HEOLDDU SOLAR FARM

Environmental Statement

Volume 3, Appendix 6.1: Preliminary Ecological Appraisal

September 2025

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Abbreviations

Abbreviation	Meaning
ASNW	Ancient Semi-Natural Woodland
CIEEM	Chartered Institute of Ecology and Environmental Management
EIA	Environmental Impact Assessment
ES	Environmental Statement
FISC	Field Identification Skills Certificate
HSI	Habitat Suitability Index
LEDS	Landscape and Ecological Design Scheme
LNR	Local Nature Reserves
NBB	Net Benefit to Biodiversity
NNR	National Nature Reserves
NVC	National Vegetation Classification
OS	Ordnance Survey
PAWS	Plantation on Ancient Woodland Site
PEA	Preliminary Ecological Appraisal
PEDW	Planning Environment Decisions Wales
PRF	Potential Roosting Feature
RAWS	Restored Ancient Woodland Site
SAC	Special Areas of Conservation
SINC	Sites Important for Nature Conservation
SSSI	Sites of Special Scientific Interest
SPA	Special Protection Areas
TN	Target Note
WWBIC	West Wales Biodiversity Information Centre

Units

Unit	Description
kV	Kilovolt
m	Metres
Km	Kilometres

1 INTRODUCTION

1.1 Background

1.1.1 RPS were commissioned by Heolddu Solar Park Ltd. (on behalf of Qualitas Energy) to prepare a Preliminary Ecological Appraisal (PEA) of a proposed solar farm development located on land at Maesmawr and Treforris Fawr Farm, Ferryside in Carmarthenshire.

1.1.2 The proposed solar farm development includes the construction and operation of a solar photovoltaic electricity generating station ('solar farm') and associated ancillary development, including a 132kV substation, with landscape and environmental enhancements, hereafter referred to as the 'Proposed Development'.

1.1.3 The Proposed Development is the subject of an Environmental Impact Assessment (EIA) submitted to Planning and Environment Decisions Wales (PEDW). The full description of the Proposed Development is in Environmental Statement (ES) Volume 1, Chapter 2: Project Description.

1.1.4 The Proposed Development site is defined by the red line as illustrated at Volume 2, Figure 1.1 of ES. The area within the red line is hereafter referred to as the 'Site' and is made up of two broad compartments, 'Solar Area West' and 'Solar Area East'. Solar Area West is centred on grid reference SN3880810269 and Solar Area East is centred on grid reference SN4016310827. The two compartments are connected by the public highway.

1.1.5 The Site is primarily farmland, with Solar Area West used predominantly for the purposes of silage production. Farm buildings are located just north of Solar Area West, forming part of Maesmawr Farm. Solar Area East is largely south – south east sloping pastoral land with cattle grazing the area for most of the year.

1.2 Purpose and Scope of Report

1.2.1 This PEA has been prepared with reference to the Chartered Institute of Ecological Management (CIEEM)'s Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) and provides an assessment of the ecological baseline of the Site. The findings of the PEA are presented in this report and on accompanying figures (Volume 2, Figures 6.1 – 6.3). The aims and objectives of the PEA were to:

- undertake a desk-based review of relevant designated sites and records of protected and/or notable species within appropriate study areas;
- map and assess the habitats present within and (where necessary) in proximity to the Site;
- assess the Site for its potential to support protected and notable species

1.2.2 Further ecological surveys and assessments were undertaken prior to and alongside the preparation of this PEA, with additional surveys still to be completed. Surveys undertaken at the Site have included bat, badger *Meles meles*, otter *Lutra lutra*, water vole *Amphibius arvicola,* hazel dormouse *Muscardinus avellanarius*, great crested newt *Triturus cristatus* and breeding and wintering bird surveys. The findings of these surveys are presented in the Interim Protected and Notable Species Survey Report (Volume 3, Appendix 6.2) and the Breeding and Wintering Bird Survey (Volume 3, Appendix 6.3).

1.2.3 The potential for impacts to occur on biodiversity from the Proposed Development, including the likely significant beneficial and adverse effects are discussed in Volume 1, Chapter 6: Biodiversity. Avoidance, mitigation, restoration and enhancement measures, including the Proposed Development's approach to delivering a Net Benefit for Biodiversity (NBB) are also discussed in the ES. Finer detail in relation to these measures is set out in the Landscape and Ecological Design Strategy (Volume 3, Appendix 2.1).

1.3 Ecological Background

1.3.1 The western section of Solar Area West was subject to a series of ecological surveys and assessments in 2015 by Wildlife Matters to support a solar farm referred to as Bryncoch Solar. Bryncoch Solar was consented in 2016 but was not developed. Bryncoch Solar's Phase 1 habitats survey report (Wildlife Matters, 2015) indicated that the grasslands were 'poor in biodiversity', with 98% of biodiversity within the development site's hedgerows.

1.4 Relevant Legislation and Planning Policy Context

1.4.1 This PEA has been compiled with reference to the following relevant nature conservation legislation, national and local planning policy and biodiversity framework. A summary of legislation relevant to protected and/or notable species is summarised in Appendix A. The relevant legislation and national and local policy includes:

- Carmarthenshire County Council Second Deposit Revised Local Development 2018 – 2033:
    - Strategic policy SP 14 Protection and Enhancement of the Natural Environment;
    - Local policy EQ4 Biodiversity;
    - Loca policy EQ5 Corridors, Networks and Features of Distinctiveness;
- Carmarthenshire County Council Supplementary Planning Guidance (SPG) Nature Conservation and Biodiversity;
- Carmarthenshire Nature Recovery Action Plan (2022 – 2030);
- Developments of National Significance (Wales) Regulations 2016 (as amended);
- Environment (Air Quality and Soundscapes) (Wales) Act 2024;
- The Environment (Wales) Act 2016;
- The Wellbeing of Future Generations (Wales) Act 2015;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;
- The Countryside and Rights of Way Act 2000 (as amended);
- Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017;
- Planning Policy Wales, Edition 12 (2024);
- Future Wales: the national plan 2040 (2021);
- Technical Advice Note 5 (TAN5): Nature Conservation and Planning 2009;

2 METHODS

2.1 Desk Study

2.1.1 Biodiversity records were obtained from West Wales Biodiversity Information Centre (WWBIC) in December 2024. The dataset obtained from WWBIC comprised the following biodiversity data within 2 km of the Proposed Development.

- International Nature Conservation Designations, i.e. Ramsar site, Special Areas of Conservation concern (SAC). Special Protection Areas (SPA), and any proposed or candidate SACs, SPAs or Ramsar sites;
- National statutory nature conservation designations i.e. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR);
- Non statutory nature conservation designations i.e. Sites Important for Nature Conservation (SINC);
- Ancient woodlands; and
- Protected and notable species records

2.1.2 This report only presents species records from within the last 10 years, as records older than this are considered historic.

2.1.3 Publicly available datasets obtained from DataMapWales were obtained to review information on statutory designated sites up to 5 km.

2.1.4 Additional information on nature conservation designations and Priority Habitats[1] were obtained from DataMapWales. Aerial imagery and Ordnance Survey (OS) mapping was reviewed to assess the accuracy of Priority Habitat and Ancient Woodland designations, including the presence of waterbody and watercourses.

2.2 Habitat Survey

2.2.1 Habitat surveys of the Site were undertaken over the course of several months between December 2024 and June 2025. The surveys were undertaken using an approach that combined the Phase 1 habitat survey methodology (JNCC, 2016) and elements of the UKHab survey methodology (UKHab, 2023). A walkover was undertaken in December 2024 to scope for the necessary further ecological surveys and assessments. Follow up habitat surveys were undertaken in May and June to update the habitat baseline during the optimal survey period.

2.2.2 Select grasslands were also subject to quadrat sampling with the aim of understanding its vegetation fit with one of the British National Vegetation Classification (NVC) communities. The habitat surveys were undertaken by a suitably experienced and qualified ecologist with a Level 4 Field Identification Skills Certificate (FISC). Habitats within the Site were classified, mapped and described in terms of their structure and broad floristic composition. A botanical species list was compiled for woodland, scrub, grassland and wetland habitats. A botanical species lists was obtained for hedgerow habitats at a Site scale, whereby a species list was obtained for all hedgerows per compartment area (i.e. Solar Area West and Solar Area East, rather than per each individual hedgerow.

2.2.3 As part of the habitat survey, notes on each Solar Area's condition were made to support an assessment of the Site's overall ecosystem functioning. Information contained within Terrestrial and freshwater Resilient Ecological Networks: a guide for practitioners in Wales (Garrett and Ayling, 2021) was used to inform a broad assessment of each habitat's diversity, condition and connectivity.

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[1] Priority Habitats of principal importance to biodiversity in Wales as per Section 7 of the Environment (Wales) act 2016

2.2.4 Botanical information obtained from quadrat sampling was run through modular analysis software RMAVIS[2] to calculate similarities and assign the vegetation data to British NVC communities.

2.2.5 Where invasive non-native plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were encountered their location was recorded but an exhaustive search for invasive species did not form part of the survey scope.

2.2.6 The vice county recorder (botany) for Carmarthenshire was contacted to obtain a list of axiophytes[3] to understand the value of habitats within the Site.

2.3 Notes and Limitations

2.3.1 The desk study data is third party controlled data, purchased for the purposes of this report only. RPS cannot vouch for its accuracy and cannot be held liable for any error(s) in these data.

2.3.2 It should be noted that whilst every effort has been made to provide a comprehensive description of the Site, no investigation can ensure the complete characterisation and prediction of the natural environment.

2.3.3 The habitat survey map (Volume 2, Figure 6.3) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a PEA, the maps are not intended to provide exact locations of key habitats.

2.3.4 Percentage cover and the raw output of RMAVIS has not been included in this report.

2.3.5 The protected and notable species assessment provides a preliminary view of the likelihood of select species / species groups occurring within the Site and surrounding habitats based on the suitability of the habitat, known distribution of the species in the local area and empirical evidence. It should not be taken as providing a full and definitive survey of any protected and/or notable species group. Further surveys have been undertaken alongside and following the preparation of this PEA to ascertain the presence or likely absence of species within the Site (Volume 3, Appendix 6.2 and Volume 3, Appendix 6.3)

2.3.6 Most ecological data remain valid for only short periods due to the inherently transient nature of the topic. The survey results contained in this report are considered accurate for a minimum of 18 months to two years (CIEEM, 2019), assuming no significant changes to the Site's conditions.

[2] R Modular Analysis of Vegetation Information System

[3] Indicators of habitats that could be considered important for conservation (Walker, 2016)

3 RESULTS

3.1 Desk Study

Designated Sites

3.1.1 Two internationally designated sites were identified within 5 km of the Site. The closest international site was the Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries SAC, 1.47 km from the Site to the west.

3.1.2 Nine nationally designated sites were identified within 2 km of the Site. The closest nationally designated site was Gwel y Coed SSSI located 1.46 from the Site, to the south. The Afon Tywi SSSI was located 1.47 km from the Site, to the west. The other seven SSSIs were identified from 2km to 5km, some of which were designated for their geological interest.

3.1.3 One LNR was identified within 5 km of the Site, this was Glan-yr-Afon LNR. No NNRs were identified during the search.

3.1.4 All statutory designated sites identified within 5km are summarised in Table 1 and are illustrated on Volume 2, Figure 6.1.

Table 1: Statutory Designated Sites within 5km

Site Name	Type	Distance from Site (km)	Area (ha)	Features of Interest
Internationally sites within 5 km				
Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries	SAC	1.47	66092.05	Annex I habitats are the primary reason for designation: • Sandbanks(1110): Includes Helwick Bank and smaller sandbanks with species adapted to high disturbance • Estuaries(1130): Four international interconnected estuaries with diverse sediments, species, and habitat transitions • Mudflats/Sandflats(1140): Extensive intertidal flats with rich bivalve, worm, and plant communities. • Shallow Inlets/Bays(1160): Diverse conditions and seabed types supporting varied marine species. • Glasswort Saltmarsh(1310): Pioneer vegetation linking saltmarshes and sand dunes. • Atlantic Salt Meadows (1330): Grazed saltmarsh with distinctive vegetation and habitat transitions.
Twyni Bae Caerfyrddin/ Carmarthen Bay Dunes	SAC	4.36	1204.02	Annex I habitats that are the primary reason for designation: • Embryonic shifting dunes (2110): Three Carmarthen Bay Dubes within the Burry Inlet are representative examples of embryotic shifting

Site Name	Type	Distance from Site (km)	Area (ha)	Features of Interest
				dunes in south Wales. *Elytrigia juncea* is the dominant sand binding species; • Shifting dunes along the shoreline with *Ammophilia arenaria* "white dunes" (2120): Representative of mobile dunes containing a large area of shifting dunes along the shoreline; • Fixed coastal dunes with herbaceous vegetation "grey dunes" (2130): Important dune system with actively-forming spits and well-conserved structure and function. Vegetation included extensive areas of fixed dune grassland with red fescue *Festuca rubra* and lady's bedstraw *Galium verum* and semi-fixed dune grassland with marram *Ammophila arenaria* and red fescue; • Dunes with Salix repens ssp, argentea (Salicion arenariae) (21270): Representative of dunes with *Salix repens* ssp. *Argentea* in south Wales. Three dune systems associated with the Burry Inlet – Whiteford and Pembrey Dunes, Laugharne and Pendine Burrows – contain examples of the habitat type, part of a range of dune habitats on the site; • Humid dune slacks (2190): Representing the largest area of humid dune slacks in Wales (almost 100ha). Many of these dune slacks are species rich including rare annex II species 1903 fen orchid *Liparis loeselii*
Nationally designated sites within 5 km				
Gwel Y Coed	SSSI	1.46	5.96	Containing a large population of Killarney fern *Trichomanes speciosum*
Afon Tywi	SSSI	1.47	1249.5	Extends downstream from Llandovery to its confluence with the Afon Taf and Pembrey Coast SSSI. This actively eroding, meandering river on an alluvial floodplain creates extensive shingle banks, supporting birds, and invertebrates. The river is of special interest for its fish species, otters, and saltmarsh vegetation in the lower reaches.
Coed Gwempa	SSSI	2.74	19	Coed Gwempa is a semi-natural woodland lying on fairly level ground, some of which slopes very gently northwards towards the Gwendraeth Fach river, south-west of Pontantwyn village. The underlying rock is Old Red Sandstone, overlain by boulder-clay, giving rise to generally waterlogged conditions, particularly in the north-west of the site, where a small area of alder carr and open herbaceous vegetation has developed.

Site Name	Type	Distance from Site (km)	Area (ha)	Features of Interest
Creigiau Llansteffan (Llanstephan Cliffs)	SSSI	2.91	3.2	Site designated for geological interest. The site shows a coastal section exposing the Psammosteus Limestone horizon and overlying sandstones and shales, within the Red Marl Group of the Lower Old Red Sandstone.
Arfordir Pen-bre / Pembrey Coast	SSSI	3.06	4119.7	This site is of special interest for its intertidal, saltmarsh and sand dune habitats including vegetational transitions, its wet woodland and neutral grassland as well as associated scrub and river and open channel habitats and two rare plants. Nationally important numbers of oystercatchers *Haematopus ostralegus* and sanderlings *Calidris alba* occur as well as an assemblage of invertebrates, including rare species such as the ground beetle *Panagaeus cruxmajor* and the weevil *Datonychus arquatus,* all of which are of special interest.
Smarts Quarry	SSSI	3.59	2.6	Site designated for geological interest. Smarts Quarry presents a section in Namurian quartzite, and is principally of importance for the presence of abundant, bivalve produced, stellate feeding traces on a bedding surface
Craig Ddu - Wharley Point Cliffs	SSSI	3.75	43.4	The Old Red Sandstone cliffs extending from Craig Ddu to Wharley Point, located between the Taf and Tywi estuaries on the south Carmarthen coast, are noted for their botanical and ornithological interest; additionally several invertebrate taxa of note occur there. The geographical position of the site, which is open to the ameliorating influences of the Atlantic, has resulted in a strong representation of species that require mild winter conditions. The frosttender maidenhair fern *Adiantum capillus-veneris*, sea spleenwort Asplenium marinum and madder Rubia peregrina are good examples; likewise the centipedes *Lithobius pilicornis* and *Hydroschendyla submarina*, which otherwise are mostly found only in south-west England
Aber Taf / Taf Estuary	SSSI	4.09	1494.3	The Taf Estuary is of special interest for its saltmarsh vegetation, which is associated with extensive areas of intertidal mud, sand and the river channel. The site is also of special interest for two species of migratory fish.
Cwm Clydach, Cydweli	SSSI	4.47	7.6	Cwm Clydach, Cydweli is of special interest for its communities of lower plants (lichens) and ferns. Located about 4 km from the coast near the ancient port of Cydweli (Kidwelly), Cwm Clydach is a deep ravine cut into a low ridge of slightly calcareous and resistant sandstones of Upper Carboniferous age, popularly known as the "Farewell Rock" by past generations of miners as no coal lay beneath it.

