

Ymgynghoriaeth Gwynedd Consultancy (YGC)

Barmouth Viaduct Gardens

Preliminary Ecological Appraisal

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 285699-00

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1. Introduction

1.1 Project background

Ove Arup and Partners Limited (Arup) has been appointed by Ymgynghoriaeth Gwynedd Consultancy (YGC) of Cygnor Gwynedd Council (CGC) to undertake a Preliminary Ecological Appraisal (PEA) for the detailed design of the Viaduct Gardens Flood Alleviation Scheme (FAS), hereafter referred to as the 'Scheme'.

Barmouth (Abermaw) in Gwynedd, Wales is located on the northern shore on the mouth of the Mawddach Estuary. Barmouth seafront is prone to flooding due to both overtopping of the sea wall and surface run-off from the bluff behind the town (Dinas Oleu). A Project Appraisal Report (PAR) was originally undertaken in 2004. This was updated in 2018 and formed the basis of an Outline Business Case (OBC), approved June 2021.

The OBC presented five objectives of the Scheme:

1. Reduce the risk of coastal flooding to properties at the Viaduct Gardens frontage, Barmouth;
2. Maintain existing landscape character of the area whilst enhancing sea defences;
3. Reduce flood risk to the A496 county road;
4. Enhance sea defences without causing damage/ harm to the natural environment; and
5. Maintain the Cambrian coast railway.

Nine options were presented within the OBC for coastal flood risk management along the seafront, of which Option 8 was preferred. Option 8 works include:

- a raised sea wall with new access gates;
- repairs to the existing sea wall;
- a new 450mm culvert in Church Street with gullies; and
- a new pumping station and outfall to upgrade existing network with additional gullies.

1.2 The Site

A plan of the site location including the study area is provided in Figure 1. The preferred option (Option 8) covers two distinct stretches of sea front at Barmouth. For the purposes of this Project, these are referred to as Frontage 1 and Frontage 2 as shown in Figure 1. Since the OBC was approved, the proposed approach along Frontage 2 has been reviewed. Concerns over the feasibility and viability of constructing a permanent set-back flood wall parapet have led to an emerging option of property level protection approach to minimise changes to the public infrastructure of the sea front. While YGC explore this option, Arup's commission in Frontage 2 is limited to including it within project investigations. The main focus of the study and design is therefore Frontage 1 and the area immediately behind Viaduct Gardens.

The Viaduct Gardens area is located near St David's Church at the south end of the town and consists of a pedestrianised public space which is bounded landward by the A496 (Porkington Terrace) and Church Street. On the seaward side is a slightly raised parapet seawall which runs along the harbour area and is just behind the railway viaduct near where it makes landfall. In addition to the railway line and roads there is significant infrastructure at this location in the form of a Welsh Water (DCWW) combined pump and combined sewer overflow (CSO), and an electricity substation.

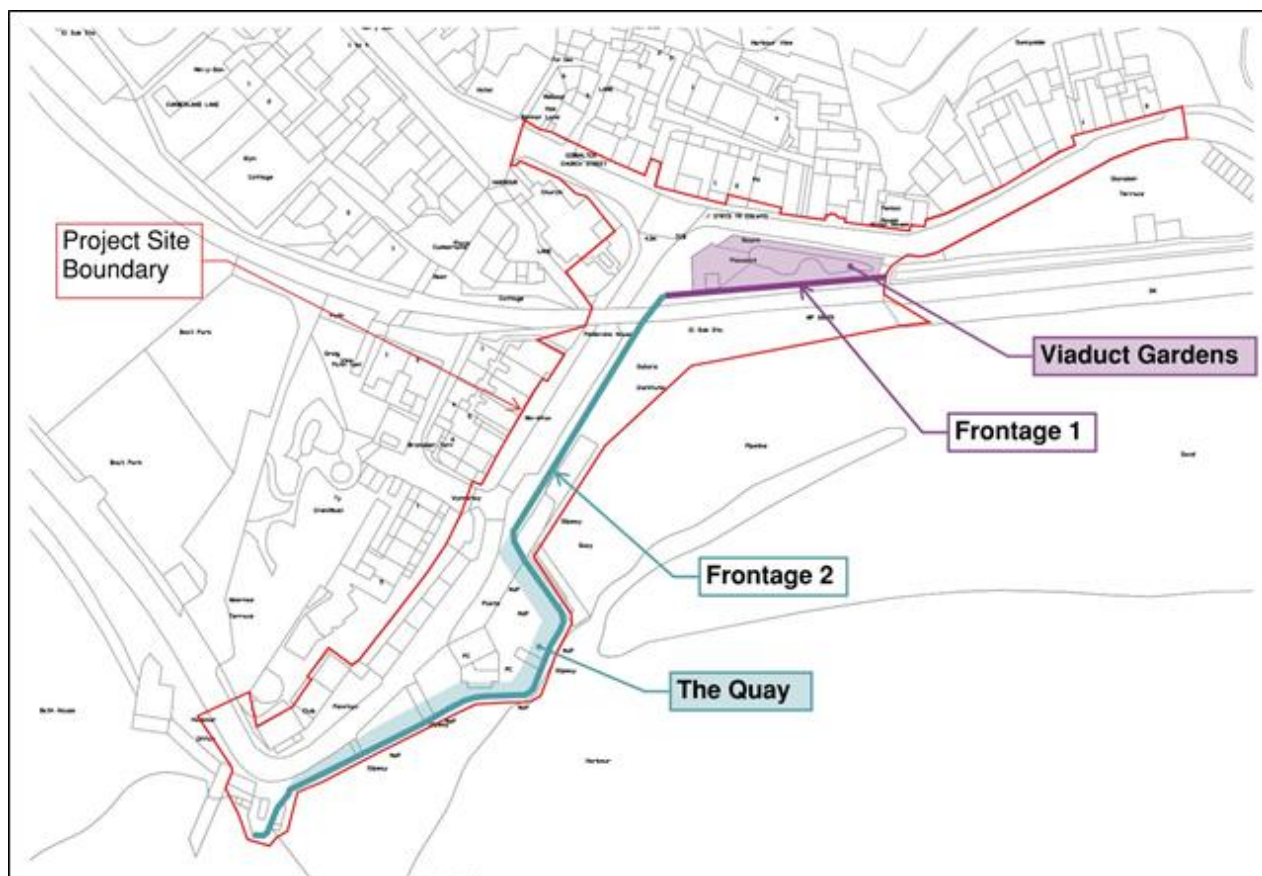


Figure 1.1: Site location plan. Study area outlined in red with key features labelled.

1.3 Scope of this report

The purpose of this report is to quantify and evaluate the potential effects of the development on habitats, species and ecosystems. This involves an assessment of the habitats present within the footprint of the works and the potential for the site to support any legally protected or notable species. Following this assessment, the report will then detail the need for any further surveys and make recommendations for mitigation and enhancement measures to be incorporated into the project where appropriate. This PEA has been written in accordance with the Guidelines for Preliminary Ecological Appraisal 2nd Edition¹.

The objectives of this PEA are:

1. To establish baseline ecological conditions in the site and within the immediate vicinity, including its potential to support important habitats and notable / protected / invasive species;
2. To identify key ecological constraints to the proposed works;
3. To inform project design to allow significant ecological effects to be avoided or minimised wherever possible; and
4. To recommend further ecological surveys required to inform an updated ecological assessment as appropriate.

¹ Chartered Institute of Ecology and Environmental Management (CIEEM) (2017). Guidelines for Preliminary Ecological Appraisal. 2nd Edition. [Online] available at: <https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpea/> (Accessed: 22/03/22).

1.4 Legislative and policy context

A list and brief overview of the key legislation that has been taken into account for the purpose of this assessment is detailed below. A full list of relevant legislation and policy is provided in Appendix A.

- The Conservation of Habitats and Species Regulations 2017 - as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Environment (Wales) Act 2016;
- Planning Policy Wales 2021;
- National Park and Access to the Countryside Act 1949 (as amended);
- Countryside and Rights of Way Act 2000 (CRoW);
- The Hedgerow Regulations 1997;
- Birds of Conservation Concern 5 2021;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996; and
- The Invasive Alien Species (Enforcement and Permitting) Order 2019.

The Conservation of Habitats and Species Regulations (CHSR) 2017 (as amended) sets out protection for habitats and species listed within its annexes. This includes legislation covering European Protected Species (EPS) and the National Site Network² (NSN).

The WCA protects a range of wildlife, the most relevant to this report including: the protection of wild birds and their eggs whilst nests are in use, making it an offence to injure or kill a number of species listed on Schedule 5, protecting wild plants listed under Schedule 8, and making it unlawful to plant or otherwise cause to spread in the wild any plant which is listed under Part II of Schedule 9. Together the CHSR and WCA form the precedent for species and habitat protection in England and Wales, which are further supplemented by legislation noted above. This legislation must be considered as part of any development proposals regardless of whether planning permission is required.

At the national level, the Environment (Wales) Act 2016 requires public authorities to seek to maintain and enhance biodiversity to promote the resilience of ecosystems when undertaking their functions. This includes consideration of species and habitat listed under Section 7 of this act as those of ‘principal importance’ to conserving and enhancing biodiversity in Wales. Additionally, Chapter 6 of Planning Policy Wales³ (which relates to conserving and enhancing the natural environment) requires development plan strategies, policies and development proposals to secure the conservation and enhancement of biodiversity, including the conservation of wildlife and habitats, safeguarding the ecological networks and components which underpin them (e.g. water and soil) and improve ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.

Further consideration to the Sustainable Management of Natural Resources (SMNR) as required under the Environment (Wales) Act has been detailed under the Natural Resources Policy⁴ (Welsh Government, 2017). This includes:

² Formerly known as ‘Natura 2000 sites’ or ‘European sites’.

³ Welsh Government Planning Policy Wales Edition 11. February 2021. Planning Policy Wales - Edition 11 (gov.wales)

⁴ <https://gov.wales/sites/default/files/publications/2019-06/natural-resources-policy.pdf>

- Using resources sustainably to support move towards a more circular economy and accelerating green growth through increasing renewable energy and resource efficiency;
- Improving ecosystem health and resilience to tackle climate change and the decline in biological diversity through the delivery of nature-based solutions for mitigation and adaption; and
- Taking a place-based approach to deliver better results at a local level by enabling collaboration at the right scale (e.g. site, regional catchment, landscape or ecosystem) and at the right locations to tackle issues and maximise benefits. Area statements (as required under Section 11 of the Environment (Wales) Act) will play a key role in identifying these local opportunities and constraints.

1.5 Local policy

Seven local planning policies are set out within the Joint Anglesey and Gwynedd Local Development Plan (LDP) (2011–2025)⁵ (see Appendix B). The current LDP encourages ‘Conserving and Enhancing the Natural Environment’ by recognising the statutory protection afforded to internationally and nationally designated landscapes, sites/ habitats and individual species. This LDP also acknowledges the key role of the planning system in protecting and enhancing the natural environment.

The current LDP is due to be updated with a Replacement Joint LDP. Local policy is subject to change upon publication of the latest LDP.

Area statements have been produced detailing the key challenges that are faced in different localities across Wales. The North West Wales Area Statement⁶ covers an extensive landscape of settlements, lowland and coastal areas, as well as upland areas (including Snowdonia National Park). The key challenge stakeholders identified in North West Wales is the climate and environment emergency with impacts of rising sea levels highlighted as a threat to vulnerable communities along the coast and severe droughts and increased frequency of wild fires causing additional stress of native wildlife and natural habitats. Further key themes identified relating to biodiversity included reconnecting people with nature, encouraging a sustainable economy, supporting sustainable land management and opportunities for resilient ecosystems.

As part of the Area Statements opportunities for biodiversity relating to the key challenges identified have included:

- Using nature-based solutions to tackle climate change, such as improving management of forests and peatlands to increase greater storage of carbon and water;
- Tapping into natural flood risk management to reduce the risk of flooding and coastal erosion to areas across the North West; and
- To support flood defences there is an opportunity to build softer approaches that encourage natural flood management techniques, including: restoring degraded peatland, tree planting in the uplands and reinstating hedgerows. This will support biodiversity conservation and habitat connectivity.

