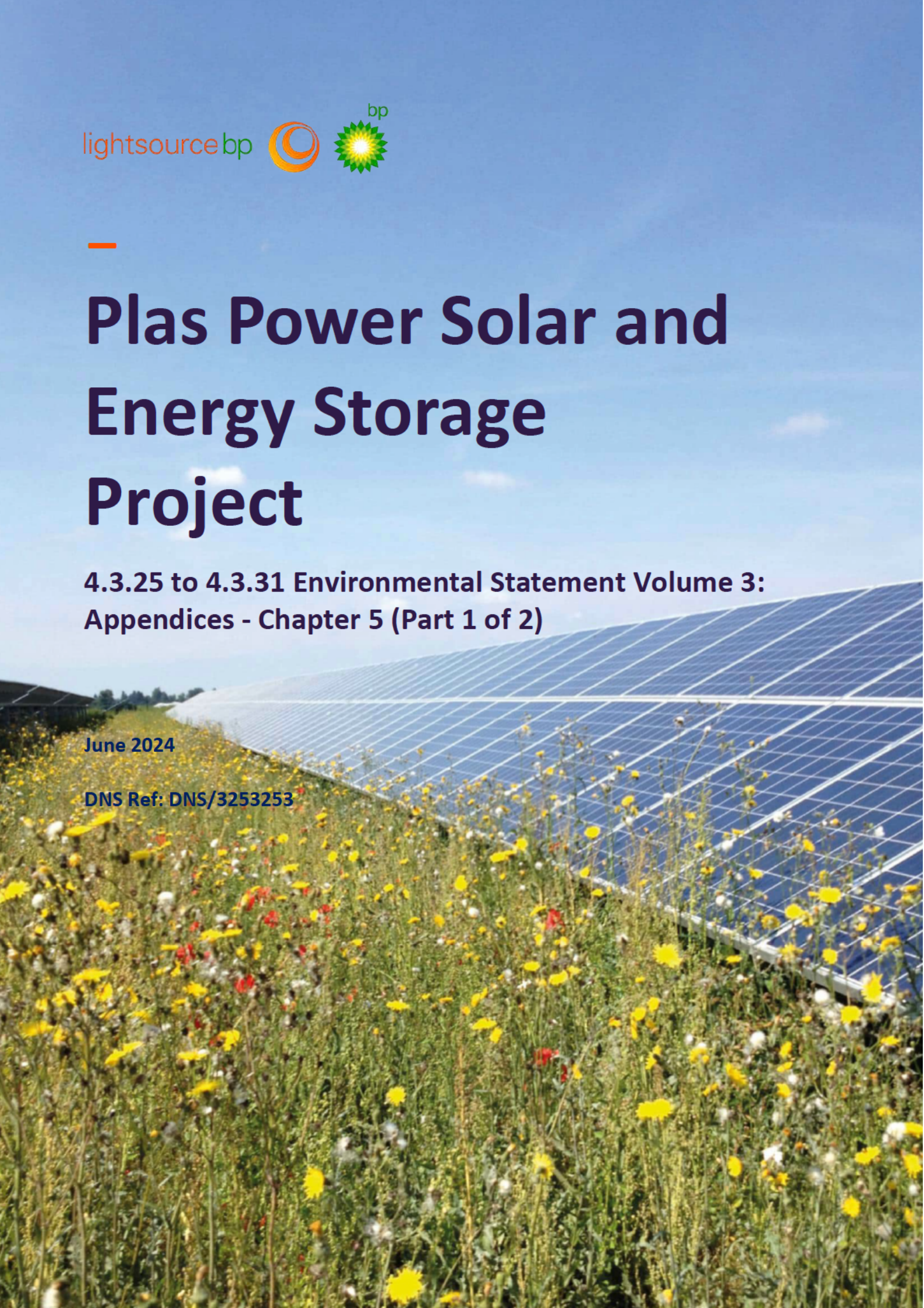


Plas Power Solar and Energy Storage Project

4.3.25 to 4.3.31 Environmental Statement Volume 3: Appendices - Chapter 5 (Part 1 of 2)

June 2024

DNS Ref: DNS/3253253

Appendix 6.1
Preliminary Ecological Appraisal

MAKING COMPLEX EASY

A TETRA TECH COMPANY

PRELIMINARY ECOLOGICAL APPRAISAL

Plas Power Solar and Energy Storage Project



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1
June 2023

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Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Issue	Georgia Kelly	Tim Oliver	Tim Oliver	28/06/2023

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Prepared for:

Lightsource bp

EXECUTIVE SUMMARY

- RPS were commissioned by Lightsource bp to undertake a Preliminary Ecological Appraisal of the Plas Power Estate, located to the west of Wrexham, North Wales. This comprised a desk study, Phase 1 habitat survey and an assessment of the potential for the site and immediate surroundings to support species of principal importance, species of conservation concern and legally protected species which could present a constraint to the development of the proposed Plas Power Solar and Energy Storage Project on the site.
- The survey area is approximately 145 ha in size and largely comprises arable fields (grass leys) and improved pasture bounded by hedgerows with some blocks of woodland adjoining the survey area.
- The Proposed Development adjoins Big Wood Wildlife Site and Higher Berse Marsh Wildlife Site. The River Clywedog flows through Big Wood.
- The closest statutory designated site is Gatewen Marsh SSSI, located 1.18km north-east of the survey area. Johnstown Newt Sites SAC covers multiple sites in the wider area with the closest being 1.94km south of the survey area. The potential for the Proposed Development to affect nearby designations should be assessed in a Shadow HRA.
- The majority of habitats within the survey area have low value for wildlife and are commonly occurring in the surrounding landscape. Higher value habitat within the survey area includes the mature trees and species-rich hedgerows.
- Any lighting used during construction will be directed away from boundary habitat and hedgerows. There will be no lighting used during the operation of the site.
- Good working practices and environmental protection will be implemented throughout the construction phase to protect designated sites and surrounding habitats from indirect impacts.
- Small patches of Japanese knotweed are present in the northern section of the survey area which will be subject to control to prevent spread and ultimately aim to eradicate the plant from the site.
- Mitigation measures will be implemented as required to protect the following species: bats, otter, wintering birds, great crested newt, dormouse, breeding birds and badger.
- Recommendations have been made for biodiversity enhancement measures. Ultimately the site design and landscape proposals must be able to clearly demonstrate a net benefit for biodiversity and ecosystem resilience.

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1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS was commissioned by Lightsource bp to undertake a Preliminary Ecological Appraisal (PEA) of the Plas Power Estate at Wrexham, North Wales. The site is subject to proposals for development as the proposed Plas Power Solar and Energy Storage Project.

1.1.2 To undertake an initial assessment of the potential ecological impact of the proposals, a desk study, Phase 1 Habitat Survey, and a preliminary protected species assessment were carried out. This is termed as a Preliminary Ecological Appraisal Report (PEAR) in accordance with CIEEM (2017). This assessment is considered 'preliminary' until any required protected species, habitat or invasive species surveys are completed, and the results incorporated into a final Ecological Appraisal or Ecological Impact Assessment (EcIA) which supports the planning application.

