

# DRAGON MEADOW LNG SOLAR FARM, MILFORD HAVEN

**Ecological Impact Assessment**

Prepared for: Anesco Ltd

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# 1.0 Introduction

## 1.1 Background

SLR Consulting Limited was commissioned by Anesco Ltd to undertake an ecological survey and desk study of a 38.99 acre/15.78 hectare site at the Dragon Liquefied Natural Gas (LNG) Terminal in Milford Haven, South Wales (central OS grid reference: SM926047). The results have been used to prepare an Ecological Impact Assessment (EclA) to inform a planning application for a solar farm with 9.99 MWp of installed capacity, known as 'Dragon Meadow LNG Solar Farm'.

## 1.2 Site Description

The Ecological Survey Area is shown in Drawing 1, and the proposed Site Layout in Appendix 1.

The 15.78ha application site (herein referred to as the 'Site') is dominated by two fields. The eastern field comprises neutral grassland and the western field comprises modified grassland. Hedgerows are present on the northern Site boundary, and between the two fields, whilst the western and southern boundaries comprise scrub. A small brick building is located in the north-eastern corner of the western field, which is connected to a large maritime marker.

The Site lies in Waterston, to the east of Milford Haven, in South Wales. The wider landscape predominantly comprises of agricultural land with scattered urban developments.

The Site lies on the coast, and Pembrokeshire Marine/ Sir Benfro Forol Special Area of Conservation (SAC) and Milford Haven Waterway Site of Special Scientific Interest (SSSI) lie approximately 50m to the south of the Site.

## 1.3 Details of the Proposed Development

The proposed development comprises:

- An array of solar panels, cabling, and panel mounting frames;
- Approximately 43 inverters mounted to the back of the arrays;
- Low voltage switchgear and transformers;
- High voltage switchgear;
- An Intake substation;
- An educational building; and
- A 2.4m high security fence installed around the perimeter of the site with a security beam sensor.

In total, the solar farm will support 18,495 solar modules, arranged in arrays which are approximately 8 metres apart (as measured from the front of one panel to the front of the next) with 3.59 metre spacing between them (as measured from the back of one panel to the front of the panel behind it). All panels shall face south, with a pitch of 15°. Access would be achieved from the north-west of the Site, through an existing access track. The access track will be extended to run along the northern Site boundary.

The solar farm shall not be lit.

## 1.4 Purpose of this Report

This report seeks to:

- Describe the baseline data collection and assessment methodologies used;
- Summarise the baseline ecological conditions and identify important ecological receptors, where relevant;
- Identify and describes all potentially significant ecological effects associated with the proposed development upon important receptors (or confirms that no potentially significant effects will occur);
- Set out the mitigation and compensation measures required to ensure compliance with nature conservation legislation and/ or to address any potentially significant ecological effects, where relevant;
- Provide an assessment of the significance of any residual effects to important receptors (where relevant), and the legal and policy implications; and
- Identify appropriate enhancement measures, where appropriate.

## 1.5 Evidence of Technical Competence and Experience

The fieldwork was undertaken by Ms Liz Probert, a Senior Ecologist at SLR Consulting, with over eight year's professional experience.

The report was produced by Mrs Vanessa Jackson, a Senior Field Ecologist at SLR Consulting, and Associate Member of the Chartered Institute of Ecology and Environmental Management (ACIEEM), with six years' professional experience.

The report has been peer reviewed by Gary Oliver, a Principal Ecologist at SLR and Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM), with over 26 years' relevant experience within ecological consultancy.

## 2.0 Relevant Legislation and Planning Policy

### 2.1 Relevant Legislation

A summary of national planning policy relevant to biodiversity in Wales is provided below. Note that the summary provided here is intended for general guidance only and the original policy documents should be consulted for definitive information.

#### 2.1.1 Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law, making it an offence to deliberately capture, kill or disturb<sup>1</sup> wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). From 1<sup>st</sup> January 2021, the 2017 Regulations are one of the pieces of domestic law that transposed the land and marine aspects of the Directive. Most of the changes involved transferring functions from the European Commission to the appropriate authorities in England and Wales, all other processes or terms in the 2017 Regulations remain unchanged and existing guidance is still relevant.

#### 2.1.2 Wildlife & Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CRoW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; • intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act;
- intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;
- Pick or uproot any wild plant listed under Schedule 8 of the Act; or
- Plant or cause to grow in the wild any plant species listed under Schedule 9 of the Act.

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<sup>1</sup> Disturbance, as defined by the Conservation of Habitats and Species Regulations 2010, includes in particular any action which impairs the ability of animals to survive, breed, rear their young, hibernate or migrate (where relevant); or which affects significantly the local distribution or abundance of the species.

### 2.1.3 Protection of Badgers Act 1992

The Protection of Badgers Act 1992 makes it illegal to kill, injure or take a badger or to intentionally or recklessly interfere with a badger sett. Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

### 2.1.4 Environment (Wales) Act 2016

The Environment (Wales) Act 2016 seeks to ensure that natural resources are managed sustainably such that they are able to deliver social, economic and environmental benefits, including nature-based solutions to climate change adaptation and mitigation. The Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. Part 1 Section 6 of the Act introduces a biodiversity duty, that requires public authorities to seek to maintain and enhance biodiversity in the exercise of their functions and in so doing promote the resilience of ecosystems.

Section 7 of the Act lists living organisms and types of habitat in Wales, considered to be of key significance to sustain and improve biodiversity in relation to Wales.

## 2.2 Relevant Planning Policy

### 2.2.1 Planning Policy Wales Edition 11 2021

Planning Policy Wales (PPW) delivers land use planning policy for Wales and provides a framework for the effective preparation of local planning authorities' development plans. This is supplemented by 21 topic based Technical Advice Notes (TANs). Technical Advice Note 5- Nature Conservation and Planning is a key TAN in relation to nature conservation and biodiversity.

Section 6.4 of PPW covers Biodiversity and Ecological Networks, and includes the following:

6.4.3 *Development plan strategies, policies and development proposals must consider the need to:*

- *support the conservation of biodiversity, in particular the conservation of wildlife and habitats;*
- *ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;*
- *ensure statutorily and non-statutorily designated sites are properly protected and managed;*
- *safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and*
- *secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.*

6.4.5 *Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity. In doing so planning authorities must also take account of and promote the resilience of ecosystems, in particular the following aspects:*

- *diversity between and within ecosystems;*
- *the connections between and within ecosystems;*
- *the scale of ecosystems;*

- *the condition of ecosystems including their structure and functioning; and*
- *the adaptability of ecosystems.*

6.4.6 *In fulfilling this duty, planning authorities must have regard to:*

- *the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016;*
- *the SoNaRR, published by NRW; and*
- *any Area Statement that covers all or part of the area in which the authority exercises its functions.*

## 2.2.2 Local Planning Policy

The Pembrokeshire County Council Local Plan was adopted on 28<sup>th</sup> February 2013, which sets out the Council's policies and proposals to guide planning decisions and establishes the framework for the sustainable growth and development of the Borough up to 2021. Relevant passages from the Plan are as follows: -

### GN.37 Protection and Enhancement of Biodiversity

*"All development should demonstrate a positive approach to maintaining and, wherever possible, enhancing biodiversity. Development that would disturb or otherwise harm protected species or their habitats, or the integrity of other habitats, sites or features of importance to wildlife and individual species, will only be permitted in exceptional circumstances where the effects are minimised or mitigated through careful design, work scheduling or other appropriate measures."*

## 2.2.3 Pembrokeshire Local Biodiversity Action Plan (LBAP)

The Pembrokeshire LBAP lists Habitat Action Plans for grassland, heathland, lowland farmland, wetlands, freshwater, woodland, coastal, marine, brown field and urban. The BAP also includes Species Action Plans which may be of relevance to the Site, including

- All bat species;
- Farmland birds;
- Reptiles and amphibians including slow worm (*Anguis fragilis*), common toad (*Bufo bufo*), grass snake (*Natrix helvetica*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*);
- Otter (*Lutra lutra*);
- Chough (*Pyrrhocorax pyrrhocorax*);
- Kestrel (*Falco tinnunculus*); and
- Dormouse (*Muscardinus avellanarius*).

## 3.0 Methodology

The baseline ecological data was collated by a combination of desk-based study and field survey consistent with all current standard methodologies and published good practice guidelines.

### 3.1 Desk Study

An ecological data search was requested from the Local Environmental Records Centre (LERC) Wales to obtain records of protected and otherwise notable species, and non-statutory protected sites for the Site and land within a 2km radius of its centre. This data was supplied on the 21<sup>st</sup> September 2021.

An internet-based desk study was also undertaken, whereby the Multi-Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.gov.uk>) was searched for statutory designated sites (such as Sites of Special Scientific Interest (SSSI)), both for the Site itself and land within a 2km radius on the 4<sup>th</sup> November 2021.

### 3.2 Field Survey

#### 3.2.1 Habitats

An ecological walkover of the Site and surrounding areas was undertaken by Ms Liz Probert, Senior Ecologist with SLR Consulting on 27<sup>th</sup> September 2021.

The survey was carried out on a cloudy day with occasional light rain and light wind, and an ambient temperature of 14 °C.

The site was surveyed to identify the broad habitat types present in accordance with the UK Habitat Survey (UKHab) methodology<sup>2</sup>. The methodology was extended to include searches for features of interest, such as notable or protected species of flora and fauna, as well as habitats capable of supporting such species.

The UK Habitat Classification (UKHab) system comprises a principal hierarchy (the Primary Habitats) which involves the identification of broad habitats and Priority habitats, as well as the use of non-hierarchical Secondary codes.

In addition, plant species listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*) were searched for.

#### 3.2.2 Fauna

The ability of the Site to support protected or notable species, including reptiles, badger (*Meles meles*), bats, great crested newt (*Triturus cristatus*) and breeding birds, was assessed and field evidence of such species was searched for.

Trees within the Site boundary or wider survey area were assessed from ground-level, to gauge their overall suitability for roosting bats (high, medium or low), based on criteria within the third edition of the Bat

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<sup>2</sup> <https://ukhab.org>

Conservation Trust's Good Practice Guidelines<sup>3</sup>.

### 3.3 Assessment Approach

The ecological evaluation and impact assessment approach used here is based on Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland ("CIEEM guidelines") (CIEEM, 2018<sup>4</sup>).

#### 3.3.1 Important Ecological Receptors

Ecological receptors can be important for a variety of reasons and the rationale used to identify them is explained here. Importance may relate, for example, to the quality or extent of the Site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

Importance should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International;
- National (i.e. UK/ Wales etc.);
- Regional (i.e. South Wales);
- County (i.e. Pembrokeshire); and
- Local (i.e. within 2km).

The importance of the various habitats has been measured against published selection criteria where available and relevant. Examples of relevant criteria includes descriptions of habitats listed on Annex 1 of the Habitats Directive; Local Wildlife Site Selection Criteria; and Habitat Action Plans (HAPs) contained within Local Biodiversity Action Plans.

In assigning a level of importance to a species, it is necessary to consider their distribution and status, including a consideration of trends where relevant. Reference has therefore been made to published lists and criteria where appropriate. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive) and Birds of Conservation Concern (BoCC)<sup>5</sup>.

For the purposes of this report ecological features of local importance or greater and/ or subject to legal protection have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms and have therefore been omitted from the assessment process.

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<sup>3</sup> Collins, J. (2016) Bat Surveys for Professional Ecologists. Good Practice Guidelines. Third edition. Bat Conservation Trust, London.

<sup>4</sup> Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland, September 2018.

<sup>5</sup> Eaton, M.A., Aebischer, N.J., Brown, A., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A., & Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108: 708-746.

### 3.3.2 Impact Assessment

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- incorporating measures to avoid and mitigate these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

When describing impacts, consideration has been given to the following, as appropriate:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wet grassland.

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions, as well as its distribution and its typical species within a given geographical area; and
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

### 3.3.3 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of the CIEEM guidelines (2018). Significance relates to the weight that should be attached to effects when decisions are made.

For the purpose of EclA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/ local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

## 3.4 Limitations

### 3.4.1 Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that protected species not identified during the data search do in fact occur within the vicinity of the Site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

### 3.4.2 Accessibility and Survey Timing

The Site, and immediately surrounding areas, were fully accessible, and as such no access restrictions apply.

The survey was conducted in September towards the end of the optimum botanical survey season, however, the survey was conducted by a competent and experienced botanist and the habitats identified comprised of common and widespread species, therefore this does not present an appreciable constraint to survey or assessment.

## 4.0 Results

### 4.1 Statutory and Non-Statutory Protected Areas

#### 4.1.1 Statutory Designated Sites

Two statutory designated sites are located approximately 50m to the south of the Site, namely Pembrokeshire Marine/ Sir Benfro Forol Special Area of Conservation (SAC) and Milford Haven Waterway Site of Special Scientific Interest (SSSI), as summarised in Table 4-1 below.