Site Name	Type	Distance from Site (km)	Area (ha)	Features of Interest
Locally Designated Sites within 5 km				
Glan-yr-Afon	LNR	1.46	5.96	A former reclamation site restored to marshy grassland.

3.1.5 The only non-statutory designated site recorded within 2 km of the Site was of a B-Line Network[4] 70m to the west of the Site. The B-line Network is illustrated on Volume 2, Figure 6.2.

Ancient Woodland and Priority Habitats

3.1.6 Multiple parcels of ancient woodland were identified within 2 km of the Site. These parcels included 32 Ancient Semi-Natural Woodland (ASNW), 24 Restored Ancient Woodland Sites (RAWS), three Plantation on Ancient Woodland Site (PAWS), and three Ancient Woodland Site of Unknown Category. The closest Ancient Semi-Natural Woodland Site was adjacent to the Site, west of Solar Area West. Ancient woodlands identified as part of the desk study are illustrated on Volume 2, Figure 6.2.

3.1.7 The desk study assessment also identified several Priority Habitats within 2km of the Site. This included Lowland Dry Acid Grassland, Maritime Cliff and Slopes, Purple Moor Grass and Rush Pasture and Coastal Saltmarsh and Floodplain Grassland. Neither of these habitat types were recorded within the Site. The nearest Priority Habitat was a parcel of Purple Moor Grass and Rush Pasture habitat, 500m to the north west of the Site.

Protected and Notable Species

3.1.8 Species records from the last 10 years and within 2km of the Site are summarised in Table 2 below.

Table 2: Protected and Notable Species within 2km of the Site

Species	Scientific Name	Conservation Status[5]	No. of Records	Location of closest record (m)	Year of most recent record
Mammals - Bats					
Brown long-eared bat	*Plecotus auritus*	EPS, S7, WCA5, RDB2(UK)	12	506	2015
Common pipistrelle	*Pipistrellus pipistrellus*	EPS, WCA5, S7, RDB2(UK), LBAP	15	506	2015

[4] Large networks of flower-rich areas for invertebrate pollinators created by Buglife.

[5] EPS – European Protected Species, WCA – Subsection 1(1) (protection of birds) of the Wildlife and Countryside Act 1981, WCA1 – Schedule 1 of the Wildlife and Countryside Act 1981, WCA5 – Schedule 5 of the Wildlife and Countryside Act 1981, WCA9 – Schedule 9 of the Wildlife and Countryside Act 1981, S7 – Section 7 (Priority Species) of the Environment (Wales) Act 2016, BA –, BoCCW Red – Birds of Conservation Concern Wales Red List Species, BoCCW Amber – Birds of Conservation Concern Amber List Species, BDir1 - EC Birds Directive Annex 1 Species, , RDB1(UK) – UK Red Data Book listing based on IUCN guidelines, RDB2(UK) – UK Red Data Book listing (Nationally Rare and Scarce), LBAP – Local Biodiversity Action Plan Species for Carmarthenshire County Council

Species	Scientific Name	Conservation Status[5]	No. of Records	Location of closest record (m)	Year of most recent record
Daubenton's bat	*Myotis daubentonii*	EPS, WCA5, RDB2(UK)	1	1515	2015
Greater Horseshoe bat	*Rhinolophus ferrumequinum*	EPS, , WCA5, S7, RDB2(UK), LBAP	5	506	2017
Myotis Sp.	*Myotis* Sp.	EPS, WCA5	23	506	2015
Natterer's bat	*Myotis nattereri*	EPS, WCA5, RDB2(UK)	6	506	2015
Noctule bat	*Nyctalus noctula*	EPS, WCA5, S7, RDB2(UK)	15	506	2015
Soprano pipistrelle	*Pipistrellus pygmaeus*	EPS, WCA5, S7, RDB2(UK)	8	506	2015
Mammals – Other					
Hazel dormouse	*Muscardinus avellanarius*	EPS, WCA5, S7, LBAP	3	291	2023
Hedgehog	*Erinaceus europaeus*	S7	17	353	2019
Otter	*Lutra lutra*	EPS, S7, WCA5, RDB2(UK), LBAP	3	1888	2016
Polecat	*Mustela putorius*	S7, RDB2(UK)	1	1876	2015
Amphibians and reptiles					
Smooth newt	*Lissotriton vulgaris*	WCA5	1	997	2017
Common toad	*Bufo bufo*	WCA5, S7	1	1456	2017
Common lizard	*Zootoca vivipara*	WCA5, S7	2	1732	2017
Slow worm	*Anguis fragilis*	WCA5, S7	2	1183	2015

Species	Scientific Name	Conservation Status[5]	No. of Records	Location of closest record (m)	Year of most recent record
Birds					
Bullfinch	*Pyrrhula pyrrhula*	WCA, S7, BoCCWAmber	1	1511	2014
Dunnock	*Prunella modularis*	WCA, S7 BoCCWAmber	1	1508	2022
Grey heron	*Ardea cinerea*	WCA	3	1907	2020
Grey wagtail	*Motacilla cinerea*	WCA, BoCCWAmber	2	976	2017
House sparrow	*Passer domesticus*	WCA, S7, BoCCWAmber	16	1508	2023
Hoopoe	*Upupa epops*	WCA1, BoCCWAmber	2	819	2023
Red kite	*Milvus milvus*	BDir1, WCA1, WBAm(RSPB)	2	165	2015
Redwing	*Turdus iliacus*	WCA, WCA1, BoCCW Amber	1	404	2015
Song thrush	*Turdus philomelos*	WCA, S7,	3	942	2017
Swallow	*Hirundo rustica*	WCA	1	1592	2014
Invertebrates					
August Thorn	*Ennomos quercinaria*	S7	3	1992	2017
Centre-barred sallow	*Atethmia centrago*	S7	1	1992	2019
Cinnabar	*Tyria jacobaeae*	S7	1	1607	2016
Garden tiger	*Arctia caja*	S7	1	1170	2024
Large garden bumblebee	*Bombus ruderatus*	S7, RDB2(UK)	2	1508	2022
River Skater	*Aquarius najas*	RDB2(UK)	1	1525	2015

Species	Scientific Name	Conservation Status[5]	No. of Records	Location of closest record (m)	Year of most recent record
Small phoenix	*Ecliptopera silaceata*	S7	4	1896	2022
Small square-spot	*Diarsia rubi*	S7	2	1992	2017
Vascular and Non-Vascular Plants					
Corn marigold	*Glebionis segetum*	RDB1(UK)	2	1487	2016
Fritillary	*Fritillaria meleagris*	RDB2(UK)	1	1494	2017
Bluebell	*Hyacinthoides non-scripta*	WCA8	7	315	2016
Invasive Non-Native Species					
Japanese knotweed	*Reynoutria japonica*	WCA9	1	1549	2022
Montbretia	*Crocosmia pottsii x aurea = C. x crocosmiiflora*	WCA9	1	1514	2016
Rhododendron	*Rhododendron ponticum*	WCA9	2	1812	2015
Grey squirrel	*Sciurus carolinensis*	WCA9	1	1403	2019

3.2 Habitat Survey

3.2.1 Broad habitat types are set out in Table 3 below and broken down into more detailed habitat types from paragraph 3.2.5 onwards. A description of the structure, management, and floristic composition of each habitat type is provided, including condition information.

3.2.2 The order of the habitat descriptions broadly reflects their ordering in the Phase 1 habitat survey handbook and does not reflect habitat importance. Botanical nomenclature is as per the Botanical Society of Britain & Ireland's Plant Atlas 2020 (Stroh et al., 2023) and a species list is in Appendix C.

Table 3: Broad Habitat Types within the Site

Habitat Type	Area (ha)	Length (km)
Semi-natural broadleaved woodland	1.22	
Dense and scattered scrub	0.18	
Grasslands – poor semi-improved and neutral	77.48	
Arable – rye-grass and clover ley	0.13	
Hedgerows – intact and defunct		10.83
Marginal / Inundated - open vegetation	0.07	

Habitat Type	Area (ha)	Length (km)
Waterbodies	0.05	
Watercourses and ditches		0.86
Bare and disturbed ground	0.02	
Artificial features – fence lines/gates, infrastructure and hardstanding	0.4	0.17

3.2.3 Each field within the Site has been assigned a number for the purpose of the Proposed Development design (e.g., Field 1, Field 2, Field 3, etc.). For clarity, consistency, and ease of viewing the habitat data, references have been made to Field numbers when describing habitats. Field numbers are used as reference points for select habitats (woodlands, grasslands, watercourses, hedgerows etc.). Field numbers are identified on Volume 2, Figure 6.3 of this document. The habitat descriptions are separated into two areas of the Site, Solar Area West and Solar Area East.

3.2.4 Target notes obtained as part of the habitat surveys are referenced in select sections below (where relevant). Habitats too small to map were also recorded as target notes and described in the relevant sections. Target note locations are included as circular icons on Volume 2, Figure 6.3 and presented in table format in Appendix B. Pictures of each habitat are included below their descriptions.

Solar Area West

Semi-Natural Broadleaved Woodland

3.2.5 Two parcels of woodland were recorded in Solar Area West (BW1 and BW2). BW1 was identified at the edge of Field 9 extending to the edge of Field 7, south of Field 10. The second parcel extended from the eastern edge of Field 4 to the south west corner of Field 3, continuing westwards outside of the Site, north of Field 5. The two parcels were separated by a farmyard track. Both parcels were situated to the south of Maesmawr Farm buildings (where were outside of the Site). Both woodland parcels enclosed a slow flowing watercourse and were bordered on their southern side by an intact hedgerow, which had started to form part of the woodland's shrub layer.

3.2.6 BW1 was a ~200m section of broadleaved woodland that separated Field 7 and Field 10 (just to the east of Field 4). The woodland was an ash-sycamore-oak woodland with a shrub layer of hazel, pedunculate oak and goat willow *Salix caprea*. A shallow ditch with slow flowing water was recorded within the woodland which appeared to be fed by a broken, exposed pipe in the east of the woodland. An intact hedgerow was recorded along the woodland's fringe, bordering both Field 7 and Field 10. The field layer of the woodland was made up of bluebell, lesser celandine, red campion, enchanter's nightshade, dog's mercury *Mercurialis perennis*, wood avens and wood speedwell. Opposite-leaved golden saxifrage *Chrysosplenium oppositifolium* was locally frequent in wetter parts of the woodland. Yorkshire fog and false brome was recorded intermittently, with hart's-tongue, scaly- male fern and broad buckler-fern also recorded. Bramble had colonised much of the field layer, extending into the shrub layer and ivy had begun to form a carpet, colonising tree stems.

3.2.7 BW2 was broadleaved woodland extending from Field 4 westwards was an oak-hazel-ash woodland with pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* making up the canopy trees, with scattered sycamore *Acer pseudoplatanus*. Hazel *Corylus avellana*, including coppiced stools and lower growing sycamore made up the shrub layer, with scattered hawthorn *Crataegus monogyna*. Bramble *Rubus fruticosus* agg. was interspersed amongst the shrub layer, with ivy *Hedera helix* covering stems of many of the canopy trees. The ground layer (particularly to the west of Field 4 and south of Field 3) comprised a mixture of bluebell *Hyacinthoides non-scripta*, lesser celandine *Ficaria verna*, enchanter's nightshade *Cricaea lutetiana*, scaley male-fern *Dryopteris affinis* agg., red campion *Silene dioica* and wood speedwell *Veronica montana* with scrambling cleavers *Galium aperine* and common nettle *Urtica dioica*. Grasses were frequent to occasional, with Yorkshire fog *Holcus lanatus* being the most prominent. False brome *Brachypodium sylvaticum*, false-oat grass *Arrhenatherum elatius* and the ferns hart's-tongue *Asplenium scolopendrium*, lady-fern *Athyrium filix-femina* and broad buckler-fern *Dryoperteris dilitata* were recorded. The woodland was connected further west-south west into a parcel of ancient woodland, which adjoined the Site, on the edge of the western corner of Field 5.

3.2.8 A section of BW2 to the north of Field 4 was a much narrower woodland, largely comprised of pedunculate oak with a shrub layer of hazel, sycamore and occasional grey willow *Salix cinerea*. Common nettle, cleavers, herb-Robert *Geranium robertianum*, wood avens and dog's mercury were present in the field layer. The woodland's field layer was bordered by a dense fringe of hoary willowherb, before becoming a flowing water channel, densely vegetated with hemlock water-dropwort *Oenanthe crocata* and fool's-water-cress *Helosciadium nodiflorum.*

3.2.9 Whilst semi-natural, the woodlands on or adjacent to the Site were not considered to be exemplars of the Priority Habitat Lowland Mixed Deciduous Woodland given the presence of sycamore forming part of the woodland's canopy trees and willow species within the shrub layer.

Picture 1. Shrub layer on the edge of Field 10, within BW1

Picture 2. Canopy, shrub layer and field layer south of Field 3, within BW2

Picture 3. Woodland fringe north of Field 4 where the hedgerow had become part of the shrub layer within BW2, just east of TN13

Picture 4. Canopy and shrub layer of the woodland along the north western border of Field 4, running along the southern edge of BW2

Poor Semi-Improved Grassland

3.2.10 All fields within the Site were relatively species poor, damp, mesotrophic grasslands loosely resembling British NVC community MG6 *Lolium perenne* - *Cynosurus cristatus* grassland. All fields within Solar Area West were reportedly managed for silage, with each grassland undergoing three cuts between March and September and sprayed with fertiliser following each cut. The grasslands are not grazed during the spring, summer and autumn months. In winter, the grasslands are grazed on rotation by sheep. During the late spring / early summer months, the grasslands become less diverse with both perennial rye-grass *Lolium perenne* and Italian rye-grass *Lolium multiflorum* being the most abundant grass species in the sward. During late May the sward length in some of the fields had reached heights of 50cm with certain areas growing to 70cm.

3.2.11 Whilst more botanically diverse in the early spring months, the grassland sward was still dominated by coarse grasses, though other grasses (not typical of improved vegetation) and broadleaved forbs characteristic of wetter conditions were present. Yorkshire fog *Holcus lanatus* was the most abundant grass in the sward in spring, with perennial rye-grass , meadow foxtail, crested dog's-tail and sweet vernal grass all frequently recorded. Following multiple cuts and applications of fertiliser, perennial rye-grass and Italian rye-grass became the most abundant grass in the sward.

3.2.12 During May and early June, cuckoo flower *Cardamine pratensis* was frequent throughout and most prevalent in Field 4 and 5, as was common dandelion *Taraxicum officinale* agg. and white clover *Trifolium repens*. Common mouse-ear *Cerastium fontanum*, common daisy *Bellis perennis* common sorrel *Rumex acetosa*, broadleaved dock *Rumex obtusifolius* were recorded occasionally. Timorthy *Phleum pratense* was recorded in June, with creeping bent *Agrostis stolonifera* recorded in the sward in late June.