1.1.3 The aim of the PEA is to provide an initial assessment of the site's ecological value, and the potential impacts on the site as a result of the Proposed Development. The assessment is based on the following elements undertaken as part of the PEA:

- a desk-based search for designated sites and records of protected species and other species that could present a constraint;
- Phase 1 habitat survey of the habitats present within the survey area;
- an assessment of the survey area for potential to support protected species or other species that could present a constraint, and make appropriate recommendations for further survey work if necessary;

1.1.4 The findings of the PEA are presented in this report and the accompanying Habitats Map based on the Phase 1 Habitat Survey. This report is referred to as a Preliminary Ecological Appraisal Report (PEAR) in accordance with CIEEM (2017).

1.1.5 The PEAR also provides outline options for avoidance / mitigation / compensation measures as appropriate; and makes recommendations for appropriate biodiversity enhancements in line with national and local planning policy.

1.1.6 This report pertains to these results only. Recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS. This report and the supporting survey and desk-based assessment have been carried out and prepared in accordance with the British Standard for Biodiversity Code of Practice for Planning and Development (BS42020:2013).

1.2 Survey Area Description

1.2.1 The survey area is approximately 145 ha in size located to the west of Wrexham, North Wales, centred at grid reference SJ 301 501.

1.2.2 The survey area comprises two sections of land located to the north and south of the A525. The majority of the survey area lies to the south of the A525 and covers 125 ha of farmland, most of which is pasture. A 20 ha section of the survey area lies to the north of the A525 and largely comprises arable farmland.

1.2.3 The arable fields in the northern and western half of the survey area is undulating and are grass leys used for silage production. Land in the eastern and southern sections is generally flat and used for sheep and cattle grazing. Other habitats within the survey area include hedgerows, mature and semi-mature trees, a stand of tall ruderal and managed amenity grassland.

1.2.4 Big Wood Wildlife Site (WS) adjoins the survey area to the south with the River Clywedog flowing through this block of woodland. Higher Berse Marsh WS adjoins the survey area at the north and Afon Gwenfro WS lies beyond the B5430 (Higher Berse Road) to the north of the survey area.

1.2.5 The A483 dual carriageway is located to the east of the survey area, adjoining the site boundary to the south-east.

1.2.6 The wider landscape comprises farmland, the city of Wrexham to the east and smaller villages to the north and east. The Berwyn and South Clwyd mountains lie 1.82km to the west of the survey area.

1.3 Legislation and policy

1.3.1 Relevant legislation, policy guidance and both Local and National Biodiversity Action Plans (BAPs) are referred to throughout this report where appropriate. Their context and application is explained in the relevant sections of this report.

1.3.2 The relevant articles of legislation are:

- Environment (Wales) Act 2016
- The Conservation of Habitats and Species Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Countryside and Rights of Way Act 2000;
- The Natural Environment and Rural Communities Act 2006;
- Planning Policy Wales
- Technical Advice Note 5 (TAN5)
- Denbighshire Council Local Biodiversity Action Plan

1.3.3 A summary of legislation relevant to protected or other species identified as potential constraints in this report is provided in Appendix A.

2 METHODS

2.1 Desk Study

2.1.1 Ecological records within a 2 km radius of the survey area were requested from Cofnod (North Wales Environmental Information Centre). Data requests were limited to records for protected species recorded within the last ten years and sites of nature conservation interest within 2 km of the survey area. This included a review of existing statutory sites of nature conservation interest, such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Area of Conservation (SACs) and National Nature Reserves (NNRs), and non-statutory sites, such as Sites of Importance for Nature Conservation (SINCs) and Local Wildlife Sites (LWSs).

2.1.2 Locations of statutory designated sites were accessed via the government 'MAGIC' website (MagicMap, 2016).

2.1.3 A 1:25,000 OS map was used to identify nearby features such as ponds or green corridors that could provide habitat or connectivity to other areas.

2.2 Ecological Appraisal

2.2.1 The site survey element of the ecological appraisal consisted of two components: a Phase 1 Habitat Survey and a scoping survey for protected species and other species of conservation concern which could present a constraint to development.

2.2.2 This survey provides an update to the Phase 1 undertaken by RPS in 2021 (RPS, 2019).

2.2.3 The survey was undertaken on 5th and 6th April 2023 by Georgia Kelly. The Phase 1 Habitat Survey followed the standard methodology (JNCC, 2016), and as described in the Guidelines for Preliminary Ecological Assessment (CIEEM, 2018). In summary, this comprised a walkover of the survey area and recording the habitat types and boundary features present.

2.2.4 The on-site habitats were assessed for their suitability to support protected species or other species of conservation importance that could pose a planning constraint. The suitability of adjacent off-site habitats, and the survey area's connectivity with suitable habitats in the surrounding area was taken into account when assessing the survey area's potential to support protected species.

2.2.5 Areas of habitat and other features of interest considered suitable for protected species or those of conservation interest, such as refuges and ponds were recorded. A preliminary search was made of suitable habitat for evidence of use by protected species although this search was not exhaustive.

2.3 Limitations

Desk Based Assessment

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.

Survey

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

2.3.3 The protected/notable species assessment provides a preliminary view of the likelihood of these species occurring on the survey area, based on the suitability of the habitat, known distribution of the species in the local area provided in response to our enquiries and any direct evidence on the

survey area. It should not be taken as providing a full and definitive survey of any protected/notable species group.

Accurate Lifespan of Ecological Data

2.3.4 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for two years, assuming no significant considerable changes to the survey area conditions.

3 RESULTS

3.1 Designated Sites

3.1.1 Statutory and non-statutory designated sites within the search area are described in Table 3.1. The table also provides an evaluation of the sensitivity of the designations relative to the proposed works.

Table 3-1 Statutory and non-statutory Nature Conservation Designations within 10km and 2km of the survey area

Designation	Distance from survey area (km)	Description	Potential adverse effects of Proposed Development
Statutory Designated Sites			
Johnstown Newt Sites SAC	1.94	This site supports one of the largest known populations of GCN in Great Britain and has been the focus of much conservation management. It comprises two post-industrial sites where coal and clay have been extracted.	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
Berwyn and South Clwyd Mountains SAC	2.36	The primary reasons for the site's designation are its European dry heath and blanket bog habitat. Berwyn contains the largest stands of upland European dry heath in Wales and the most extensive tract of near-natural blanket bog in Wales.	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
River Dee and Bala Lake SAC	7.11	- Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation - Atlantic salmon *Salmo salar* - Floating water-plantain *Luronium natans*	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
Midland Meres & Mosses Phase 2 Ramsar	5.87	The site comprises a diverse range of habitats from open water to raised bog and supports a number of rare species of plants associated with wetland habitat. This includes the nationally scarce cowbane *Cicuta virosa* and, elongated sedge *Carex elongata*. Also present are the nationally scarce bryophytes *Dicranum affine* and *Sphagnum pulchrum*. The site additionally supports an assemblage of invertebrates including several rare species.	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
Gatewen Marsh SSSI	1.18	The site is one of three significant examples in the county of the "southern mesotrophic mires" wetland type. It occupies the flat valley bottom of a tributary of the River Gwenfro.	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
Stryt Las A'r Hafod SSSI	1.94	A composite site of special interest for its amphibians, in particular its GCN population which is one of the largest known breeding populations of the GCN in Great Britain.	The potential for direct and indirect impacts on the designation will be assessed in a shadow HRA.
Non-statutory Designated Sites			
Higher Berse Marsh WS	Adjoins northern survey area	Two areas of marshy grassland separated by Higher Berse road. The southern section adjoins the development and includes an area of wet woodland with a pond at the centre. Other habitats within the designation include fen, marshy grassland,	Stand-offs and good environmental working practices will be followed which will ensure the adjoining WS is