**Table 4-1 Statutory Designated Sites within 2km of the centre of the Site**

Grid Ref.	Site Name	Reason for Designation	Distance from Site <sup>6</sup>
SM 92614 04550	Pembrokeshire Marine/ Sir Benfro Forol (SAC)	Qualifying Features: lagoons, allis shad ( <i>Alosa alosa</i> ), twaite shad ( <i>Alosa fallax</i> ), Atlantic salt meadows, estuaries, grey seal ( <i>Halichoerus grypus</i> ), river lamprey ( <i>Lampetra fluviatilis</i> ), shallow inlets and bays, otter, intertidal mudflats and sandflats, sea lamprey ( <i>Petromyzon marinus</i> ), reefs, subtidal sandbanks, sea caves, and shore dock ( <i>Rumex rupestris</i> ).	50m to the south
SM 92614 04550	Milford Haven Waterway (SSSI)	Milford Haven Waterway is of special interest for its geology, ancient woodland, marine biology, saltmarsh, swamp, saline lagoons, rare and scarce plants and invertebrates, nationally important numbers of migratory waterfowl, greater horseshoe ( <i>Rhinolophus ferrumequinum</i> ) and lesser horseshoe ( <i>Rhinolophus hipposideros</i> ) bats and otter.	50m to the south

Both statutory sites are designated predominantly due to their marine features, which will not be impacted by the proposals.

Milford Haven Waterway SSSI is designated for its migratory waterfowl and horseshoe bats, and therefore this statutory designated site has been brought forward for further assessment.

#### 4.1.2 Non-Statutory Designated Sites

There is one non-statutory designated site located within 2km of the Site, which is a Regionally Important Geodiversity Site (RIGS), known as 'Wear Point', approximately 460 metres to the east of the Site. This site is designated for its geological features, and does not have scope to be adversely affected by the proposals, therefore non-statutory sites have been removed from further assessment.

<sup>6</sup> At closest, point, measured 'as the crow flies'

### 4.1.3 Priority Habitats

There are several priority habitats listed under Section 7 of the Environment (Wales) Act/UK Biodiversity Action Plan within 2km of the Site. Two of these priority habitats are located adjacent to the Site, a summary of these sites is provided in Table 4-2 below.

**Table 4-2 Priority Habitats Adjacent to Site**

Priority Habitat Name	Designation	Distance from Site <sup>7</sup>
Coastal Saltmarsh	UKBAP <sup>8</sup> , S7 <sup>9</sup> , LBAP <sup>10</sup>	Adjacent to south
Ancient Woodland	LBAP	Adjacent to north-west

Due to the low impact nature of the proposals, neither of these priority habitats are considered to have scope to be adversely affected, and therefore these habitats have been removed from further assessment.

## 4.2 Habitats

The 'UKHab' habitats present on the Site are illustrated in Drawing 1 and described below.

### 4.2.1 Other neutral grassland (g3c)

The eastern field (Plate 1) is dominated by neutral grassland that appeared to have been recently cut at the time of the survey; it is regularly used to graze sheep. The sward predominantly comprises perennial ryegrass (*Lolium perenne*), annual meadow grass (*Poa annua*), cock's foot (*Dactylis glomerata*), and rough meadow grass (*Poa trivialis*), with creeping thistle (*Cirsium arvense*), common nettle (*Urtica dioica*), yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*), and field madder (*Sherardia arvensis*) also occurring.

There are wide strips of neutral grassland with a longer sward along the western and southern boundaries of the western field (Plate 2) and along the southern and eastern boundaries of the eastern field. The sward is taller and appears not to have been mown recently or as frequently as the rest of the field. There is a more diverse range of species within these stripes, with creeping softgrass (*Holcus mollis*), common bent (*Agrostis capillaris*), cow parsley (*Anthriscus sylvestris*), hogweed (*Heracleum sphondylium*), and common hawkweed (*Hieracium lachenalia*) present, as well as the species present within the rest of the eastern field.

A small area of unmown neutral grassland is also present within the north-eastern corner of the western field around the brick building and maritime marker (TN1 in Drawing 1; Plate 3). This area is dominated by false oat grass (*Arrhenatherum elatius*) and cock's foot, with dense areas of bramble (*Rubus fruticosus* agg.).

These areas of neutral grassland are not botanically diverse; as such they are assessed as having less than local intrinsic ecological importance and have been removed from further assessment.

<sup>7</sup> At closest, point, measured 'as the crow flies'

<sup>8</sup> UKBAP: UK Biodiversity Action Plan Priority Habitat

<sup>9</sup> S7: Environment (Wales) Act 2016

<sup>10</sup> LBAP: Pembrokeshire Biodiversity Action Plan habitat



**Plate 1:** Eastern field – photograph taken facing northeast



**Plate 2:** Tussocky grass along western boundary of western field – photograph taken facing west



**Plate 3:** Tussocky grassland and bramble scrub around brick building and maritime marker – photograph taken facing north

#### 4.2.1 Modified grassland (g4)

The western field (Plate 4) appears to be more nutrient-enriched than the eastern field and does not appear to have been grazed recently. It is dominated by perennial rye grass with a much less diverse range of species, such as white clover (*Trifolium repens*), broad-leaved dock (*Rumex obtusifolius*), common sorrel (*Rumex acetosa*), creeping buttercup (*Ranunculus repens*), and ribwort plantain.

The modified grassland is not botanically diverse; and as such is assessed as having less than local intrinsic ecological importance and has been removed from further assessment.



**Plate 4:** Modified grassland in western field – photograph taken facing northwest

#### 4.2.2 Hedgerow (h2a; H1-H2)

The hedgerow separating the two fields is approximately 1.5-2m tall and wide (H1 in Drawing 1; Plate 5). The hedgerow predominately comprises hawthorn (*Crataegus monogyna*), with blackthorn (*Prunus spinosa*) and sycamore (*Acer pseudoplatanus*) interspersed along its length. It is fenced on both sides with a field gate in the middle. The ground flora consists of the species present in both grassland fields, as well as common nettle, bracken (*Pteridium aquilinum*), cleavers (*Galium aparine*), and hedge bedstraw (*Galium mollugo*).

The hedgerow along the northern boundary of both fields (H2 in Drawing 1; Plate 6) has been planted on a 0.5m tall earth bank. The hedgerow primarily consists of hawthorn and blackthorn with occasional elder (*Sambucus nigra*), sycamore, and dogwood (*Cornus sanguinea*) also present.

Hedgerows are a priority habitat (i.e. habitat of principle importance under the NERC Act 2006), and given their structure and form, both boundary hedgerows are assessed as having local ecological importance; as such the potential impact of the scheme upon hedgerows has been subject to further assessment.



Plate 5: Hedgerow H1 between the two fields – photograph taken facing southwest

#### 4.2.3 Blackthorn scrub (h3a) and Mixed Scrub (h3h, off-site)

The fields are bordered to the west and south by dense stands of blackthorn scrub (Plate 7).

An area of mixed scrub (Plate 8) is present in the north-eastern off-site corner of the eastern field, which is dominated by bramble, with blackthorn and hawthorn also present. Immature sycamore, elder, and ash (*Fraxinus excelsior*) (with signs of ash dieback) are growing along the northern edge of the scrub.

The boundary scrub comprises of common and widespread species, however the scrub forms ecologically valuable boundary features, and scrub has therefore been assessed as having local ecological importance and has been subject to further assessment.



**Plate 6:** Hedgerow H2 on earth bank along northern boundary – photograph taken facing north



**Plate 7:** Blackthorn scrub along southern boundary – photograph taken facing south

#### **4.2.4 Buildings (u1b5)**

A small brick building (Plate 9) is located in the north-eastern corner of the western field. It is connected to a large maritime marker (TN1 in Drawing 1) by electrical wires which power lights on the marker. The potential for the building to support roosting bats is discussed in Section 4.3.1.1.



**Plate 8:** Mixed scrub in north-eastern corner of eastern field – photograph taken facing east.



**Plate 9:** Small brick building and maritime marker in north-eastern corner of the western field.

#### 4.2.5 Schedule 9 Invasive Plants

No Schedule 9 plant species were found on Site, or along the Site boundaries during the ecological walkover; and have therefore been removed from further assessment.

## 4.3 Protected and Notable Species

### 4.3.1 Mammals

#### 4.3.1.1 Bat

There are numerous bat records within 2km of the Site, including brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), greater horseshoe bat, lesser horseshoe bat, Leisler's bat (*Nyctalus leisleri*), *Myotis* species, Nathusius pipistrelle (*Pipistrelle nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctule*), serotine (*Eptesicus serotinus*), soprano pipistrelle (*Pipistrellus pygmaeus*), barbastelle (*Barbastellus barbastellus*), and whiskered bat (*Myotis mystacinus*).

There are no trees within the Site which are considered suitable for roosting bats.

A small brick building lies in the north-eastern corner of the western field, which is considered to have Low potential for roosting bats, although no evidence of roosting bats was identified during the walkover survey. The doorway was sealed, however there are small gaps in broken vents on the north-eastern elevation of the building (Plate 10), facing towards hedgerow H2, creating potential bat access points.



**Plate 10:** Potential access points into brick building – photograph taken facing southwest

The boundary hedgerows and scrub provide potential habitat for foraging and commuting bats.

Based on the number and species assemblage of bats likely to use the boundaries of the Site, and habitat located a short distance beyond, bats have been assessed as having local intrinsic ecological importance, and the potential impact of the scheme upon foraging and roosting bats has been subject to further assessment.

#### 4.3.1.2 Badger

There are several records of badger within 2km of the Site, the closest being over 450m from the boundary.

Occasional mammal paths were observed within the hedgerows around the Site boundaries, although no evidence of badger was found on Site or within 30m from its boundary. Nonetheless, the boundary hedgerows

and scrub offer potential opportunities for sett excavation, and the grassland could provide suitable foraging and commuting habitat for badgers.

As a precaution, it is therefore recommended that a pre-commencement walkover is carried out to search for freshly excavated setts. In the unlikely event that such setts are found, necessary precautions/ sensitive working methods shall be taken.

#### 4.3.1.3 Hazel Dormouse

There are no records of hazel dormouse within 2km of the Site, and the nearest confirmed record is over 2km away, in Saundersfoot.

Whilst the boundary hedgerows and scrub, and the off-Site scrub located to the south and west of the Site, offers potential for dormice, the core of the Site, consisting of modified and neutral grassland, is not suitable for this species.

Given the lack of suitable habitat within the core of the Site, and the absence of hazel dormice records within the local environment, this species is deemed unlikely to be present and has been removed from further assessment.

#### 4.3.1.4 Otter and Water Vole

There are three records of otter within 2km of the Site, the closest of which is approximately 250m to the west, dating from 2011. There are no records of water vole (*Arvicola amphibius*) within 2km of the Site.

There are no riparian habitats within the Site. Whilst there is a waterbody 60m to the north-west of the Site which has the potential to support both otter and water vole, connectivity between this waterbody and other suitable waterbodies is limited. Otter and water vole are therefore unlikely to be present and both have therefore been removed from further assessment.

#### 4.3.2 Great Crested Newt

There are records of common toad (*Bufo bufo*) and common frog (*Rana temporaria*) within 2km of the Site dating between 2010-2012, however there are no records of great crested newts within 2km of the Site. Great crested newts are generally considered to be absent from Pembrokeshire due to a lack of records for the county.

The Site does not contain any waterbodies, though one exists approximately 60m to the north-west of the Site, within adjacent woodland, with a further waterbody located approximately 125m to the north-east of the Site. No other waterbodies which could be used by breeding amphibians are present within 250m of the Site.

Given the lack of great crested newt records within 2km of the Site and in the whole of Pembrokeshire, the lack of waterbodies within the Site, and the presence of only two waterbodies within 250m of the Site, great crested newts are considered unlikely to be present within the Site, or be affected by the proposals, and have therefore been removed from further assessment. The Site has sub-optimal conditions for other species of amphibian, so amphibians have been omitted from further assessment.

#### 4.3.3 Reptiles

There are records of grass snake, common lizard, slow-worm and adder within 2km of the Site. The closest being a record of a slow-worm, located within the scattered scrub adjacent to the northern Site boundary,

dating from 2019. Common lizard was recorded approximately 120m north-west of the Site in 2012, and grass snake approximately 160m north-west of the Site in 2012. The nearest adder record lies over 1.5km from the Site.

The tussocky neutral grassland around the western and southern boundaries of the western field, and the southern and eastern boundaries of the eastern field are considered to offer suitable habitat for reptiles, particularly as this habitat is contiguous with larger areas of tussocky neutral grassland located adjacent to the Site.

However, whilst there is potential for reptiles to occur around the margins of the Site, the core of the Site lacks the necessary shelter or cove, such that reptiles are deemed highly unlikely to occur here within any regularity, nevertheless, given the legal protection afforded to reptiles, this group has been considered further.

#### 4.3.4 Nesting Birds

There are numerous records of birds within 2km of the Site, including barn owl (*Tyto alba*), black-tailed godwit (*Limosa limosa*), brambling (*Fringilla montifringilla*), Cetti's warbler (*Cettia cetti*), fieldfare (*Turdus pilaris*), golden plover (*Pluvialis apricaria*), green sandpiper (*Tringa ochropus*), greenshank (*Tringa nebularia*), kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), red kite (*Milvus milvus*) and redwing (*Turdus iliacus*), all of which are listed under Schedule 1 of the Wildlife and Countryside Act (1981, as amended).