3.2.13 Some field corners, and sections next to gate entrances were left unmanaged, which allowed additional broadleaved forbs to flower (TN 16 and TN 17). Rough meadow-grass *Poa trivialis*, Timothy, creeping bent and Yorkshire fog were locally abundant, with false oat-grass encroaching from hedgerows. Marsh foxtail *Alopecurus geniculatus* and soft rush *Juncus effusus* were occasionally recorded in some of the field corners (along the northern edges of Field 7). Greater bird's-foot trefoil *Lotus pedunculatus* was recorded in selected corners (between Field 4 and 5) and toad rush *Juncus bufonis* agg was recorded growing in areas of shorter vegetation, near bare groun. Other species noted were meadow vetchling *Lathyrus pratensis* and tufted vetch *Vicia cracca*. scarlet pimpernel *Lysimachia arvensis* and red bartsia *Odontites vernus* were rare, identified in shorter grassland at entrance gates.

3.2.14 Grasslands were the largest habitat type within the Solar Area West making up more than 40 ha. They were connected to hedgerows and woodlands, with some field edges providing stepped ecotones but were in a relatively poor condition given the frequent management and abundance of coarse grasses and undesirable species.

Picture 5. Field 1 in winter, grazed by sheep

Picture 6. Field 8 in late May

Picture 7. Field 14 in early May

Picture 8. Field 14 and Field 15 in early May


Picture 9. Field 7 in late May


Picture 10. Field 12 in late June


Picture 11. Field 4 sprayed with fertiliser in early July


Picture 12. Unmanaged corner of Field 7 in early July

Watercourses and Ditches

3.2.15 One watercourse (WC1) was recorded within Solar Area West. A short section of the watercourse was present within the Site, which was situated within BW1 and the narrow section of BW2. It continued downstream to the west, through the wooded corridor and outside of the Site. The watercourse was a shallow, narrow, meandering stream that passed through BW1 (from a broken pipe at TN19) underneath a grassy farm track, into BW2. The section of BW2 outside of the Site, south of Maesmawr Farm buildings (TN15) was an open, poorly defined channel densely vegetated by hemlock water-dropwort, hoary willowherb *Epilobium hirsutum*, common nettle, and fool's water-cress.

3.2.16 The section of the stream within BW2 was a narrow, sinusoidal channel with hazel copse, bramble and tall forbs along the banksides. The stream had a relatively slow flow and a silty substrate, with rocks partly exposed within the channel. Rocks and tree bases were carpeted in cypress-leaved plait-moss *Hypnum cupressiforme.* Banksides were mostly 45 degrees, though short stretches were almost vertical. The banksides were less sheer in the eastern section of the channel (TN13), supporting typical woodland vegetation. Red campion, dog's mercury, cleavers, nettle, lady-fern, scaly male-fern, bluebell and Yorkshire fog were recorded along banksides. Intermittent hemlock water-dropwort, fool's-water-cress and brooklime were recorded primarily where the flow had slowed to form pools. Much of the steeper banksides comprised overhanging vegetation, with relatively limited in-channel vegetation. The stream channel comprised a rocky substrate, with much of the rock formations protruding out of the water. Riffles were present in the upper reaches of the watercourse, to the south of TN14, where the watercourse was outside of the Site. An overland flow was recorded flowing southwards near TN14 into the woodland, discharging into the WC1.

Picture 13. Broken pipe within BW1, at TN19

Picture 14. Watercourse within BW2, east of TN13 and south west of TN14

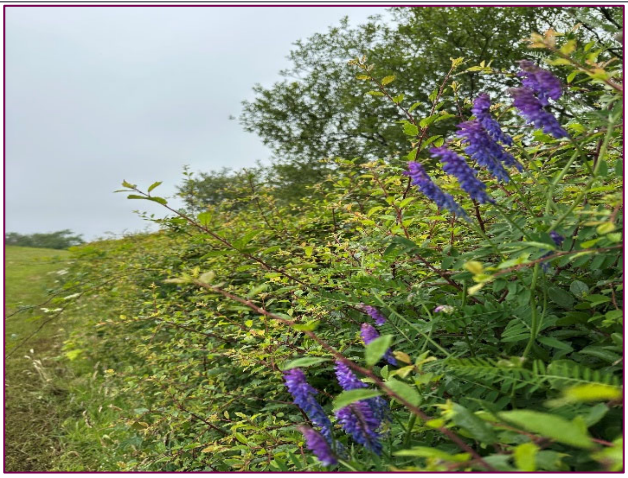
3.2.17 A dry 10m long ditch was recorded along the eastern boundary of Field 9. The ditch was a shallow, grassy depression running parallel with the hedgerow. Meadowsweet was recorded locally within the ditch, along with Yorkshire fog, false-oat grass and intermittent common nettle.

Hedgerows – intact, species-rich

3.2.18 All fields within Solar Area West were bordered by hedgerows. Many of the hedgerow borders were Intact and species-rich, with at least five woody species within a 30m stretch and more than 10 non-woody, climbing and non-climbing vascular plants present. Hedgerow faces facing into each field are managed at least once a year. Hedgerow faces that bordered roads were managed two or more times a year. Hedgerows were typically 1.5 – 2metres wide and 2 metres high in early July.

3.2.19 The most abundant species recorded within the species-rich hedgerows was hawthorn and blackthorn *Prunus spinosa.* Both species were constant throughout all hedgerows. Other species recorded within the hedgerows included hazel, ash and sycamore which were all frequent, with occasionally occurring pedunculate oak. Elder was recorded occasionally, as was goat willow. Bramble was also a frequent species, as was bracken, both extending into the hedgerow canopy. Dog rose and honeysuckle were recorded occasionally, and certain hedgerow stretches such as a 10m section in the south east corner of Field 7 comprised a continuous line of gorse *Ulex europaeus*.

3.2.20 Hedgerow bases were largely made up of coarse grasses specifically Yorkshire fog which was which was a frequently recorded. Other coarse grasses recorded includes rye-grasses, rough meadow grass, cock's foot *Dactylus glomerata* and false-oat grass. Forbs frequently recorded included common hogweed *Heracleum sphondylium*, common nettle, cleavers and red campion, with occasional meadow vetchling, tufted vetch, common hemp-nettle *Galeopsis tetrahit*, lesser stitchwort *Stellaria graminea* and black bryony *Tamus communis*. Meadowsweet *Filipendula ulmaria* was locally abundant, occurring in patches rather than scattered, this was noticed along specific hedgerows, particularly the hedgerow along the southern border of Field 14. Rough chervil was recorded in the hedgerow bordering the woodland in the west of Field 4. The climbers white bryony *Brionica dioica* and honeysuckle *Lonicera periclymenum* were also noted along the hedgerow.



Picture 15. Species-rich hedgerow on northern border of Field 4, bordering BW2

Picture 16. Species-rich hedgerow on western border of Field 8

Hedgerows – intact, species poor

3.2.21 Some of the hedgerows within Solar Area West were noticeably species poor, with blackthorn and hawthorn identified as the only two wooded species in a 30m stretch. These were typically in the east of the Site, bordering Field 9, 12 and 13. Other species recorded within species-poor hedgerows included bracken and bramble which were frequent, with hedge bases comprised primarily of coarse grasses, common nettle and hogweed. Some of the hedgerows were lined by dry, grassy vegetated ditches, some of which comprised locally abundant meadowsweet. This was typically the case along the hedgerow bordering Field 9.

3.2.22 A 10m gap was recorded in the hedgerow bordering Field 6 and Field 8 where coarse grasses and bramble had colonised around the exposed post and wire fence.

Picture 17. Hedgerow along eastern boundary of Field 9

Picture 18. Hedgerow along eastern boundary of Field 14

Hedgerows - hedge with trees, species-rich

3.2.23 A species-rich hedge with one Turkey oak *Quercus cerris* tree was recorded along the border of Field 5 and Field 6. The hedgerow was species rich with a similar botanical composition to the connecting hedgerows along the southern boundary of Field 4 and Field 7. Hawthorn, blackthorn, hazel, sycamore and pedunculate oak were all recorded within the hedge canopy, with scrambling honeysuckle, white bryony and bramble. Yorkshire fog, false-oat grass, common nettle, cleavers, tufted vetch, herb-Robert, hogweed and bramble were all recorded as part of the hedgerows ground flora.

Hedgerows - hedge with trees, species-poor

3.2.24 A species-poor hedge with trees slowly grading into scattered scrub was recorded along the northwest boundary of Field 14. The hedgerow comprised low growing hawthorn and bramble, with intermittent blackthorn. Five pedunculate oak trees were recorded within the hedgerow, with crowns extending into the Site. All five trees were mature and less than 10m high.

Fencelines and Artificial Features

3.2.25 All Site boundaries were bounded by post and wire fencelines, within hedgerows. A post and wire fence was recorded running the length of Field 7, bordering Field 4, terminating in a metal gate. Gates were recorded on the borders of all fields within Solar Area West.

3.2.26 A small circular concrete structure was recorded within the eastern boundary hedgerow of Field 14, filled halfway with water. The water had a layer of common duckweed *Lemna minor* on the surface.

3.2.27 Field 8 was an active camping ground with water filling and disposal areas and a portable toilet recorded along its eastern boundary.

Picture 19. Fenceline in background between Field 4 and Field 7

Picture 20. Field Gate in the north of Field 12

Solar Area East

Semi-Natural Broadleaved Woodland

3.2.28 A claw shaped oak-ash-hazel woodland was recorded along the northern, eastern and southern edge of Field 20, bordering Field 21 and separated into two parcels (BW3 and BW4). The woodland's structure was varied between BW3 and BW4 with the western end beginning as a hedgerow along the north western boundary of Field 20, gradually widening in the centre of BW3 with a clear woodland ground layer, eventually becoming a high canopy woodland in the east of BW3 with trees up to 15m in height. The woodland skirted around Field 20 in the south becoming BW4 and was primarily made up of mature pedunculate oak and ash, with occasional sessile oak *Quercus petraea* trees. The shrub layer in BW4 was predominantly hawthorn-hazel, which connected abruptly into the hedgerow along the southern boundary of Field 19.

3.2.29 The woodland supported two seasonally drying watercourse channels (WC2 and WC3) described in paragraph 3.2.45). The watercourse's topography within BW3 changed gradually as it meandered from the western end of the woodland to the east. The western section comprised steep banksides and the central section supported a much flatter topography (likely a result of channel modification) before becoming sheer as the woodland continued eastwards. Hart's-tongue, scaly male-fern and lady-fern were recorded along the crest of the banksides.

3.2.30 Grey willow was recorded intermittently along the watercourse, replaced by beech and sycamore on the woodland fringes, particularly in more open parts of the woodland. A relatively small woodland glade section towards the centre of BW3 was present with scattered larger mature pedunculate oak trees and an open, grazed grassland ground layer. A field gate was recorded along the northern edge of the woodland (TN10), into Field 21, with evidence of cattle poaching identified at the mouth of the gate. None of the trees in the woodland were considered ancient, veteran or champion. Several ash trees presented signs of decay, typical of ash dieback *Hymenoscyphus fraxineus.*

3.2.31 Much of the wooded vegetation along the northern edge of BW3 was narrow and scrubby in between larger trees, and the field layer contained scattered bluebell, broad buckler-fern, cleavers, ivy, wood avens and red campion. Bramble had colonised much of the field layer, with ivy forming a matt in places. As the woodland continued eastward, the ground layer became sparse with limited vegetation, mostly intermittent scattered nettle and bramble (TN9). In late May – June, WC3 (within the woodland) had dried evidence of cattle poaching was more pronounced. Much of the vegetation in the field layer within this section was bare, with coarse grasses Yorkshire fog and cock's-foot recorded near the field gate (TN10). A relatively small number of bluebell plants were recorded along the banksides, with wetter sections (in channel) supporting intermittent fool's-water-cress, wavy bittercress and brooklime. Localised patches of opposite-leaved golden-saxifrage were recorded, as was redshank *Persicaria maculosa*. Common nettle had become frequent along the edges of trampled sections.

3.2.32 BW4 was north east sloping, with steep banksides for most of its length (which supported a wooded stream section of WC4). WC4 converged with WC3 along the eastern limits of BW3. Hart's-tongue, scaly male-fern and lady-fern were recorded scattered along the bank faces, on the crest and on the flatter parts of the bank. Yorkshire fog was recorded on the fringe of the woodland along the woodland's fence border, with red campion, dog's mercury, enchanter's nightshade, wood avens, ivy and wood speedwell all recorded in the field layer, along the flatter bank top. The watercourse was dry from late May onwards.

3.2.33 As in Solar Area West, much of the woodland compartment within Solar Area East was not considered an exemplar of the Priority Habitat Lowland Mixed Deciduous Woodland. The only part of the woodland that was assessed as meeting the criteria was the section of woodland in the eastern corner of BW3 and northern parts of BW4. Canopy trees of oak and ash, with evidence of coppiced trees and a ground flora of persistent ancient woodland indicators were present in these sections. Sections of the woodland in the west of BW3 comprised sycamore, lacked a varied shrub and ground layer before narrowing into a hedgerow.

Picture 21. Shrub and field layer in BW4

Picture 22. Narrowed section of woodland within BW3


Picture 23. Woodland glade in BW3 at TN11


Picture 24. Canopy trees within BW3, at TN10


Picture 25. Field layer and shrub layer of woodland along the northern boundary of Field 20 within BW3 (TN9).


Picture 26. Narrowed, sparse understory and scattered shrub layer along ditch between Field 20 and Field 21, west of TN7 within BW3.

Dense and Scattered Scrub

3.2.34 Sections of dense and scattered scrub were recorded across the Site. A small patch was recorded on the southern edge of Field 19 (Scrub 1) with prominent patches within and along Field 20 (Scrub 2), and in the north west of Field 24 (Scrub 3).

3.2.35 Scrub 1 was a relatively small patch of gorse, bramble and blackthorn scrub recorded at the southern boundary of Field 19, forming an acute angle with the Site's hedgerow boundary. The scrub was mostly continuous, forming a partially connective link with the hedgerow boundary in the south western corner of Field 19. The feature formed a mosaic with the surrounding grassland, seasonally drying ditch and hedgerows. Cattle gates were recorded extended from the scrub's southern fringe.

3.2.36 Scrub 2's structure varied between its southern and northern limits. It was connected to hedgerows in the north and south and comprised scattered grey willow with intermittent pedunculate oak, low growing gorse patches, hazel and hawthorn. The understory varied along the habitat, with bramble colonising much of the more open sections along with gorse. Coarse grasses were recorded at the base of the more open sections specifically Yorkshire fog, perennial rye-grass and Timothy. A ditch flowed through the scrub habitat in winter, but had dried by late May.

3.2.37 Scrub 3 was a section of scattered scrub (likely to be a former hedgerow) and was recorded bisecting Field 16 and Field 24 with mostly an intermittent willow *Salix* sp. and hawthorn. The feature was partially connected to the boundary hedgerow along the north of Field 16, with evidence of past connectivity to a relict hedgerow along the south of Field 16. Grassy undulating banks were present between each shrub, with bare ground surrounding the vegetation on the west, and a wet fringe of bare ground and inundated / open vegetation on the east

Picture 27. Scrub 1 at the southern limits of Field 19

Picture 28. Scattered scrub remnants between Field 16 and Field 24, and relict hedgerow further in background

Picture 29. Grey willow scrub between Field 20 and Field 19, just south of the spring at TN5

Neutral Grassland

3.2.38 A 0.3 ha section of *Holcus*-*Juncus* neutral grassland was recorded in the north west of Field 20. The grassland parcel was south east sloping and slightly more diverse than the surrounding grasslands, with species more characteristic of rush pasture. Areas of the grassland closer to the ditch were typically characteristic of marshy habitat conditions, with species diversity reducing further to the north of the field. The presence of species typical of marshy environments is likely a result of a spring to the north west (at TN5, see Picture 29).