Designation	Distance from survey area (km)	Description	Potential adverse effects of Proposed Development
		semi-improved neutral grassland, semi-natural broadleaved woodland, standing water and swamp.	protected. No adverse effects are anticipated.
Big Wood WS	Adjoins southern boundary	A mixture of conifer plantation, beech plantation and patches of semi-natural broadleaved woodland along the River Clywedog. Many conifer trees have been felled as part of the management regime. The broadleaved canopy is dominated by sycamore and beech. The section adjoining the survey area is open, lacking a dense understorey and is frequented by dog walkers.	Stand-offs and good environmental working practices will be followed which will ensure the adjoining WS is protected. No adverse effects are anticipated.
Afon Gwenfro WS	0.43	A reclaimed coal site with semi-improved neutral grassland, scrub, broadleaved woodland and a small wetland. Species present within the grassland include: kidney vetch, hare's-foot clover, squirrel-tail grass, marsh horsetail, common spotted orchid, yellow oat-grass, black knapweed. The wetland is dominated by sea club-rush. Sections of woodland comprise ash, alder and sycamore.	None anticipated.
Nant Mill – Grasslands WS	0.20	A section of grassland located between Big Wood and Mill Terrace Road.	None anticipated.
Nant Mill Bat Sites WS	0.17	A large building supporting bat roosts located to the west of Big Wood.	None anticipated.
New Broughton Meadow WS	0.55	The site includes, marshy grassland, wet alder / willow carr, a pond, sandy grassland and scrub. Species present within the grassland include goat's-beard, ox-eye daisy, common toadflax and bird's-foot trefoil.	None anticipated.
Legacy Substation WS	0.97	Land surrounding the Legacy Substation, including semi-improved neutral grassland, scrub and semi-natural broadleaved woodland. Species present within the grassland include: bee orchid, yellow wort and common centuary.	None anticipated.
Berse Drelincourt WS	0.57	A mosaic of semi-natural habitats including scrub, a stream, semi-improved neutral grassland, semi-natural broad-leaved woodland and standing water. The grassland supports common spotted orchid, glaucous sedge and bird's-foot trefoil, kidney vetch, ox-eye daisy and squirrel-tail fescue.	None anticipated.
Crematorium WS	1.27	Two herb-rich semi-improved neutral grassland hay meadows. There is also a broadleaved woodland and patches of parkland. The designation includes two ponds with fringed water lily, common reedmace, water plantain and reed sweet grass. Royal fern and ostrich fern also occur.	None anticipated.
Moss Valley WS	1.21	Wooded valley slopes with adjoining grassland. The eastern slopes have a canopy of pendunculate oak, sycamore and ash with some planted beech and a fairly diverse ground flora. To the south-east is herb-rich semi-improved neutral grassland. To the south-west, there is a disused railway line with uncommon species present, such as upright brome, rat's-tail fescue, and hare's-foot clover.	None anticipated.

Designation	Distance from survey area (km)	Description	Potential adverse effects of Proposed Development
Bronwylfa Wood WS	1.75	Semi-natural broad-leaved woodland along Pentre Bychan Brook. Sycamore is the most dominant tree in the canopy with some ash and oak. Holly, hazel and elm form the understorey. Ramsons, male fern and soft grass are frequent in the ground flora. Patches have been replanted with conifers.	None anticipated.
The Smelt WS	1.34	A complex area along the river Clywedog, with broad-leaved woodland, scrub, neutral grassland, species-rich marshy grassland and some very small patches of calcareous grassland along the river banks. The broad-leaved woodland is dominated by sessile oak and ash.	None anticipated.
Erddig Estate WS	1.31	National Trust estate with woodlands, semi-improved neutral grasslands and marshes. The woodlands, grassland and marshes support an array of uncommon species. The amount of mature trees in the park is exceptional and these have correspondingly excellent insect communities with 12 notable species and 1 red data book species discovered.	None anticipated.
New Brighton WS	1.71	The site includes a disused lead mine, dismantled railway and an old silica rock quarry, which is still partly in use. It has been recolonised by a mosaic of birch scrub and heather, gorse, bracken and semi-improved acid grassland. It is a good area for birds.	None anticipated.
Plas Mostyn Mawr WS	1.56	A sloping field of semi-improved neutral grassland with gorse scrub and several marshy patches. Common gorse, ribwort plantain and rough hawkbit are abundant. Alder trees follow the river Gwenfro which flows though the bottom of the field. Breeding linnets have been recorded.	None anticipated.
Roseburn Fields WS	1.66	Three fields of semi-improved neutral grassland. The field on the west side of the track is grazed by ponies and is dominated by crested dog's tail. The two hay fields on the east side of the track are dominated by Yorkshire fog, with abundant common bent, creeping bent and common knapweed.	None anticipated.
Cae Plasmostyn Bach WS	1.97	A west facing slope of short semi-improved neutral grassland with occasional gorse bushes and abundant crested dog's-tail, ribwort plantain and rye grass. Common cat's ear is frequent and common knapweed and burnet saxifrage also occur.	None anticipated.

Abbreviations used in Table 3.1: SAC: Special Area of Conservation; SSSI: Site of Special Scientific Interest; WS: Wildlife Site; ha: hectare.

3.2 Phase 1 Habitat Survey

3.2.1 All habitats within and adjoining the survey area are described in Table 3.3. An evaluation is provided of the potential for the habitats to be affected by the Proposed Development.

The location and extent of habitats is shown on the Habitat Plan (Drawing 1).

Table 3-2 Habitat descriptions and evaluation

Habitat description	Photograph	Position within development
Habitats within the survey area boundary		
Arable fields The northern area and western part of the survey area are undulating arable fields used as grass ley and crop production. There are nine fields in total, primarily bounded by hedgerows.		Conversion to pasture, primarily located beneath solar arrays.
Improved pasture fields The eastern and southern areas of the survey area comprise improved grassland pasture fields. This includes 11 fields in total. The fields are largely flat. The fields are dominated by perennial rye-grass *Lolium perenne*. Rarely present within the grassland were other grass species such as creeping bent *Agrostis stonolinfera*, annual meadow-grass *Poa annua*, and Yorkshire fog *Holcus lanatus* and forbs such as spear thistle *Cirsium vulgare*, white clover *Trifolium repens* and creeping buttercup *Ranunculus repens*. Field F9 and the margin of F14 were dominated by perennial rye-grass but subject to low levels of grazing with the dense sward reaching up to 30cm in height. Elsewhere, all the improved pasture had swards of less than 10cm.		Primarily located beneath solar arrays.