The chough is a Pembrokeshire LBAP species, and whilst no records of this species were provided for land within 2km of the Site by Local Environmental Records Centre (LERC) Wales, it has been considered further, given that this species tends to nest in coastal cliffs and feed on short grassland near the coast.

Manx shearwater (*Puffinus puffinus*) is on the amber list of Birds of Conservation Concern (BoCC)<sup>11</sup>, and whilst no manx shearwater records were provided for land within 2km of the Site, this species has been considered further, in response to pre-application comments received from Pembrokeshire County Council<sup>12</sup>.

During the walkover survey, a kestrel (*Falco tinnunculus*), a Pembrokeshire LBAP species, was seen foraging over the eastern field, and a snipe (*Gallinago gallinago*) was flushed from the western field. Species identified within the hedgerows included robin (*Erithacus rubecula*), dunnoek (*Prunella modularis*), magpie (*Pica pica*), and blackbird (*Turdus merula*).

The boundary habitats such as the hedgerows and blackthorn scrub provide habitat for nesting birds, and there is potential for ground-nesting bird species to nest within the neutral grassland, albeit not in large numbers.

Overall, the Site is assessed as having less than local importance for nesting birds, however, given the legal protection afforded to birds, and active bird nests, the potential impact of the scheme during construction, if carried out within the bird breeding season, has been subject to further assessment.

<sup>11</sup> Eaton, M.A., Aebischer, N.J., Brown, A., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A., & Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108: 708-746.

<sup>12</sup> Undated correspondence from Rebecca Blackman, Planning Ecologist, Pembrokeshire County Council.

### 4.3.5 Other Species

There are several records of hedgehog (*Erinaceus europaeus*) within 2km of the Site, however whilst the boundary hedgerows and scrub provide potential hibernation sites for hedgehog, the core of the Site does not, though it may provide foraging habitat for this species. Given that gaps shall exist at the base of security fence such that hedgehog, and other small mammals, can continue to access it post-installation; hedgehog has therefore not been considered further.

There are several records of invertebrate species within 2km of the Site, however none of the Site habitats are of a quality or structure which could support notable species or assemblages of invertebrates.

## 4.4 Summary of Important Ecological Receptors

Ecological receptors assessed as having local importance or greater, as well as legally protected species and/ or habitats, which could potentially be affected by an unmitigated scheme are summarised in Table 4-3.

Where a receptor has been omitted from detailed assessment (due to no potential impacts arising or it having less than local ecological importance), a rationale has been provided earlier within this report.

**Table 4-3: Summary of Important Ecological Features Subject to Detailed Assessment**

Important Ecological Receptor	Scale at which Feature is Important	Comments on Legal Status and/ or Importance
Milford Haven Waterway SSSI	Local	Milford Haven Waterway is located 50m to the south of the Site, designated for its special interest for its geology, ancient woodland, marine biology, saltmarsh, swamp, saline lagoons, rare and scarce plants and invertebrates, nationally important numbers of migratory waterfowl, greater horseshoe ( <i>Rhinolophus ferrumequinum</i> ) and lesser horseshoe ( <i>Rhinolophus hipposideros</i> ) bats and otter.
Hedgerows H1-2 & boundary scrub	Local	Hedgerows constitute a Priority Habitat; hedgerows have intrinsic value and are likely to support a range of protected and notable species, and to act as general wildlife corridors.
Foraging and Roosting Bats	Local	A small building within the north—eastern corner of the western field has Low potential for roosting bats; boundary hedgerow and scrub have potential for foraging and commuting bats. All British bats are ‘European protected species’.
Badger	Less than Local (field margins have scope to support setts in the future)	Badgers, and their places of shelter and protection (i.e. setts) are legally protected under the Protection of Badgers Act 1992.
Reptiles	Less than Local	The boundary hedgerows and scrub and the neutral

Important Ecological Receptor	Scale at which Feature is Important	Comments on Legal Status and/ or Importance
		<p>grassland field margins have potential to support reptiles, however the 'core' of the Site is considered to have little potential for reptiles.</p> <p>Protected from killing and injuring under the Wildlife and Countryside Act 1981 (as amended).</p>
Breeding birds	Less than Local	<p>Whilst the Site has potential to support a limited number of ground-nesting species, and passerine species within the boundary hedgerows, overall it does not have scope to support a nesting bird assemblage of importance.</p> <p>However, native birds, and the nests, eggs and young of native birds, are protected against killing and injury/ damage and destruction under the Wildlife and Countryside Act 1981 (as amended).</p> <p>Particular consideration has been given to the potential impact upon chough and manx shearwater.</p>

## 5.0 Assessment of Effects, including Mitigation Measures and Proposed Biodiversity Enhancements

### 5.1 Statutory Designated Sites

Milford Haven Waterway SSSI is located 50m to the south of the Site, and is designated for its horseshoe bats, as well as marine features.

The provision of substantial new hedgerow planting and introduction of woodland planting, as discussed in Section 5.2 below, will benefit all bat species, including horseshoe bats, by better-connecting the off-site and on-site habitats, and providing substantial foraging and commuting habitat for bats.

In addition, the Site will not be lit. Horseshoe bats and the Milford Haven Waterway SSSI are therefore not considered to be adversely affected by the proposals, and the proposals are likely to lead to a positive overall impact for bats, as discussed further in Section 5.3.1.

### 5.2 Habitats

#### 5.2.1 Hedgerows and Scrub

The perimeter security fence shall be located at least 10 metres from hedgerows and mature trees, and as such none of their features, including the Root Protection Zones (RPZs) of any trees, shall be impacted.

The existing hedgerows H1 and H2 will be retained, with the exception of two small gaps totalling 26 metres which need to be removed to facilitate access.

On the western boundary, the existing dilapidated fencing and scrub will be replaced with a new native hedgerow, approximately 250 metres in length. A further native hedgerow will also be planted on the south-eastern boundary, over 536 metres in length (refer to Landscape Strategy Plan, provided in Appendix 3).

The new hedgerow habitat shall be planted in a double-staggered row at 0.5 metre centres and arranged, in single species groups of 3-7 plants. All stock shall be of British origin, and of local provenance if possible.

The new hedgerow hedgerow mix shall be as follows:

Hedgerow mix	Additional Information
Hazel <i>Corylus avellana</i> (20%)	1+2; Transplant – seed raised; branched; 4 breaks; 80-100 cm high
Hawthorn <i>Crataegus monogyna</i> (35%)	1+2; Transplant – seed raised; 4 breaks; 80-100 cm high
Holly <i>Ilex aquifolium</i> (10%)	Leader with laterals; 2L; 40-60 cm high
Blackthorn <i>Prunus spinosa</i> (35%)	1+2; Transplant – seed raised; branched; 3 breaks; 80-100 cm high

#### 5.2.2 Native Woodland Planting

An area of 0.0995ha of native woodland planting shall occur on the north-western Site boundary, planted at 4 metre centres.

Hedgerow mix	Additional Information
Field maple <i>Acer campestre</i> (25%)	1+2; Transplant – seed raised; branched; 4 breaks; 80-100 cm high
Downy birch <i>Betula pubescens</i> (25%)	1+2; Transplant – seed raised; 4 breaks; 80-100 cm high
Holly <i>Ilex aquifolium</i> (25%)	Leader with laterals; 5L; 60-80 cm high
Rowan <i>Sorbus aucuparia</i> (25%)	1+1; Transplant – seed raised; branched; 80-100 cm high

The new planted woodland will strengthen the connection to the off-site woodland on the north-eastern Site boundary, and the scrub and new hedgerow on the southern boundary.

Together the proposed hedgerow and woodland planting shall deliver a net positive impact, considered to be significant at the local level.

## 5.3 Species

### 5.3.1 Roosting and Foraging Bats

Whilst a small area of scrub on the western boundary and 26 metres of hedgerow will be removed to facilitate access, the provision of new hedgerows and woodland habitat, as described within Section 5.1 and illustrated in Appendix 3, will appreciably enhance the Site for foraging and commuting bats by providing additional habitat and better-connecting the existing hedgerows together.

The existing brick building with Low potential for roosting bats will be retained, and six bat boxes shall be erected on poles and positioned across the Site, with a focus on the northern and southern Site boundaries, which are located close to likely bat commuting routes and flight lines. These boxes shall be positioned at least four metres above ground-level, facing south or south-east. They shall comprise Schwegler 1FF<sup>13</sup>, or similar (as approved by a suitably experienced ecologist).

Overall, there will be a positive and significant impact upon bats, as a result of the proposals.

### 5.3.2 Badger

Although no badger setts or other field signs were recorded during the ecological survey, the Site, and in particular its boundaries, have potential for badger, and therefore as a precaution a pre-commencement walkover shall be carried out to search for freshly excavated setts. In the unlikely event that such setts are found, necessary precautions/ sensitive working methods shall be taken.

Gaps measuring a minimum of 35cm high by 30cm wide will be created at the base of the perimeter fence, at strategic locations, to allow access into the Site by badger. This will ensure that badgers, and other wildlife, including hedgehog and other small mammals, are able to take advantage of the undisturbed foraging opportunities within the Site. The predicted impact upon the potential value of the Site for badger is 'No Net Change'.

<sup>13</sup> <https://www.nhbs.com/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel>

### 5.3.3 Reptiles

In the absence of mitigation, there is a small possibility that reptiles could be injured or killed during installation works. To reduce the likelihood of killing or injuring reptiles to negligible levels, the following sensitive working measures shall be adopted, for any works required within the boundary habitats (such as the neutral grassland field margins):

- If construction is to commence within the active period for reptiles (i.e. March to October) then habitat manipulation and ecological supervision will be undertaken to encourage reptiles away from areas of suitable habitat (i.e. vegetated margins) within the working footprint, and towards the off-Site habitat to the south and south-west. This will be achieved using the following steps:
  - The area of vegetation requiring removal would first be subject to a finger-tip search by a suitably experienced ecologist;
  - The vegetation would then be cut in a directional manner, under an ecological watching brief;
  - If any reptiles are found during the above works, they would be carefully moved to a safe place well away from the working area by the ecologist.

The Site lacks refugia suitable for hibernating reptiles, and therefore if works are to be undertaken in the hibernation period (i.e. November to February), the risk of injuring reptiles is considered negligible, and no precautionary working measures would be required in this period.

In addition, the suitable terrestrial habitat for reptiles within the Site post-installation will be enhanced, through the planting of new hedgerows and woodland and the seeding of EM1 General Purpose Meadow Mixture. Five hibernacula will also be created within the Site. The locations of the hibernacula are shown in Appendix 3, which are positioned in tussocky grassland, in a sunny area, so that the long banks face south. The hibernacula will be a minimum of 4 metres long, 2 metres wide and 1 metre deep. The hibernacula will be formed by removing turf, excavating and filling with core material such as cut timber, brush and tree roots, covering with turf, and incorporating access entrances for reptiles.

With the above mitigation measures in place, there would be no significant residual impact upon reptiles, and the Site will be enhanced for reptile species post-development.

### 5.3.4 Breeding Birds

The boundary hedgerows and scrub have the potential to support a range of breeding birds, however, these linear features will not be affected, with the exception of two small gaps in the hedgerows to facilitate access and the removal of scrub on the western boundary to be replaced by a new native hedgerow. The grassland forming the core of the Site also has some potential to support ground-nesting species.

Therefore, to avoid the potential killing/ injury of birds and damage/ destruction of their nests, installation work will either take place outside of the main bird breeding season (which broadly extends between March and August inclusive) if possible, or immediately following a search for active nests by a qualified ecologist, if this is not possible.

No records of chough were provided by LERC (Wales) for land within 2km of the Site, and there is no reference

to chough within the Milford Haven Waterway Environmental Surveillance Group 2019 Annual Report<sup>14</sup> or the Review of the Status of Wetland Birds in Milford Haven Waterway<sup>15</sup>. In addition, the larger populations of chough are found at Castlemartin Coast Special Protection Area (SPA) 4.79km to the south-west of the Site, and Skomer, Skokholm and the Seas off Pembrokeshire SPA, 10km south of the Site, therefore the likelihood of chough occurring on Site is low.

Furthermore, chough feed on short grass near sea cliffs and the majority of the grassland within the Site will be retained. The grassland within the perimeter fence will be subject to grazing or be regularly mown, and therefore should chough occur they are unlikely to be affected by the proposals, indeed the availability of short grassland within the perimeter fence, around the solar panels, has potential to benefit this species.

Concerns have been raised by Ms Rebecca Blackman, Planning Ecologist at Pembrokeshire County Council that young manx shearwater may mistake the solar panels for water and injure themselves. However, the solar farm will not be lit and is not located in close proximity to any manx shearwater breeding sites. The main populations of breeding manx shearwater are found at Skomer, Skokholm and the Seas off Pembrokeshire SPA, 10km south of the Site; birds from these colonies are highly unlikely to be attracted to the Site, and therefore the potential impact upon this species is likely to be negligible.