3.2.39 The grassland vegetation was strongly associated with the vegetation community MG10 *Holcus lanatus Juncus effusus* grassland*,* with localised parts of the sward transitioning to M23 *Juncus effusus/acutiflorus – Galium palustre rush-pasture*, though not an exemplar of this community. Prior to quadrat sampling, sharp-flowered rush *Juncus acutiflorus* was the more prominent rush species in the grassland, with soft rush becoming slightly more abundant during late June / early July. Patches of pointed spear-moss *Calliergonella cuspidata* were also recorded within the grassland, forming localised patches. Whilst Yorkshire fog was the most abundant grass species, crested dog's tail and sweet vernal grass were frequently recorded and marsh foxtail was locally frequent. Creeping bent, perennial rye-grass and rough meadow-grass were all recorded occasionally, with floating sweet-grass *Glyceria fluitans* recorded in a few select patches closer to a ditch running along the southern limits of the grassland. The most abundant forb species recorded were creeping buttercup, with white clover, common sorrell, ribwort plantain *Plantago lanceolata* and creeping cinquefoil also recorded, but slightly less frequently. Cuckoo flower was occasional and in some parts locally frequent, with distinct patches recorded across the grassland. Lesser spearwort *Ranunculus flammula*, marsh bedstraw *Galium palustre*, bog stitchwort *Stellaria alsine*, and greater bird's-foot trefoil were recorded occasionally. Tufted forget-me-not and ivy leaved crowfoot were rare, and were restricted to the lower sections of the grassland, near the bank of WC2.

Picture 30. Neutral grassland in Field 20 in early May with hedgerow in the background.

Picture 31. Field 20 in late May grazed by cattle with Scrub 2 in background.

3.2.40 Glaucous sedge *Carex flacca* and oval sedge *Carex leporina* were locally occasional, with carnation sedge *Carex panacea* and hairy sedge *Carex hirta* recorded much less frequently than the other two sedge species.

Poor Semi-Improved Grassland

3.2.41 The grasslands within Solar Area East were a series of mesotrophic grasslands (similar to that of Solar Area West) broadly resembling the MG6 *Lolium perenne* - *Cynosurus* cr*istatus* vegetation community. Much of the Site's grasslands were gently south sloping except for Field 16 and the northern parts of Field 24 which were situated on a levelled-out plateau at the northern end of the Site.

3.2.42 The grasslands were homogenous, relatively species-poor (typically less than 8 species per m^2) and comprised mostly productive grasses, with Yorkshire fog being the most abundant grass in the sward, though other grass species typical of less fertile soils were present. The grasslands followed a similar trend in conditions to Solar Area West between early spring and early summer, with undesirable species (specifically thistles and docks) becoming more frequent as a result of cattle trampling and grazing.

3.2.43 During early spring, Yorkshire fog was abundant in the sward with crested dog's-tail, and sweet vernal grass frequently occurring. Perennial rye-grass was also frequently recorded, along with white clover, creeping buttercup and common dandelion. Cuckoo flower was recorded occasionally across all grasslands, along with ribwort plantain, common daisy, common mouse-ear and common sorrel. Oval sedge and floating sweet-grass were rare, restricted to a few individuals in Field 19 (proximal to the flush) and the northern eastern edges of Field 24. Sweet vernal grass was locally abundant in Field 17. Fast growing species specifically perennial rye-grass and white clover became more abundant in June-July, with creeping thistle *Cirsium arvense* and broadleaved dock increasing in abundance, particularly in Field 22 – Fields 26. Creeping bent was noted as locally frequent in the sward in late June – July, with rough meadow-grass recorded occasionally and false-oat grass encroaching into some field edges. Marsh foxtail was locally occasional on the edge of Field 16 and near.


Picture 32. Southern half of Field 20, with neutral grassland in the background and cuckoo flower and creeping buttercup in flower in foreground


Picture 33. Field 19 in early May


Picture 34. Field 17 in late May with cattle in background


Picture 35. Field 21 in late May with BW3 in background


Picture 36. Field 24 in June


Picture 37. Field 26 in June with an off-Site woodland in background

Picture 38. Field 23 in early July with scattered dock

Picture 39. Field 22 in early July with scattered thistles

Arable – Rye-grass and clover ley

3.2.44 A perennial rye-grass–white clover ley was recorded to the north of Field 24 along the footprint of the proposed abnormal load route. No other vascular plants were recorded in the sward.

Picture 40. Rye-grass and clover ley north of Field 24

Picture 41. Rye-grass land clover ley north of Field 24

Marginal / Inundation - Open vegetation

3.2.45 An ellipsoid parcel of open vegetation was recorded surrounding a waterbody in the north west of the Site, within Field 24. The vegetation was sparse, with sections of bare soil resulting from cattle poaching. The northern sections of the vegetation comprised a series of rush species, notably hard rush *Juncus inflexus*, soft rush, sharp-flowered rush and less frequently, toad rush. Hard rush and soft rush were locally abundant becoming less prominent to the east and south. Other species recorded frequently included lesser spearwort, water-purslane *Lythrum portula*, marsh cudweed *Gnaphalium uliginosum*, marsh yellowcress *Rorippa palustris* and water starwort *Calitriche* sp. Bog stitchwort, ivy-leaved crowfoot, redshank and oval sedge were recorded occasionally, with marsh foxtail recorded along the edges of the vegetation before transitioning into grassland. The composition of the vegetation community, particularly along the southern and eastern fringes resembled a transitional vegetation community between communities OV29 *Alopecurus geniculatus - Rorippa palustris* community and OV31 *Rorippa palustris – Gnaphalium uliginosum* community.

Picture 42. Vegetation around waterbody within Field 24 in late May

Picture 43. Poor semi-improved grassland in foreground within Field 24 in late May, with Scrub 3 in background

Waterbodies

3.2.46 A waterbody was recorded in the northern limits of Field 24, holding water during the winter of 2024 until early June 2025. From late June onwards the waterbody had dried. The waterbody was heavily cattle poached from March onwards, which had created uneven ground along the margins. No aquatic macrophytes were recorded within the waterbody.

Picture 44. Waterbody in February

Picture 45. Waterbody in May

Watercourses and Ditches

3.2.47 A watercourse dividing into two distinct channels (WC2 and WC3) was recorded within the Site. The channels converged at the eastern corner of Field 20 but were sourced from different areas within the landscape. The first watercourse channel (WC2) was a seasonally drying ditch that originated outside of the Site, to the west of Field 18. The ditch flowed overland through Field 19 (eastward) along its southern edge (Picture 49) before filtering into a ditch channel adjacent to Field 19's. The section of overland flow was along the existing bare ground / gravel access track at the entrance of Solar Area East, which had dried towards the end of May, before being poached by cattle. A broken pipe was recorded adjacent to the existing access track (see Picture 27). The vegetation along the shallow ditch channel to the west of the entrance gate / access track consisted of fool's-water-cress, brooklime, creeping buttercup and occasional stands of soft rush with scattered patches of bare earth. The ditch eventually transitioned into a stream as it passed through BW4. The wooded stream section had relatively steep banksides and was lined by hawthorn and hazel shrubs, with scattered scaly male-fern and hart's-tongue.

3.2.48 The second ditch in Solar Area East (WC3) bisected the neutral and poor semi-improved grassland. The ditch was spring fed from the edge of Field 19 (TN 5), where it then flowed through Field 20 into a wooded stream on the edge of Field 20, bordering Field 21. The section of WC3 was open, with shallow banksides. WC3 was a seasonally drying water feature, with typical wetland vegetation present within and along the channel's banksides. The channel comprised coarse grasses (mostly along the crest), with scattered soft rush and cuckoo flower on the northern side, and fool's watercress, brooklime and lesser spearwort within and on channel edges, with tufted forget-me-not and ivy-leaved crowfoot scattered above the toe of the channel.

3.2.49 WC3 entered the woodland along the northern boundary of Field 19, before flowing eastwards (Picture 47). The wooded section had sheer banksides with intermittent rocks and limited vegetation, before levelling out (Picture 48) and converging with the wooded stream (situated along the southern boundary) in the east of Field 20.

Picture 46. Overland flow of WC2 at Field 19 entrance gate in early May

Picture 47. Dry ditch channel of WC2 within woodland BW3

Picture 48. Slow flowing, shallow watercourse further east of channel in Picture 47 within BW3 (near TN10)

Picture 49. Slow flowing, shallow, partially modified ditch in Field 20 in February, with BW3 in background.

Hedgerows – intact, species-rich

3.2.50 The hedgerow along the western boundary of Field 17, and along the western and northern boundary of Field 16 were considered to be species rich features. Several 30m sections comprised more than four woody species specifically hazel, ash, pedunculate oak, blackthorn and hawthorn, several climbers specifically black bryony and honeysuckle and several forbs within the hedgerow's ground flora including foxglove, tufted vetch, meadow vetchling and meadowsweet.

3.2.51 All species-rich hedgerows within the Site were assessed as Priority Habitats. None of the hedgerows qualified as important hedgerows under the Hedgerow Regulations.

Picture 50. Species-rich hedgerow bordering Field 16, along its northern edge

Picture 51. Species-rich hedgerow connecting into Scrub 3 in Field 16, bordering Field 24

Hedgerows – intact, species-poor

3.2.52 All other hedgerows across Solar Area East were species-poor comprising a hawthorn and blackthorn dominated linear feature. Hazel, pedunculate oak and sycamore were other species frequently recorded across the hedgerow network, though most 30m stretches were limited to hawthorn and blackthorn. Gorse was noted as locally frequent within the hedgerows, with a 200m section of gorse dominated hedgerow along the northern border of field 24. Rowan *Sorbus aucuparia* and grey willow were locally occasional, specifically along the hedgerow bordering Field 21.

3.2.53 Hedgerow bases were frequently made up of bramble, coarse grass and common nettle, fringed by a linear stretch of bare ground. Broadleaved dock was occasionally recorded along the bases. The structure of the hedgerows along Field 21 and Field 19 were starting to resemble scrub features.

3.2.54 Intact hedgerows were also recorded on either side of the public highway, within the section connecting Solar Area West and Solar Area East.

3.2.55 All species-poor hedgerows within the Site were assessed as Priority Habitats. None of the hedgerows qualified as important hedgerows under the Hedgerow Regulations.

Picture 52. Species-poor hedgerow along southern border of Field 19

Picture 53. Species-poor hedgerow growing out on western border of Field 20, south of Scrub 2

Hedgerows – defunct / relict

3.2.56 Several hedgerows within Solar Area East were laden with intermittent breaks along their lengths, and no longer able to provide barriers to domesticated animals. The hedgerow canopies of three hedgerows were intermittently disconnected. The hedgerow along Field 19's field border was primarily a hawthorn-bramble hedgerow with intermittent blackthorn and hazel, and grey willow recorded at the hedgerow's northern end. Gorse was also recorded intermittently as was bracken, with the hedgerow ground flora largely dominated by bramble and the remnants of coarse grasses from the adjacent grassland. The hedgerow was bordered on the east by bare ground.

3.2.57 Whilst the canopy of the hedgerow bordering Field 22 and Field 21 was connected, much of the mid and ground layer was open with frequent gaps, resembling a line of scattered shrubs than a hedgerow. The ground flora was a continuation of the grassland in Field 22 and Field 21, with scattered patches of bare ground as a result of cattle trampling.

3.2.58 A patchy relict hedgerow was recorded at the northern limits of Field 17 (and bordering Field 16), slowly beginning to resemble scattered scrub and consisting of mostly hawthorn, hazel, ash and blackthorn. The vegetation was approximately 200m in length with intermittent gaps and a sparse undulating ground layer, primarily made up of the adjoining coarse grassland species and sections of bare ground. Some of the feature's canopy remained connected but other parts were isolated. Several hawthorn shrubs were gnarled, and selected ash trees (towards the eastern end of the feature) had grown above the hawthorn – hazel canopy. Hawthorn, hazel and blackthorn shrubs were no larger than 3 metres in height.

Picture 54. Hedgerow no longer intact between Fields 18 and Field 19

Picture 55. Defunct hedgerow bordering Field 21 and Field 22

Picture 56. Defunct / relict hedgerow between Field 16 and Field 17

Bare and Disturbed Ground

3.2.59 Several sections of the Site had been disturbed by cattle and tracked by agricultural machinery. A bare ground track was recorded, extending from the Site's access gate, running along the edge of the western and northern boundaries of Field 19 connecting with the field into Field 23.

3.2.60 Localised areas of trampled ground were recorded across the Site, with patches noted near field gates in Field 22, Field 23 and Field 24. Pineapple weed, annual meadow grass and greater plantain were scattered across parts of Site's bare ground.

Picture 57. Bare ground around entrance gate of Field 23

Picture 58. Bare ground track along edge of Field 19

Artificial Features

3.2.61 Post and wire fences, field gates and metal troughs made up the artificial features within Solar Area East. These were scattered across the Site, primarily along field boundaries. A dilapidated stone structure outside of the Site, just beyond Field 26 was also identified (TN 3).

3.2.62 The section of land between Solar Area West and Solar Area East was made up of an artificial sealed surface in the form of the public highway. Residential houses and farmlands were recorded to the south and north of the road.

Picture 59. Trough and entrance gate between Field 19 and Field 18 with cattle in background

Picture 60. Artificial, sealed surface (public highway) between Solar Area West and Solar Area East with residential units to the right (south of the highway), and intact hedgerow to left

3.3 Protected and/or Notable Species

3.3.1 The results of the desk study and an assessment of the potential for the Site to support protected and/or notable species is set out below. Species groups which are unlikely to use the habitats and features on site (e.g. protected fish species or notable fungi assemblages) have not been discussed below. Additionally, the conservation and geographical importance of species and species groups have not been assigned in this report. The conservation importance of a species group or ecological feature is defined in Volume 1, Chapter 6: Biodiversity of the ES.

Bats

3.3.2 A minimum of eight bat species were recorded from 27 records as part of the desk study. The closest record was of a soprano pipistrelle 419 m from the Site. No roosts were recorded within 2 km of the Site in the last 10 years.

Roosting

3.3.3 There were no structures within the Site, though a dilapidated structure was recorded on the edge of Field 26, at TN3. The structure was no larger than 2m and comprised several shallow crevices suitable for smaller numbers of bats with no more than low suitability as per standard guidance (Collins, 2023). Multiple structures were recorded 30 m to the north of the Solar Area West, this included the Maesmawr Farm buildings north of Field 4. Of these buildings, two single storey stone barn buildings were considered suitable for roosting bats. Both buildings were open and exposed but comprised features suitable to support up to low suitability for roosting as per standard guidance (Collins, 2023).

3.3.4 Multiple trees were identified as potentially supporting features for bats during the winter walkover in December 2024. A follow up ground level tree assessment in February 2025 identified 14 trees with potential roosting features (PRFs). PRF inspections were undertaken in May 2025 (RPS, 2025[b]).

Commuting and Foraging

3.3.5 Both areas of the Site had suitability to support foraging and commuting bats. The hedgerow network across both areas offered linear, connected flight lines within the Site and to the wider landscape. Select hedgerows specifically those that were assessed as species rich at the time of the habitat survey provided the highest value of foraging resource given their potential for supporting pollinating invertebrates.

3.3.6 Woodlands offered sheltered flight lines and were well connected to other woodlands and hedgerows outside of the Site. The open watercourse provided another linear commuting route, particularly for bats to commute across open fields. The seasonally drying water features (waterbody, WC2 and WC3) across the Site could support common and widespread terrestrial invertebrates which would provide a foraging source for foraging bats.

3.3.7 The Site was assessed as supporting moderate habitat suitability for commuting and foraging bats. Bat activity surveys are in progress.