Habitat description	Photograph	Position within development
Semi-improved grassland The northern section of the survey area includes two small areas of semi-improved grassland. The fields have a low species diversity, characterised by Yorkshire fog, creeping bent, cock's-foot *Dactylis glomerata*, hogweed *Heracleum sphondylium* and nettle *Urtica dioica*. Strips of rank grassland and tall ruderal vegetation were also present along trackways within the central area.		Primarily located beneath solar arrays.
Species-rich hedgerows Eleven hedgerows within the survey area are species-rich with 5 or more woody plant species represented in the hedgerow. The majority of these are located within the northern section. Species frequently present within the species-rich hedgerows include: hazel *Corylus avellana*, sycamore *Acer pseudoplatanus,* ash *Fraxinus excelsior*, holly *Ilex aquifolium*, English oak *Quercus robur*, blackthorn *Prunus spinosa*, field rose *Rosa arvensis* and elder *Sambucus nigra*. Less frequent species include: willow species *Salix* sp., bramble *Rubus fructicosus* spp., cherry *Prunus avium*, alder *Alnus glutinosa*, plum *Prunus* sp., field maple *Acer campestre*, apple *Malus* sp., beech *Fagus sylvatica* and elm *Ulmus* sp. The majority of hedgerows within the northern section include mature and semi-mature trees, typically sycamore, oak and ash. Fewer large trees were present in the central area.		Retained field boundaries between solar arrays.

Habitat description	Photograph	Position within development
Species-poor hedgerows There is a total of 20 species-poor hedgerows within the survey area, the majority of which adjoin the section south of the A525. These are typically dominated by hawthorn *Crataegus monogyna*. Other dominant species include holly, hazel, damson, bramble and gorse *Ulex europeaus*.		Retained field boundaries within the proposed Plas Power Solar and Energy Storage Project with only small amounts of hedgerow removal to widen existing access points.
Trees In addition to the trees within hedgerows, scattered semi-mature trees are present in fields F6 (oak) and F20 (willow). At the edges of fields F32 and F33 are young silver birch *Betula pendula*, alder and fruit trees (cherry, damson and apple).		Retained in hedgerows, field boundaries and in fields.

Habitat description	Photograph	Position within development
Dry ditches Seven dry ditches are present within the survey area. Alongside fields F17/F18 the ditch is shallow and located within woodland and scrub. In fields F26, F27 and F31 the ditches are shallow, grassy and unshaded. On the boundaries of F20 and F29 the ditches have man-made vertical banks which are shaded by tall ruderal vegetation, trees and scrub. The dry ditch along field F20 is only 0.5m deep and connects to the offsite waterbody (P2), while adjoining field F29 the ditch is 1.5m deep.		Retained on field boundaries.
Drains Drain D2 runs between the southern boundary of arable field F4 and the A525. To the west the drain is unshaded with shallow banks supporting tall ruderal vegetation. To the west hedgerows H15 and H16 overhang the drain which has steep grassy banks. The ditch had a water depth of 5cm during the survey walkover. A man-made ditch along the eastern boundary of field F30 is similar to those adjoining F20 and F29 but holds a small amount of water (less than 5cm in depth).		Outside solar arrays with stand-offs.

Habitat description	Photograph	Position within development
Habitats adjoining Survey Area Boundary		
Watercourses The River Clywedog flows through Big Wood at the south of the survey area. At the south of the survey area the river is 5m wide with shallow fast-flowing water and a stony riverbed. The woodland corridor through which the river flows is 50m wide. A small drain (D5) is culverted beneath Field F34 into Big Wood. The channel is up to 0.5m wide with a depth of less than 5cm and a stony substrate. The banks are steep, 2m in height and support ivy and ferns.	River Clywedog: 	Outside the site with substantial stand-off.
Semi-natural broadleaved woodland Big Wood, a semi-natural broadleaved woodland designated as a Wildlife Site adjoins the survey area to the south. The section adjoining the survey area contains frequent semi-mature to mature trees with species including oak, sycamore, ash and beech. The woodland has a sparse shrub layer of hawthorn and bramble. The ground flora includes dog's mercury *Mercurialis perennis*, tufted hair-grass *Deschampsia cespitosa*, mosses, ferns. Patches of bluebell *Hyacinthoides* sp. are present. Higher Berse Marsh WS adjoins the eastern boundary at the north of the survey area. The designated Wildlife Site supports a small section of young semi-natural broadleaved woodland. The woodland is lower lying than the surrounding fields with steep, bracken covered banks on the western boundary. The habitat comprises an assemblage of mostly young trees, hawthorn and bramble scrub and lacks ground flora or a distinct shrub layer.		Outside the site, adjoins southern boundary. Adjoins eastern boundary of northern section of the site. A much smaller section of similar habitat lies at the west of the northern area.

Habitat description	Photograph	Position within development
A block of woodland, some of which is semi-natural broadleaved with adjoining sections of mixed plantation adjoins Field F18. The semi-natural woodland is dominated by young to semi-mature trees, with a mixture of oak, ash, sycamore and beech. A sparse shrub layer of hawthorn and bramble is present. The ground flora comprises patches of ivy, ferns and dog's mercury.		Adjoins site boundary with stand-offs from solar panels.
Mixed plantation woodland The mixed plantation woodland adjoining field F18 comprises similar species to the adjoining semi-natural woodland and additionally include conifer, pine and larch. The habitat has developed a sparse shrub layer and ground flora of similar species to the surrounding semi-natural woodland		Adjoins site boundary with stand-offs from solar panels.
A second area of mixed plantation woodland lies adjoins the central section of the survey area. The woodland block is dominated by young silver birch and ash with hawthorn, alder and pine *Pinus* sp. also present. The ground flora comprises sprawling bramble and grasses.		Adjoins site boundary with stand-offs from solar panels.

Habitat description	Photograph	Position within development
		
Waterbodies There are three waterbodies in close proximity to the survey area, referred to as ponds P1-P3 on the Habitat Map. P1 is located within Higher Berse Marsh WS approximately 70m from the survey area boundary. The pond measures approximately 40m by 10m and has formed in a lower lying area of the marsh, with shallow gently sloping banks. Willow trees and mixed species scrub surround the pond. Within the central area, P2 is a rectangular man-made waterbody located within a mixed plantation woodland. It is 150m by 50m and has a margin of common reed *Phragmites australis* and bulrush Typha latifolia. Mallards *Anas platyrynchos* were present on the waterbody during the survey walkover. The waterbody adjoins the survey area boundary.	P2: 	Outside the site with substantial stand-off. Adjoins site boundary with stand-off from solar panels.