⁵ <https://www.gwynedd.llyw.cymru/en/Council/Documents---Council/Strategies-and-policies/Environment-and-planning/Planning-policy/Anglesey-and-Gwynedd-Joint-Local-Development-Plan-Written-Statement.pdf> [Last accessed: 05/04/2022]

⁶ <https://naturalresources.wales/about-us/area-statements/north-west-wales-area-statement/?lang=en> [online] [Last Accessed: 05/04/2022]

2. Methodology

2.1 Zone of Influence

The current guidance on ecological assessments (Chartered Institute of Ecology and Environmental Management (CIEEM)⁷ recommends that all ecological features that occur within a 'Zone of Influence' (ZoI) for a proposed development are investigated.

The ZoI includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of wider disbenefits including, but not limited to, any increase in air, water, or noise pollution; or visual or vibrational disturbance during construction and/or operation.

The ZoI is variable depending on the nature of the construction activities and the ecological receptors affected. For this assessment the following zones have been defined (Table 1).

Table 2.1: Zone of influence used for this assessment

Ecological features	Zone of Influence
Statutory designated sites	10km around site boundary
Non-statutory designated sites	2km buffer around site boundary
Relevant species records (including protected and invasive species)	2km from around boundary
Appraisal of habitats and potential for protected species	50m buffer around site boundary

2.2 Desk study

A desk study has been undertaken to determine the presence of designated sites and protected or notable species within the ZoI of the site, as determined in Section 2.1. Species records obtained from the local data centre (Cofnod) have been curtailed to the last ten years to ensure validity. The following sources have been consulted as part of the desk study:

- Multi-Agency Geographical Information for the Countryside (MAGIC)⁸;
- Cofnod - the Local Environmental Records Centre for North Wales⁹
- Joint Nature Conservation Committee (JNCC)¹⁰;

⁷ Chartered Institute of Ecology and Environmental Management (CIEEM), 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine.

⁸ <https://magic.defra.gov.uk/MagicMap.aspx>

⁹ <https://www.cofnod.org.uk/Home>

¹⁰ <https://jncc.gov.uk/>

- Natural Resources Wales Wildlife and Biodiversity Guidance and Advice¹¹;
- Lle: A Geo-Portal for Wales¹²
- OS Open Maps (<https://www.openstreetmap.org>);

2.3 Extended Phase 1 Habitat Survey

The site was inspected to establish the presence, or potential presence, of protected or notable species or habitats (or invasive species) which would be affected by the proposed works. Habitats were mapped on the Extended Phase 1 Habitat Survey Plan with reference to JNCC's Handbook for Phase 1 Habitat Survey¹³ within and up to 50m from the Site boundary. Target Notes (TNs) were used to highlight any features of interest, such as those that provide suitable habitat for protected species, or habitats that were too small to appear at the drawing's resolution.

Relevant species included all those protected by European or UK law, and notable species including those identified as being of principal importance in Wales, in response to Section 7 of the Environment (Wales) Act 2016 (Appendix A), as follows:

- Rapid visual inspection to identify structures and trees (from the ground only) that will require further survey to assess their suitability to support breeding, resting and hibernating bats, based on those outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines Good Practice Guidelines¹⁴;
- Outline the potential for habitats to support badger (*Meles meles*) and carry out preliminary searches for signs of badger activity including setts, tracks, foraging holes and latrines¹⁵;
- Outline the potential for habitats and watercourses to support otter (*Lutra lutra*) and carry out preliminary searches for signs of otter¹⁶;
- Outline the potential for habitats to support nesting birds (including any old nests);
- Outline the potential for habitats to support common species of reptiles; adder, (*Vipera berus*), grass snake (*Natrix helvetica*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*)¹⁷;
- Outline the potential for habitats to support assemblages of notable invertebrates; and
- Searching for evidence of the presence of invasive plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), such as New Zealand pigmyweed (*Crassula Helmsii*) or Japanese knotweed (*Fallopia japonica*) and The Invasive Alien Species (Enforcement and Permitting) Order 2019, which are subject to strict legal control, such as Himalayan balsam (*Impatiens glandulifera*).

An Extended Phase 1 Habitat Survey was undertaken by Arup Ecologist Hayley Glanville between 9th and 10th February 2022. Alongside this survey, a preliminary inspection of the intertidal habitats was carried out by Arup Graduate Consultant Bethan Follis.

¹¹ <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity>

¹² <http://lle.gov.wales/home>

¹³ JNCC (2016). Handbook for Phase 1 habitat Survey: technique for environmental audit.

¹⁴ Collins, J. (2016). Bat Surveys: Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London.

¹⁵ Harris, S., Cresswell, P. and Jefferies, D., 1989. Surveying Badgers. Mammal Society.

¹⁶ Chanin, P. (2003). Monitoring the Otter, *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10., English Nature, Peterborough.

¹⁷ Gent, T. & Gibson, S. (2003). Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough.

2.4 General survey limitations and specific constraints

The findings presented in this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys can be limited by factors affecting the presence of plants and animals, such as the time of year, migration patterns and behaviour. This survey was undertaken in February which is beyond the optimal period for vegetation surveys (typically April to September) and as such, some species and indicators may therefore have not been identified.

Whilst not a full protected species or botanical survey, an Extended Phase 1 Habitat Survey allows an experienced ecologist to obtain a sufficient understanding of the ecology of a site in order to either confirm the conservation importance of the site and assess the potential for impacts on habitats and species likely to represent a material consideration in planning terms, or to ascertain that further surveys will be required before such confirmation can be made.

The survey period was timed to be carried out during the level of low tide, however during this survey period some substrate within the southern aspect of the survey area was still situated below the tide. This restricted surveyor access to fully survey the coast, including the seawall for potential marine invertebrate species and potential bat roosting features (PRF). A Phase 1 Habitat survey of coastal substrate (intertidal habitat) was still able to be carried out due to the high visibility and shallow level of the sea water. Surveyors were able to continue this survey by viewing the habitat from above, standing atop the seawall behind a barrier.

The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. Moreover, information obtained during the desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a habitat or species does not necessarily mean the absence of habitats or species on the site or surrounding.

In spite of the limitations outlined above, this report is considered to deliver an adequate baseline appraisal of the ecological features for the management scheme. The limitations are not considered critical enough to skew the outcomes and further recommendations described in this report.

3. Results and interpretations

3.1 Designated sites

3.1.1 Statutory designated sites

A total of nine internationally designated sites were identified within 10.0km of the proposed works, including Special Areas of Conservation (SAC) and Special Protection Areas (SPA). Two of these sites, Llein Peninsula and the Sarnau SAC and Meirionnydd Oakwoods and Bat Sites SAC, are situated within 2.0km of the proposed works.

A total of seventeen Sites of Special Scientific Interest (SSSIs) were identified within 10.0km of the proposed works. Two of these sites, Mawddach Estuary SSSI and Barmouth Hillside SSSI were identified within 2.0km of the site. Full details of statutory sites, including details of the site's features can be found in Table 2 and viewed in Figure 2.1.

Table 3.1: Statutory designated sites

Designated site	Site features	Distance and direction from the sites
Internationally designated sites		
Llein Peninsula and the Sarnau SAC	This site is primarily designated for: - Sandbanks which are slightly covered by sea water all the time; - Estuaries, including the Glaslyn/Dwryd, Mawddach and Dyfi estuaries. The intertidal sandflats support communities of burrowing invertebrates, including dense populations of polychaete worms (such as <i>Levinsenis gracilis</i>), crustaceans (such as <i>Eudorella truncata</i>), bivalve molluscs (such as <i>Mysella bidentata</i>) and gastropod molluscs (such as <i>Otina ovata</i>); - Saltmarsh fringing the shores of the estuaries, and the saltmarsh creeks and pools, are important habitat features for juvenile fish; - Coastal lagoon Morfa Gwylt is a small percolation lagoon that consists of a depression in a shingle bar across the mouth of the Afon Dysynni in mid Wales. This is the only example of a percolation lagoon in Wales. Three lagoonal specialists have been found at this site: an amphipod (<i>Sphaeroma hookeri</i>), a bryozoan (<i>Conopeum seurati</i>) and an alga (<i>Chaetomorpha linum</i>); - Large shallow inlets and bays, such as the seabed of Tremadog Bay on the south side of the Llein Peninsula, consisting of a mosaic of different sediment types. Algal species (<i>Naccaria wiggii</i> and <i>Sciniaia</i> spp.) are present. Burrowing animals, including bivalves, crabs, brittlestars, urchins and worms, dominate the muddier sediments. Beds of eelgrass (<i>Zostera angustifolia</i>) and muddy gravel shores. Gravelly beach supports a nationally rare amphipod (<i>Pectenogammarus planicrurus</i>). Several unusual species include bearded red seaweed (<i>Anotrichium barbatum</i>) and a mantis shrimp (<i>Rissoides desmaresti</i>); and - Reefs encompassing a varied range of reef habitats, including submerged and intertidal glacial moraines. There are distinctive communities on bedrock and boulders, ranging from sites exposed to very strong	On site.

Designated site	Site features	Distance and direction from the sites
	wave action and/or tidal streams to sites sheltered from strong water movement. Algal communities are dominant over much of the reefs, with growths of foliose red and brown algae forming very dense beds in many places, in the absence of shading from kelp. Two brown algae species (<i>Chorda filum</i> and <i>Laminaria saccharina</i>) and red algae flourish on or near the reef crest, the number of algae species on pebbles increases with depth. In certain areas there are extensive forests of sea-oak (<i>Halidrys siliquosa</i>). Rich animal-dominated biotopes are found in the deeper parts of the reefs, including crustaceans, cnidarians, sponges, hydroids and encrusting bryozoans. • Glasswort (<i>Salicornia</i> sp.) and other annuals colonising mud and sand; • Otter, grey seals (<i>Halichoerus grypus</i>) and bottlenose dolphins (<i>Tursiops truncatus</i>) are present.	
Meirionnydd Oakwoods and Bat Sites SAC	The site is primarily designated for its old sessile oak (<i>Quercus petraea</i>) woods with genus Ilex and genus Blechnum in the British Isles, alluvial forests with alder (<i>Alnus glutinosa</i>) and ash (<i>Fraxinus excelsior</i>) (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>), and lesser horseshoe (<i>Rhinolophus hipposideros</i>) bat populations which includes the majority of known maternity roosts in Meirionnydd and several hibernacula.	20m north-east at closest approach.
Northern Cardigan Bay SPA	Over winter: Red-throated diver (<i>Gavia stellata</i>), 1,186 individuals representing 7% of the wintering population in Great Britain (2001/02 – 2003/04)	3.5km west, hydrologically connected via Mawddach Estuary and west towards Barmouth Bay.
Cadair Idris SAC	Oligotrophic to mesotrophic standing waters, with clear-water lakes with aquatic vegetation and poor to moderate nutrient levels. Contains siliceous scree with parsley fern (<i>Cryptogramma crispa</i>) and wavy hair grass (<i>Deschampsia flexuosa</i>) NVC community present. Calcareous and siliceous rock slopes with chasmophytic vegetation are also important for this site, including <i>Cryptogramma crispa</i> – <i>Deschampsia flexuosa</i> NVC community present in some places.	4.3km south-east at closest approach.
Morfa Harlech a Morfa Dyffryn SAC	Designated for its presence of important species, including dunes with creeping willow (dunes with <i>Salix repens</i> ssp. <i>Argentea</i> (<i>Salicion arenariae</i>)), embryonic shifting dunes, humid dune slacks, petalwort (<i>Petalophyllum ralfsii</i>) and shifting dunes along the shoreline with European marram grass (<i>Ammophila arenaria</i>) – known as ‘white dunes’.	7.1km north-west at the closest approach, connected hydrologically along the west coast.
Cadair Idris NNR	The rocky peaks of Cadair Idris were formed by volcanic processes and later sculpted over many Ice Ages by glaciers as they thawed and shattered the rocks. The geology supports a wealth of wildlife and special plants.	8.1km south-east at closest approach.
Morfa Dyffryn NNR	Morfa Dyffryn National Nature Reserve is one of the most important dune systems in Wales because of its bare sand and wildlife habitats. Dunes like these with bare sand areas are becoming increasingly rare.	8.6km north-west at closest approach, connected hydrologically along the west coast.