In terms of the potential impact upon birds in general, the provision of substantial new hedgerow planting and introduction of woodland planting will benefit many species.

In order to enhance the Site further for birds, four bird boxes shall be mounted on poles and positioned across the Site, focussed on the northern and southern Site boundaries. These shall comprise two barn owl boxes and two kestrel boxes which shall be positioned at least 4 metres above ground-level, and face east, away from prevailing winds.

The design of the kestrel boxes shall be the Kestrel Open Nest Box<sup>16</sup> or similar, with a large opening for kestrels and a covered roof. The design of the owl boxes shall be durable, designed for external use (some boxes are designed for internal use only, for example, where placed within barns, and are not sufficiently weather-proof or robust for external use). The specific design of each box type to be used shall be approved by an appropriately experienced ecologist, though suitable designs are available from the Barn Owl Trust<sup>17</sup>.

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<sup>14</sup>Milford Haven Waterway Environmental Surveillance Group, (2019). Milford Haven Waterway Environmental Surveillance Group Annual Report 2019.

<sup>15</sup>Haycock A (2019). A review of the status of wetland birds in the Milford Haven Waterway and Daugleddau Estuary, 2019. A report to the Milford Haven Waterway Environmental Surveillance Group.

<sup>16</sup> <https://www.nhbs.com/kestrel-open-nest-box>

<sup>17</sup> <https://www.barnowltrust.org.uk/product/barn-owl-nestbox-for-use-on-trees/>

## 6.0 Construction Environmental Management Plan (CEMP: Biodiversity) and Biodiversity Management Plan (BMP)

### 6.1 Site preparation and Precautions

#### 6.1.1 Sensitive Working Methods/ Precautions to be Taken During Construction

Before any materials or machinery are brought onto Site, if deemed necessary protective fencing shall be erected around all existing boundary hedgerows as set out in BS 5837: 2012<sup>18</sup> in order to create an appropriate operational buffer zone. This fencing shall be maintained throughout the duration of the construction phase.

Access to the Site will be gained from an existing access track to the north-west of the Site. The provision of an access route will result in the loss of two small sections of the existing boundary hedgerows H1 and H2.

Sensitive working methods should be adhered to, such as not leaving sharp wires within the fencing, as well as no chemicals or exposed trenches left overnight, to protect badgers that may be using the Site.

A search will also be undertaken for nesting birds, if works are carried out between March and August inclusive, and if active nests are found, the nest and suitable buffer shall remain undisturbed until the young have fledged or the nesting attempt is complete.

#### 6.1.2 Cultivation and De-compaction

The proposed methods of cultivation will be reviewed prior to the works commencing, in recognition of the need for a flexible approach, including the availability of machinery and the prevailing Site conditions/ proposed timing of the works.

All areas to be subject to grassland seeding and hedgerow/ tree planting will be assessed for compaction prior to planting/ seeding and if necessary and practical, decompaction (for example, using a disc harrow) will be carried out to a depth of 300mm, with soils loosened, aerated, and broken up, when ground conditions are reasonably dry. Disc harrowing will not be carried out within operational buffer zones.

#### 6.1.3 Herbicide

If deemed necessary, a suitable non-residual herbicide (such as glyphosate) will be applied to those areas to be subject to wildflower meadow seeding and hedgerow/ tree planting, ahead of these works taking place. Two weeks will be allowed before planting operations commence, following the application of the non-residual herbicide.

### 6.2 Hedgerow and Woodland Planting and Maintenance

The hedgerow and woodland planting species have been selected for their wildlife value, as they will provide winter berries/ fruits and/ or nuts, as well as suitable cover for breeding birds.

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<sup>18</sup> British Standards Institute (2012) BS 5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations. BSI, London

All plant handling and planting operations will comply with relevant clauses (Parts I to III) of CPSE 'Handling and Establishing of Landscape Plants' (obtainable from the Horticultural Trades Association).

The health and wellbeing of all planting stock will be ensured before commencing work, including root system condition.

All transplants will be bare-root and supplied to site in bags containing the whole root system.

All hedgerow shrubs will be planted in a 0.5 metre wide x 0.3 metre deep trench (or larger if necessary, in order to take the full spread of the roots); the sides and bottom of the trench will be forked over and 'ripped' to facilitate proper drainage, prior to back-filling. The trench will be excavated on the same day as planting and will be back-filled with an appropriate excavated topsoil/ compost mix. Compost will only be used if necessary; should compost be deemed necessary, it will be Compost Association certified, or obtained from a supplier conforming to this specification.

When planted, the top of the root collar will be level with the surrounding soil surface and the ground around the plant will be firmed in by treading, taking care to avoid scuffing or damage. The completed planting pit will be either at ground level or slightly domed to prevent water-logging. On no account will any roots be left exposed (to prevent desiccation) or bent. The planting bed will then be mulched with mature coniferous bark, with an even particle size of between 5 - 35mm, to a depth of 75mm (minimum), over weed-free soil, after completion of planting (and, if necessary, watering).

All planting will be individually protected either by 0.6 metre high and 50 mm diameter photodegradable tube guards, or greater if dictated by the girth of the tree (such as spiral HDPE from Acorn Planting Products, or similar approved) supported by a single stout 900 mm cane (inserted 300 mm below ground level) or, in the case of the more bushy species, a 0.6 m high shrub shelter and softwood timber stakes of no less than 80 mm diameter driven 400 mm into the ground.

In order to achieve good rates of establishment, the hedgerow shall be planted in the early Spring (March), or the Autumn (October or November); planting may also take place within the mid-winter period, if it is mild, but planting should not take place if the ground is frozen or water-logged.

Once established these hedgerows shall be maintained at a height of at least 2.5-3 metres; the height will be increased for hedgerows and areas of scrub which can be allowed to grow taller without shading the panels. Hedgerows will be pruned in February, alternating on a two or three-year rotation. Where one side of the hedgerow falls on third party land, that side of the hedgerow should not be pruned without the landowner's permission.

Once established, the planting area of the woodland shall be re-mulched during Years 1-3 to minimise competition from weeds and grasses. Selective thinning and coppicing of the woodland shall be carried out, of approximately 30% of plants in Year 5. Deadwood and brash piles will be left in-situ, to provide habitat for species such as reptiles, amphibians and invertebrates.

The existing and planted hedgerows will be maintained at a height of 2.5-3 metres, being cut in late winter (ideally February) to provide fruits, nuts and berries for 'winter thrushes' and other wildlife.

## 6.3 Wildflower Grassland

Following installation of the solar farm, the existing grassland within the perimeter fence shall be retained as grazing pasture or mown on a regular basis. The existing grassland outside of the perimeter fence shall be allowed to grow to a tall sward and mown no more than once annually.

An area of 0.089ha on the eastern Site boundary will be sown with a general purposed meadow mixture (Emorsgate EM1<sup>19</sup>).

The EM1 General Purpose Meadow Mix will contain the following species:

Wildflower Species	Grass Species
Yarrow <i>Achillea millefolium</i> (0.1%)	Common bent <i>Agrostis capillaris</i> (8.0%)
Common knapweed <i>Centaurea nigra</i> (3.5%)	Crested Dog's-Tail <i>Cynosaurus cristatus</i> (28.0%)
Cross wort <i>Cruciata laevipes</i> (2.2%)	Red fescue <i>Festuca rubra</i> (24.0%)
Ox-eye daisy <i>Leucanthemum vulgare</i> (3.5%)	Smaller Cat's-Tail <i>Phleum bertolonii</i> (4.0%)
Ribwort plantain <i>Plantago lanceolata</i> (6.5%)	Smooth-stalked meadow-grass <i>Poa pratensis</i> (16.0%)
Salad burnet <i>Poterium sanguisorba</i> ( <i>Sanguisorba minor</i> ) (2.0%)	
Selfheal <i>Prunella vulgaris</i> (0.1%)	
Meadow buttercup <i>Ranunculus acris</i> (2.0%)	
Bladder Champion <i>Silene vulgaris</i> (0.1%)	

The meadow mix shall be sown at a rate of 4g/ m2.

Seeding will take place during suitable conditions (i.e. when the ground is moist but not waterlogged) and the area rolled to ensure good ground to seed contact. Seeding of Emorsgate meadow mix EM1 could, potentially, take place at any time of year, including within the summer, if the ground is damp. However, the optimal sowing season is Autumn (September or October) or Spring (March or April).

The areas to be sown should be disc harrowed (to a depth of 30 cm), where necessary, to create a medium tilth. This would then be followed by the application of the seed, which would be scattered onto the surface, and then rolled, rather than 'drilled' into the ground.

A final decision on when to prepare the ground, prepare the seedbed, and then to broadcast and roll the seed, will be made once construction works are complete.

<sup>19</sup> <https://wildseed.co.uk/mixtures/view/2/basic-general-purpose-meadow-mixture>

Grass seeding will take place immediately following appropriate ground preparation, leaving sufficient time for the ground to have recovered from the glyphosate application (this is normally around two weeks after application).

Growth and establishment of grasslands may be slow initially. Weed growth would be controlled by more frequent topping or mowing in the first, and if necessary, the second, growing season.

Rolling may be undertaken, as appropriate, to level the ground, press in smaller stones, encourage tillering and flatten molehills, during suitably dry conditions and timed to avoid potential damage to ground-nesting birds (i.e. generally not between mid-March and start of August, subject to assessment).

The EM1 General Purpose Meadow Mix contains a large proportion of perennial species, many of which are slow to germinate. It is likely that a range of annual 'weeds' may germinate much more quickly. In order to control these, and to improve the chances of the meadow mix establishing successfully, areas sown will normally be cut or mown at least twice (to a sward height of approximately 75mm) in the first year of sowing (once in Spring, and again in the Autumn). If the seed is sown in the autumn, the initial Spring cut is normally unnecessary.

Bi-annual cutting may need to be repeated in Year 2, depending on the rate of establishment.

Once established, mowing of the EM1 general purpose meadow mix would normally involve a single cut, in September.

By maintaining a range of sward heights in this way, cover is provided for small mammals and invertebrates in the longer vegetation, whilst creating foraging opportunities for species such as barn owl, kestrel when these animals venture out into the shorter grassland, when they become more vulnerable to predation.

Other than to spot-treat 'weeds' such as thistles, no herbicides would be used on the Site.

Effective security systems are vital to the successful safeguarding and protection of solar farms, as not only do functioning systems, and triggered alarms, deter break-ins, but they can lead to their identification and subsequent arrest of perpetrators. Furthermore, deterring entry can avoid those breaking in from potentially coming to harm by the cutting of live cables.

However, security systems/ alarms can be triggered by the movement of vegetation, and this can result in the equipment concerned being isolated. This can leave sites in a highly vulnerable state and can invalidate insurance certificates.

Therefore as part of the ongoing management regime it is proposed that a 5 metre wide strip of vegetation be frequently cut along the security system 'sight line' in order to try and avoid security alarms from being triggered.

## 6.4 Formal Biodiversity Net Gain (BNG) Calculations

Biodiversity Metric 3.0<sup>20</sup> was used to calculate the existing baseline score for the Site and the post-development score of the scheme, considering the relevant biodiversity enhancements proposed.

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<sup>20</sup> The Biodiversity Metric 3.0, auditing and accounting for biodiversity, Technical Supplement, Beta Edition, Natural England Joint Publication JPO29, Natural England.

The full results are provided in Appendix 4 (supplied separately), in summary the Site was assessed as having a baseline value of 48.04 biodiversity units; following installation and taking into account all of the biodiversity enhancements described within the report, and summarised in the Landscape Strategy Plan (Appendix 3), the Site is predicted to have a value of 53.35 biodiversity units, equating to a 11.06% net increase.

In terms of linear habitats, approximately 786 metres of new native species-rich hedgerow shall be planted, including 536 metres along the south-eastern boundary and 250 metres on the western boundary, equating to a 147.02% net increase in hedgerow units.

This is a significant net increase, in terms of overall BNG and linear habitats.

## 6.5 Post-Construction Monitoring

Once the solar farm has been installed it shall be subject to annual monitoring by an appropriately experienced ecologist. This shall include (amongst other things):

- Monitoring of the pole-mounted bat boxes (to establish if they have been used);
- Monitoring of the pole-mounted kestrel and barn owl box (to establish if they have been used);
- An inspection of hedgerow and woodland survival and establishment;
- An assessment of the establishment of the Emorsgate EM1 wildflower grassland;
- Post-construction bird monitoring surveys, including for chough.

Monitoring shall involve two visits a year; in the summer (June or July) and the autumn (September or October, during which the bat boxes shall be inspected and cleaned, and the bird boxes also cleaned). The results shall be presented in an annual monitoring report, which will be issued to the local planning authority. This management report shall provide feedback into ongoing management protocols, such that management can be tweaked, where practical.

## 7.0 Summary of Ecological Effects

The overall net impact of the scheme upon receptors of ecological importance is illustrated in Table 7-1 below, along with the proposed biodiversity enhancements, and the precautions that will be taken to ensure legal compliance with respect to legally protected species.