Habitat description	Photograph	Position within development
P3 is located to the west of the survey area, 75m from the boundary. The pond adjoins broadleaved woodland and a rural track, with farm buildings, woodland and grassland between the pond and survey area. The pond measures 50m by 25m. Duckweed *Lemna* sp. entirely covers the pond.	P3: 	Outside the site with substantial stand-off.
Invasive Species The invasive Schedule 9 species Japanese knotweed is present in two locations along the southern boundary of arable field F4.		Along site boundary of northern section.

3.3 Ecological Scoping Survey

3.3.1 The potential value of habitats within or adjoining the survey area for protected species is described in Table 3.3 below. An evaluation of potential effects of the development on these species is provided.

Table 3-3 Protected Species Evaluation

Species / taxa	Suitable habitat within or adjoining the survey area	Potential adverse effects of Proposed Development
Bats	The grassland and woodland edges are suitable foraging habitats for bats. The adjoining woodlands will form wildlife corridors with importance in the wider landscape. The offsite ponds may also attract high levels of foraging activity. Hedgerows and fields within the survey area will also be used by foraging and commuting bats. Mature and semi-mature trees within and adjoining the survey area are of a sufficient age and size to contain potential roost features which may support bats. While there are no buildings within the survey area boundary, several houses and farm buildings adjoin the Proposed Development and may have potential to support bat roosts. The local records centre holds records of bat roosts recorded in buildings within the wider Plas Power Estate in 2019. A BLE roost of up to 19 individuals was recorded along with common pipistrelle and Natterer's bat roosts of 1-2 bats. During activity surveys of the wider estate myotis species and noctule were additionally recorded.	Removal / fragmentation of habitat valuable for bats or light spill onto potential roost feature would have potential adverse effects on bats.
Dormouse	The survey area is located at the northern end of the dormouse distribution in the UK, however dormice are known to be present within the county. The local records centre hold no recent records of dormouse within 2km of the survey area. There are many intact hedgerows within the survey area most of which are wide, dense and directly connected to woodland. The woodlands and species-rich hedgerows support a range of species which would provide food sources and provide habitats that could support dormice.	The Proposed Development will retain the existing hedgerow network. While no hedgerow removal is anticipated should there be a need to create access points through hedgerows there is potential for adverse effects on dormouse in the absence of mitigation.

Species / taxa	Suitable habitat within or adjoining the survey area	Potential adverse effects of Proposed Development
Otter	An otter survey undertaken in 2021 recorded signs of otter along the River Clywedog at the south of the survey area (RPS, 2021). The local records centre hold records of otter from locations east and south of the survey area, the closest of which are along the River Clywedog and of roadkill on the A525 and A483. Pond P2 could support fish and is connected to Big Wood via a 25m wide linear mixed plantation. Pond P3 is covered by duckweed and unlikely to support fish. The onsite drainage ditches hold very little water and negligible value for otter.	Stand-offs between the solar arrays and boundary woodlands will protect potential resting places for otter. Works such as cable installation would have the potential to impact upon otters if undertaken in close proximity to resting areas / holts.
Birds - wintering	The wintering bird survey recorded a range of species of conservation interest using the survey area. Black-headed gull, rook and meadow pipit were present in numbers of up to county level importance and common gull in numbers of up to local importance. The majority of activity was associated with the grazed pasture fields. Lower levels of activity were recorded in the arable grass-ley fields and field boundary habitat.	Works resulting in elevated levels of noise or lighting, such as piling or floodlighting, may cause temporary displacement of wintering birds.
Birds - breeding	The pasture fields provide suitable nesting habitat for ground nesting birds and low numbers of skylark and meadow pipit were recorded nesting within the survey area (RPS, 2021). Willow warbler and dunnock were recorded nesting within the onsite hedgerows and adjoining woodland. Other species of conservation interest breed within the adjoining woodlands and River Clywedog habitat.	Works within the pasture fields during the breeding season would have potential to result in damage or disturbance to nests if present. Removal or light spill onto scrub, trees or grassland where nests are present may would cause disturbance. Stand-offs from the boundary habitat will protect nesting birds in these areas from adverse impacts.
Great crested newt	A small population of GCN has been recorded in pond P3, 90m west of the survey area (RPS, 2021). A medium sized meta-population is present in ponds P8 and P9, 770m west of the survey area. A small population has been assumed in a dry pond (P5) 360m east of the survey area. The local records centre holds additional records of GCN 940km east of the survey area and 1.22km south of the survey area. The majority of the survey area (short grazed pasture and arable ley) has negligible vale for GCN. Hedgerow bases and taller areas of grassland may be used by GCN moving through the survey area.	In the absence of mitigation, works within habitat suitable for GCN would have potential to adversely affect reptiles.

Species / taxa	Suitable habitat within or adjoining the survey area	Potential adverse effects of Proposed Development
Reptiles	The local records centre holds records of grass snake, common lizard and slow worm from several areas in the locality, the closest of which is 1.52km west of the survey area. The majority of the survey area comprises arable grass-leys and closely-grazed pasture which will have negligible value for reptiles. Habitat capable of being used by reptiles is largely restricted to the few areas of semi-improved grassland and the bases of the field boundary hedgerows where dense vegetation cover provides potential cover and foraging opportunities. These areas are isolated from other areas of high value reptile habitats outside the survey area. They would not be expected to support more than small-sized populations of slow worm and grass snake.	In the absence of mitigation, works within habitat suitable for reptiles would have potential to adversely affect reptiles.
Water vole	The River Clywedog and tributary stream located adjacent to the southern section of the survey area provide suitable habitat for water vole. The closest water vole record to the survey area is 3.67km east of the survey area along the River Gwenfro, on the eastern side of Wrexham. The drainage ditches all have limited foraging opportunities and a shallow water depth which would provide little cover for water voles. They have low-negligible potential to support water vole. Other ditches within the survey area have negligible value for water voles due to the absence of suitable emergent or bankside vegetation and shallow water depth. The local records centre has no recent records of water vole within 2km of the survey area.	None anticipated.
Other Species	Brown hare, polecat and hedgehog are all known to occur in the local area and are Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016. The arable field and margins could be part of the habitats used by the local brown hare population although none were seen during the survey area walkover survey. Hedgehog and polecat have both been observed within or directly adjoining the survey area and will be utilising parts of the survey area within a home range.	Potential for reduced use of fenced areas by brown hare.

4 MITIGATION AND ENHANCEMENT

4.1 Designated sites

4.1.1 The development proposal will include protection measures to avoid the potential for any adverse impacts on the designated Wildlife Sites adjoining the boundary of the survey area: Higher Berse Marsh and Big Wood. Parts of the fields adjoining the designated sites will become stand-off / buffer zone between the solar arrays and the off-site features of high nature conservation value.

4.1.2 A shadow Habitats Regulations Assessment (HRA) will be prepared to assess potential impact pathways between qualifying features of the Natura 2000 sites or SSSIs and the Proposed Development.

4.1.3 The shadow HRA will assess potential impact pathways resulting from the Proposed Development and each of the Natura 2000 sites and their qualifying features.

4.1.4 The assessment will make reference to the construction methods, proposed operations and environmental protection measures.