Designated site	Site features	Distance and direction from the sites
Craig yr Aderyn (Bird's Rock) SPA	Chough (<i>Pyrrhocorax pyrrhocorax</i>) present during the breeding season, 6 pairs representing 1.8% of the breeding population of Great Britain (1999). A total of 55 individuals of chough present over winter, representing 8% of the wintering population of Great Britain (1996).	8.6km south-east at closest approach.
Rhinog SAC	Designated for its dry heaths and old sessile oak woods, with genus <i>Ilex</i> and genus <i>Blechnum</i> .	9.5km north.
Nationally designated sites		
Mawddach Estuary SSSI	Designated for its biological features, including the estuary itself, a large shallow estuary which drains south-west into Cardigan Bay, and a series of adjacent habitats. The overall management objective for the SSSI is to retain the habitat- and species-related interest of the area. Aber Mawddach supports other notable invertebrates and is of local importance for its breeding birds and wintering wildfowl. Breeding birds include skylark (<i>Alauda arvensis</i>), barn owl (<i>Tyto alba</i>), song thrush (<i>Turdus philomelos</i>), reed bunting (<i>Emberiza schoeniclus</i>), grasshopper warbler (<i>Locustella naevia</i>), reed warbler (<i>Acrocephalus scirpaceus</i>), kingfisher (<i>Alcedo atthis</i>), water rail (<i>Rallus aquaticus</i>) and goosander (<i>Mergus merganser</i>). Chough feed here, and breed and roost nearby. Wintering wildfowl and waders include wigeon, teal, oystercatcher, curlew and shelduck. The Mawddach estuary used to be locally important for breeding lapwings up until the early 1990s.	On site.
Barmouth Hillside SSSI	Situated on the slopes immediately north of Barmouth town, containing an area of rare wind-pruned oak woodland. This site also contains disused quarries, mine workings and spoil tips as a legacy of previous slate mining activity. Species in ground flora include bluebell (<i>Hyacinthoides non-scripta</i>) and wood sage (<i>Teucrium scorodonia</i>). Localised nutrient enrichment due to the presence of manganese shales results in more lush flora including Ramsons (<i>Allium ursinum</i>) and Cuckoo-pint (<i>Arum maculatum</i>) with ash often abundant. One to two pairs of chough breed here and feeding chough are regularly seen in small numbers throughout the year. A flock of 30 birds has been recorded recently and the site used to support a communal roost.	20m north-east at closest approach.
Ty Bach Ystlumod SSSI	Tŷ Bach Ystlumod is of special interest as a breeding roost of lesser horseshoe bats. The bats use Tŷ Bach Ystlumod during the summer months to raise their young. The bats use walls extending from the roost as flight lines to access the adjacent mature broadleaved woodland, which provides extensive feeding habitat.	2.5km south-east at the closest approach.
Arthog Hall Woods SSSI	A biological site selected as an example of a bryophyte-rich woodland with several rare and uncommon species. Sessile oak and downy birch (<i>Betula pubescens</i>) are the main canopy tree species with smaller amounts of ash, beech (<i>Fagus sylvatica</i>) and sycamore (<i>Acer pseudoplatanus</i>). Rare and uncommon bryophytes are present (<i>Jamesoniella autumnalis</i> , <i>Adelanthus</i>	2.9km south-east at closest approach. 4.4km connected hydrologically, however the Afon Arthog is upstream of the Mawddach Estuary and is

Designated site	Site features	Distance and direction from the sites
	<i>decipiens</i> , <i>Lepidozia cupressina</i> , <i>Fissidens celticus</i> and <i>Riccurdia palmata</i>).	not at risk of hydrological contamination.
Glannau Tonfanau i Friog SSSI	Geological and marine biological features, including its structural geological and mineralogical features which provide important evidence regarding the age of the Dolgellau Gold-Belt. This coast is also of special interest for its biogenic reefs, specialised rockpools and its extensive, natural, mixed substrate shore. There are unique reef features providing habitat for marine life. Coast here is known for extensive natural mixed substrata shore with honeycomb worm (<i>Sabellaria alveolata</i>) biogenic reefs and diverse coralline rockpools.	3.5km south hydrologically connected along Barmouth Bay.
Cregennen a Pared y Cefn Hir SSSI	Nationally important geological site providing exposed sections through the lower part of the Aran Volcanic Group. Site enables observing the relationships between rocks of mixed origin and for dating the volcanic episodes which interrupted normal marine sedimentation. The site is a key teaching, educational and research locality which is complementary to the classic volcanic terrain of nearby Cadair Idris.	3.9km east at the closest approach.
Cadair Idris SSSI	Rocky peaks formed by volcanic processes and later sculpted over many Ice Ages by glaciers as they thawed and shattered the rocks. The geology supports a wealth of wildlife and special plants.	4.3km south-east at closest approach.
Coedydd Abergwynant SSSI	Situated within Snowdonia National Park. Large oak woodland along the often steep-sided ravine of the Afon Gwynant. Dominated by sessile oak, also areas of mixed deciduous woodland with ash and wych elm (<i>Ulmus glabra</i>), and locally rare shrub spindle (<i>Euonymus europaeus</i>) reflects the underlying, less-acidic Ordovician volcanic rocks amongst the more common, acidic sedimentary rocks. Important site for ferns and bryophytes, also lichen flora. Several species of true flies Diptera have been recorded which are of restricted local or national distribution (including the rare <i>Dicranota gracilipes</i>).	5.9m east at closest approach. Connected hydrologically, however the Afon Gwynant is upstream of the Mawddach Estuary and therefore is not at risk of hydrological contamination.
Coed Cors y Gedol SSSI	One of the best examples of a woodland type for which West Wales is an important centre of distribution. It has a diversity of young, regenerating sessile oak and birch, smaller amounts of ash and goat willow (<i>Salix caprea</i>), and enhanced structural diversity with large amounts of hazel (<i>Corylus avellana</i>) and mature woodland to the south and south of the central area. There is a diversity of ground flora, fern and bryophyte. Grasses with rare bryophytes are present.	6.6km north-west at closest approach. Connected hydrologically, however the Afon Ysgethin is situated upstream, therefore is not at risk of hydrological contamination.
Morfa Dyffryn SSSI	Sand dunes, the seashore, saltmarsh and grassland. The site is also notified for its nationally rare and scarce higher plants, mosses and liverworts, nationally rare and scarce invertebrates, a population of great crested newts and honeycomb worm reefs.	6.9km north-west at closest approach.
Llyn Gwernan SSSI	An important palynological site, notable for an unusual thickness of Devensian Late-glacial organic deposits. These deposits preserve a detailed pollen record which, together with radiocarbon dates, has allowed far greater resolution of Late-glacial environmental change in Wales than at other sites.	8.4km east at the closest approach.

Designated site	Site features	Distance and direction from the sites
Craig yr Aderyn (Bird's Rock) SSSI	An important breeding location for chough and cormorant (<i>Phalacrocorax carbo</i>), a roosting site for chough throughout the year. Craggs support over 1% of the British population of breeding chough, with five or more pairs nesting in holes and crevices. Non-breeder chough in the summer, high numbers outside the breeding season. Represent between 4-6% of the British wintering population. Unimproved acid grassland to north and east forms a large-scale mosaic with bracken (<i>Pteridium aquilinum</i>). The maintenance of a short sward of this grassland is one of the major factors influencing the number of breeding and roosting birds. Acidic, dry heathland occurs in the south-eastern part of the site. A small area of base-enriched marshy grassland above Gesail adds to the plant diversity.	8.6km south-east at closest approach.
Llwyn-iarth SSSI	Species-rich neutral grassland and large population of wood bitter-vetch (<i>Vicia orobus</i>). Extensive areas of flush and fen, and mixture of habitats which includes wet heath, marshy and acid grassland. It is also note for its geology.	8.6km east at the closest approach.
Penmaenuchaf Hall SSSI	A breeding roost of the lesser horseshoe bat. Used during the summer months by bats in order to raise their young. Lesser horseshoes return annually to the same site. Since 1994, the site has been used by over 100 bats annually. The site also supports a breeding roost of brown long-eared bats (<i>Plecotus auritus</i>). Natterer's bats (<i>Myotis nattereri</i>), common pipistrelles (<i>Pipistrellus pipistrellus</i>) and whiskered/Brant's bats (<i>Myotis mystacinus/brandtii</i>) have also been recorded at the site.	8.6km east at the closest approach.
Caeau Bwlch SSSI	The site supports one or more populations of hornet robberfly (<i>Asilus crabroniformis</i>), a rare species of fly which was first recorded here in 1992. This is one of the most important sites for the species in Wales and is currently one of only two known sites in north-west Wales.	9.4km north-west at closest approach.
Foel Ispri SSSI	One of numerous mines in the vicinity which lie within the Dolgellau Gold Belt. Of special scientific interest for the study of in situ mineralisation and associated wall-rock alteration as well as facilitating investigations into the mechanism of lode emplacement in various types of rock.	9.4km north-east at the closest approach.
Rhinog SSSI	Composed of hard, acidic Cambrian grits of the Harlech Dome, Rhinog has a rugged topography with block-littered slopes, numerous cliffs and rock outcrops. Heather (<i>Calluna vulgaris</i>) dominates large areas. Bryophyte carpets occur underneath and northern species (including <i>Ptilium cristacastrensis</i> and <i>Anastrepta orcadensis</i>) are present. Unique in Britain, its low level of grazing exploitation is unusual, suitable ecological study of upland vegetation less degraded than in most British mountains.	9.5km north.

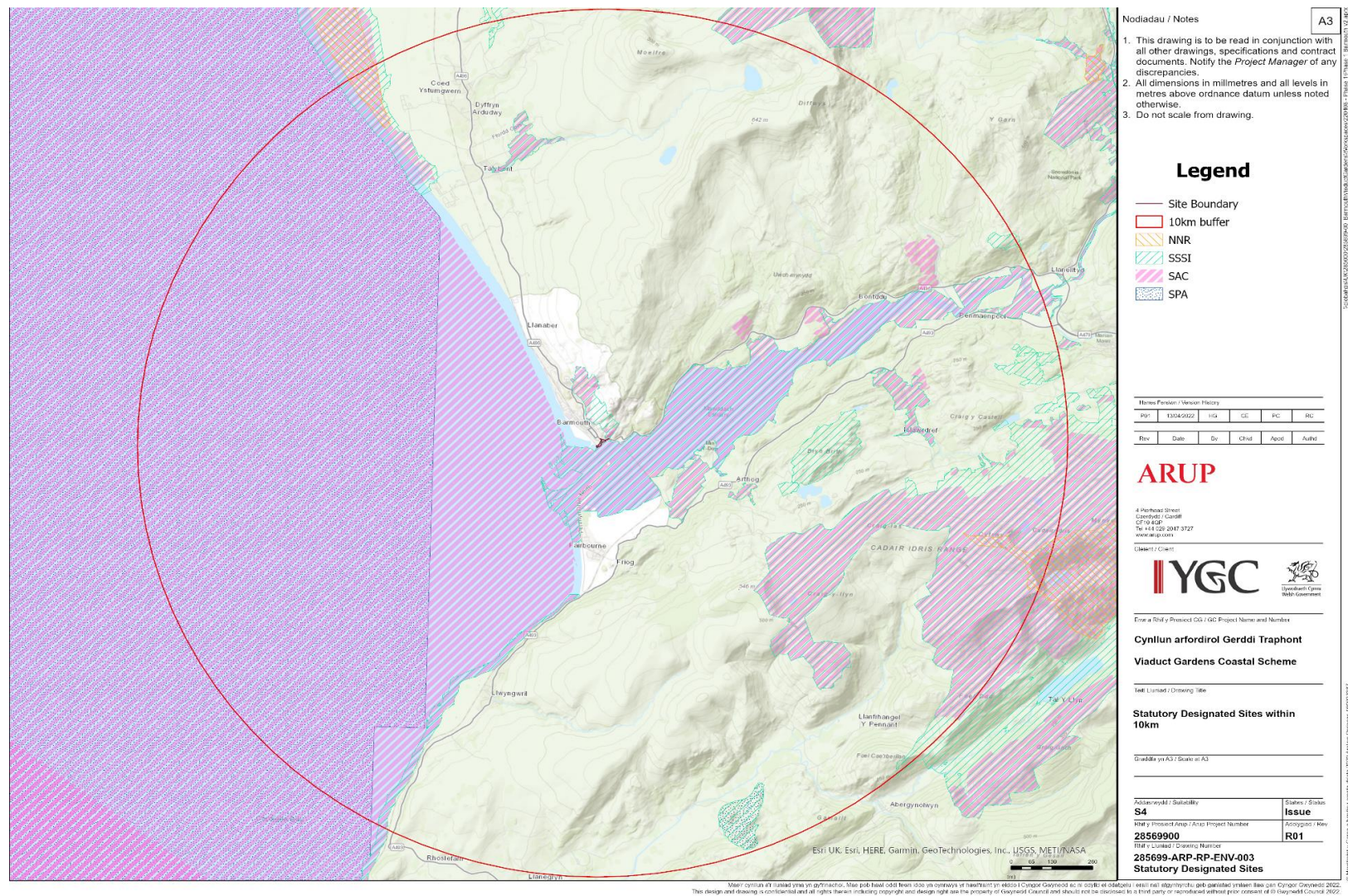


Figure 3.1: Location of statutory designated sites within 10km of site boundary¹⁸

¹⁸ Multi-Agency Geographical Information for the Countryside (MAGIC), [Online] Available at: URL: <https://magic.defra.gov.uk/MagicMap.aspx> [Last Accessed: 07/04/2022]. Ordnance Survey 100022861.