**Table 7-1: Net Impact Upon Important Ecological Features (including Site Enhancement)**

Important Ecological Receptor	Scale at which Feature is Important	Overall Net Impact
Milford Haven Waterway SSSI	Local	Positive impact upon bats, including horseshoe bats, through new native hedgerow and woodland planting.
Hedgerows H1-2 & boundary scrub	Local	No damage to boundary vegetation, including Root Protection Zones (RPZs), with the exception of a two minor gaps in each hedgerow, totalling 26 metres, to facilitate access. Planting of 786 metres of native species-rich hedgerow. Planting of 0.0995ha of native woodland. Positive (Significant) impact at the local level.
Foraging and Roosting Bats	Local	No damage or loss of potential bat roosts, and provision of six additional roosting opportunities. Provision of enhanced foraging and commuting opportunities, through new native hedgerow and woodland planting. Positive (Significant) impact at the local level.
Reptiles	Less than Local	Sensitive working measures when working within boundary habitats. Seeding of 0.089ha of EM1 General Meadow Mixture, 0.0995ha of woodland planting and the creation of five reptile hibernacula will enhance the Site for reptiles. Positive (Minor) impact at less than local level.
Breeding Birds	Less than Local	Killing or injuring birds/ damaging or destroying their nests will be avoided by clearing the site outside of the main bird breeding season (i.e. September to February), or immediately following a search by an ecologist. Erection of two pole-mounted barn owl and two

Important Ecological Receptor	Scale at which Feature is Important	Overall Net Impact
		pole-mounted kestrel boxes; planting of 786 metres of new native hedgerow and 0.0995ha of native woodland. Positive impact at less than Local level.
Biodiversity Net Gain	N/A	Predicted increase of 5.31 biodiversity units, from a baseline of 48.04 units to 53.35 post-installation. This equates to a 11.06% net increase.

# DRAWING 1

## UK Habitat Survey Results

192300

192450

192600

192750

192900

193050

193200

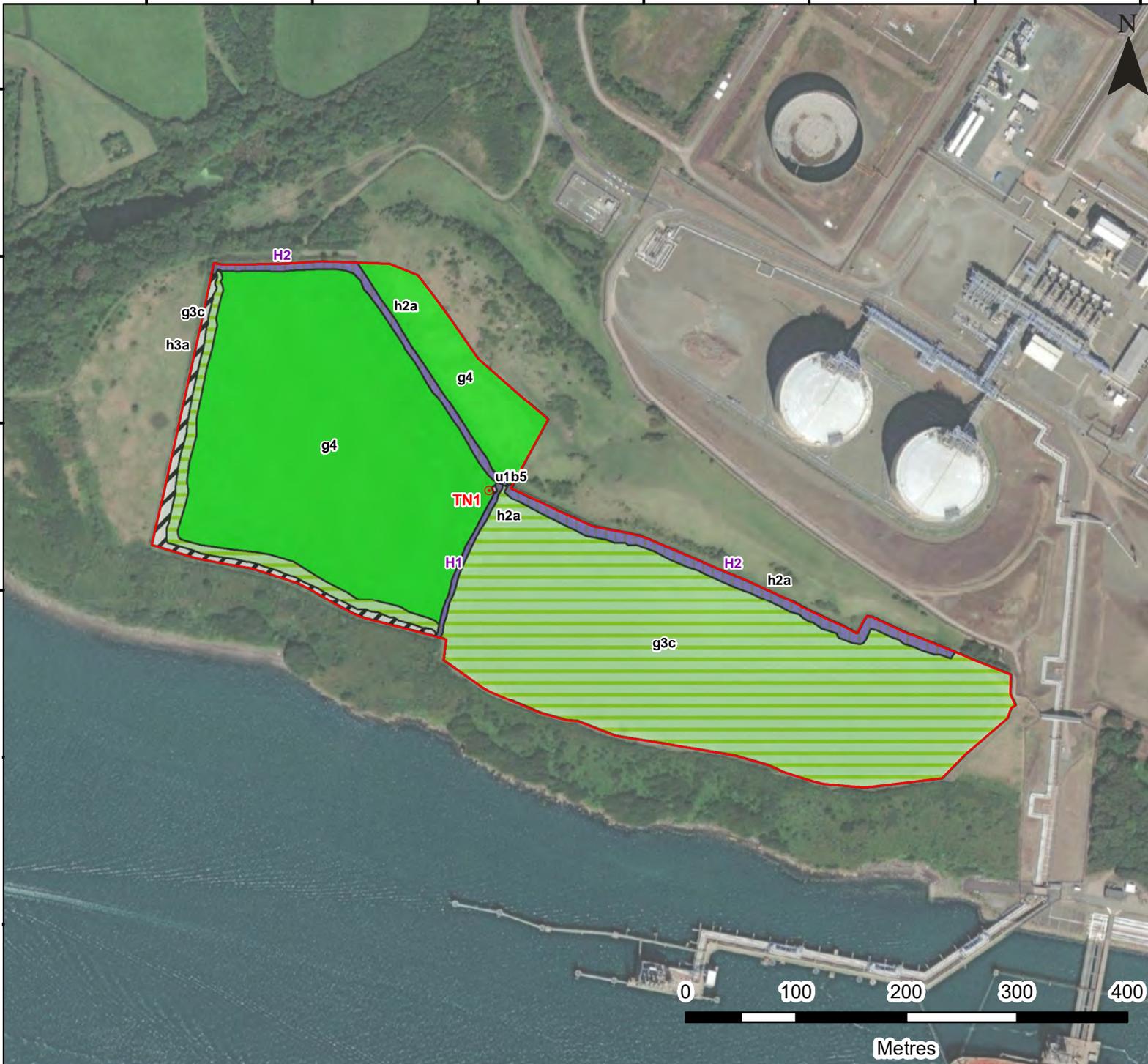
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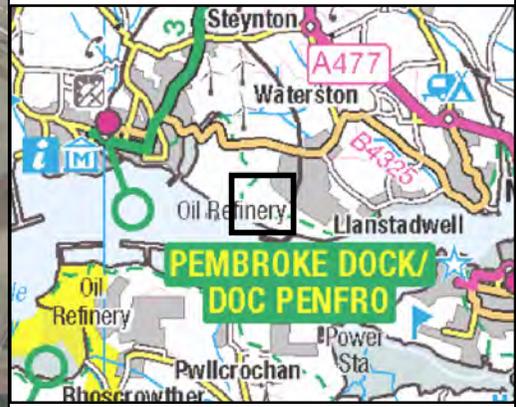
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05075.00127.0001.0 UK Habitats Survey Results



**LEGEND**

- Site Boundary
- ⊙ Target Note
- g3c - Other Neutral Grassland
- g4 - Modified Grassland
- h2a - Hedgerow (Priority Habitat)
- h3a - Blackthorn Scrub
- u1b5 - Buildings





4/5 LOCHSIDE VIEW  
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EH12 9DH

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www.slrconsulting.com

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**DRAGON MEADOW LNG SOLAR FARM**

**ECOLOGY**

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**UK HABITATS SURVEY RESULTS**

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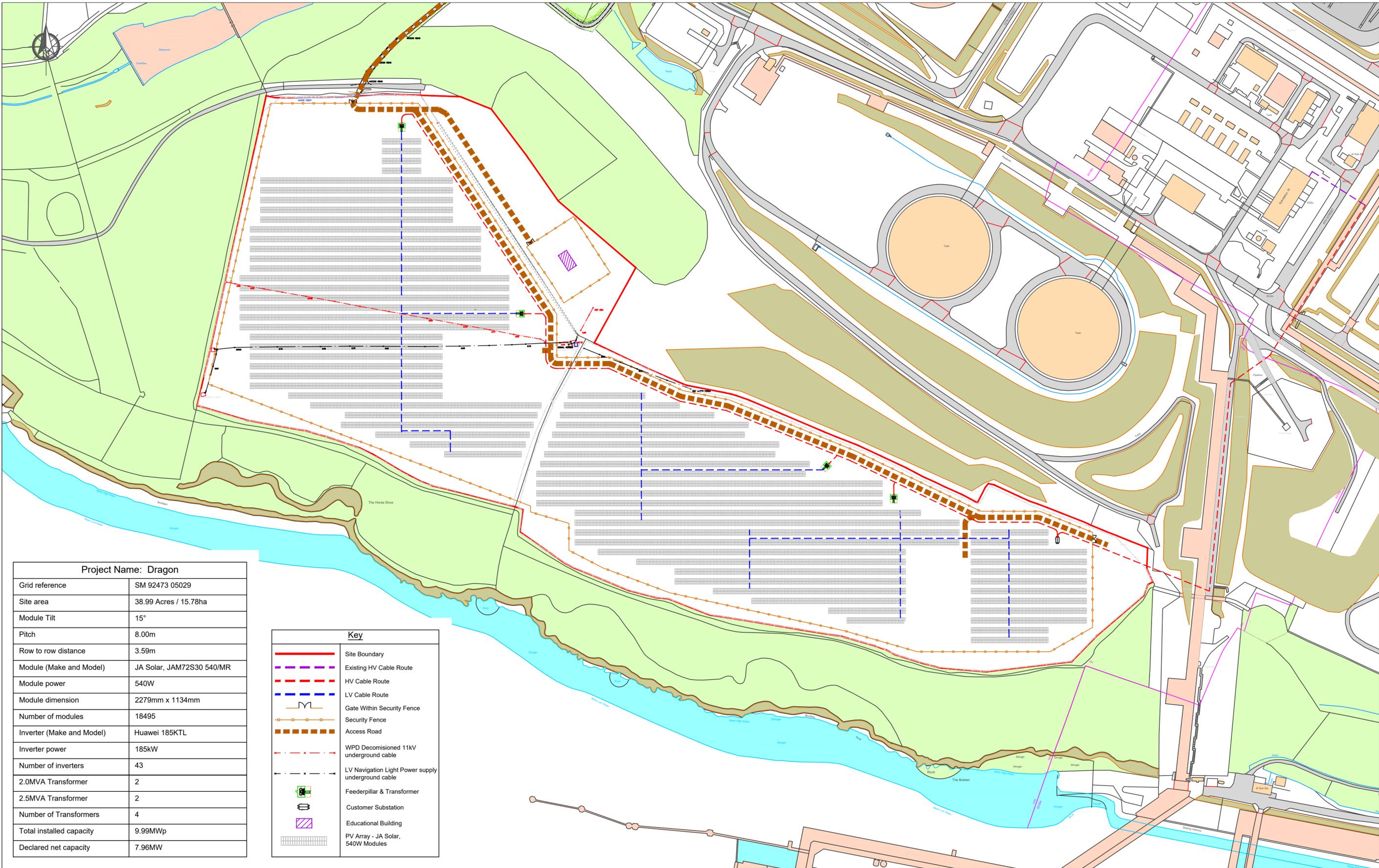
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Scale 1:5,000 @ A4	Date OCTOBER 2021
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# APPENDIX 1

## Proposed Site Layout



Project Name: Dragon	
Grid reference	SM 92473 05029
Site area	38.99 Acres / 15.78ha
Module Tilt	15°
Pitch	8.00m
Row to row distance	3.59m
Module (Make and Model)	JA Solar, JAM72S30 540/MR
Module power	540W
Module dimension	2279mm x 1134mm
Number of modules	18495
Inverter (Make and Model)	Huawei 185KTL
Inverter power	185kW
Number of inverters	43
2.0MVA Transformer	2
2.5MVA Transformer	2
Number of Transformers	4
Total installed capacity	9.99MWp
Declared net capacity	7.96MW

Key	
	Site Boundary
	Existing HV Cable Route
	HV Cable Route
	LV Cable Route
	Gate Within Security Fence
	Security Fence
	Access Road
	WPD Decommissioned 11kV underground cable
	LV Navigation Light Power supply underground cable
	Feederpillar & Transformer
	Customer Substation
	Educational Building
	PV Array - JA Solar, 540W Modules

Installer Details Anesco Ltd. The Green, Easter Park, Benyon Road, Reading, RG7 2PQ Tel: 0845 894 4444	Comments	Revision A Issued for comment B Educational building added to site and red line boundary amended C Drawing Updated D Amendments for Mitigation Strategy	Description	Revised By JH JH JH JH	Approved By	Date 26/08/2021 07/09/2021 27/09/2021 11/10/2021	Installation Address West Perimeter Road, Dragon LNG Terminal, Milford Haven, SA73 1DR	Project DRAGON LNG SOLAR FARM - MEADOW	
		Scale 1:2000@A2	Drawn By JH	Checked By	Signed by PM	Date Checked	Page 1 of 1	Sheet A2	Title SITE LAYOUT



## APPENDIX 2

### Desk Study Data from LERC Wales



# Aderyn

LERC Wales' Biodiversity Information & Reporting Database

Customer Reference: Dragon Meadow

[PUBLIC]