Hazel Dormouse

3.3.8 Three records of hazel dormouse were recorded as part of the desk study. The closest record was 291 m from the Site, within a woodland to the north.

3.3.9 The Site offered optimal suitability for nesting, commuting and foraging hazel dormouse primarily through hedgerow connectivity, and their links to on and off-Site woodlands. Some of the hedgerows across both areas of the Site were species rich, comprising a diverse composition of both woody and herbaceous vascular plants offering foraging resource.

3.3.10 Whilst some of the hedgerows across the Site were defunct, the structure of the intact hedgerows offered suitable conditions for summer nest building and dispersal routes within and outside of the Site. The connectivity to off-Site woodlands, particularly in Solar Area East provided opportunities for hibernation nesting. Scrub habitats were located within wetter conditions within Solar Area East and were largely a fragmented feature of the Site providing sub-optimal conditions for hazel dormouse, particularly for hibernation nesting. Some hazel dormouse individuals could make use of the scrub canopy layer, particularly where it connected into hedgerows.

3.3.11 On-Site woodlands and their canopies offered optimal connectivity across each of the Site's areas primarily linking into the hedgerow network and the wider landscape. Hazel was frequently recorded within woodland shrub layers, offering additional foraging opportunities. Some of the hazel stands were coppiced, offering further shelter opportunities at their bases. The structure of both on-Site woodlands varied, with Solar Area East lacking a well-suited ground, shrub and canopy layer interface in select parts (specifically BW3).

3.3.12 Dormouse surveys targeting suitable habitat within the Site are in progress.

Badger

3.3.13 No recent records of badger were recorded as part of the desk study within 2km.

3.3.14 The Site provides suitable commuting, foraging and sett building habitat for badger primarily along field edges, along hedgerows and within the wooded corridors in both areas. Hedgerows and woodlands were well connected to areas outside of the Site and offered opportunities for dispersal.

3.3.15 Evidence of badger was confirmed during the walkover in December 2024 in the form of sett entrances, the locations of which are kept confidential. Badger surveys were undertaken in 2025 as part of otter and water vole surveys, with camera traps deployed around sett entrances.

3.3.16 The sett locations are provided in a confidential appendix to the interim protected and notable species report (Volume 3, Appendix 6.2).

Otter

3.3.17 A total of three records of otter were recorded as part of the desk study. The closest record was 1590 m from the Site.

3.3.18 No signs or evidence of otter was recorded during the habitat surveys. Whilst both areas within the Site comprised watercourses with opportunities for the creation of resting places, otter suitability overall was considered sub-optimal given the largely open nature of both Solar Area West and Solar Area East,. The watercourse flowing westward in Solar Area West was narrow with a shallow depth (no greater than 15cm at its highest) with the water level significantly lower in June, reducing the availability of prey items available to otter across the season. Whilst the watercourse was connected to coastal areas of Carmarthen Bay, this was 2km downstream. The woodland corridor surrounding the watercourse offered suitable areas for the creation of resting places potentially suitable for younger males, though was unlikely to support natal dens given the lack of density in the structure of the field and shrub layer.

3.3.19 The watercourse within Solar Area East had dried by late May / early June and was considered sub-optimal for otter during most of the year, particularly as a source for foraging. The Nant Morlais (450m to the east) is likely to be more suited to sustaining the local otter population's prey source. Sections of the watercourse in Solar Area East, specifically the wooded section along the southern boundary of Field 20 could be used occasionally as shelter given its enclosed canopy, steep banksides and vegetated crest.

3.3.20 Otter surveys targeting both watercourses and up to 300m downstream (where accessible) are in progress, with one spring visit already completed (Volume 3, Appendix 6.2).

Water Vole

3.3.21 No records of water vole were identified as part of the desk study.

3.3.22 Site conditions were largely sub-optimal for water vole given the open nature of the fields, their routine intensive management (cutting and grazing) and the lack of ditch-grassland mosaics recorded across both areas. Solar Area West comprised fields routinely cut for silage and were surrounded by arable land which provided relatively limited foraging resource for water vole. The woodland stream within and outside of Solar Area West offered aquatic habitat for water vole, though banksides were generally sheltered and lined by trees and scrub. Bankside topography varied along the watercourse with a combination of sheer and gradually sloping banksides. The more open, gradually sloping banksides supported tall ruderal and scrubby vegetation, specifically red campion, common nettle and bramble.

3.3.23 Opportunities for water vole were similar within Solar Area East given watercourse channels were largely situated within wooded corridors. A seasonally drying ditch was recorded within Field 20 (fed by a spring) before flowing into a woodland, though this had dried by end of May / late June, becoming a dry ditch. Whilst the channel offered foraging opportunities during early spring, the area was grazed by cattle, which reduced the bankside sward heights, limiting cover along the ditch.

3.3.24 One water vole survey has been completed to date, with cameras deployed in suitable locations (Volume 3, Appendix 6.2).

Priority Mammals

3.3.25 Two priority mammal[6] species, western European hedgehog and polecat were recorded as part of the desk study. This included a total of 17 records of western European hedgehog and one record of polecat. No other priority mammal species were recorded as part of the desk study.

3.3.26 No signs or evidence of western European hedgehog or polecat were recorded during the habitat survey. Hedgerows, scrub and woodland fringes provided suitable foraging, commuting and nesting habitat for both species. Areas off-Site specifically the barn buildings could offer additional sites for the creation of nests, particularly for western European hedgehog.

3.3.27 Whilst the Site's grasslands could be used by both species, field edges are likely to be used most frequently to provide cover during commuting and dispersal. Both species are unlikely to frequently cross through the centre of the grasslands.

Breeding Birds

3.3.28 A total of 25 records from eight bird species were identified as part of the desk study, which comprised common and widespread species, and species of conservation concern. Red kite was the only species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). The closest record was of a song thrush 942 m from the Site.

3.3.29 The Site's hedgerow network and woodlands provide optimal conditions for breeding birds, specifically breeding passerines. The vegetation cover provided by the hedgerow network offered nest building suitability, foraging opportunities for adults and post-juvenile individuals, and suitable roosting sites. Woodlands offered similar opportunities within canopies and the shrub layer, with several scattered trees offering wound / decay features suitable for use as a nest site. The canopy trees at the eastern boundary of Solar Area East, specifically in the east of Field 20 could support birds of prey, though no evidence was recorded during the habitat surveys. Fields across the Site could be used for hunting.

3.3.30 The Site was less suitable for ground nesting birds specifically skylark and meadow pipit given the intensive management within Solar Area West and intensive grazing in Solar Area East. The sward lengths were either too low as a result of cutting or too high during the peak breeding attempts within Solar Area West.

3.3.31 Common and widespread species of passerine (including migrant species) were recorded most frequently during the habitat survey and included: Robin, wren, chaffinch, goldfinch, blue tit, great tit, blackcap, chiff chaff, carrion crow, magpie, jackdaw and whitethroat. Buzzard and red kite were also recorded circling overhead.

[6] Priority mammals are those that are listed as Priority Species on Section 7 of the Environment (Wales) Act 2016

3.3.32 Breeding bird surveys were commenced in March 2025 and completed in June 2025 (Volume 3, Appendix 6.3).

Wintering Birds

3.3.33 No waders or wildfowl species were recorded as part of the desk study, and no flocks or wintering assemblages of finches were recorded. One record of a redwing (wintering thrush species) was recorded in 2015.

3.3.34 The open, ungrazed fields of Solar Area East and the hedgerow network in both areas provided suitable conditions particularly for wintering thrush species (redwing and fieldfare *Turdus pilaris*) with the surrounding arable fields outside of the Site providing additional foraging opportunities. Field boundaries and woodland edges could also support roosting sites and foraging areas for some wintering waders, with the scattered trees and woodlands providing roosting sites for starling. Some of the fields, particularly those in Solar Area East could offer opportunities for wintering geese.

3.3.35 Whilst the Site supports damp pasture, it does not form part of an important floodplain and is not considered a valuable wetland landscape typical of those (near coastal / estuarine interfaces) that could support important numbers of wintering waders and wildfowl. The Site is more than 5 km from Carmarthen Bay SPA (designated for common scoter, only), and more than 3 km from the nearest SSSI that has nationally important numbers of typical wintering waders (oystercatcher and sanderlings) listed as notable features (Arfordir Pen-bre / Pembrey Coast). The Site does not share similar habitats with either of the above designated sites.

3.3.36 Wintering bird surveys were commenced in November 2024 and completed in March 2025 (Volume 3, Appendix 6.3).

Reptiles

3.3.37 A total of 5 records from two species were recorded as part of the desk study. The closest record was of a smooth newt, 1183 m from the Site.

3.3.38 Habitat suitability for reptiles was largely restricted to hedgerow and woodland edges, with some of the unmanaged field edges in Solar Area West and grassland ecotones in Solar Area East also providing opportunities for basking and shelter. Much of the grasslands within Solar Area West were unsuitable given their open nature, fluctuating sward length and routine management.

3.3.39 Several areas within Solar Area East could provide opportunities for reptiles, such as the south facing grasslands bordered by scrub and hedgerow features, though habitat mosaics such as the scrub-grassland-tall herb interfaces typically needed for reptiles to flourish were absent. The neutral grassland, ditch and scrub edges offered shelter, dispersal and foraging opportunities for reptiles, as did the grassland and relict hedgerow in Field 17, though given the continuous disturbance from grazing cattle from March onwards, reptiles are unlikely to frequently utilise the features.

Amphibians

3.3.40 A total of four records from two species were recorded as part of the desk study. The closest record was of a smooth newt, 997 m from the Site.

3.3.41 As with reptiles, much of the terrestrial habitat suitability for amphibians was limited to hedgerow edges and woodland fringes. Both areas were largely open and lacked suitable mosaics for safe and continuous dispersal through the landscape, though the woodland and scrub habitats provided suitable areas for hibernation.

3.3.42 Aquatic habitat was limited to a seasonally drying waterbody in the north of Field 24, which had no in-water aquatic macrophytes that would other be used by newts to deposit eggs. Small pooling areas within the waterbody in the spring could be used by some amphibians to deposit eggs (e.g. common frog), but given the poor water conditions, turbidity and cattle poaching, amphibians would be less likely to depend on the waterbody for reproduction. Additionally, the waterbody provided limited suitability for great crested newt displaying and egg laying and was assessed as having poor suitability as per the Habitat Suitability Index (HSI) criteria (Oldham et al., 2000).

3.3.43 No other waterbodies within 500m of the Site were identified as part of the desk study. Great crested newt eDNA sampling and HSI was undertaken in May 2025 (Volume 3, Appendix 6.2).

Invertebrates

3.3.44 A total of 15 records from eight species were recorded as part of the desk study. The closest record was of a dingy skipper, 241 m from the Site.

3.3.45 Habitats suitable for terrestrial invertebrates were largely restricted to hedgerow and woodland habitats within the Site. The grasslands were intensively managed and were assessed as relatively species poor (except for part of Field 20). Given the limited diversity of forbs within the grasslands, most of the Site's grasslands were considered suitable for supporting common and widespread species of invertebrate only. The neutral grassland in the north of Field 20 could provide additional opportunities for invertebrate foraging and egg laying given its increased vascular plant diversity

3.3.46 Hedgerows, specifically those assessed as species-rich provided an array of vascular plants which could be used as terrestrial invertebrates to forage. Plant species recorded included common hemp nettle, meadow vetchling, red campion, meadowsweet and honeysuckle, all of which would be expected to support invertebrate foraging. The waterbody and watercourses in Solar Area East were seasonally drying, drying out towards the end of May and were considered to be sub-optimal freshwater features. The watercourse in Solar Area East (specifically the section north of Field 20) could provide opportunities for common and widespread species of aquatic invertebrates, though this would be limited to the winter and early spring months only given its seasonal drying.

3.3.47 The butterfly species red admiral, large white and small copper were recorded during the habitat surveys, as was the common horsefly.

Native Vascular and Non-Vascular Plants

3.3.48 A total of five records from three species of native vascular plants were recorded as part of the desk study. The closest was of a bluebell, 315 m from the Site. No non-vascular plants or lichens were recorded.

3.3.49 The only protected vascular plant species recorded during the habitat survey was bluebell, recorded within the ground layer of all woodlands within the Site. No other species listed on Schedule 8 of the Wildlife and Countryside Act (1981) were identified. Additionally, no plants listed on the Vascular Plant Red Data List for Wales (Dines, 2008) were identified during the habitat survey.

3.3.50 Six species listed on the provisional list of axiophyte species for Carmarthenshire were recorded within the Site. Five were recorded in the neutral grassland north of Field 20 and were ivy-leaved crowfoot, glaucous sedge, hairy sedge, carnation sedge and tufted forget-me-not. Water purslane was recorded in the open vegetation in Field 24, and rough chervil was recorded within the hedgerow bordering Field 4.

3.3.51 No protected or notable non-vascular plants were recorded during the habitat survey. Whilst non-vascular plants were recorded during the habitat survey, a targeted survey for non-vascular plants did not form part of the habitat survey.

Invasive Non-Native Species

3.3.52 Five records of vascular plant and one mammal record listed on Schedule 9 of the Widlife and Countryside Act 1981 were recorded as part of the desk study. The closest was of a grey squirrel 1403 m from the Site.

3.3.53 No invasive non-native species were recorded during the habitat survey of the Site.

4 DISCUSSION AND SUMMARY

4.1.1 This section provides a summary of the findings of this updated PEA for designated sites, habitats and species. It does not discuss mitigation, implications of the Proposed Development or recommendations for further survey. The findings of the relevant protected species surveys are set out in the Protected Species Survey Report (Volume 3, Appendix 6.2). The appropriate avoidance, mitigation and enhancement measures designed as part of the Proposed Development are discussed within the Ecology Chapter of the Environmental Statement (Volume 1, Chapter 6).

4.2 Designated Sites

4.2.1 Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries SAC was identified as the nearest international site to the Site. The Afon Tywi SSSI (a nationally designated site) overlapped with the Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries boundary. Both sites were identified as being just under 1.5 km from the Site.

4.2.2 Given the nature of the Proposed Development (solar photovoltaic arrays) and the distance between the Site and Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries SAC (nearest designated site), it is considered unlikely that the Proposed Development would give rise to likely significant effects on qualifying features, specifically its habitat designations. Given the limited suitability for otter within the Site, it is also unlikely that the habitats are functionally linked to Bae Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries. Notwithstanding this assessment, a HRA presenting the potential impact pathways on relevant designated sites (including supporting information) has been prepared (Volume 3, Appendix 6.4). Whilst SSSIs do not form part of the HRA process, the Afon Tywi SSSI has been dually assessed within the HRA given its overlap with the Carmarthen Bay and Estuaries SAC and similar qualifying features.

4.2.3 Glan-yr-Afon LNR was identified 1.46 km to the southeast of the Site. The only non-statutory designated site identified within 2 km was of a B-Lines network. The site was located outside of the Site, 70m to the west.

4.3 Habitats

4.3.1 Whilst no parcels of ancient woodland were recorded within the Site, one parcel was identified adjacent to Field 5 to the west of the Site. A total of 62 ancient woodland parcels were identified within 2 km of the Site.

4.3.2 Hedgerows were the only Priority habitat recorded within the Site during the habitat survey based on habitat characteristics and conditions. Lowland mixed deciduous woodland and coastal saltmarsh were recorded in the wider landscape as part of the desk study, obtained from data provided by SEWBReC. Hedgerows were the only priority habitat recorded within the Site during the habitat survey.

4.3.3 The habitat survey identified 10 broad habitat types. The most common and widespread broad habitat within the Site was grasslands, with poor semi-improved grassland making up the majority of the total area. A parcel of neutral grassland resembling a *Holcus*-*Juncus* vegetation community was recorded in the north of Field 20 and assessed as being more diverse than most other grasslands within Solar Area East.