3.1.2 Non-statutory designated sites

There are 30 non-statutory designated sites within 2.0km of the Site. St David's Church lies within the Site boundary. Two listed buildings, listed as 'Quay Cottage' and 'Former Wash-House Or Shop Advanced to the Right Of Quay Cottage', are within 50m of the Site. This list of Sites is comprised of Sites of Importance for Nature Conservation (SINCs), ancient woodland sites and a traditional orchard site, outlined in Table 3.2.

Table 3.2: Non-statutory designated sites

Designated site	Site features	Distance and direction from the site
Dinas Oleu SINC	Habitat includes dry dwarf shrub heath	78m north
Garn SINC	Habitat includes: dry heath/acid grassland mosaic; acid grassland	0.2km east at closest approach
Orielton Wood SINC	Habitat includes: broadleaved woodland; dry dwarf shrub heath	0.5km east
Ancient Woodland 25273	Restored Ancient Woodland Site	0.5km east
Ancient Woodland 24006	Ancient Semi Natural Woodland	0.5km east
Ancient Woodland 24007	Ancient Semi Natural Woodland	0.6km north east
Ancient Woodland 24015	Restored Ancient Woodland Site	0.6km north east
Ancient Woodland 24008	Ancient Semi Natural Woodland	0.7km north east
Ancient Woodland 24002	Ancient Semi Natural Woodland	0.8km north west
Wern Mynach SINC	Habitat includes: wet woodland; marshy grassland.	1.0km north west
Ancient Woodland 24009	Ancient Semi Natural Woodland	1.1km north west
Fegla Fawr Saltings SINC	Coastland. Grazed saltings of grass (<i>Puccinellia Festuca</i>) with some open mud and channels. <i>Carex punctata</i> and <i>Eleocharis quinqueflora</i> occur with lichen flora, <i>Anagallis minima</i> and <i>Radiola linoides</i> on slopes at east edge dependent upon maritime conditions.	1.1km south east
Ancient Woodland 24016	Restored Ancient Woodland Site	1.2km north west
Ffridd y Graig & south to Garn SINC	Habitat includes: acid grassland; dry dwarf shrub heath	1.2km north
Ancient Woodland 24011	Ancient Semi Natural Woodland	1.3km north west
Ancient Woodland 24015	Ancient Semi Natural Woodland	1.3km north east
Ancient Woodland 24004	Ancient Semi Natural Woodland	1.3km north west
Coed Glan y Mawddach SINC	Habitat includes: woodland - mixed, many exotic spp.	1.4km north east
Ancient Woodland 24003	Ancient Semi Natural Woodland	1.4km north
Ancient Woodland 24283	Restored Ancient Woodland Site	1.4km north east
Fegla Fawr Hill SINC	Heavily grazed rocky lowland (coastal) grassland. Oak woodland with a wide range of flowering plants, lichens bryophytes. Includes <i>Euonymus europaeus</i> and <i>Ophioglossum azoricum</i> , latter at SH62921490 to SH63001490 (now in SSSI)	1.5km north east

Designated site	Site features	Distance and direction from the site
Ceilwart-ganol SINC	Habitat includes: acid grassland; bracken	1.5km north west
Ancient Woodland 24017	Restored Ancient Woodland Site	1.5km north east
Ancient Woodland 42005	Ancient Semi Natural Woodland	1.5km north west
Ancient Woodland 25274	Ancient Semi Natural Woodland	1.5km south east
Traditional Orchards	GWYN0334	1.7km north west
Ancient Woodland 24278	Ancient Semi Natural Woodland	1.8km south east
Ancient Woodland 24284	Ancient Semi Natural Woodland	1.8km south east
Llwyn-on SINC	Peatlands. Basin mire of <i>Erica/ Eriophorum</i> with some sphagnum and <i>Juncus acutiflorus</i>	1.8km north east
Barmouth Junction Railway SINC	Disused railway line. <i>Foeniculum vulgare</i> , <i>Heracleum sphondylium</i> , <i>Hypericum perforatum</i> , <i>Lathyrus sylvestris</i> , <i>Lathyrus pratensis</i> and <i>Ononis repens</i> on railway ballast	1.9km south east

3.2 Habitats

3.2.1 Desk study

Several of the habitats within and adjacent to the study area are likely to be considered habitats of principal importance for the conservation of biodiversity as listed on Section 7 of the Environment (Wales) Act (2016). These are summarised below:

- Saline lagoon at Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Intertidal mudflats within Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Sheltered muddy gravels within Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Coastal grazing marsh surrounding Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Subtidal sandbanks present in Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Honeycomb worm (*Sabellaria alveolata*) reefs within Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Reedbeds within Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC;
- Upland oak woodland at Meirionnydd Oakwoods and Bat Sites SAC;
- Inland rock outcrop and scree habitat at of Barmouth Hillside SSSI and Dinas Oleu SINC;
- Coastal saltmarsh present in Mawddach Estuary SSSI and Lleyn Peninsula and the Sarnau SAC, adjacent to Barmouth Bridge and Fairbourne Spit;
- Coastal sand dunes situated south at Fairbourne Spit;
- Estuarine rocky habitats situated at south-west Barmouth and Fairbourne Spit;
- Traditional orchard situated 1.7km north-east of the Site; and
- Dry heath/acid grassland mosaic at Barmouth Hillside SSSI.

Furthermore, a total of 18 ancient woodland sites were identified within 2.0km of the study area. These habitats of principle importance for conservation are protected under Planning Policy Wales 2021¹⁹ (Appendix A).

3.2.2 Field survey

Habitats within the survey area are described below. These should be read in conjunction with the Extended Phase 1 Habitat Survey Plan and associated target notes (Figure 4). The habitats are listed in the order found in the JNCC's Phase 1 Handbook.

3.2.2.1 A2.2 Scattered scrub

Scattered scrub is present within the church courtyard within the north-west of the Site, comprising rose (*Rosa* sp.) shrubs.

3.2.2.2 A 3.1 Broadleaved parkland/scattered trees

Broadleaved parkland trees are scattered within the Viaduct Gardens area, comprising entirely of cherry (*Prunus* sp.). Four cherry trees are scattered surrounding the border of the church courtyard.

¹⁹ Welsh Government Planning Policy Wales Edition 11, February 2021. Planning Policy Wales - Edition 11 (gov.wales)

3.2.2.3 A3.2 Coniferous parkland/scattered trees

Coniferous parkland trees are scattered within the Viaduct Gardens area, comprising western red cedar (*Thuja plicata*).

3.2.2.4 H1.1 Intertidal mud/sand

There is a mosaic of intertidal habitat present within the northern aspect of the coastal area, between the south-facing sea wall and the north-facing slipway. A strip of intertidal bare sand is present within the Mawddach Estuary underneath Barmouth Bridge and on the south aspect of the Barmouth Bridge. Bare sand is present adjacent to the north-facing slipway and extends north towards the Barmouth Bridge, parallel with the iron fencing.

Intertidal bare sand is the only intertidal habitat present within the southern aspect of the site. This habitat is adjacent to the seawall and extends from the north-facing slipway southwards to the south-facing slipway. The tide within the southern aspect of the Site was above the coastal substrate level, therefore was surveyed from above the seawall, looking through the depth of the tide at the substrate below.

3.2.2.5 H1.1.3 Intertidal mud/sand with brown algal beds

Intertidal sand with sparse brown algal beds is present within the mosaic intertidal habitat that is situated in the northern area of the coastal habitat, between the south-facing sea wall and the north-facing slipway. It is grouped in two areas. A strip of this habitat is present adjacent to the east-facing seawall, on the north aspect of the north-facing slipway. It is adjacent to an area of intertidal boulders/rocks that have become established by brown algal beds. Species present include egg wrack (*Ascophyllum nodosum*), bladder wrack (*Fucus vesiculosus*) and spiral wrack (*Fucus spiralis*).

3.2.2.6 H1.2 Intertidal shingles/cobbles

Intertidal shingle habitat is within the mosaic intertidal habitat that is situated in the northern area of the coastal habitat, between the south-facing sea wall and the north-facing slipway. It is present underneath the Barmouth Bridge, extending slightly south into the coastal area and stretching west parallel with the bridge. It is adjacent to artificial sea wall, which is present on its north and east aspect.

3.2.2.7 H1.2.2 Intertidal shingles/cobbles with green algal beds

Intertidal shingles with green algal beds are present in a small area within the mosaic intertidal habitat that is situated in the northern area of the coastal habitat. Species present include sea lettuce (*Ulva* sp).

3.2.2.8 H1.3 Intertidal boulders/rocks

Intertidal boulders and rocks are present within the mosaic intertidal habitat that is situated in the northern area of the coastal habitat, between the south-facing sea wall and the north-facing slipway. Boulders are present underneath the west aspect of the Barmouth Bridge and adjacent to the south-facing sea wall.

3.2.2.9 H1.3.3 Intertidal boulders/rocks with brown algal beds

Intertidal rocks with brown algal beds are present within the mosaic intertidal habitat that is situated in the northern area of the coastal habitat, between the south-facing sea wall and the north-facing slipway. The rocks extend from the east side of the Barmouth Bridge south-eastwards to the Site boundary. Species present include egg wrack, bladder wrack and spiral wrack.

3.2.2.10 I1.4 Other exposure

Rock exposure that has become colonised by vegetation, situated between Barmouth Sailors' Institute and Barmouth Bridge. Species present include willow (*Salix* spp.), ivy-leaved toadflax (*Cymbalaria muralis*), maidenhair spleenwort (*Asplenium trichomanes*), ivy (*Hedera* spp.), ribwort plantain (*Plantago lanceolata*), common dandelion (*Taraxacum officinale*), red valerian (*Centranthus ruber*) and cock's-foot (*Dactylis glomerata*).

3.2.2.11 J1.2 Amenity grassland

Amenity grassland is present within the Viaduct Gardens area and within the church courtyard. A mixture of species are present within these areas, including perennial ryegrass (*Lolium perenne*), common chickweed (*Stellaria media*), common daisy (*Bellis perennis*), ribwort plantain, common dandelion, forget-me-not (*Myosotis* spp.), bittercress (*Cardamine* spp.), rough hawkbit (*Leontodon hispidus*), and common yarrow (*Achillea millefolium*). Species present within margins included crane's-bill (*Geranium* spp.), lesser celandine (*Ficaria verna*), bramble (*Rubus* spp.), common daisy and white clover (*Trifolium repens*).