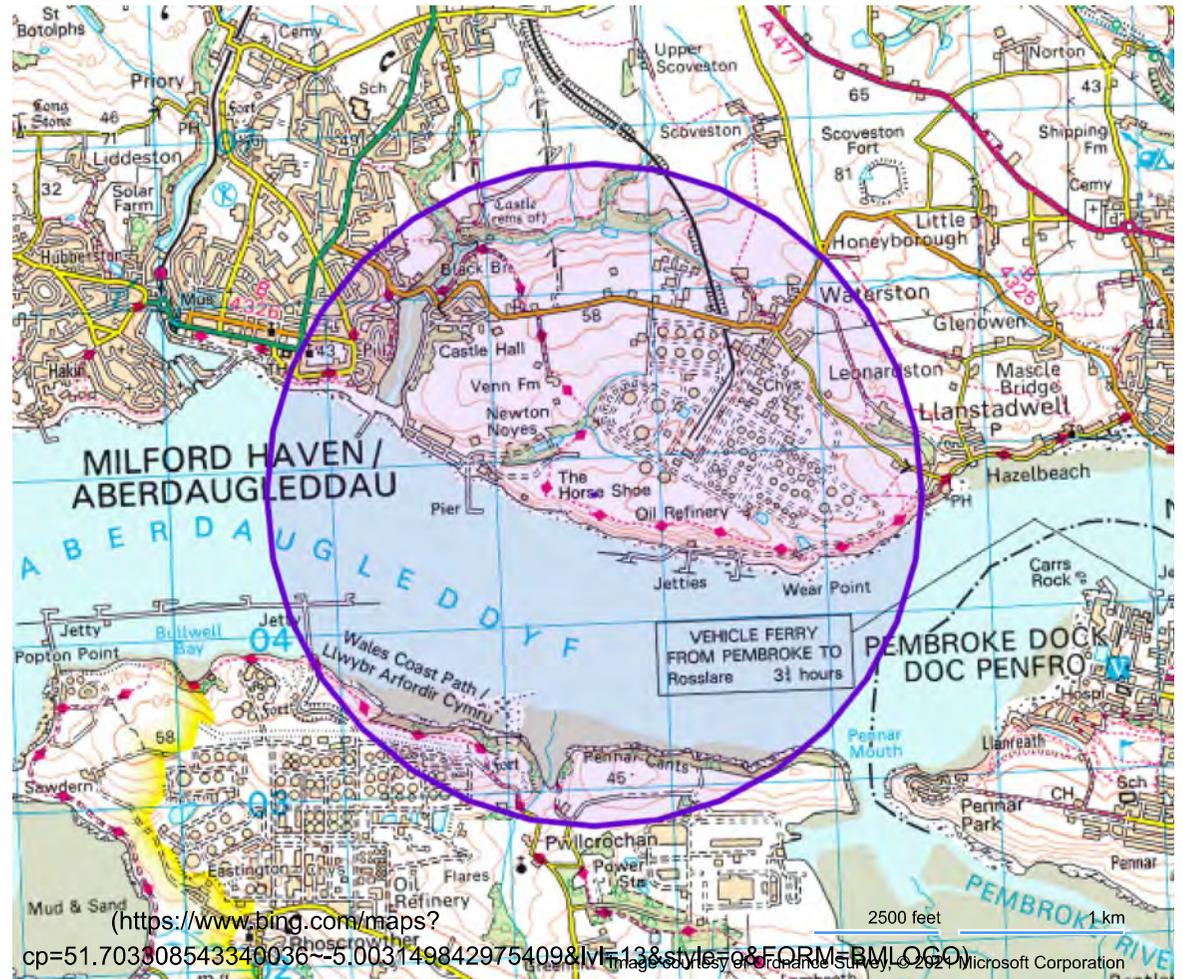
LERC Reference: None

Date: 21-Sep-2021 16:10

## Search Results Summary

Package C: Priority Species 2km Search for relevant species, designated sites and Phase I habitats within 2km of your location(s)

Taxon Group	Count
Algae	12
Birds	602
Bryophytes	41
Fish	3
Fungi and Slime Moulds	5
Invertebrates (insect)	59
Invertebrates (other, marine)	2
Invertebrates (other, marine or freshwater)	36
Mammals (marine)	1
Mammals (terrestrial)	208



Reptiles and Amphibians	45
Vascular Plants	31
Sites	8

## Location

Location Type: Gridref

Details: SM 92584 04777

Area m<sup>2</sup>: 12,495,765

---

## Data Description

- **Distance:** Indicates the distance, in metres, between the grid reference of the record (using the central point of the grid square) and the centre of the search location.
  - **Grid Reference:** Full grid reference based on the Ordnance Survey grid system. For any Sensitive Species Records, this cannot be released into the Public Domain.
  - **Status:** Any local, national or international conservation statuses or legal protection which apply to this species and whether it is included in any Local Biodiversity Action Plans. See 'Abbreviations' for more details.
- 

## Abbreviations

- BA = Protection of Badgers Act
- UKBAP = UK Biodiversity Action Plan Priority Species
- UKBAP (R) = UK Biodiversity Action Plan Priority Species (Research only species)
- BDir1 = EC Birds Directive Annex 1 Species
- BDir21 = EC Birds Directive Annex 2.1 Species
- BDir22 = EC Birds Directive Annex 2.2 Species
- Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats
- Bonn = The Bonn Convention on the Conservation of Migratory Species of Wild Animals Species
- CITES = Convention on International Trade in Endangered Species
- EPS = European Protected Species
- HDir = EU Habitats Directive Species
- NRW = Natural Resources Wales Priority Species
- RD1 (Wales) = Welsh Red Data Book listing based on IUCN guidelines
- RD1 (UK) = UK Red Data Book listing based on IUCN guidelines
- RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce)
- WBR (RSPB) = RSPB Welsh Red listed birds (not based on IUCN criteria)
- WBAm (RSPB) = RSPB Welsh Amber listed birds (not based on IUCN criteria)
- UKBR (RSPB) = RSPB UK Red listed birds (not based on IUCN criteria)
- UKBAm (RSPB) = RSPB UK Amber listed birds (not based on IUCN criteria)

## Abbreviations (cont.)

- S7 = Environment Act (Wales) Section 7 Species
  - WCA1.1 = Wildlife and Countryside Act Schedule 1 Part 1 Species
  - WCA5 = Wildlife and Countryside Act Schedule 5 Species
  - WCA8 = Wildlife and Countryside Act Schedule 8 Species
  - WCA9 = Wildlife and Countryside Act Schedule 9 Species
  - INNS = Invasive Non-Native Species
  - WSG.P = Guidelines for the Selection of Wildlife Sites in South Wales - Primary species
  - WSG.C = Guidelines for the Selection of Wildlife Sites in South Wales - Contributory species
  - WVP = IUCN Threat Listing of Welsh Vascular Plants
  - LBAP (xxx) = Local Biodiversity Action Plan Species (see key below)
  - LI (SEWBRc) = Locally Important Species (as identified by local specialists) in SEWBRc area
  - LI (BIS) = Locally Important Species (as identified by local specialists) in BIS area
  - LI (BRYO-MON) = Locally or nationally scarce or rare bryophyte in Monmouthshire
  - LI (VC##) = Locally Important Species (as identified by local specialists) in Vice County ##
  - LI (VC##, LS) = Locally Scarce in Vice County ##
  - LI (VC##, LR) = Locally Rare in Vice County ##
  - LI (VC##, EX) = Extinct in Vice County ##
  - LI (VC##, UR) = Under Recorded in Vice County ##
-

## Local Biodiversity Action Plan abbreviations

- ANG: Isle of Anglesey
- BBNP: Brecon Beacons National Park
- BGW: Blaenau Gwent
- BRG: Bridgend
- CDF: Cardiff
- CER: Ceredigion
- CLY: Caerphilly
- CON: Conwy
- CRM: Carmarthenshire
- DEN: Denbighshire
- FLI: Flintshire
- GWY: Gwynedd
- MON: Monmouthshire
- MTR: Merthyr Tydfil
- NEW: Newport
- NPT: Neath Port Talbot
- PEM: Pembrokeshire
- POW: Powys
- RCT: Rhondda Cynon Taff
- SNP: Snowdonia National Park
- SWN: Swansea
- TRA: Trunk Roads Estate
- TRF: Torfaen
- VoG: Vale of Glamorgan
- WRE: Wrexham

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## LERC Wales Aderyn Commercial Contacts

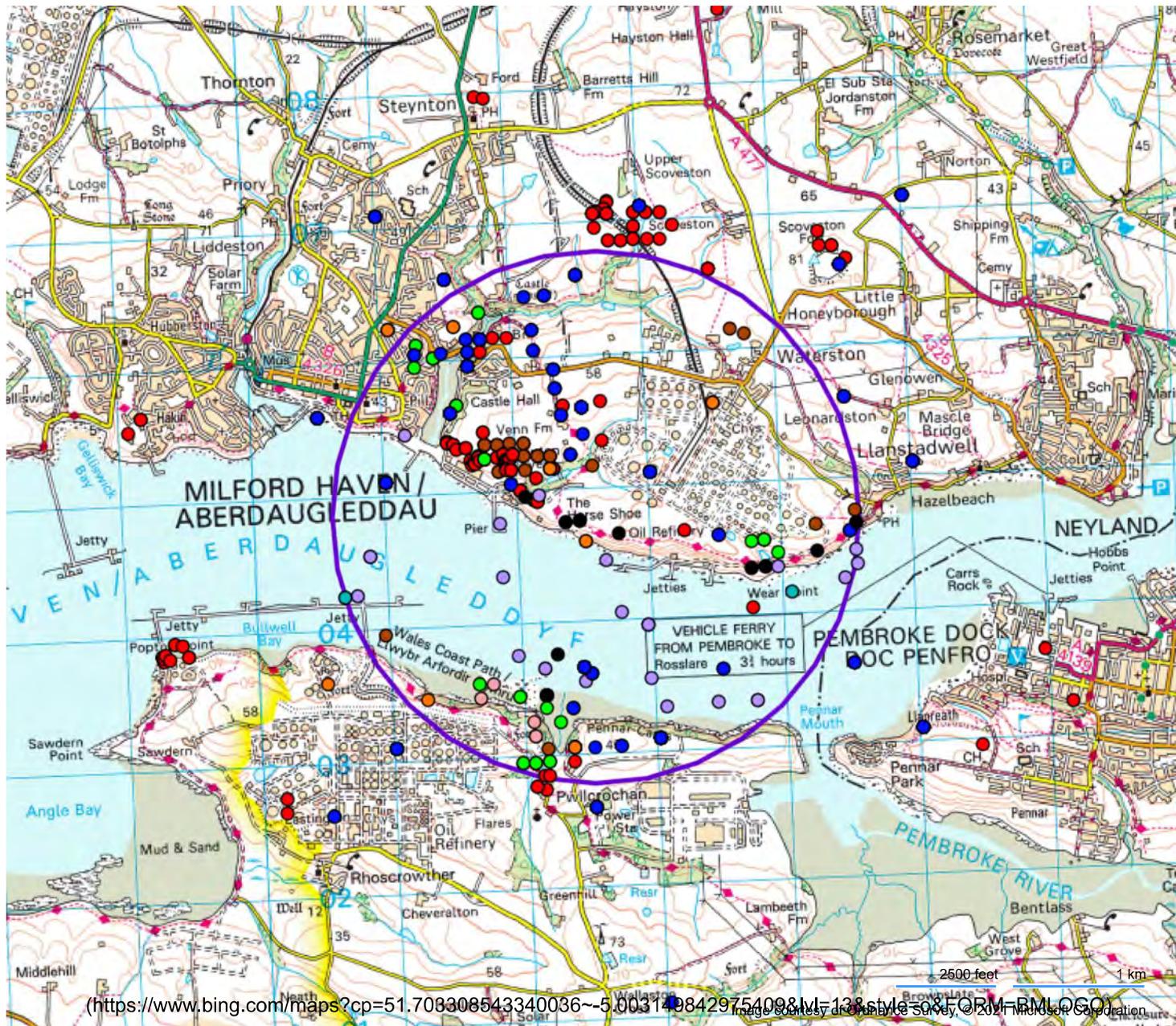
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Website: [aderyn.lercwales.org.uk](http://aderyn.lercwales.org.uk)

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# Species Map

Species records are mapped below. Records are mapped as centred points (centre of grid reference polygon).



Icon	Name
●	Algae
●	Birds
●	Bryophytes
●	Fish
●	Fungi and Slime Moulds
●	Invertebrates (insect)
●	Invertebrates (other, marine)
●	Invertebrates (other, marine or freshwater)
●	Mammals (marine)
●	Mammals (terrestrial)
●	Reptiles and Amphibians
●	Vascular Plants

# Designated Sites

Below is a summarised list of sites within the search area (based on the largest buffer).