4.2 Habitats

4.2.1 The development will retain the hedgerow network and mature and large semi-mature trees. The majority of the large trees within the survey area are situated within the hedgerow field boundaries and will be incorporated into the layout of the project to maintain higher value biodiversity features over the lifetime of the development and following decommissioning.

4.2.2 Any localised loss of hedgerows would need to be mitigated with the planting of new native trees and shrubs in groups or hedge lines. The area of creation would be higher than the extent of loss and should be positioned to directly benefit connectivity through the survey area.

4.2.3 All boundary habitats will be protected from adverse change during construction or once the Proposed Development is operational. The solar array and associated infrastructure should be located further than 10m from all the wooded stream sides on the boundaries of the survey area.

4.2.4 Measures will be undertaken to prevent the spread of Japanese knotweed during the construction phase with the aim to eradicate it from the site.

4.3 Species

Bats

4.3.1 Stand-offs should be implemented around all boundary habitats. Minimum 10m stand-offs from boundary trees would reduce the potential for potential disturbance during the construction phase. If lighting is required during construction this should be directed away from hedgerows and boundary habitats.

Otter

4.3.2 Should the cable installation require works within Big Wood, the route and working method should be designed to avoid impacts on otter. Any works with potential to result in disturbance or damage to an otter resting place or holt would require a Natural Resources Wales (NRW) licence.

Wintering Birds

4.3.3 Sowing sections of the site with a mixed species mixture of winter crops will provide foraging resources for wintering birds. In addition to the management of the grassland, new winter crop areas should ensure the site continues to provide foraging resources for wintering birds.

Great Crested Newt, Dormouse, Breeding Birds and Reptiles

4.3.4 A GCN Mitigation Strategy will be prepared for the development to ensure GCN and their habitats are protected during the construction and that additional habitat is provided to safeguard the population over the operational life of the Proposed Development. The mitigation measures will additionally provide protection for reptiles.

4.3.5 While no hedgerow removal is anticipated, should there be a need to create access points through hedgerows the habitat will be checked by a suitably experienced ecological clerk of works (ECoW) in advance of any habitat clearance. The ECoW will check the habitat for GCN, dormouse, active birds nests and reptiles.

4.3.6 Appropriate mitigation will be implemented should protected species be recorded. In the event that dormouse or GCN are encountered, works should stop until an NRW licence is obtained.

4.3.7 Ensuring the hedgerows remain unlit during construction and operation will prevent disturbance to the above species.

Ground-nesting Birds

4.3.8 To prevent potential adverse effects on ground-nesting birds, a check should be undertaken by an ECoW no more than 48 hours in advance of works within the pasture fields during the breeding bird season (generally March-August inclusive).

4.3.9 Suitable buffer zones should be implemented around active nests. No works should be undertaken within the buffer and the buffer areas should remain unlit.

4.4 Enhancement opportunities

4.4.1 The development design should seek to create new hedgerows and areas of scrub. Existing species-poor and gappy hedgerows can also be enhanced through infill planting. New planting should use a range of native species. Hedgerow planting will benefit a range of wildlife by providing additional habitat and enhancing connectivity across the site.

4.4.2 Creation of a new pond would provide new habitat for GCN, grass snake and invertebrates. Locating a pond close to the woodland edge with areas of tall grassland and scrub nearby would further increase the habitat value.

4.4.3 Sowing the land beneath the solar arrays with a meadow grassland mixture and managing this to support a range of diverse sward will increase its biodiversity value.

4.4.4 Management of some areas of the site as tussocky grassland will provide habitat for ground-nesting birds and provide variation in habitat structure.

4.4.5 Management of the grassland and hedgerow bases to increase their species diversity would increase invertebrates populations, providing additional prey resources for reptiles and GCN. Taller grassland will also provide greater cover for these species.

4.4.6 Additional scrub planting along the site boundary adjoining Big Wood would provide additional areas of cover in an undisturbed area and create an ecotone between the woodland and grassland.

5 CONCLUSIONS

5.1.1 The survey area largely comprises arable fields used as grass-ley and improved pasture, bounded by hedgerows, drains and blocks of woodland. A watercourse (River Clywedog) lies 50m south of the site boundary at the closest point).

5.1.2 A Shadow HRA will be undertaken to assess the potential effects of the development on nearby designations.

5.1.3 The Proposed Development of the site as the proposed Plas Power Solar and Energy Storage Project is anticipated to result in the loss of low value habitat, primarily arable and improved grassland fields and several species-poor semi-improved grassland fields.

5.1.4 The development will be designed to protect hedgerows, drains and mature trees within the site. Stand-offs and best practice measures will be employed to protect habitats adjoining the Proposed Development include woodland and watercourses including areas that fall within designed Wildlife Sites of county importance.

5.1.5 Measures to control and where possible eradicate Japanese knotweed which is present within the northern area will form part of the project.

5.1.6 Potential effects on the following species should be considered in the site design and mitigation measures incorporated where necessary to protect the value of the site for them:

- Bats
- Otter
- Dormouse
- Badgers
- GCN
- Wintering birds
- Breeding birds
- Reptiles

5.1.7 The solar energy park should be designed to include enhancements for biodiversity over the lifetime of the project. Enhancement opportunities include:

- Creation of new hedgerows and areas of scrub
- Enhancement of existing species-poor and gappy hedgerows
- Creation of a new pond
- Meadow grassland sowing and management
- Management of areas of tussocky grassland
- Sowing sections of land with of winter crop mixture
- Enabling the development of dense scrub within Big Wood Wildlife Site