3.2.2.12 J1.4 Introduced shrub

Non-native shrubs have been planted for ornamental purposes within the Viaduct Gardens area to border the grassland area. Species present included *Phormium* spp., *Viburnum* spp. and family Cupressaceae.

3.2.2.13 J2.4 Fence

Iron fencing borders the Viaduct Gardens area, segregating it from the concrete path and road. Wooden fencing is present within the Viaduct Gardens area to form a bin store.

Iron fencing is present as a boundary between the promenade and the seawall edge, stretching along the south-west perimeter of the promenade.

Fencing is present within the church courtyard, segregating the courtyard on the south-east aspect of the church from the grassland on the north-east aspect of the church.

3.2.2.14 J2.5 Wall

Wall is present around the perimeter of the church gardens and borders the courtyards of residential houses and shops. Species identified growing on the wall included common polypody (*Polypodium vulgare*), maidenhair spleenwort, common sowthistle (*Sonchus oleraceus*), herb robert (*Geranium robertianum*), self-heal (*Prunella vulgaris*), moss (*Bryophyta* sp.) and ivy-leaved toadflax.

Wall is present behind buildings on the west aspect of the Quay, forming a barrier between the building's rear open space and public access. There is an inclined pathway on the west aspect of the wall that leads to residential housing and a hotel.

3.2.2.15 J3.5 Artificial sea wall

The seawall is present on the south-east aspect of the site, bordering where the land meets the coast. It extends from Frontage 1 southwards along Frontage 2. It is of masonry composite.

3.2.2.16 J3.6 Buildings

A range of residential, commercial, worship and leisure activity buildings are found within 50m of the site.

3.3 Protected and notable species

Records of protected and notable species within 2.0km of the proposed Scheme at Viaduct Gardens, Barmouth are listed below. All records below were observed during the last 10 years. Species-specific legislation is outlined in Appendix A.3. Records of bat roosts and badgers are sensitive and should be treated as confidential.

3.3.1 Mammals

3.3.1.1 Bats

Desk study

Bat species recorded during the last ten years within 2.0km of the Site comprise common pipistrelle and lesser horseshoe bat. A common pipistrelle was recorded foraging approximately 0.2km north-west of the Site at the Lion Hotel, Barmouth. Three lesser horseshoe bat roosts have been recorded, the closest record being that of a hibernation roost situated 1.5km north-east of the Site, near Panorama Walk.

Field survey

During the Extended Phase 1 Habitat survey, a rapid visual inspection of trees and buildings was carried out to identify whether further surveys would be required in order to assess the roosting potential of trees and buildings surrounding the Site. There were no trees within 50m of the Site that had potential to support roosting bats. At least three buildings were noted with potential to support roosting bats, including St David's Church, a public toilets block and residential housing. Exposed rock and cliff face habitat situated within 50m north of the Site also has potential to support roosting bats in voids or crevices such as cracks, breaks and flakes²⁰. Suitable foraging habitat is also present within surrounding designated sites, including areas of scrub present on the rock face and scrub and trees present within 50m north-east of the Site.

3.3.1.2 Riparian mammals

Desk study

No records of water vole (*Arvicola amphibius*) were returned within 2.0km of the Site. A total of three records of otter were found within 2.0km of the Site. The closest record is a sighting of a foraging otter approximately 0.4km south of the Site at Barmouth Breakwater, Gwynedd. Other evidence of otter includes spraints, footprints and feeding remains. It is important to note that Cofnod returned records of breeding populations within 2.0km of the Site prior to the year 2012 where one adult female was observed with two pups, and on a separate occasion a lactating female was recorded. Woodland is situated within Orielton Wood nearby which may be suitable for holts and other resting sites. Reedbeds within Mawddach Estuary are suitable for resting and breeding sites for otter.

Field survey

During the Extended Phase 1 Habitat Survey, no evidence of otter or water vole was found. Suitable habitat for otter is present within 50m of the Site, including shallow, inshore marine areas for feeding and the open, low-lying coast, with a connected river Afon Mwaddach for commuting. Whilst carrying out the Extended Phase 1 Habitat Survey, a conversation with a local resident informed that an otter was observed on the promenade in the southern area of the Site in 2017. No suitable habitat for water vole was recorded within 50m of the Site.

3.3.1.3 Badger

Desk study

A single badger (*Meles meles*) record was found within 2.0km of the Site. The live badger was observed approximately 1.0km north-west of the Site on the A496 roadside.

Field survey

During the Extended Phase 1 Habitat Survey, no evidence of badger or was recorded within 50m of the Site. Suitable foraging habitat may be present within residential and public gardens, such as St David's Church courtyard and Viaduct Gardens. Although suitable soil for sett creation is present within 50m of the Site, there is a low amount of hedgerow and woodland cover within these areas and is situated adjacent to residential housing, a footpath, and the A496. Due to likely disturbance in these areas, it is unlikely for a badger sett to be created within the survey area.

3.3.1.4 Other notable species

Desk study

Species listed under Section 7 Environment (Wales) Act 2016 have been recorded within 2.0km of the Site within the last 10 years. Eight records of hedgehog (*Erinaceus europaeus*) were found within 2.0km of the

²⁰ Bat Rock Habitat Key, 2021. *Bats Roost in Rock – A Guide to Identification and Assessment for Climbers, Cavers & Ecology professionals*. Pelagic Publishing, Exeter.

Site. The closest record is a live sighting within the site boundary, near St David's Church. One record of brown hare (*Leus europaeus*) was found approximately 1.0km north of the Site, within a field. Five records of polecat (*Mustela putorius*) was found approximately 0.2km north of the Site, within Dinas Oleu SINC. No evidence of bottlenose dolphin has been recorded within 2.0km of the Site, however it is one of the species for which Llyn Peninsula and the Sarnau SAC is designated.

Field survey

No evidence of notable species was recorded during the Extended Phase 1 Habitat survey. Suitable habitat within 50m of the Site includes gardens within urban areas that may be used by foraging hedgehogs and may provide opportunity for breeding, resting and hibernation.

3.3.2 Birds

Desk study

Records of 611 birds were returned within 2.0km of the Site comprising 104 species. The following WCA Schedule 1 species were included²¹:

- Peregrine (*Falco peregrinus*);
- Red kite (*Milvus milvus*);
- Whimbrel (*Numenius phaeopus*);
- Chough;
- Barn owl;
- Great northern diver (*Gavia immer*);
- Osprey (*Pandion haliaetus*);
- Whooper swan* (*Cygnus cygnus*);
- Brambling* (*Fringilla montifringilla*);
- Black redstart (*Phoenicurus ochrurus*);
- Redwing* (*Turdus iliacus*);
- Common scoter (*Melanitta nigra*);
- Mediterranean gull (*Ichthyophaga melanocephala*); and
- Cetti's warbler (*Cettia cetti*).

The closest record was that of chough, where their presence has been recorded at Barmouth Hillside SSSI adjacent to the Site.

Records of 324 birds listed within Birds of Conservation Concern (BoCC)^{22,23} are present within 2.0km of the Site comprising 25 species of Red (R) and 35 species of Amber (A) status. Species of particular concern within this list include wading bird species bar-tailed godwit (*Limosa lapponica*) (R), curlew (*Numenius*

²¹ Although records of Schedule 1 birds are present within 2.0km of the survey area, it is unlikely for some of these species to breed within 50m of the survey area due to availability of suitable habitat. Schedule 1 species unlikely to breed within the survey area are marked with an asterisk (*).

²² Stanbury, A., Eaton, M., Aebischer, N., Blamer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. & Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 114: pp.723-747.

²³ Johnstone, I. & Bladwell, S. (2016). Birds of Conservation Concern in Wales 3: the population of birds in Wales. *Birds in Wales*, 13: pp.3-11.

arquata) (R), lapwing (*Vanellus vanellus*) (R), ringed plover (*Charadrius hiaticula*) (R) and overwintering wading species whimbrel (A) and common redshank (*Tringa totanus*) (R). Lleyn Peninsula and the Sarnau SAC and Mawddach Estuary SSSI provide suitable habitat for these birds. Additionally, Barmouth Hillside SSSI supports chough (A) throughout the year and has visitors throughout the year including pied flycatcher (*Ficedula hypoleuca*) (R), black redstart (*Phoenicurus ochruros*) (A) and wood warbler (*Phylloscopus sibilatrix*) (R).

Field survey

Wood pigeon (*Columba palumbus*) was observed nesting on Barmouth Bridge within Viaduct Gardens area, on the south-facing side of the bridge. Suitable habitat within 50m of the Site for nesting and/ or foraging wading, breeding and/ or overwintering birds includes areas within Mawddach Estuary SSSI, sand dunes, sandflats, rocky shores, cliff edges and crevices of rock faces, clusters of trees, scrub and bare ground.

3.3.3 Herpetofauna

Desk study

Four records of common lizard (*Zootoca vivipara*) were returned within 2.0km of the Site. The closest record was found 0.1km north of the Site on a private garden wall. A single record of adder (*Vipera berus*) was returned within 2.0km of the Site. The adder was a juvenile female found on a footpath of Dinas Oleu SINC.

No records of amphibians, including great crested newt (*Triturus cristatus*), were returned within 2.0km of the Site. The only standing waterbody present within 2.0km of the Site was situated 1.8km south of the Site, within a field that may sometimes be dry. This waterbody is situated across the Mawddach Estuary and Barmouth Bridge. It is unlikely to contain great crested newts and unlikely to be impacted by the proposed works, therefore does not require further survey. It is unlikely that great crested newts are present within the survey area and have been descope for the remainder of the report. Furthermore, GCN are generally absent from this region of Wales, although some sightings have been recorded at Llanbedr 11.7km north²⁴.

Field survey

No evidence of reptiles or amphibians was recorded during the Extended Phase 1 Habitat survey, although it is noted that the survey was undertaken outside of the optimal time of year for herpetofaunal surveys. Habitats within 50m of the Site including cliff, exposed rock, gardens, sand, walls and scrub provide suitable foraging and basking habitat for reptiles including common lizard and adder. No suitable amphibian habitat was recorded during the Phase 1 Habitat survey.

3.3.4 Fish

Desk study

No fish were recorded as present within 2.0km of the Site during the last ten years.

Field survey

Common goby (*Pomatoschistus microps*) was recorded within the estuary during low-tide, underneath rock within the intertidal habitat. The mosaic of habitat within the estuary provides opportunity for many species that thrive in intertidal habitat.

²⁴ Review of the Current Conservation Status (CCS) of the Great Crested Newt in Wales, with specific references to its long term prospects and within its stronghold in NorthEast Wales. 2018. NRW and Amphibian and Reptile Conservation Trust, Report No. 259. <https://cdn.naturalresources.wales/media/687859/eng-evidence-report-259-review-of-the-current-conservation-status-ccs-of-the-great-crested-newt-in-wales.pdf>

3.3.5 Invertebrates

Desk study

The desk study returned records of 22 invertebrate species within 2.0km of the Site. A total of 36 records of invertebrates listed under Section 7 of the Environment (Wales) Act (2016) were found, comprising the species listed below:

- Wall brown (*Lasiommata megera*) 0.5km north-east
- Forester (*Adscita statice*) 1.9km north-west
- Small pearl-bordered fritillary (*boloria selene*) 0.2km north
- Grayling (*Hipparchia Semele*) 0.6km north
- Small heath (*Coenonympha pamphilus*) 0.2km north

The closest records of Section 7 invertebrates were located 0.2km north of the Site within Dinas Oleu SINC.

Field survey

The mosaic of grassland, scrub, cliff, sand and intertidal habitats on Site are considered to be suitable to support a range of notable terrestrial and aquatic invertebrates, with good connectivity to the wider landscape.

White-clawed crayfish (*Austropotamobius pallipes*) are not considered likely to be present within the estuarine habitats on Site, due to suspected unfavourable brackish and saltwater environment and habitat substrate (bare mud/sand) and are rarely found in North West Wales..

3.3.6 Protected flora

Desk study

Four records of bluebell (*Hyacinthoides non-scripta*), which is listed under Schedule 8 of WCA, were returned within 2.0km of the Site. The closest record is situated 0.9km south of the Site.