Type	Count	Intersection Area	Percentage	Description
Special Area of Conservation	1	International - Statutory	5,270,682.00m <sup>2</sup>	42.18%
Site of Special Scientific Interest	1	National - Statutory	924,532.00m <sup>2</sup>	7.40%
Site of Special Scientific Interest (Bats)	1	National - Statutory	924,532.00m <sup>2</sup>	7.40%
Regionally Important Geodiversity Site	1	Local - Non-statutory	99,299.00m <sup>2</sup>	0.79%
Ancient Semi Natural Woodland	9	Priority Area	125,990.00m <sup>2</sup>	1.01%
Restored Ancient Woodland Site	7	Priority Area	96,993.00m <sup>2</sup>	0.78%
NRW Priority Area (Coastal Saltmarsh)	1	Priority Area	10,078,615.00m <sup>2</sup>	80.66%
B-Lines	1	Local - Non-statutory	6,483,237.00m <sup>2</sup>	51.88%

## Ancient Semi Natural Woodland

These are broadleaf woodlands comprising mainly native tree and shrub species which are believed to have been in existence for over 400 years. The ground vegetation will reflect the naturalness of these woodlands and will frequently feature species which provide clear indication of long and continued woodland cover. They will have been woodland for centuries and contribute substantially to our natural and cultural heritage.

## Restored Ancient Woodland Site

These are woodlands which are predominately broadleaves now and are believed to have been continually wooded for over 400 years. They will have gone through a phase when canopy cover will have been more than 50% non-native conifer tree species and now have a canopy cover of more than 50% broadleaf. Please note that the information sources do not identify whether broadleaved trees are site native and therefore an assumption has been made that they are native. The use of the term restored ancient woodland describes woodland which appears using remote sensing techniques to have returned to a more natural condition. The inventory designation does not mean that the woodland is fully restored or that it is in good ecological condition. Active restoration work may well be essential to consolidate the improvement in condition or to improve it further.

## B-Lines

B-Lines (0 m)

## **NRW Priority Area (Coastal Saltmarsh)**

NRW Priority habitat areas are large scale areas which were prioritised for targeted conservation work, based on factors including the habitats within them.

## **Regionally Important Geodiversity Site**

Wear Point (977 m)

## **Special Area of Conservation**

Pembrokeshire Marine / Sir Benfro Forol (141 m)

## **Site of Special Scientific Interest**

Milford Haven Waterway (141 m)

## **Site of Special Scientific Interest (Bats)**

Milford Haven Waterway (141 m)

# Designated Sites Map



(<https://www.bing.com/maps?cp=51.708308543340036~-5.003149842975409&vl=13&style=RM>)

Col.	Name
	Special Area of Conservation (5,270,682m <sup>2</sup> )
	Site of Special Scientific Interest (924,532m <sup>2</sup> )
	Site of Special Scientific Interest (Bats) (924,532m <sup>2</sup> )
	Regionally Important Geodiversity Site (99,299m <sup>2</sup> )
	Ancient Semi Natural Woodland (125,990m <sup>2</sup> )
	Restored Ancient Woodland Site (96,993m <sup>2</sup> )
	NRW Priority Area (Coastal Saltmarsh) (10,078,615m <sup>2</sup> )
	B-Lines (6,483,237m <sup>2</sup> )

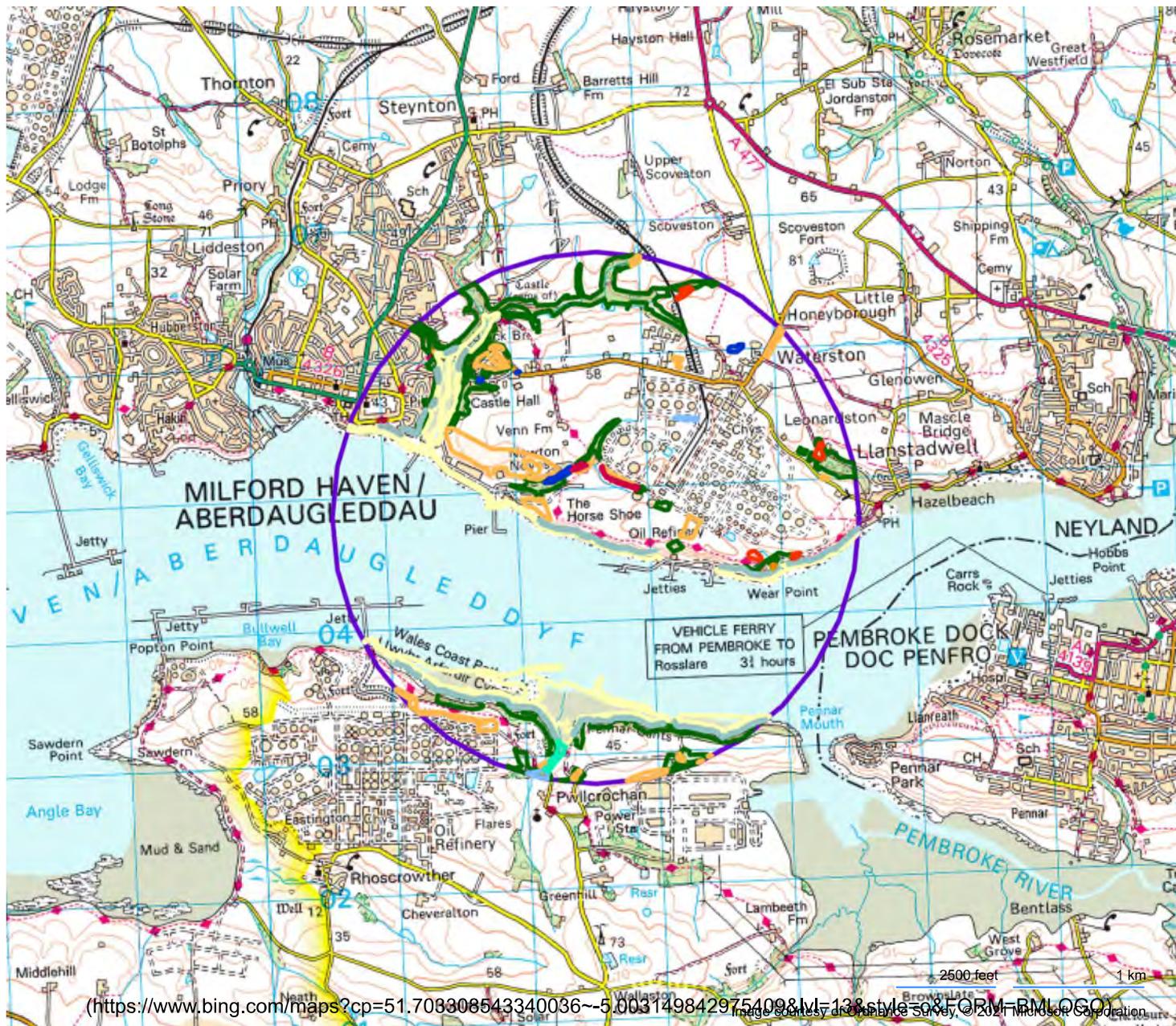
# Habitats

Below are listed habitats within the search areas (based on the largest buffer). Habitats marked in red may contain Priority habitats. Habitats are listed in order of intersection size (decending). **Common habitats are not returned..**

Code	Count	Intersection Area	Percentage	Description
A.1.1.1	42	703,892.00m <sup>2</sup>	5.63%	Semi-natural broadleaved woodland
A.2.1	57	498,764.00m <sup>2</sup>	3.99%	Dense scrub
H.1.1	9	380,640.00m <sup>2</sup>	3.05%	Intertidal mud/sand
B.2.2	21	356,885.00m <sup>2</sup>	2.86%	Semi-improved neutral grassland
H.1.2	16	291,987.00m <sup>2</sup>	2.34%	Intertidal cobbles/shingle
C.1.1	17	106,998.00m <sup>2</sup>	0.86%	Bracken
J.4	5	101,348.00m <sup>2</sup>	0.81%	Bare ground
H.1.3	11	67,801.00m <sup>2</sup>	0.54%	Intertidal rocks/boulders
H.8.1	9	66,553.00m <sup>2</sup>	0.53%	Hard cliff
J.1.2	8	51,122.00m <sup>2</sup>	0.41%	Amenity grassland
F.1	3	43,000.00m <sup>2</sup>	0.34%	Swamp
J.1.3	3	42,089.00m <sup>2</sup>	0.34%	Ephemeral/short perennial
J.3.5	3	32,984.00m <sup>2</sup>	0.26%	Sea-wall
C.3.1	4	15,187.00m <sup>2</sup>	0.12%	Tall ruderal herb
H.3.1	3	14,333.00m <sup>2</sup>	0.11%	Mud/sand above mhw
G.1	4	11,070.00m <sup>2</sup>	< 0.01%	Standing water
B.1.2	2	8,634.00m <sup>2</sup>	< 0.01%	Semi-improved acid grassland

H.2.6	1	8,474.00m <sup>2</sup>	< 0.01%	Salt marsh
H.3.2	4	7,342.00m <sup>2</sup>	< 0.01%	Shingle/gravel above mhw
B.5	2	6,248.00m <sup>2</sup>	< 0.01%	Marshy grassland
B.1.1	2	6,134.00m <sup>2</sup>	< 0.01%	Unimproved acid grassland
J.3.7	1	5,503.00m <sup>2</sup>	< 0.01%	Track (not comprehensively digitised)
H.4	5	3,799.00m <sup>2</sup>	< 0.01%	Rocks/boulders above mhw
A.1.2.2	1	1,371.00m <sup>2</sup>	< 0.01%	Planted coniferous woodland
A.1.1.2	1	1,150.00m <sup>2</sup>	< 0.01%	Planted broadleaved woodland
A.4.1	1	536.00m <sup>2</sup>	< 0.01%	Felled broadleaved woodland
H.8.4	1	468.00m <sup>2</sup>	< 0.01%	Coastal grassland

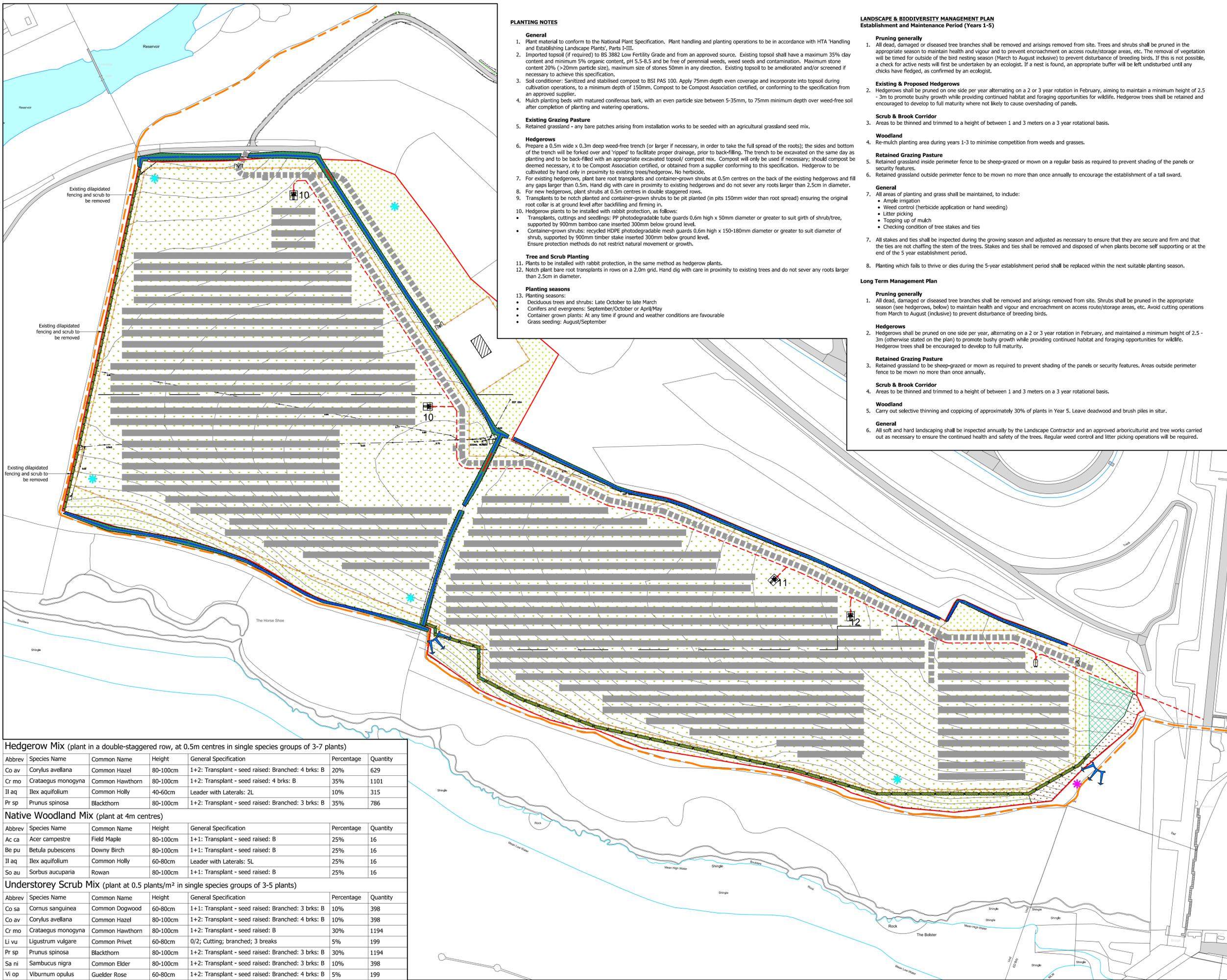
# Habitats Map



Col.	Name
	Semi-natural broadleaved woodland (703,892m <sup>2</sup> )
	Intertidal mud/sand (380,640m <sup>2</sup> )
	Semi-improved neutral grassland (356,885m <sup>2</sup> )
	Intertidal cobbles/shingle (291,987m <sup>2</sup> )
	Intertidal rocks/boulders (67,801m <sup>2</sup> )
	Hard cliff (66,553m <sup>2</sup> )
	Swamp (43,000m <sup>2</sup> )
	Standing water (11,070m <sup>2</sup> )
	Semi-improved acid grassland (8,634m <sup>2</sup> )
	Salt marsh (8,474m <sup>2</sup> )
	Shingle/gravel above mhw (7,342m <sup>2</sup> )
	Marshy grassland (6,248m <sup>2</sup> )
	Unimproved acid grassland (6,134m <sup>2</sup> )
	Coastal grassland (468m <sup>2</sup> )