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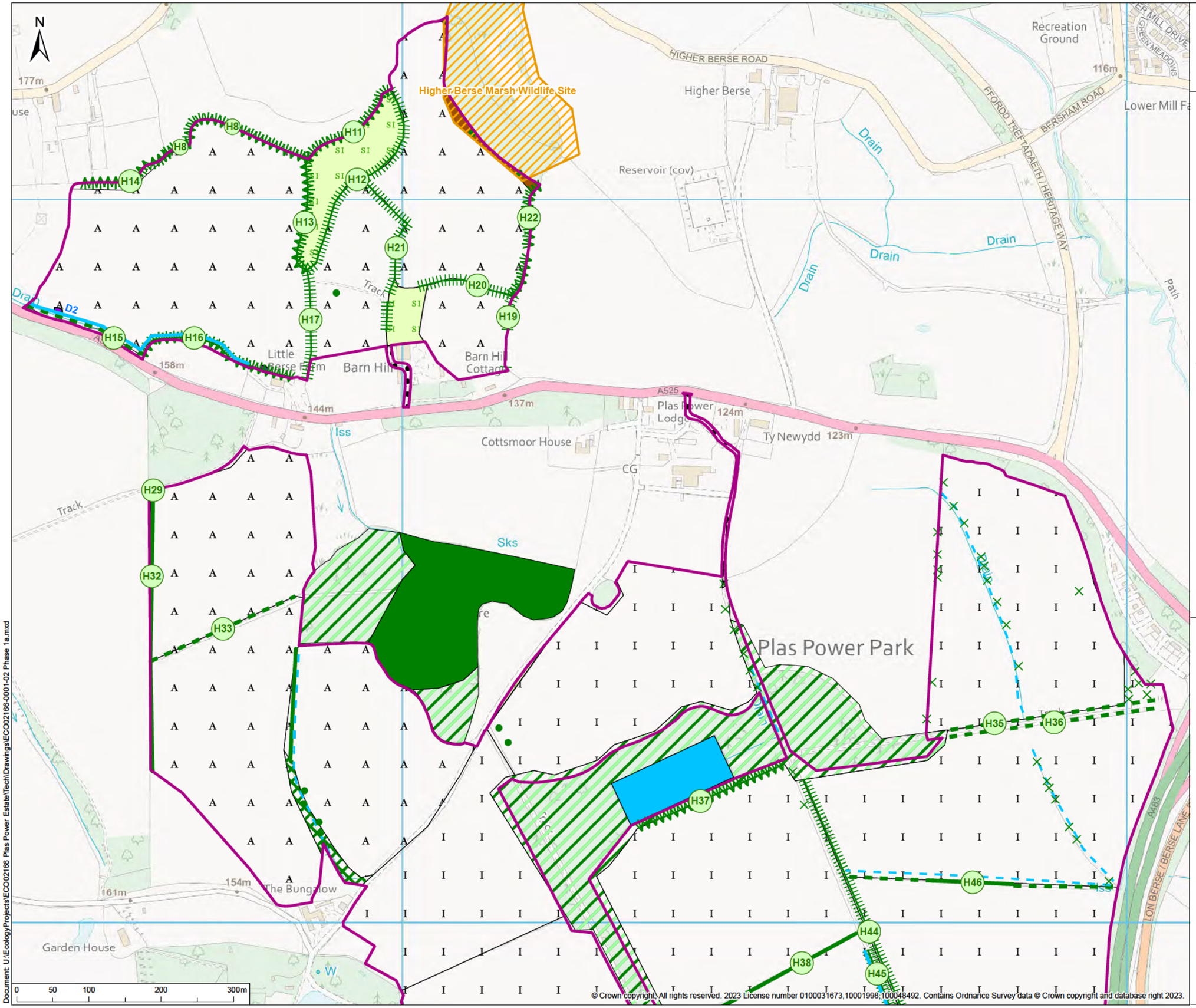
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DRAWINGS

Drawing 1 **Habitat Plan**



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- Survey Boundary
- Wildlife sites
- A — Arable
- Bare ground
- Bracken - continuous
- Broadleaved woodland - semi-natural
- I — Improved grassland
- Mixed woodland - plantation
- Japanese Knotweed
- SI — Poor semi-improved grassland
- Scrub - dense/continuous
- Standing water
- Defunct hedge - species-poor
- Dry ditch
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - species-poor
- Standng water
- Scattered scrub
- Scattered tree - broadleaved
- H1 — Hedgerow number
- F1 — Field number
- W1 — Watercourse number
- D1 — Ditch number

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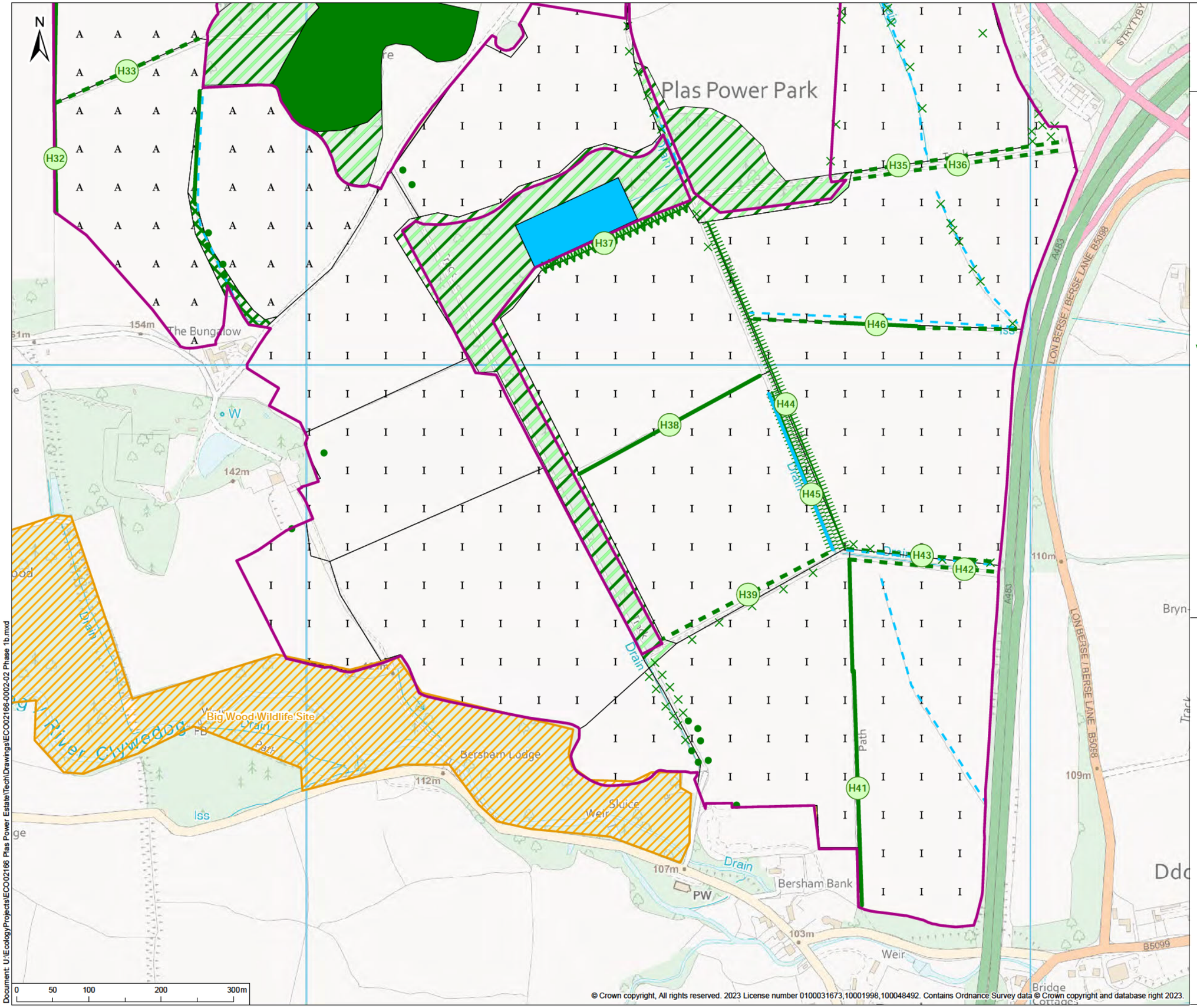
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APPENDICES

Appendix A

Relevant Legislation

A.1 GREAT CRESTED NEWTS

Great Created Newts Triturus cristatus are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (and as amended), which affords the species protection under Section 9. The species is also listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017. In combination, this makes it an offence to:

- intentionally kill, injure or take (capture etc.) a Great Crested Newt;
- possess a Great Crested Newt;
- intentionally or recklessly damage, destroy, obstruct access to any structure or place used by Great Crested Newt for shelter or protection, or disturb any animal occupying such a structure or place; and sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

Great Crested Newts are also listed on the UKBAP as a Priority Species and are listed as a species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales under Section 7 of the Environment (Wales) Act 2016.