4.3.4 More than 9 km of hedgerow was identified within the Site, which included species-rich, species poor and defunct types, with scattered trees recorded in some of the Site's boundaries. Other habitats included scrub (dense and scattered), broadleaved woodland, waterbodies, watercourses and ditches and wetland habitats, specifically marginal / inundation vegetation.

4.3.5 Impacts and effects on habitats considered to be important features are assessed as part of the Ecological Impact Assessment (EcIA) in Chapter 6 of the ES (Volume 1, Chapter 6)

4.4 Protected and/or Notable Species

4.4.1 The results of the desk study, habitat survey and protected and/or notable species assessment highlighted the potential for the Site to support several protected or notable species. These include roosting, commuting and foraging bats, badger, hazel dormouse, other mammals such as western European hedgehog and polecat, with less suitable habitats for otter and water vole. The Site was assessed as suitable for other taxonomic groups such as breeding and wintering birds, with limited suitability for reptiles, amphibians and noteworthy invertebrates.

4.4.2 Further ecological survey and assessment work has been undertaken within and in proximity to the Site (Volume 3, Appendix 6.2). No evidence of hazel dormouse has been recorded during field surveys to date, though surveys are currently ongoing. No bat roosts were recorded in trees with PRFs, though passive acoustic monitoring undertaken has recorded a minimum of seven species along linear features and woodland. No evidence of otter or water vole has been recorded along watercourses and within woodlands and grasslands.

4.4.3 The Site is primarily made up of common and widespread species of breeding birds, with most of the activity recorded in hedgerows and woodlands. Species of conservation concern have been recorded including ground nesting species (skylark and meadow pipit), though no confirmed breeding territories of these species were recorded. The wintering assemblage included common and widespread species, with flocks of starling, fieldfare and redwing recorded within and outside of the Site across the wintering bird survey period.

4.4.4 Sampling for great crested newt eDNA confirmed a negative result, indicating likely absence of the species from the Site and surrounding area. Given the nature of the Proposed Development (solar farm) and the limited suitability of reptile habitat mosaics, reptile surveys have not been undertaken.

4.4.5 No invasive non-native plants or animals were recorded during the habitat surveys within the Site. Badger evidence was confirmed within the Site during a winter walkover in December 2024. The legal protection afforded to the species and species groups referred to above is outlined within Appendix A.

4.4.6 Impacts and effects on species considered to be important features are assessed as part of the Ecological Impact Assessment in Chapter 6 of the ES (Volume 1, Chapter 6).

4.5 Net Benefit for Biodiversity

4.5.1 Section 6 of the Environment (Wales) Act 2016 sets out the requirement for development in Wales to deliver a Net Benefit for Biodiversity (NBB), through improving or enabling the improvement of ecosystem resilience and delivering ecological enhancement (the ‘Biodiversity Duty’).

4.5.2 For a development to showcase that it can deliver NBB, the stepwise approach must be adhered to (Welsh Government, 2023). The stepwise approach is a mitigation hierarchy (enshrined in national planning policy) that development proposals must adhere to when optioneering its design layout. It includes the following steps:

1. Avoid
2. Minimise
3. Mitigate / restore
4. Compensate on-site
5. Compensate off-site

4.5.3 At each level the additional value of habitat enhancement and the importance of long-term management is recognised in delivering benefits. Alongside the stepwise approach, the Biodiversity Duty (as detailed in Section 6 of PPW 12) sets out considerations for assessing and improving ecosystem resilience. This includes incorporating the DECCA framework into decision making. The framework comprises the following aspects:

- **D**iversity - the need to consider diversity at all levels from genetic to ecosystem and landscape scale diversity in underpinning biodiversity and ecosystem resilience.
- **E**xtent – consideration of the scale at which a feature contributes to biodiversity and ecosystem resilience, and the importance of strategic integration.

- **C**ondition – consideration of the ecological condition and health of biodiversity features and the factors that contribute or detract from good condition such as climate change, recreational pressure, pollution and invasive non-native species.
- **C**onnectivity – consideration of the importance of connectivity in maintaining ecosystem function and particularly in ecosystem resilience by allowing species to move in response to environmental pressures such as climate change.
- **A**daptability– considering all aspects of biodiversity and ecosystem and their interaction with the human environment in promoting the ability to adapt to and recover from environmental pressures.

4.5.4 NBB can be demonstrated by firstly avoiding valuable habitats and species, sensitive ecological features and healthy functioning ecosystems, developing in areas with lower biodiversity value instead. Mitigation can then be implemented for the loss of lower value areas, before targeting the restoration of sub-optimal / undesirable areas to improve resilience and provide biodiversity enhancement. Green infrastructure connectivity should be maintained as far as practicably possible as part of site selection and design optioneering.

4.5.5 Information to support the Proposed Development's adherence to the stepwise approach (considering the ecological baseline as set out in this report) and its aim for delivering NBB is set out within the Landscape and Ecological Design Scheme (LEDS) Strategy (Volume 3, Appendix 2.1) and the Green Infrastructure Statement that accompanies the application.

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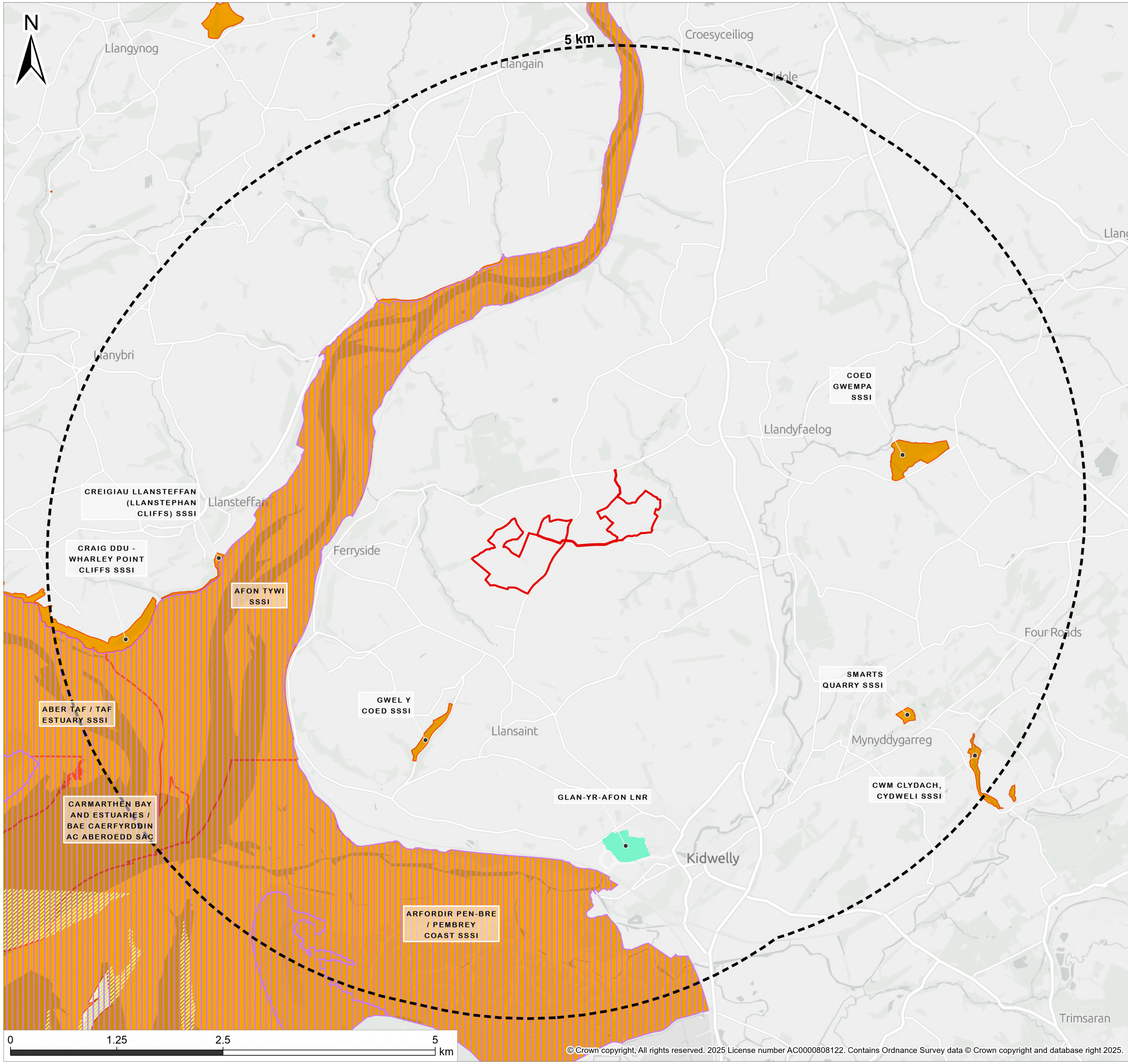
FIGURES

Volume 2, Figure 6.1 Statutory Designated Sites

Volume 2, Figure 6.2 Non-Statutory Designated Sites and Ancient Woodland

Volume 2, Figure 6.1 Habitat Map



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Qualitas energy

Legend

- Site
- 5 km buffer from site
- Local Nature Reserve
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

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Project Name	**Heolddu Solar Farm**
Drawing Title	**Statutory Designated Sites within 5 km**
Figure Number	**6.1**
Drawing Number	**NDIP00319-0015-03**

Rev	Date	Status	By	CB
03	06/08/2025	FINAL	AC	LR

Scale @ A3	Plot Size	Datum
1:45,000	**294 x 277 mm**	**OSGB 1936**

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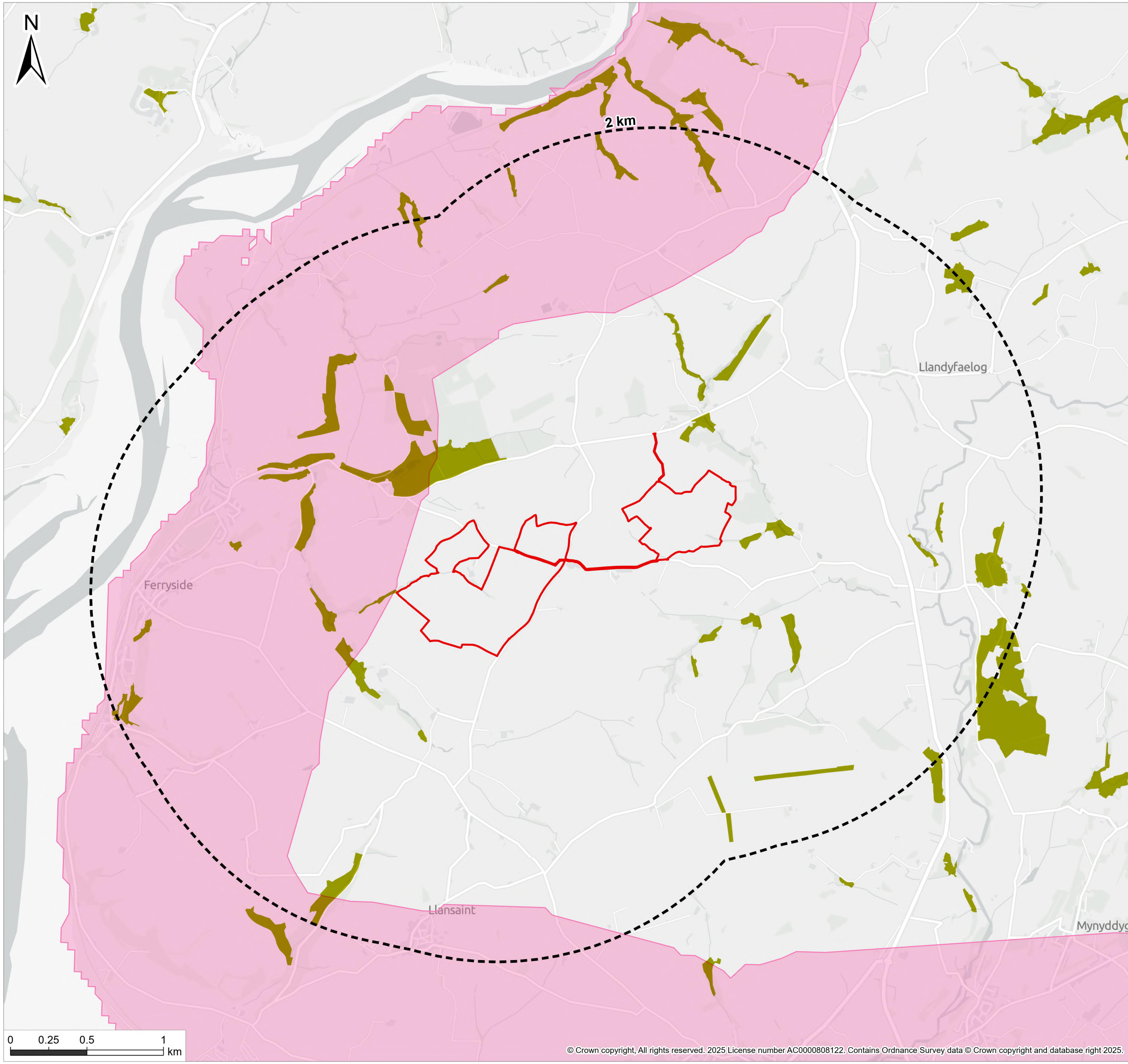

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Qualitas energy

Legend

- Site
- 2 km buffer from site
- Ancient woodland
- B-lines network

Project Name	**Heolddu Solar Farm**
Drawing Title	**Non-Statutory Designated Sites and Ancient Woodland within 2 km**
Figure Number	**6.2**
Drawing Number	**NDIP00319-0016-03**

Rev	Date	Status	By	CB
03	31/07/2025	FINAL	AC	LR

Scale @ A3	Plot Size	Datum
1:25,000	**294 x 277 mm**	**OSGB 1936**

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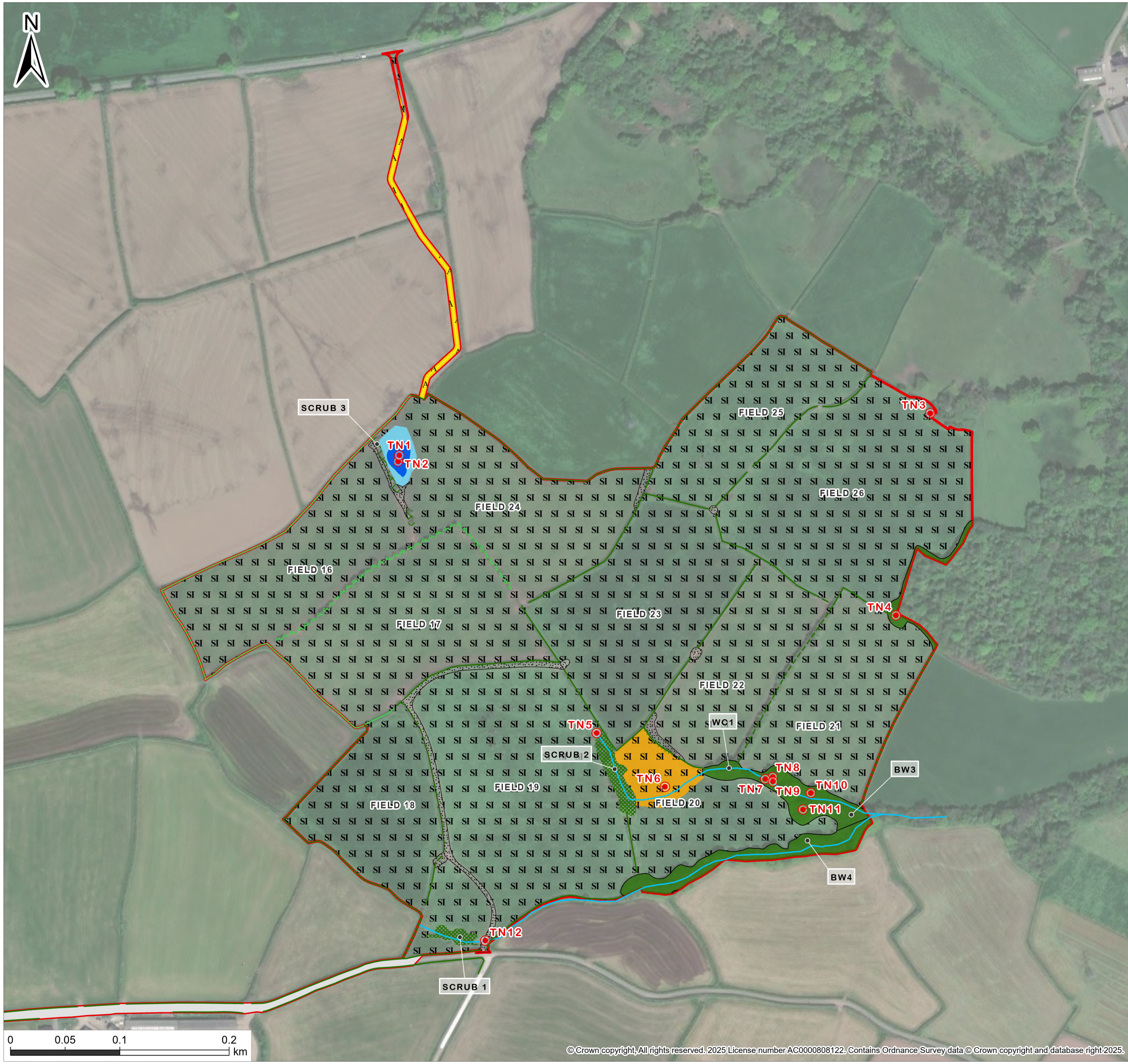