## APPENDIX 3

### Landscape Strategy Plan



**PLANTING NOTES**

- General**
- Plant material to conform to the National Plant Specification. Plant handling and planting operations to be in accordance with HTA 'Handling and Establishing Landscape Plants', Parts I-III.
  - Imported topsoil (if required) to BS 3882 Low Fertility Grade and from an approved source. Existing topsoil shall have a maximum 35% clay content and minimum 5% organic content, pH 5.5-8.5 and be free of perennial weeds, weed seeds and contamination. Maximum stone content 20% (>20mm particle size), maximum size of stones 50mm in any direction. Existing topsoil to be ameliorated and/or screened if necessary to achieve this specification.
  - Soil conditioner: Sanitized and stabilised compost to BSI PAS 100. Apply 75mm depth even coverage and incorporate into topsoil during cultivation operations, to a minimum depth of 150mm. Compost to be Compost Association certified, or conforming to the specification from an approved supplier.
  - Mulch planting beds with matured coniferous bark, with an even particle size between 5-35mm, to 75mm minimum depth over weed-free soil after completion of planting and watering operations.
- Existing Grazing Pasture**
- Retained grassland - any bare patches arising from installation works to be seeded with an agricultural grassland seed mix.
- Hedgerows**
- Prepare a 0.5m wide x 0.3m deep weed-free trench (or larger if necessary, in order to take the full spread of the roots); the sides and bottom of the trench will be forked over and 'ripped' to facilitate proper drainage, prior to back-filling. The trench to be excavated on the same day as planting and to be back-filled with an appropriate excavated topsoil/compost mix. Compost will only be used if necessary; should compost be deemed necessary, it to be Compost Association certified, or obtained from a supplier conforming to this specification. Hedgerow to be cultivated by hand only in proximity to existing trees/hedgerow. No herbicide.
  - For existing hedgerows, plant bare root transplants and container-grown shrubs at 0.5m centres on the back of the existing hedgerows and fill any gaps larger than 0.5m. Hand dig with care in proximity to existing hedgerows and do not sever any roots larger than 2.5cm in diameter.
  - For new hedgerows, plant shrubs at 0.5m centres in double staggered rows.
  - Transplants to be notch planted and container-grown shrubs to be pit planted (in pits 150mm wider than root spread) ensuring the original root collar is at ground level after backfilling and firming in.
  - Hedgerow plants to be installed with rabbit protection, as follows:
    - Transplants, cuttings and seedlings: PP photodegradable tube guards 0.6m high x 50mm diameter or greater to suit girth of shrub/tree, supported by 900mm bamboo cane inserted 300mm below ground level.
    - Container-grown shrubs: recycled HDPE photodegradable mesh guards 0.6m high x 150-180mm diameter or greater to suit diameter of shrub, supported by 900mm timber stake inserted 300mm below ground level.
 Ensure protection methods do not restrict natural movement or growth.
- Tree and Scrub Planting**
- Plants to be installed with rabbit protection, in the same method as hedgerow plants.
  - Notch plant bare root transplants in rows on a 2.0m grid. Hand dig with care in proximity to existing trees and do not sever any roots larger than 2.5cm in diameter.
- Planting seasons**
- Planting seasons:
    - Deciduous trees and shrubs: Late October to late March
    - Conifers and evergreens: September/October or April/May
    - Container grown plants: At any time if ground and weather conditions are favourable
    - Grass seeding: August/September

**LANDSCAPE & BIODIVERSITY MANAGEMENT PLAN**  
Establishment and Maintenance Period (Years 1-5)

- Pruning generally**
- All dead, damaged or diseased tree branches shall be removed and arisings removed from site. Trees and shrubs shall be pruned in the appropriate season to maintain health and vigour and to prevent encroachment on access route/storage areas, etc. The removal of vegetation will be timed for outside of the bird nesting season (March to August inclusive) to prevent disturbance of breeding birds. If this is not possible, a check for active nests will first be undertaken by an ecologist. If a nest is found, an appropriate buffer will be left undisturbed until any chicks have fledged, as confirmed by an ecologist.
- Existing & Proposed Hedgerows**
- Hedgerows shall be pruned on one side per year alternating on a 2 or 3 year rotation in February, aiming to maintain a minimum height of 2.5 - 3m to promote bushy growth while providing continued habitat and foraging opportunities for wildlife. Hedgerow trees shall be retained and encouraged to develop to full maturity where not likely to cause overshadowing of panels.
- Scrub & Brook Corridor**
- Areas to be thinned and trimmed to a height of between 1 and 3 meters on a 3 year rotational basis.
- Woodland**
- Re-mulch planting area during years 1-3 to minimise competition from weeds and grasses.
- Retained Grazing Pasture**
- Retained grassland inside perimeter fence to be sheep-grazed or mown on a regular basis as required to prevent shading of the panels or security features.
  - Retained grassland outside perimeter fence to be mown no more than once annually to encourage the establishment of a tall sward.
- General**
- All areas of planting and grass shall be maintained, to include:
    - Ample irrigation
    - Weed control (herbicide application or hand weeding)
    - Litter picking
    - Topping up of mulch
    - Checking condition of tree stakes and ties
  - All stakes and ties shall be inspected during the growing season and adjusted as necessary to ensure that they are secure and firm and that the ties are not chaffing the stem of the trees. Stakes and ties shall be removed and disposed of when plants become self supporting or at the end of the 5 year establishment period.
  - Planting which fails to thrive or dies during the 5-year establishment period shall be replaced within the next suitable planting season.
- Long Term Management Plan**
- Pruning generally**
- All dead, damaged or diseased tree branches shall be removed and arisings removed from site. Shrubs shall be pruned in the appropriate season (see hedgerows, below) to maintain health and vigour and encroachment on access route/storage areas, etc. Avoid cutting operations from March to August (inclusive) to prevent disturbance of breeding birds.
- Hedgerows**
- Hedgerows shall be pruned on one side per year, alternating on a 2 or 3 year rotation in February, and maintained a minimum height of 2.5 - 3m (otherwise stated on the plan) to promote bushy growth while providing continued habitat and foraging opportunities for wildlife. Hedgerow trees shall be encouraged to develop to full maturity.
- Retained Grazing Pasture**
- Retained grassland to be sheep-grazed or mown as required to prevent shading of the panels or security features. Areas outside perimeter fence to be mown no more than once annually.
- Scrub & Brook Corridor**
- Areas to be thinned and trimmed to a height of between 1 and 3 meters on a 3 year rotational basis.
- Woodland**
- Carry out selective thinning and coppicing of approximately 30% of plants in Year 5. Leave deadwood and brush piles in situ.
- General**
- All soft and hard landscaping shall be inspected annually by the Landscape Contractor and an approved arboriculturist and tree works carried out as necessary to ensure the continued health and safety of the trees. Regular weed control and litter picking operations will be required.

The scaling of this drawing cannot be assured

Revision \_\_\_\_\_ Date \_\_\_\_\_ Dm \_\_\_\_\_ Cld \_\_\_\_\_

**LEGEND**

- Site Boundary
- Existing Water Courses and Water Features
- Contours/Spot Heights (Metres AOD)
- Public Rights of Way / Pembrokeshire Coast Path
- Key Views
- Existing Interpretation Boards to be Replaced (details to be agreed)
- Proposed locations for reptile hibernacula (details below)
- Existing Hedgerow to be Retained (and managed to a minimum height of 2.5 - 3m)
- Existing Hedgerow to be Removed
- Proposed Hedgerow (to be maintained to a minimum height of 2.5 - 3m)
- Proposed Native Woodland Planting
- Existing Grassland within proposed perimeter fence to be Retained as Grazing Pasture or mown on a regular basis
- Existing grassland outside perimeter fence to be allowed to grow to a tall sward and cut no more than once annually
- Proposed General-purpose Meadow Mixture Emorsgate EM1 (to be cut annually)
- Proposed Security Fence
- Proposed Access Route
- Proposed Solar Panels

- Specification for Reptile Hibernacula**
- Minimum size to be 4m by 2m and 1m deep, ideally larger.
  - Location in a sunny position, orientated so that the longer dimension faces south, in tussocky grassland.
  - Construction methods:
    - Remove the turf from the footprint of the hibernaculum and set aside.
    - On well-drained soil excavate to a depth of approximately 50 cm and set aside spoil (this is unnecessary on poorly drained soils).
    - Fill the footprint or pit with core material. Materials likely to retain moisture are preferable, such as cut timber, brush and grubbed up tree roots. Other material such as inert hardcore, bricks, rocks, and building rubble may also be used. Materials that will decompose should not be placed beneath heavy components such as bricks or rocks, to reduce the risk of collapse.
    - Pack the larger spaces within the core materials with wood chippings, loose topsoil or spoil.
    - Cover the hibernaculum with the turves removed from the footprint, leaving openings to allow reptiles to access fill material.

**Hedgerow Mix (plant in a double-staggered row, at 0.5m centres in single species groups of 3-7 plants)**

Abbrev	Species Name	Common Name	Height	General Specification	Percentage	Quantity
Co av	Corylus avellana	Common Hazel	80-100cm	1+2: Transplant - seed raised: Branched: 4 brks: B	20%	629
Cr mo	Crataegus monogyna	Common Hawthorn	80-100cm	1+2: Transplant - seed raised: 4 brks: B	35%	1101
Il aq	Ilex aquifolium	Common Holly	40-60cm	Leader with Laterals: 2L	10%	315
Pr sp	Prunus spinosa	Blackthorn	80-100cm	1+2: Transplant - seed raised: Branched: 3 brks: B	35%	786

**Native Woodland Mix (plant at 4m centres)**

Abbrev	Species Name	Common Name	Height	General Specification	Percentage	Quantity
Ac ca	Acer campestre	Field Maple	80-100cm	1+1: Transplant - seed raised: B	25%	16
Be pu	Betula pubescens	Downy Birch	80-100cm	1+1: Transplant - seed raised: B	25%	16
Il aq	Ilex aquifolium	Common Holly	60-80cm	Leader with Laterals: 5L	25%	16
So au	Sorbus aucuparia	Rowan	80-100cm	1+1: Transplant - seed raised: B	25%	16

**Understorey Scrub Mix (plant at 0.5 plants/m<sup>2</sup> in single species groups of 3-5 plants)**

Abbrev	Species Name	Common Name	Height	General Specification	Percentage	Quantity
Co sa	Cornus sanguinea	Common Dogwood	60-80cm	1+1: Transplant - seed raised: Branched: 3 brks: B	10%	398
Co av	Corylus avellana	Common Hazel	80-100cm	1+2: Transplant - seed raised: Branched: 4 brks: B	10%	398
Cr mo	Crataegus monogyna	Common Hawthorn	80-100cm	1+2: Transplant - seed raised: B	30%	1194
Li vu	Ligustrum vulgare	Common Privet	60-80cm	0/2; Cutting; branched; 3 breaks	5%	199
Pr sp	Prunus spinosa	Blackthorn	80-100cm	1+2: Transplant - seed raised: Branched: 3 brks: B	30%	1194
Sa ni	Sambucus nigra	Common Elder	80-100cm	1+2: Transplant - seed raised: Branched: 3 brks: B	10%	398
Vi op	Viburnum opulus	Gelder Rose	60-80cm	1+2: Transplant - seed raised: Branched: 4 brks: B	5%	199

**FIGURE X**

Project: Dragon LNG Solar Farm Milford Haven  
Drawing Title: Landscape Strategy Plan

Date: 20.10.2021 Scale: 1:1,250 @A1 / 1:2,500 @A3  
Project No: 33264 Drawing No: LN-LP-10  
Drawn by: JM Check by: JM  
ML Revision: A

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## APPENDIX 4

### Results of Metric 3.0 Biodiversity Net Gain Calculations (Supplied Separately in Excel spreadsheet)

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