A single record of prickly saltwort (*Salsola kali subsp. kali*) , listed under Section 7 of the Environment (Wales) Act (2016), was returned within 0.3km of the Site.

Field survey

No species of protected flora were recorded during the Extended Phase 1 Habitat survey. It is noted that the survey was undertaken outside of the optimal time of year for vegetation surveys and so a full vegetative survey was not undertaken. In particular, it is considered likely that the mosaic of sand and grass habitats to the south of the Site could support notable plant species, in addition to the grass and cliff mosaic habitat within the Site.

3.3.7 Invasive non-native species

Desk study

A total of 48 records of invasive, non-native species (INNS) of fauna and flora listed under Section 9 of the WCA and the Invasive Alien Species (Enforcement and Permitting) Order 2019 were returned from the data search.

Thirteen records of Canada goose (*Branta canadensis*) were found within 2.0km of the Site, the closest record approximately 0.1km south-east of the Site.

A total of six floral INNS were recorded within 2.0km of the Site, they are listed below:

- Rhododendron (*Rhododendron ponticum*);
- Himalayan balsam (*Impatiens glandulifera*);

- Himalayan cotoneaster (*Cotoneaster simonsii*);
- Japanese knotweed (*Reynoutria japonica*);
- Japanese rose (*Rosa rugosa*); and
- Montbretia (*Crocsmia pottsii* x *aurea* = *C. x crocosmiiflora*).

The closest records include Japanese rose approximately 0.1km west of the Site, in addition to Japanese knotweed and montbretia approximately 0.1km south-east of the Site.

Field survey

No INNS were recorded within 50m of the Site during the Extended Phase 1 Habitat survey, although the survey was undertaken outside of the optimal survey period. An INNS survey will be undertaken by a suitably qualified ecologist during the optimal survey period.

4. Recommendations

Recommendations for further consultation, further species surveys or general best practice mitigation to minimise impacts of the proposed works on habitat and species are stated below, in line with PEA guidance. Measures to enhance biodiversity are also recommended in this section.

In general, the following best-practice measures should be considered when designing the construction phase of the works (subject to further surveys being undertaken)²⁵:

- A toolbox talk should be given to all contractors working within the site by a Suitably Qualified Ecologist (SQE) prior to works, detailing the potential for protected species/habitat within the site, the working methods to be employed and the procedure to follow should any species be identified. A record of attendance should be kept on site, which contractors should sign to indicate they have understood the toolbox talk; and
- A Construction Environmental Management Plan (CEMP) should be produced and should be maintained by the Contractor during the construction phase. This will include site-specific methods to ensure that all site activities, especially those in proximity to watercourses and waterbodies are controlled and are in accordance with relevant legislation and undertaken in compliance with the relevant Guidelines for Pollution Prevention (GPP/PPG²⁶) and industry best practice (GPP5²⁷, CIRIA²⁸).

4.1 Designated sites

Lleyn Peninsula and the Sarnau SAC and Mawddach Estuary SSSI are situated within the Site boundary, designated for its sandbanks, estuaries, coastal lagoons, large shallow inlets and bays, and reefs. Due to the location of the SAC and SSSI within the Site, impact pathways to designated features and potential for effect will be outlined within a Habitats Regulations Assessment (HRA).

Meirionnydd Oakwoods and Bat Sites SAC (20m north of the proposed works) is designated for its lesser horseshoe bat populations, including maternity roosts and hibernacula. Barmouth Hillside SSSI, forming part

²⁵ Further to additional surveys, it may be necessary to change the recommendations provided below for during the clearance and construction phases and provide additional recommendations for mitigation based on the presence of protected species or notable habitats.

²⁶ <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/> [Accessed: 28/03/2022]

²⁷ Natural Resources Wales (NRW), the Northern Ireland Environment Agency (NIEA), Scottish Environment Protection Agency (SEPA) (2018). Guidance for Pollution Prevention – Works or maintenance in or near water: GPP5 v1.2 Feb 2018. <http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf> [Accessed: 28/03/2022]

²⁸ CIRIA (2018) CIRIA <http://www.ciria.org> [Accessed: 28/03/2022]

of the Meirionnydd Oakwoods and Bat Sites SAC, is notified for its geology and has potential to provide suitable hibernacula for this species. Impact pathways to designated features and potential for effect by the works will be outlined within a HRA. These suitable bat habitats are within close proximity to potential bat buildings that were identified within the survey area, in particular St David's Church, as such there is potential for species to commute to the SSSI/ SAC for foraging.

As a result of recent case law as ruled by the European Court of Justice²⁹, mitigation measures cannot be included within the Screening stage of the HRA, and therefore any potential pathways for effect will need to be evaluated within a Stage 2: Appropriate Assessment. Mitigation measures may need to be considered for roosting and commuting bats within this assessment, for example avoiding nightworks or inclusion of sensitive task-lighting (if required), minimisation of vegetation removal (particularly where linear flightlines could be affected) and air quality management including wetting of construction dust.

Three hydrologically connected sites (North Cardigan Bay SPA, Morfa Harlech a Morfa Dyffryn SAC and Morfa Dyffryn NNR) are situated at least 3.5km away, after the Mawddach Estuary has dispersed into Barmouth Bay. Mitigation measures will be carried out in compliance with CIRIA C532 'Control of water pollution from construction sites' guidance³⁰ to ensure there is minimal risk of hydrological contamination. It is currently considered unlikely that the works will have a significant impact on the surrounding designated sites, however this is subject to change as the scope of works and methodology become more defines. The likelihood of significant effect of the works on designated sites will be fully assessed and reported within the HRA.

Internationally designated sites listed below are at a distance of at least 4.3km from the Site. As a result, the proposed works are unlikely to have a significant impact on these sites:

- Cadair Idris SAC;
- Cadair Idris NNR;
- Craig yr Aderyn (Bird's Rock) SPA; and
- Rhinog SAC.

The likelihood of a significant impact of the works on internationally designated sites will be fully assessed and reported within the HRA.

Fifteen SSSIs are situated over 2.5km away from the Site. The proposed works are unlikely to have a significant impact on these sites due to this distance.

4.2 Habitats

Works have the potential to cause destruction of habitats within, directly adjacent or hydrologically connected to the Site, including ancient woodland and several habitats likely to be considered habitats of principal importance for the conservation of biodiversity as listed on Section 7 of the Environment (Wales) Act 2016. These are summarised below:

- Saline lagoon;
- Intertidal mudflats;
- Sheltered muddy gravels;
- Coastal grazing marsh;

²⁹ ECJ (2018). People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

³⁰ Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M. & Owens, D. (2001). CIRIA C532: Control of water pollution from construction sites – guidance for consultants and contractors. CIRIA: London.

- Subtidal sandbanks;
- Honeycomb worm reefs;
- Reedbeds;
- Upland oakwood;
- Inland rock outcrop and scree habitat;
- Coastal saltmarsh;
- Coastal sand dunes;
- Estuarine rocky habitats;
- Ancient semi-natural woodland and restored ancient woodland; and
- River.

Further priority habitat may also be present in the wider landscape from the survey area.

An intertidal survey was carried out on 29th March 2022. The survey was undertaken during suitable daylight hours around spring tides, with suitable weather conditions. An Intertidal Survey Report will be completed separately to the PEA.

The development proposals at the site should seek to avoid impacts to habitats of ecological value where possible. Where avoidance of such habitat is not possible, their loss or damage should be minimised. Works in the vicinity of the estuary and intertidal zone will utilise pollution prevention measures to minimise silt dispersed downstream during works around the watercourse and spillway. Any loss of valuable habitat should be adequately mitigated through offsetting and enhancement in order to comply with national and local planning policy, reinstated on at least a like-for-like basis, and clear biodiversity gains should be demonstrated.

The recommendations provided here are based on a preliminary appraisal of the ecological value within the Site. The results of further surveys should be used to refine priorities for habitat retention within the development design, and to inform mitigation design for unavoidable losses of valuable habitats.

4.3 Protected and notable species

There is potential for several protected or notable faunal species to occur at the Site. These species represent constraints to the proposed works as summarised below.

4.3.1 Bats

Bats are protected under the WCA and the CHSR. They are protected from disturbance, capture, injury and killing and their roosts are protected from obstruction, damage or destruction.

During the Extended Phase 1 Habitat Survey, at least three buildings were noted with potential to support roosting bats, including St David's Church, a public toilets block and residential housing. Suitable foraging habitat is also present within surrounding designated sites. Under the current scope of works, it is unlikely that buildings within the Site will be significantly impacted by the works and therefore a Preliminary Roost Assessment (PRA) is not currently required. Requirement of a PRA is to be kept under review in the case that the scope of works is altered to directly impact buildings and/or cause significant indirect impacts from works vibrations. If required, further surveys of potential roosting features will follow the guidelines as detailed in the Bat Conservation Trust Good Practice Guidelines³¹.

³¹ Collins, J> (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust: London.

Although no winter foraging habitat is present within the site boundary, bats from within the designated sites may still fly within range of the proposed works if carried out during winter. Measures to avoid disturbance should be considered within the detailed design with potential important foraging and commuting features retained as far as possible.

If temporary construction lighting is required during the bat activity season for works, this would consist of directional lighting using hoods or cowls designed to ensure no light spill over 0.5 Lux on to any potential commuting and foraging areas. Details of a sensitive lighting plan will need to be included within the CEMP for any night-time/ dusk working. The lighting design will need to follow best practice guidance by the Bat Conservation Trust and the Institution of Lighting Professionals³².

4.3.2 Otter

Otters are protected under the WCA and CHSR. Under this legislation, they are protected from disturbance, capture and injury/killing. Their breeding sites and resting places are also protected from damage and destruction.

Suitable habitat for otter is present within 50m of the Site, including shallow, inshore marine areas for feeding and the open, low-lying coast, with a connected river Afon Mwaddach for commuting and woodland situated within Orierton Wood nearby which may be suitable for holts and other resting sites³³. Reedbeds within Mawddach Estuary are also suitable for resting and breeding sites. Whilst carrying out the Extended Phase 1 Habitat Survey, a conversation with a local resident informed that an otter was observed on the promenade in the southern area of the Site in 2017. Records of otter are also present within 0.4km of the Site.

The current scope of works is unlikely to significantly impact local otter populations, however due to activity recorded within the area a precautionary method of works must be in place prior to construction. The requirement for further otter surveys will be kept under review until the detailed design of the works is completed. If further surveys are required, they should follow the best practice survey guidelines³⁴. If otter resting places and/or holts are found to be present within the vicinity of the proposed works, a protected Species Licence for otters may be required from NRW. Pre-construction surveys may be required as part of the licence conditions to identify any new evidence of otter resting sites on Site and allow for amendments to any Licence requirements. Pollution prevention measures will be included within the CEMP to avoid impact to surrounding habitat.

4.3.3 Badger

Badgers are protected under the Protection of Badgers Act 1992. They are protected from disturbance (while in their setts), injury and killing. Setts are protected from obstruction, damage or destruction.

The closest record of a badger was a sighting approximately 1.0km north-west of the Site on the A496 roadside. Badgers are nocturnal, may be active within urban areas during the night and can move into an area and establish setts quickly. The current scope of works is unlikely to significantly impact local badger populations and further badger surveys are not required, however a precautionary method of works should be in place prior to construction. If a badger sett is identified at the time of survey consideration would need to be given to obtaining a licence from NRW or Welsh Government in order to authorise the damage or loss of badger setts, which would otherwise be illegal.

General measures also should be included in the CEMP to avoid entrapment or harm to badgers. Excavations should be covered when works are not taking place, especially overnight. Where deep excavations are made, a mammal ladder, or cut access, should be installed to allow badgers a means of escape from the trench. Any temporarily exposed open pipes should be capped to ensure that badgers cannot enter them.

³² <https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349>

³³ <https://sac.jncc.gov.uk/species/S1355/>

³⁴ <https://ptes.org/house-a-dormouse/dormice-in-decline/current-dormouse-distribution-map/>

4.3.4 Other notable mammal species

Any action that intentionally inflicts unnecessary suffering on any wild animal is an offence under the Wild Mammals (Protection) Act 1996. Should wild mammals be encountered during vegetation clearance and ground breaking works, the mammals will need to be moved to safe place by a suitably qualified ecologist.