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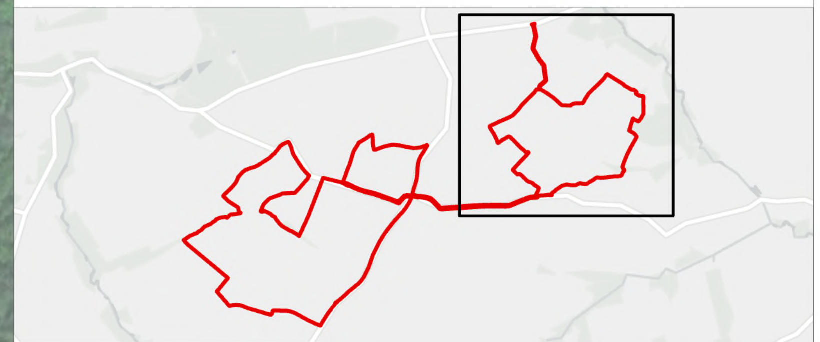
Qualitas energy

Legend

- Site
- A1.1.1 - Woodland - broadleaved - semi-natural
- A2.1 - Dense scrub
- A2.2 - Scattered scrub
- SI B2.2 - Neutral grassland - semi-improved
- SI B6 - Poor semi-improved grassland
- F2 - Marginal and inundation
- G1 - Standing water
- A J1.1 - Arable
- J4 - Bare ground
- J5 - Hardstanding
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.2.1 - Defunct hedge - native species-rich
- J2.2.2 - Defunct hedge - species-poor
- J2.3.2 - Hedge with trees - species-poor
- G2 - Running water
- Target Notes



Project Name	**Heolddu Solar Farm**
Drawing Title	**Habitat Map - Solar Area East**
Figure Number	**6.3.1**
Drawing Number	**NDIP00319-0014-05**

Rev	Date	Status	By	CB
05	19/08/2025	FINAL	AC	LR

Scale @ A3	Plot Size	Datum
1:3,500	**294 x 277 mm**	**OSGB 1936**

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Qualitas energy

Legend

- Site
- A1.1.1 - Woodland - broadleaved - semi-natural
- SI B6 - Poor semi-improved grassland
- J5 - Hardstanding
- J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J2.3.2 - Hedge with trees - species-poor
- J2.4 - Fence
- J2.5 - Wall
- G2 - Running water
- J3.6 - Dry ditch
- Target Notes

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Project Name	**Heolddu Solar Farm**
Drawing Title	**Habitat Map - Solar Area West**
Figure Number	**6.3.2**
Drawing Number	**NDIP00319-0014-05**

Rev	Date	Status	By	CB
05	19/08/2025	FINAL	AC	LR

Scale @ A3	Plot Size	Datum
1:4,500	**294 x 277 mm**	**OSGB 1936**

\\CARD-PH-02\EnvPlanningProjects\Current projects\794-PLN-NDIP-00319 Heolddu Solar\Tech\Drawings\NDIP00319-0014-05.aprx - NDIP00319-0014-05-Habitat Plan

Appendix A
Relevant Legislation

REPTILES

All common UK reptile species (adder *Vipera berus*, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*) are protected through part of Section 9(1 and 5) of the Wildlife & Countryside Act 1981 (as amended). This prohibits:

- Intentional or reckless injuring or killing;
- Selling, offering or exposing for sale, or having in possession or transporting for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal; or
- Publishing or causing to be published any advertisement likely to be understood as conveying buying or selling, or intending to buy or sell, any of those things.

Slow worm, common lizard and grass snake are also listed as Priority Species under Section 7 of the Environment (Wales) Act 2016.

BIRDS

All birds, their nests and eggs are afforded protection under the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. It is an offence to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; and
- intentionally take or destroy the egg of any wild bird.

Schedule 1 birds cannot be intentionally or recklessly disturbed when nesting and there are increased penalties for doing so. Licences can be issued to visit the nests of such birds for conservation, scientific or photographic purposes but not to allow disturbance during a development even in circumstances where that development is fully authorised by consents such as a valid planning permission.

Multiple bird species are also listed as Priority Species under Section 7 of the Environment (Wales) Act 2016.

BATS

All British bat species are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. All British bats are also included on Schedule 2 of The Conservation of Habitats and Species Regulations 2017 as European Protected Species. It is an offence to:

- intentionally or recklessly kill, injure or capture bats;
- deliberately or recklessly disturb bats (whether in a roost or not); and
- damage, destroy or obstruct access to bat roosts

A roost is defined as 'any structure or place which [a bat] uses for shelter or protection'. As bats tend to reuse the same roosts, legal opinion is that a roost is protected whether or not bats are present at the time of survey.

A licence will therefore be required by those who carry out any operation that would otherwise result in offences being committed.

The following bat species are listed as Priority Species under Section 7 of the Environment (Wales) Act 2016: Barbastelle, Bechstein's, noctule, soprano pipistrelle, common pipistrelle, brown long-eared, greater horseshoe, and lesser horseshoe.

BADGER

Badgers are protected under the Protection of Badgers Act 1992. This act is based on the need to protect badgers from baiting and deliberate harm or injury. The act makes it an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat a badger, or attempt to do so;
- Intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access routes.

A sett is defined as “any structure or place that displays signs indicating current use by a badger”.

DORMOUSE

Hazel dormouse *Muscardinus avellanarius* is fully protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. The Regulations prohibit:

- Intentionally, recklessly or deliberately kill, injure or take a dormouse;
- The deliberate disturbance of this species in such a way as to be significantly likely to affect:
  - Their ability of to survive, hibernate, migrate, breed, or rear or nurture their young; or;
  - The local distribution or abundance of dormice.
- Damage or destruction of a breeding site or resting place (nest);
- The possession or transport of dormice or any other part of.

Dormice are also protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion in Schedule 5. Under the Act, they are protected from:

- Intentional or reckless disturbance (at any level);
- Obstruction of access to any place of shelter, breeding or rest;
- Selling, bartering or exchange of these species, or parts of.

Offences can be deliberate, intentional or reckless and penalties for any of the above include fines of up to £5k and imprisonment of up to 6 months, per animal affected.

Hazel dormouse is listed as a Priority Species under Section 7 of the Environment (Wales) Act 2016.

OTTER AND WATER VOLE

Water vole and otter and their habitats are fully protected under the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to:

- Capture, kill or injure a water vole or otter;
- Damage, destroy or obstruct access to a breeding site or resting place (i.e. burrow);
- Disturb a water vole or otter whilst in a place of shelter;
- Possess or control a water vole or otter (live or dead), any part of a water vole or otter or anything derived from a water wole or otter;
- Sell, barter or exchange a water vole or otter (live or dead), any part of a water vole or otter or anything derived from a water vole or otter; and / or
- Advertise or offer for sale, barter or exchange a water vole or otter (live or dead), any part of a water vole or otter or anything derived from a water vole or otter.

Offences can result from intentional or reckless actions. Penalties include fines of up to £5000 and / or imprisonment for up to six months, per offence. Under certain circumstances a licence can be granted by Natural England to permit activities that would otherwise constitute an offence.

Otters have additional protection, being listed as a European Protected Species (EPS) under Conservation of Habitats and Species Regulations 2017. This makes it an offence to deliberately or recklessly:

- Capture, injure or kill an Otter;

- Harass an Otter or group of Otters;
- Disturb an Otter in a holt or any other structure or place it uses for shelter or protection;
- Disturb an Otter while it is rearing or otherwise caring for its young;
- Obstruct access to a holt or other structure or place Otters use for shelter or protection or to otherwise deny the animal use of that place;
- Disturb an Otter in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species;
- Disturb an Otter in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.
- It is also an offence to:
- Damage or destroy a breeding site or resting place of such an animal (note that this does not need to be deliberate or reckless to constitute an offence);
- Keep, transport, sell or exchange or offer for sale or exchange any wild Otter or any part or derivative of one (if obtained after 10 June 1994).

Both species are listed as Priority Species under Section 7 of the Environment (Wales) Act 2016.

Appendix B
Habitat Survey Target Notes

Target Note Number	Description	Picture Number
1	Seasonally drying, shallow waterbody, with pools, bare earth and intermittent patches of wetland plants	42 and 42
2	Shelduck recorded on waterbody in June	45
3	Dilapidated stone structure	-
4	Large mature oak tree	-
5	Spring water feature	29
6	Soft rush becoming more abundant near stream	-
7	Watercourse splits into a second channel	-
8	Dry watercourse channel	47
9	Shaded ground layer	25
10	Field gate and cattle poached field entrances within woodland	24
11	Grassland / pastoral understory on edge of woodland	23
12	Overland flow in winter, flowing over modified track.	46
13	Narrow woodland and stream corridor, with scattered canopy trees. Bankside of tall herbs and bramble.	26
14	Partially dead sycamore tree outside of Site.	-
15	Gated section into northern fringe of woodland, dense with hoary willowherb, hemlock water-dropwort and common nettle.	-
16	Unmanaged vegetation around field gate	12
17	Unmanaged corner of field with tall grasses and forbs	-
18	Mammal push through	-
19	Broken pipe within woodland	13
20	Assemblage of plants within gate entrance - scarlet pimpernel, red bartsia, silverweed, annual meadow grass	-
21	Unmanaged corner of field with tall grasses and forbs	-
22	Two foxes recorded running away from each other	-

Appendix C
Habitat Species Lists

Solar Area West

Scientific name	Vernacular name	Estimated abundance
Semi-natural Broadleaved Woodland		
Fraxinus excelsior	Ash	Abundant
Quercus robur	Pedunculate oak	Frequent
Acer pesudoplatanus	Sycamore	Abundant
Corylus avellana	Hazel	Frequent
Acer campestre	Field maple	Rare
Crataegus monogyna	Hawthorn	Frequent
Salix cinerea	Grey willow	Occasional
Alnus glutinosa	Alder	Locally occasional
Ilex aquifolium	Holly	Occasional
Rosa canina	Dog rose	Occasional
Rubus fruticosus agg.	Bramble	Frequent
Lonicera periclymenum	Honeysuckle	Occasional
Ficaria verna	Lesser celandine	Frequent
Hedera helix	Ivy	Frequent
Circaea lutetiana	Enchanter’s nightshade	Frequent
Arum maculatum	Lords-and-ladies	Occasional
Hyacinthoides non-scripta	Bluebell	Occasional
Mercurialis perennis	Dog’s mercury	Frequent
Salix caprea	Goat willow	Occasional
Geum urbanum	Wood avens	Occasional
Asplenium scolopendrium	Hart’s-tongue	Occasional
Brionica dioica	White bryony	Rare
Scrophularia nodosa	Common figwort	Rare
Gallium aparine	Cleavers	Frequent
Dryopoteris filix-mas agg.	Male-fern	Rare
Epilobium parviflorum	Hoary willowherb	Occasional
Epilobium hirsutum	Great willowherb	Frequent
Rumex sanguineus	Wood dock	Occasional
Brachypodium sylvaticum	False brome	Occasional
Holcus lantaus	Yorkshire-fog	Occasional
Geranium robertianum	Herb-Robert	Frequent
Veronica montanum	Wood speedwell	Occasional

Scientific name	Vernacular name	Estimated abundance
Urtica dioica	Common nettle	Frequent
Dactylis glomerata	Cock's-foot	Occasional
Silene dioica	Red campion	Occasional
Alliaria petiolata	Garlic mustard	Occasional
Ranunculus repens	Creeping buttercup	Frequent
Veronica beccabunga	Brooklime	Locally occasional
Heracleum sphondylium	Hogweed	Occasional
Arentatherum elatius	False oat-grass	Occasional
Hedgerows – Intact, Species-rich		
Lolium perenne	Perennial rye-grass	Occasional
Poa trivilalis	Rough meadow-grass	Occasional
Holcus lanatus	Yorkshire-fog	Frequent
Dactylis glomerata	Cock's-foot	Occasional
Cynosurus cristatus	Crested dog's-tail	Rare
Acer pseudoplatanus	Sycamore	Frequent
Rumex obtusifolius	Broad-leaved dock	Rare
Fraxinus excelsior	Ash	Frequent
Quercus robur	Pedunculate oak	Occasional
Corylus avellana	Hazel	Frequent
Schedonorus arundinaceus	Tall fescue	Occasional
Crataegus monogyna	Hawthorn	Abundant
Heracleum sphondylium	Hogweed	Frequent
Pteridium aquilinum	Bracken	Occasional
Ulex europaea	Gorse	Occasional
Ilex aquifolium	Holly	Occasional
Prunus spinosa	Blackthorn	Abundant
Filipendula ulmaria	Meadowsweet	Locally abundant
Silene dioic	Red campion	Frequent
Rosa canina	Dog rose	Occasional
Rubus fruticosus agg.	Bramble	Frequent
Lonicera periclymenum	Honeysuckle	Frequent
Hedera helix	Ivy	Frequent
Arum maculatum	Lords-and-ladies	Occasional
Stellaria graminea	Lesser stitchwort	Occasional
Hyacinthoides non-scripta	Bluebell	Rare
Mercurialis perennis	Dog's mercury	Frequent
Asplenium scolopendrium	Hart's-tongue	Occasional
Tamus communis	Black bryony	Occasional