The retention of existing habitats and the design of new habitat corridors within the Site should consider habitat requirements of hedgehog and polecat, with a focus on maintaining permeability across the site for these species.

4.3.5 Birds

All wild birds, their young and nests are protected under the WCA from taking, injury and killing. Birds under Schedule 1 of the WCA are also protected against disturbance while nesting. Wood pigeons nest year-round and were identified nesting on Barmouth Bridge during the Extended Phase 1 Habitat survey. No further signs of breeding birds were observed during the survey. Due to the urban nature of the Site, it is not anticipated that Schedule 1 species such as chough are likely to be present within the Site, and significant impact is not anticipated for Schedule 1 birds and breeding bird species. Surveys for breeding, wading, winter and Schedule 1 bird species are unlikely to be required, however requirement for surveys may change subject to further development of the design detail.

Any vegetation clearance required in the finalised design detail (year-round with consideration of potential for earlier-nesting species) should be subject to a toolbox talk and supervised by an ecologist (or checked by an ecologist no more than 24 hours prior to clearance). If a nest is identified within or close to vegetation to be removed then it must be left in-situ and protected from the works, with no further works in the area until the young birds have fledged from the nest. It is also important to consider the potential presence of ground-nesting birds such as ringed plover, in particular with works close to the coast. The suitable buffer of works to prevent disturbance and length of time for birds to fledge is dependent upon species identified. Should further bird surveys be required prior to construction, species recorded as present may require further consideration to be given to the timings of the works, in addition to the potential requirement for Schedule 1 bird licensing application.

4.3.6 Reptiles and amphibians

Reptiles are protected from reckless or intentional harm under the WCA. The need for reptile mitigation is dependent upon completion of the detailed design of the works. Within the current scope of works, no reptile mitigation is required, however this must be kept under review until the detailed design of works is finalised. Any required vegetation clearance should be undertaken between April and the end of October, whilst reptiles and amphibians are active using a reptile sensitive methodology. Vegetation clearance should be undertaken in a directional manner towards suitable habitat under ecological supervision. Suitable hibernation features (such as riprap and log piles) should be removed by hand or by hand tools under ecological supervision. The features that are dismantled should be reinstated within a suitable location outside of the works area or removed from site.

A toolbox talk should be provided to all those working on site. If evidence of reptiles or amphibians is found, work should cease until advice has been obtained from the site ecologist.

4.3.7 Invertebrates

The mosaic of habitats within the survey area are considered to be suitable to support a range of notable invertebrates, although connectivity to the wider landscape is potentially limited by the surrounding cliff and sea. Measures to protect sensitive features, including removal of log piles outside of the construction area, and following site best-practice including pollution prevention guidelines will be of benefit to invertebrate species.

Potential enhancements for invertebrates include habitat design, such as creation of species-diverse habitats designed to enhance resource for notable invertebrates within the local vicinity.

4.3.8 Fish

The works have the potential to cause disturbance/killing/injury of fish within the Mawdach Estuary SSSI, Lleyn Peninsula and the Sarnau SAC and surrounding waterbodies. In order to avoid this, pollution prevention measures will be secured via the CEMP.

4.3.9 Invasive non-native species

Schedule 9 of the WCA and The Invasive Alien Species (Enforcement and Permitting) Order 2019 makes facilitating the spread of listed invasive species an offence.

No invasive species were recorded during the Extended Phase 1 Habitat survey. However, this survey was conducted out of the growing season, and as such it is recommended that a survey to accurately map the INNS within the Site is conducted in spring and summer, to ensure all INNS are recorded through their respective growing and flowering seasons.

Japanese rose, Japanese knotweed and montbretia were recorded within 0.1km of the Site. INNS can require multiple years of treatment to eradicate them from a site. It is recommended that a treatment plan to remove the above Japanese knotweed takes reference to the Invasive Non-native Specialists Association (INNSA) code of practice guidelines for managing Japanese Knotweed³⁵.

4.4 Enhancement measures

Measures are recommended to enhance the biodiversity within the site and surrounding area, these will need to be implemented in line with national policy (see section 1.4) during design, construction and operation. These could include:

- The deployment of bird and bat boxes on retained trees within or near to the survey area;
- The installation of planters and insect hotels within amenity grasslands to increase and protect biodiversity of local species within an urban environment³⁶;
- The installation of otter holts to enhance the opportunities for otter resting and breeding within the surrounding area of the Site;
- Removal of INNS within proximity to the Site;
- The inclusion of further logs/brush piles to encourage invertebrates and also act as a refuge for reptiles, amphibians and small mammals. Enhancement products suitable for urban environments are available³⁷;
- Implementation of a Site-wide INNS management plan to remove Japanese knotweed from within vicinity of the Site;
- Retrofitting or including pocket rock pools onto vertical sea defences, such as vertipools discussed with Swansea University;
- Tidal habitat enhancement measures include ecological enhancement techniques to improve habitat heterogeneity on coastal defence structures, such as examples outlined in Hall et al., (2018)³⁸ creating grooves within the coastal defences; and

³⁵ INNSA-Code-of-Practice.pdf (accessed 02/04/2022).

³⁶ For example, Vestre Habitats series <https://vestre.com/uk/products/habitats/habitats-leaf-2-2-2-2-2> [Accessed 19/04/2022]

³⁷ For example Vestre Pile bench allows large stones and gravel to be easily arranged into small piles < <https://vestre.com/uk/products/habitats/habitats-pile>> [Accessed 19/04/2022]

³⁸ Hall et al. (2018). Ecological enhancement techniques to improve habitat heterogeneity on coastal defence structures. Available online at: <https://doi.org/10.1016/j.ecss.2018.05.025>. (Accessed: 04/04/2022)

- Potential to collaborate with Living Seawalls³⁹ to incorporate bespoke habitat units that are both aesthetically pleasing and ecologically valuable into the seawall design. Further opportunities for tidal habitat enhancement measures will be outlined within the Intertidal Survey Report.

Some enhancement options may be eligible dependent upon landowner permissions and subject to suitable land for installation.

³⁹ <https://www.livingseawalls.com.au/>

5. Summary and Conclusions

There are nine internationally designated sites within 10.0km of the Site, Lleyn Peninsula and the Sarnau SAC of which is situated within the site boundary, designated for its marine habitats and marine wildlife populations. A Habitats Regulations Assessment will be required for any proposed works within the Site. A further 18 statutory designated sites were identified within 10.0km of the Site, including Meirionnydd Oakwoods and Bat Sites SAC situated adjacent to the Site and SSSIs located within and adjacent to the Site. There are 90 non-statutory designated Sites within 2.0km of the Site, including ancient woodland and SINC.

Habitats assessed during the field survey included: improved grassland, amenity grassland, cliff, exposed rock, structures, scrub, trees, sand, and intertidal sand/shingle/rocks/boulders with/without brown or green algal beds and running water (Afon Mawddach).

The Site has potential to support birds (including wading and overwintering birds), otter, foraging and roosting bats, reptiles, invertebrates and other Section 7 species, including notable and localised plant species. Japanese knotweed has been identified within 0.1km of the Site. A further survey at the optimal time of year for INNS is recommended.

The requirement for additional (Phase 2) ecological surveys is dependent upon the selected construction design and methods should be kept under review; potential additional survey efforts include for bats and otter.

This report is a result of survey work undertaken in February 2022. This report refers, within the limitations stated, to the condition or proposed development of the Site at the time of the inspections. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/survey. It is also advised that if there is a delay of over two years in undertaking the works, an updated walkover survey is undertaken to ensure the baseline conditions have not changed. No warranty is given as to the possibility of future changes in the condition of the Site.

This report is produced solely for the benefit of Ymgynghoriaeth Gwynedd Consultancy - Gwynedd Council and no liability is accepted for any reliance placed on it by any other party. This report is prepared for the proposed uses stated in the report and should not be used in a different context.

Appendix A

Legislation and Policy

A.1 Legislative Context

A framework of international, European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This is described in the following sections. The reader will refer to the original legislation for the definitive interpretation.

A.2 Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation⁴⁰ (Natural England). The protection afforded to SSSIs is used to underpin the designation of areas at a European Level. European Sites comprise:

- Special Areas of Conservation (SAC) designated under the Conservation of Habitats and Species Regulations 2019 (Amendment) (EU Exit) (known as the Habitats Regulations);
- Special Protection Areas (SPA) designated under the Wildlife and Countryside Act.

Wetlands of International Importance (Ramsar sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are normally also notified as SSSIs but are only considered European Sites as a matter of UK and Local Government Policy.

The Habitats Regulations transpose the requirements of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into law within England and Wales, while the Wildlife and Countryside Act transposes Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) in the law within England and Wales. Equivalent legislation exists to transpose these directives in the law within Scotland and Northern Ireland.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European Sites are considered. Specifically, Regulation 61(1) states:

“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –

(a) is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects); and

(b) is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications for that site in view of that site’s conservation objectives.”

The formal consideration of effects on European Sites is therefore undertaken by the determining authority such as the Local Planning Authority.

Local Nature Reserves can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949 (as amended). However, this protection is usually

⁴⁰ Section 28 of the Wildlife and Countryside Act 1981 (as substituted by Schedule 9 of the Countryside and Rights of Way Act 2000).

conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as sites of Importance for Nature Conservation.

These sites are protected by the relevant legislation regardless of whether planning permission is required. Where planning consent is required, they will also be protected by Planning Policy.

Country Parks, Sites of Importance for Nature Conservation (SINC), and Ancient Woodlands are protected by Planning Policy, which will apply to schemes which require planning consent.

A.3 Protected and Notable Species

A.3.1 European Protected Species

The Habitats Regulations convey special protection to a number of species which are listed in schedule 2 of the Regulations and are referred to as European Protected Species (EPS):

- All UK resident bat species;
- All whale and dolphin species;
- Large blue butterfly (*Maculinea arion*);
- Hazel dormouse (*Muscardinus avellanarius*);
- Pool frog (*Rana lessonae*);
- Sand lizard (*Lacerta agilis*);
- Fisher's estuarine moth (*Gortyna borelii lunata*);
- Great crested newt (*Triturus cristatus*);
- European otter (*Lutra lutra*);
- Wild cat (*Felis silvestris*);
- Lesser Whirlpool Ram's-horn Snail (*Anisus vorticulus*);
- Smooth snake (*Coronella austriaca*);
- Sturgeon (*Acipenser sturio*);
- Natterjack toad (*Bufo calamita*); and
- All marine turtles.

Regulation 41 makes it an offence to:

- a) Deliberately capture, injure or kill any wild animal of a EPS;
- b) Deliberately disturb wild animals of such a species;
- c) Deliberately takes or destroys the eggs of such a species; and
- d) Damages or destroys a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution of the species.

Licences can be granted by the relevant SNCO for developments (sometime referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for “*preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment*”.

A.3.2 UK Protected Species

A.3.2.1 Wildlife and Countryside Act 1981

The Wildlife and Countryside Act 1981 provide protection to both EPS and other species including wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

In England and Wales water voles are listed on Schedule 5 of the Wildlife and Countryside Act 1981, receiving full protection since 2008. The Wildlife and Countryside Act 1981 together with amending legislation, lists the following offences:

- Intentionally killing, injuring or taking a water vole by any method;
- Intentionally or recklessly damaging or destroying a water vole place of shelter or protection;
- Intentionally or recklessly damaging disturbing a water vole whilst it is occupying such a structure or place it uses for shelter or protection;
- Intentionally or recklessly obstructing access to a water vole's place of shelter or protection;
- Selling, offering for sale, or possessing or transporting for the purposes of sale, any live or dead water vole, or any part or derivative, or advertising any of these for buying or selling.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

A.3.2.2 The Protection of Badgers Act 1992

Badger and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

A.3.3 Other Legislation Relating to Species

Public authorities listed in the Environment (Wales) Act 2016, including LPAs “*must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in doing so promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions*”.

Ecosystem resilience is defined as the capacity for ecosystems to adapt, and comprises the key characteristics:

- Diversity between and within ecosystems;
- The connections between and within ecosystems;
- The scale of ecosystems; and
- The condition of ecosystems (including their structure and functioning).