Scientific name	Vernacular name	Estimated abundance
Gallium aparine	Cleavers	Frequent
Geranium robertianum	Herb-Robert	Rare
Veronica chamaedrys	Germander speedwell	Occasional
Urtica dioica	Common nettle	Frequent
Vicia cracca	Tufted vetch	Occasional
Agrostis stolonifera	Creeping bent	Frequent
Chaeropophyllum temulum	Rough chervil	Rare
Lathyrus pratensis	Meadow vetchling	Occasional
Galeopsis tetrahit	Common hemp-nettle	Occasional
Hedgerows – Intact, Species-poor		
Lolium perenne	Perennial rye-grass	Frequent
Poa trivilalis	Rough meadow-grass	Occasional
Acer pseudoplatanus	Sycamore	Occasional
Holcus lanatus	Yorkshire-fog	Frequent
Dactylis glomerata	Cock's-foot	Occasional
Rumex obtusifolius	Broad-leaved dock	Rare
Fraxinus excelsior	Ash	Occasional
Corylus avellana	Hazel	Occasional
Crataegus monogyna	Hawthorn	Abundant
Prunus spinosa	Blackthorn	Abundant
Rosa canina	Dog rose	Rare
Rubus fruticosus agg.	Bramble	Frequent
Rubus armeniacus agg.	Giant Blackberry	Rare
Hedera helix	Ivy	Frequent
Gallium aparine	Cleavers	Frequent
Geranium robertianum	Herb-Robert	Occasional
Urtica dioica	Common nettle	Frequent
Pteridium aquilinum	Bracken	Frequent
Agrostis stolonifera	Creeping bent	Occasional
Heracleum sphondylium	Hogweed	Frequent
Rumex obtusifolius	Broad-leaved dock	Occasional
Taraxacum officinale agg	Dandelion	Frequent
Urtica dioica	Common nettle	Frequent
Arentatherum elatius	False oat-grass	Frequent
Filipendula ulmaria	Meadowsweet	Locally occasional
Poor Semi-improved Grasslands		
Lolium perenne	Perennial rye-grass	Frequent to abundant
Lolium nodiflorum	Italian rye-grass	Frequent

Scientific name	Vernacular name	Estimated abundance
Poa trivialis	Rough meadow-grass	Occasional
Alopecurus pratensis	Meadow foxtail	Occasional - frequent
Cynosurus cristatus	Crested dog's-tail	Frequent
Phleum pratense	Timothy	Frequent
Cardamine pratensis	Cuckoo flower	Occasional - frequent
Holcus lanatus	Yorkshire-fog	Abundant
Dactylis glomerata	Cock's-foot	Occasional
Cynosurus cristatus	Crested dog's-tail	Occasional
Anthoxanthum odoratum	Sweet vernal grass	Occasional
Alopecurus pratensis	Meadow foxtail	Occasional
Juncus conglomeratus	Compact rush	Locally occasional
Trifolium repens	White clover	Abundant
Ranunculus repens	Creeping buttercup	Frequent
Ranunculus acris	Meadow buttercup	Occasional
Plantago lanceolata	Ribwort plantain	Occasional
Plantago major	Greater plantain	Locally occasional
Heracleum sphondylium	Hogweed	Locally occasional
Rumex obtusifolius	Broad-leaved dock	Occasional
Bellis perennis	Common daisy	Occasional
Taraxacum officinale agg	Dandelion	Frequent
Urtica dioica	Common nettle	Locally occasional
Cerastium fontanum	Common mouse-ear	Occasional – Locally frequent
Poa annua	Annual meadow-grass	Locally occasional
Matricaria discoidea	Pineappleweed	Locally occasional
Odontites vernus	Red bartsia	Locally occasional
Lysimachia arvensis	Scarlet pimpernell	Locally occasional
Arrhenatherum elatius	False oat-grass	Locally frequent
Juncus bufonis agg.	Toad rush	Locally occasional
Alopecurus geniculatus	Marsh foxtail	Locally occasional
Rumex acetosella	Common sorrel	Occasional
Potentilla anserina	Silverweed	Locally occasional
Lotus pedunculatus	Greater bird's-foot trefoil	Locally occasional

Solar Area East

Scientific name	Vernacular name	DAFOR
Semi-natural Broadleaved Woodland and Watercourse		
Fraxinus excelsior	Ash	Frequent
Quercus robur	Pedunculate oak	Abundant
Quercus patrea	Sessile oak	Occasional
Corylus avellana	Hazel	Frequent
Fagus sylvatica	Beech	Rare
Crataegus monogyna	Hawthorn	Frequent
Ilex aquifolium	Holly	Occasional
Rubus fruticosus agg.	Bramble	Frequent
Lonicera periclymenum	Honeysuckle	Rare
Hedera helix	Ivy	Abundant
Circaea lutetiana	Enchanter's nightshade	Frequent
Arum maculatum	Lords-and-ladies	Occasional
Hyacinthoides non-scripta	Bluebell	Occasional
Mercurialis perennis	Dog's mercury	Occasional
Geum urbanum	Wood avens	Frequent
Asplenium scolopendrium	Hart's-tongue	Occasional
Gallium aparine	Cleavers	Frequent
Dryopoteris affinis	Scaly male-fern	Occasional
Epilobium hirsutum	Great willowherb	Occasional
Rumex sanguineus	Wood dock	Occasional
Dryopteris dilitata	Broad buckler	Occasional
Holcus lantaus	Yorkshire-fog	Frequent
Geranium robertianum	Herb-Robert	Occasional
Veronica montana	Wood speedwell	Occasional
Urtica dioica	Common nettle	Frequent
Alliaria petiolata	Garlic mustard	Occasional
Athyrium filix femina	Lady fern	Rare
Chrysosplenium oppositofolium	Opposite-leaved golden saxifrage	Locally frequent
Helosciadium nodiflorum	Fool's-water-cress	Locally occasional
Veronica beccabunga	Brooklime	Locally occasional
Cardamine flexuosa	Wavy bittercress	Locally frequent
Rumex sanguineus	Wood dock	Occasional
Polytrichum sp.	A haircap moss	Locally occasional
Silene dioica	Red campion	Occasional
Hedgerows – Relict Hedgerow: Field 17 / Field 16		
Fraxinus excelsior	Ash	Occasional

Scientific name	Vernacular name	DAFOR
Corylus avellana	Hazel	Abundant
Crataegus monogyna	Hawthorn	Frequent
Prunus spinosa	Blackthorn	Occasional
Salix cinerea	Grey willow	Rare
Hedera helix	Ivy	Abundant
Hedgerows - Relict Hedgerow: Field 22 / Field 21		
Corylus avellana	Hazel	Occasional - frequent
Crataegus monogyna	Hawthorn	Abundant
Prunus spinosa	Blackthorn	Frequent
Salix cinerea	Grey willow	Rare
Fraxinus excelsior	Ash	Rare
Dense scrub – Field 20		
Rubus fruticosus agg	Bramble	Frequent
Quercus paterae	Sessile oak	Occasional
Ulex europaeus	Gorse	Occasional
Hedera helix	Ivy	frequent
Cretaegus monogyna	Hawthorn	Frequent
Prunus spinosa	Blackthorn	Rare
Sphondylium heracleum	Common hogweed	Occasional
Holcus lanatus	Yorkshire fog	Frequent
Corylus avellana	Hazel	Occasional
Salix cinerea	Grey willow	Occasional
Silene dioica	Red campion	Occasional
Galium aparine	Cleavers	Frequent
Dense scrub – Field 19		
Rubus fruticosus agg	Bramble	Abundant
Ulex europaeus	Gorse	Frequent
Hedera helix	Ivy	frequent
Cretaegus monogyna	Hawthorn	Frequent
Prunus spinosa	Blackthorn	Occasional
Sphondylium heracleum	Common hogweed	Occasional
Holcus lanatus	Yorkshire fog	Frequent
Scattered Scrub – Field 24		
Salix cinerea	Grey willow	Abundant
Cretaegus monogyna	Hawthorn	Frequent
Hedgerows, Intact Species-rich		
Lolium perenne	Perennial rye-grass	Occasional
Poa trivialis	Rough meadow-grass	Occasional

Scientific name	Vernacular name	DAFOR
Holcus lanatus	Yorkshire-fog	Frequent
Dactylis glomerata	Cock's-foot	Occasional
Rumex obtusifolius	Broad-leaved dock	Rare
Fraxinus excelsior	Ash	Frequent
Quercus robur	Pedunculate oak	Frequent
Corylus avellana	Hazel	Frequent
Crataegus monogyna	Hawthorn	Abundant
Pteridium aquilinum	Bracken	Occasional
Ulex europaea	Gorse	Occasional
Ilex aquifolium	Holly	Occasional
Prunus spinosa	Blackthorn	Frequent
Filipendula ulmaria	Meadowsweet	Occasional
Rosa canina	Dog rose	Occasional
Rubus fruticosus agg.	Bramble	Frequent
Lonicera periclymenum	Honeysuckle	Occasional
Hedera helix	Ivy	Frequent
Hyacinthoides non-scripta	Bluebell	Rare
Tamus communis	Black bryony	Occasional
Gallium aparine	Cleavers	Occasional
Geranium robertianum	Herb-Robert	Occasional
Urtica dioica	Common nettle	Frequent
Vicia sepium	Bush vetch	Occasional
Agrostis stolonifera	Creeping bent	Frequent
Lathyrus pratensis	Meadow vetchling	Occasional
Digitalis purpurea	Foxglove	Occasional
Silene dioica	Red campion	Occasional
Pteridium aquilinum	Bracken	Occasional - frequent
Hedgerows – Intact, Species-poor		
Lolium perenne	Perennial rye-grass	Occasional
Poa trivilalis	Rough meadow-grass	Occasional
Holcus lanatus	Yorkshire-fog	Frequent
Dactylis glomerata	Cock's-foot	Occasional
Rumex obtusifolius	Broad-leaved dock	Rare
Fraxinus excelsior	Ash	Occasional
Corylus avellana	Hazel	Occasional
Crataegus monogyna	Hawthorn	Abundant
Pteridium aquilinum	Bracken	Frequent
Ulex europaea	Gorse	Occasional

Scientific name	Vernacular name	DAFOR
Sorbus acuparia	Rowan	Rare
Ilex aquifolium	Holly	Occasional
Prunus spinosa	Blackthorn	Frequent
Rosa canina	Dog rose	Rare
Rubus fruticosus agg.	Bramble	Frequent
Hedera helix	Ivy	Frequent
Tamus communis	Black bryony	Rare
Gallium aparine	Cleavers	Frequent
Geranium robertianum	Herb-Robert	Occasional
Urtica dioica	Common nettle	Frequent
Agrostis stolonifera	Creeping bent	Occasional
Silene dioica	Red campion	Occasional
Hedgerows - Defunct		
Corylus avellana	Hazel	Occasional
Crataegus monogyna	Hawthorn	Abundant
Prunus spinosa	Blackthorn	Frequent
Fraxinus avellana	Ash	Occasional
Salix cinerea	Grey willow	Occasional
Rubus fruticose	Bramble	Frequent
Hedera helix	Ivy	Occasional
Ulex europaeus	Gorse	Occasional
Holcus lanatus	Yorkshire fog	Frequent
Silene dioica	Red campion	Occasional
Neutral Grassland		
Juncus acutiflorus	Sharp-flowered rush	Frequent
Juncus effusus	Soft rush	Frequent
Juncus inflexus	Hard rush	Locally occasional
Stellaria alsine	Bog stitchwort	Occasional
Holcus lanatus	Yorkshire fog	Abundant
Ranunculus hederafolia	Ivy-leaved crowfoot	Rare
Ranunculus flammula	Lesser spearwort	Occasional
Ranunculus repens	Creeping buttercup	Frequent
Carex leporina	Oval sedge	Locally occasional
Carex flacca	Glaucous sedge	Locally occasional
Carex hirta	Hairy sedge	Rare
Carex panacea	Carnation sedge	Locally occasional
Myosotis laxa	Tufted forget-me-not	Rare
Anthoxanthum odoratum	Sweet vernal grass	Occasional

Scientific name	Vernacular name	DAFOR
Alopecurus geniculatus	Marsh foxtail	Locally occasional
Cynosurus cristatus	Crested dog's-tail	Occasional
Lolium perenne	Perennial rye-grass	Occasional
Galium palustre	Marsh bedstraw	Occasional
Cardamine pratensis	Cuckoo flower	Occasional - frequent
Rumex acetosa	Common sorrel	Occasional
Epilobium montanum	Broadleaved willowherb	Rare
Potentilla erecta	Creeping cinquefoil	Occasional
Calliergonella cuspidata	Pointed spear moss	Occasional - frequent
Lotus pedunculatus	Greater bird's-foot trefoil	Occasional
Glyceria fluitans	Floating sweet-grass	Locally occasional
Cerastium fontanum	Common mouse ear	Occasional
Plantago lanceolata	Ribwort plantain	Occasional
Ranunculus acris	Meadow buttercup	Occasional
Sagina procumbens	Procumbent pearlwort	Locally occasional
Poa trivialis	Rough meadow grass	Locally frequent
Poor Semi-Improved Grassland		
Lolium perenne	Perennial rye-grass	Frequent
Poa trivialis	Rough meadow-grass	Occasional
Alopecurus pratensis	Meadow foxtail	Locally Occasional
Phleum pratense	Timothy	Frequent
Cardamine pratensis	Cuckoo flower	Occasional - frequent
Holcus lanatus	Yorkshire-fog	Abundant
Dactylis glomerata	Cock's-foot	Occasional
Cynosurus cristatus	Crested dog's-tail	Frequent
Anthoxanthum odoratum	Sweet vernal grass	Occasional
Alopecurus pratensis	Meadow foxtail	Occasional
Trifolium repens	White clover	Frequent
Ranunculus repens	Creeping buttercup	Frequent
Ranunculus acris	Meadow buttercup	Occasional
Plantago lanceolata	Ribwort plantain	Occasional
Plantago major	Greater plantain	Locally occasional
Rumex obtusifolius	Broad-leaved dock	Occasional
Taraxacum officinale agg	Dandelion	Frequent
Cerastium fontanum	Common mouse-ear	Occasional
Poa annua	Annual meadow-grass	Locally occasional
Matricaria discoidea	Pineappleweed	Locally frequent
Carex leporina	Oval sedge	Locally occasional

Scientific name	Vernacular name	DAFOR
Alopecurus geniculatus	Marsh foxtail	Locally occasional
Agrostis stolonifera	Creeping bent	Frequent
Rumex acetosella	Common sorrel	Occasional
Potentilla anserina	Silverweed	Locally occasional
Lotus corniculatus	Common bird's-foot trefoil	Locally frequent
Marginal / Inundated - Open Vegetation		
Juncus acutiflorus	Sharp-flowered rush	Locally frequent
Juncus effusus	Soft rush	Locally frequent
Juncus inflexus	Hard rush	Frequent
Juncus bufonis	Toad rush	Locally occasional
Stellaria alsine	Bog stitchwort	Occasional
Ranunculus hederaceus	Ivy-leaved crowfoot	Occasional
Ranunculus flammula	Less spearwort	Locally frequent
Ranunculus repens	Creeping buttercup	Locally frequent
Carex leporina	Oval sedge	Occasional
Alopecurus geniculatus	Marsh foxtail	Locally frequent
Cardamine pratensis	Cuckoo flower	Locally occasional
Rorippa palustris	Marsh yellowcress	Occasional - frequent
Calitriche sp.	A water-starwort	Occasional - frequent
Lyhtrum portula	Water-purslane	Occasional - frequent
Gnaphalium uliginsoum	Marsh cudweed	Locally frequent
Glyceria fluitans	Floating sweet-grass	Occasional
Persicaria maculosa	Redshank	Locally occasional
Ditch – Field 20		
Helosciadium nodiflora	Fool's-water-cress	Abundant
Ranunculus hederaceus	Ive-leaved crowfoot	Rare
Juncus effusus	Soft rush	Locally occasional
Ranunculus flammula	Lesser spearwort	Occasional
Veronica beccabunga	Brooklime	Locally frequent
Holcus lanatus	Yorkshire fog	Frequent
Lolium perenne	Perennial rye-grass	Occasional
Alopecurus geniculatus	Marsh foxtail	Occasional
Ditch – Field 19		
Helosciadium nodiflora	Fool's-water-cress	Frequent
Juncus effusus	Soft rush	Locally occasional
Ranunculus flammula	Lesser spearwort	Occasional
Veronica beccabunga	Brooklime	Locally frequent
Holcus lanatus	Yorkshire fog	Frequent

Scientific name	Vernacular name	DAFOR
Lolium perenne	Perennial rye-grass	Occasional
Alopecurus geniculatus	Marsh foxtail	Occasional