In complying with the Biodiversity and Resilience of Ecosystems Duty, it is necessary to have regard to:

- The list published under Section 7;

- The State of Natural Resources Report (SoNARR) published under Section 8⁴¹; and
- Any area statement published under Section 11 for an area that includes all or part of an area in relation to which the authority exercises functions.

Section 7 lists species and habitats which are ‘of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales’ (as decided by WG in consultation with Natural Resources Wales (NRW)).

Locally Protected Species which may be identified within County Local Biodiversity Action Plans (LBAP), the Royal Society for the Protection of Birds (RSPB) ‘Birds of Conservation Concern’ or Red Data books for example.

A.3.4 Invasive Non-Native Species

Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) lists certain plants and animals that are not native to Great Britain and could pose a threat to our native species and habitats.

Under this legislation it is an offence to plant or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9. It is also an offence to sell or to release into the wild any plants or animals on the Schedule.

The Invasive Alien Species (Enforcement and Permitting) Order 2019 allows for the enforcement of the EU Invasive Alien Species Regulation 1143/2014 on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species. Species on this list are no longer listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended).

People undertaking works in proximity to invasive non-native plant species should take all reasonable steps and exercise all due diligence to avoid committing an offence.

A.4 Hedgerow Regulations 1997

The Hedgerow Regulations 1997 set out a framework for the protection of hedgerows against removal where they are deemed to be important either due to their age, ecological or archaeological features. Approval is required from the local authority prior to the removal of hedgerows deemed Important under the Hedgerows Regulations.

A.5 The well-being of Future Generations Act 2015

The Well-being of Future Generations Act 2015⁴² places a duty on public bodies to carry out sustainable development. In this Act “sustainable development” means the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals.

The action a public body takes in carrying out sustainable development must include:

⁴¹ <https://naturalresources.wales/evidence-and-data/research-and-reports/the-state-of-natural-resources-report-assessment-of-the-sustainable-management-of-natural-resources/?lang=en>

⁴² Acts of the National Assembly for Wales. The Well-being of Future Generations (Wales) Act 2015. <https://www.legislation.gov.uk/anaw/2015/2/contents/enacted> [last accessed 27/04/2022].

(a) setting and publishing objectives (“well-being objectives”) that are designed to maximise its contribution to achieving each of the well-being goals, and

(b) taking all reasonable steps (in exercising its functions) to meet those objectives.

The seven well-being goals include: a resilient Wales, a prosperous Wales, a healthier Wales, a more equal Wales, more cohesive communities, a Wales of vibrant culture and thriving Welsh language and a globally responsible Wales.

Of most relevance is 'A resilient Wales', which seeks to maintain and enhance a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).

A.6 Planning Policy

A.6.1 Planning Policy Wales (PPW)

At national level, Planning Policy Wales⁴³ sets the national policies in relation to development control through the Town and Country Planning Act 1990. This is supported by a series of Technical Advice Notes, with Technical Advice Note (TAN) 5⁴⁴ being of particular relevance as it sets out the consideration of nature conservation in the determination of planning applications. This policy and TAN 5 require Local Authorities to take measures to:

- Promote the conservation of landscape and biodiversity, in particular the conservation of native wildlife and habitats;
- Ensure that action in Wales contributes to meeting international responsibilities and obligations for the natural environment;
- Ensure that statutorily designated sites are properly protected and managed;
- Safeguard protected species; and
- Promote the functions and benefits of soils, and in particular their function as a carbon store.

Developers must ensure that they comply with the above legislation by fully assessing the potential impacts on protected species and habitats from the proposed development. Where planning permission is required, this assessment must be finalised prior to and included with the submission of the planning application. The Planning Authority can then ensure that the necessary protected species and habitats information has been provided to inform an assessment and that proposals are in full accordance with relevant legislation and planning policy.

WG has produced a Nature Recovery Plan which is aimed at addressing the underlying causes of biodiversity loss by putting nature at the heart of its decision-making, by increasing the resilience of Wales' natural systems (ecosystems), and by taking specific action for habitats and species. It sets out how Wales will deliver the commitments of the EU Biodiversity Strategy and the UN Convention on Biological Diversity to halt the decline in our biodiversity by 2020 and then reverse that decline. The Nature Recovery Action Plan links to and complements The Well-being of Future Generations (Wales) Act 2015 and the Environment Act (Wales) 2016. Developments should seek to complement this, in order to meet objectives, set out in the Environment Act and Well-being Act.

Statutorily designated sites must be protected from damage and deterioration, with their important features conserved and enhanced by appropriate management.

⁴³ Welsh Government Planning Policy Wales Edition 11, February 2021. Planning Policy Wales - Edition 11 (gov.wales)

⁴⁴ Welsh Assembly Government (2009) Technical Advice Note 5: Nature Conservation and Planning.

Although non-statutory designations carry less weight than statutory designations, they can make a vital contribution to delivering an ecological network for biodiversity and resilient ecosystems, and they should be given adequate protection in development plans and the development management process.

Planning authorities must follow a step-wise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible

The presence of a species protected under European or UK legislation, or under Section 7 of the Environment (Wales) Act 2016 is a material consideration when a 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 and to ensure that the range and population of the species is sustained.

Planning authorities should protect trees, hedgerows, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial and identified green infrastructure function. Planning authorities should consider the importance of native woodland and valued trees, and should have regard, where appropriate, to local authority tree strategies or SPG. Permanent removal of woodland should only be permitted where it would achieve significant and clearly defined public benefits. Where woodland or trees are removed as part of a proposed scheme, developers will be expected to provide compensatory planting.

Ancient woodland and semi-natural woodlands and individual ancient, veteran and heritage trees are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees and woodlands should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits; this protection should prevent potentially damaging operations and their unnecessary loss. In the case of a site recorded on the Ancient Woodland Inventory, authorities should consider the advice of NRW.

Nature based solutions should be the first consideration given the opportunity to deliver other multiple benefits, including habitat creation, biodiversity enhancement and water quality improvements. Overall, green infrastructure opportunities can benefit ecosystem resilience and provide opportunities for leisure facilities or renewable energy generation.

Appendix B

Anglesey and Gwynedd Joint LDP – Local Planning Policies⁴⁵

⁴⁵ <https://www.gwynedd.llyw.cymru/en/Council/Documents---Council/Strategies-and-policies/Environment-and-planning/Planning-policy/Anglesey-and-Gwynedd-Joint-Local-Development-Plan-Written-Statement.pdf>

B.1 Conserving and enhancing the natural environment

Local Planning Policy	Summary
Strategic Policy PS 19: Conserving and where appropriate enhancing the natural environment	The Councils will manage development so as to conserve and where appropriate enhance the Plan area's distinctive natural environment, countryside and coastline, and proposals that have a significant adverse effect on them will be refused unless the need for and benefits of the development in that location clearly outweighs the value of the site or area and national policy protection for that site and area in question. When determining a planning application, consideration will need to be given to the following:- 1. Safeguard the Plan area's habitats and species, geology, history, the coastline and landscapes; 2. Protect or where appropriate enhance sites of international, national, regional and local importance and, where appropriate, their settings in line with National Policy; 3. Have appropriate regard to the relative significance of international, national or local designations in considering the weight to be attached to acknowledged interests, ensuring that any international or national responsibilities and obligations are fully met in accordance with National Policy; 4. Protect or enhance biodiversity within the Plan area and enhance and/or restore networks of natural habitats in accordance with the Local Biodiversity Action Plans and Policy AMG5; 5. Protect or enhance biodiversity through networks of green/ blue infrastructure; 6. Safeguard internationally, nationally and locally protected species; 7. Protect, retain or enhance the local character and distinctiveness of the individual Landscape Character Areas (in line with Policy AMG 2) and Seascape Character Areas (in line with Policy AMG 4); and 8. Protect, retain or enhance trees, hedgerows or woodland of visual, ecological, historic cultural or amenity value.
Policy AMG 1: Area of Outstanding Natural Beauty management plans	Proposals within or affecting the setting and/ or significant views into and out of the Areas of Outstanding Natural Beauty must, where appropriate, have regard to the relevant Area of Outstanding Natural Beauty Management Plan.
Policy AMG 2: Special landscape areas	When considering a proposal within Special Landscape Areas (SLA), as identified by the Proposals Map and listed below, there will be a need to appropriate consideration to the scale and nature of the development ensuring that there is no significant adverse detrimental impact on the landscape. The development should aim to maintain, enhance or restore the recognised character and qualities of the SLA. The proposal should have regard to the relevant 'Statement of Value and Significance'. Where appropriate, the Councils will require a Landscape and Visual Impact Assessment in order to consider the impact of the development on the designated area. In exceptional circumstances, where development is necessary and could result in significant impact on the landscape, appropriate mitigation and compensation measures should be provided.
Policy AMG 3: Protecting and enhancing features and qualities that are distinctive to the local landscape character	Proposals that would have significant adverse impact upon landscape character as defined by the Landscape Character Areas included within the current Landscape Strategy for the relevant authority, must demonstrate through a landscape assessment how landscape character has influenced the design, scale, nature and site selection of the development. A proposal will be granted provided it doesn't have significant adverse impact upon features and qualities which are unique to the local landscape in terms of visual, historic, geological, ecological or cultural aspects. Measures should be taken to ensure that the development does not: 1. Cause significant adverse impact to the character of the built or natural landscape; 2. Fail to harmonise with, or enhance the landform and landscape; and 3. Lose or fails to incorporate traditional features, patterns, structures and layout of settlements and landscape of both the built and natural environment.

Local Planning Policy	Summary
	Particular emphasis will be given to the landscapes identified by the Landscape Character Areas as being of high and outstanding quality because of a certain landscape quality or a combination of qualities. Additional consideration will also be given to development that directly affect the landscape character and setting of the AONBs or the National Park.
Policy AMG 4: Coastal protection	In considering a proposal on the coast, including the Heritage Coast, there will be a need to ensure that the proposal conforms to the following criteria:- 1. The development due to its nature must be located on the coast, or in open estuaries, or nearby, and that there is an overriding economic and social benefit from the development; 2. It does not cause unacceptable harm to: i) water quality; ii) public access considerations; iii) the built environment, or the landscape, or seascape character; and/ or iv) the area's biodiversity interests (including European Protected Areas such as marine Special Areas of Conservation and Special Protected Areas) due to their location, scale, form, appearance, materials, noise, or emissions or due to an unacceptable increase in traffic; 3. Priority is given to locations with a close visual connection to current buildings or existing structures; 4. There are no suitable alternative locations on the coast that have been developed; and 5. That the development is consistent with other policies within the Plan including Policy ARNA1.
Policy AMG 5: Local biodiversity conservation	Proposals must protect and, where appropriate, enhance biodiversity that has been identified as being important to the local area by: a) avoiding significant harmful impacts through the sensitive location of development; and b) considering opportunities to create, improve and manage wildlife habitats and natural landscape including wildlife corridors, stepping stones, trees, hedges, woodlands and watercourses. A proposal affecting sites of local biodiversity importance will be refused unless they can conform with all of the following criteria:- 1. That there are no other satisfactory alternative sites available for the development; 2. The need for the development outweighs the importance of the site for local nature conservation; and 3. That appropriate mitigation or compensation measures are included as part of the proposal. Where necessary, an Ecological Assessment which highlights the relevant local biodiversity issues should be included with the planning application.
Policy AMG 6: Protecting sites of regional or local significance	Proposals that are likely to cause direct or indirect significant harm to Local Nature Reserves (LNR), Local Wildlife Sites, or regionally important geological/ geomorphologic sites (RIGS) will be refused, unless it can be proven that there is an overriding social, environmental and/or economic need for the development, and that there is no other suitable site that would avoid having a detrimental impact on sites of local nature conservation value or local geological importance. When a development is granted, it will be necessary to ensure that there are appropriate mitigation measures in place. It will be possible to use planning conditions and/or obligations in order to safeguard the site's biodiversity and geological importance.

Appendix C

Extended Phase 1 Habitat Survey Results

C.1 Extended Phase 1 Habitat Survey Results