A.2 REPTILES

All common UK reptile species (Adder, Grass Snake, Common Lizard and Slow Worm) 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.

All common UK reptile species are also listed as species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales under Section 7 of the Environment (Wales) Act 2016.

A.3 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.

A.4 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 being of principal importance for the conservation of biodiversity in the UK, (commonly referred to as UKBAP Priority species): Barbastelle, Bechstein's, Noctule, Soprano Pipistrelle, Brown Long-eared, Greater Horseshoe, and Lesser Horseshoe. These species, along with common pipistrelle, are also listed as species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales under Section 7 of the Environment (Wales) Act 2016.

A.5 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".

A.6 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.

Dormice are also listed as a species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales under Section 7 of the Environment (Wales) Act 2016.

A.7 Water Vole and Otter

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 Vole 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 species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales under Section 7 of the Environment (Wales) Act 2016.

Appendix 6.2
Breeding Bird Survey

BREEDING BIRD SURVEY - PLAS POWER SOLAR AND ENERGY STORAGE PROJECT

On behalf of Lightsource bp

ECO00957
Breeding Bird Survey
Final
September 2021

rpsgroup.com

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1	Issue to client	Paul Turner	Tim Oliver	Tim Oliver	17/09/21

Approval for issue

Tim Oliver  17 September 2021

File/Model Location

Document location: ECO00957 Breeding Bird Survey - Plas Power

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Prepared by:
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Prepared for:
Lightsource bp

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Appendices

Appendix A Bird species recorded on site in 2021

1 INTRODUCTION

1.1 Purpose and Scope of This Report

1.1.1 RPS was commissioned by Lightsource bp to carry out a breeding birds survey of the Plas Power Estate at Wrexham, North Wales, the site being subject to proposals for the development of a solar energy farm.

1.1.2 An assessment of the Proposed Development's effect on bird populations in the area requires the ornithological value of the site to be determined.

1.1.3 The aims of the breeding birds survey reported here are to:

- provide baseline information on the current status of breeding birds within the survey area; and
- inform the design and development of any ecological mitigation and enhancement measures that may be required.

1.1.4 The greatest effort in assessing possible impacts should be targeted at species of conservation interest, i.e. legally protected or vulnerable species. The assessment of the site's importance for breeding birds in this report is focussed on the status of such species including:

- species listed in Annex 1 of the EC Birds Directive or species listed in Schedule 1 of the Wildlife and Countryside Act 1981;
- species included in the list of Species of Principal Importance prepared under Section 7 of the Environment (Wales) Act 2016;
- species of national or local conservation interest, for example those included in the Welsh Red and Amber Lists or for which UK and Local Biodiversity Action Plans have been written; and
- those occurring at a site in nationally, regionally or locally important numbers.

1.2 Study Area

Site Location and Context

1.2.1 The survey area is approximately 175 ha in size and is located to the west of Wrexham with the A483 running along its eastern boundary. The National Grid coordinates for the centre of the site are SJ 301 501. The current land use is predominantly arable and pasture farmland.

1.2.2 The extensive survey area has an irregular boundary and comprises a larger northern section and smaller southern section.

1.2.3 The northern section of the survey area is located between A525 to the north, Big Wood to the south and the A483 dual carriageway to the east and is approximately 130ha in extent. This part of the site can be broadly divided into eastern and western sections, partly divided by a linear mixed plantation surrounding a rectangular pond.

1.2.4 The southern area is located to the south of Mill Terrace Road and includes fields on either side of a tributary of the River Clywedog, west of the village of Bersham. The survey area is approximately 45 ha including three additional fields to the south of the tributary.

Site Description

1.2.5 The land in the western half of the northern section is undulating and are grass leys used for silage production, while the land in the eastern half of the northern section and the southern section is generally flat and used for sheep and cattle grazing. Other habitats within the site include hedgerows, mature and semi-mature trees, a stand of tall ruderal and managed amenity grassland.

1.2.6 Big Wood Wildlife Site (WS) lies outside the site located between the central and southern areas. Two further designated sites; Higher Berse Marsh WS and Afon Gwenfro WS adjoin the northern area. The River Clywedog flows through Big Wood and the channel adjoins a short section of the eastern boundary of the southern area.

1.2.7 The wider landscape is primarily agricultural and rural to the south and west and more urban to the north and east. The town of Wrexham lies approximately 1km to the east across the A483 dual carriageway. The Berwyn and South Clwyd Mountains lie approximately 1.8km to the west.

1.3 Legislation and Policy

Legal Protection

1.3.1 A number of bird species recorded within the UK (including those that are resident, overwintering and migratory) are listed on Annex I of the 'Birds Directive' which requires the UK Government to take special measures, including the designation of Special Protection Areas (SPAs), to ensure the survival and reproduction of these species throughout their area of distribution.

1.3.2 All birds, their nests and eggs are afforded protection under the Wildlife and Countryside Act (WCA) 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.

1.3.3 Birds of those species listed on Schedule 1 (Part 1) of the WCA, are also protected from disturbance while building a nest, or while in, on, or near a nest containing eggs or young. 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.

Birds of Conservation Concern

1.3.4 The Birds of Conservation Concern (BoCC) is an assessment of the conservation status of all regularly occurring British birds. Separate lists are published for the UK (Burns et al , 2020) and Wales (Johnstone and Bladwell, 20216). The lists (Red, Amber and Green), that indicate the level of conservation importance for each species, are derived from quantitative assessments from standardised criteria. The assessment is based on the most up-to-date evidence and criteria including conservation status at global and European levels, and, within the UK: historical trends in population and range, rarity, localised distribution and international importance. The lists are drawn together by the UKs leading bird conservation organisations, including the Royal Society for the Protection of Birds (RSPB) and British Trust for Ornithology (BTO).

1.3.5 The criteria for birds being included in the BoCC lists is as follows.

Red List:

- globally threatened;
- historical population decline in UK during 1800–1995;
- severe (at least 50%) decline in UK breeding population over last 25 years, or longer-term period; and,
- severe (at least 50%) contraction of UK breeding range over last 25 years, or the longer-term period.

Amber List:

- species with unfavourable conservation status in Europe (Species of European Conservation Concern);
- historical population decline during 1800–1995, but recovering; population size has more than doubled over last 25 years;
- moderate (25-49%) decline in UK breeding population over last 25 years, or the longer-term period;
- moderate (25-49%) contraction of UK breeding range over last 25 years, or the longer-term period;
- moderate (25-49%) decline in UK non-breeding population over last 25 years, or the longer-term period;
- rare breeder; 1–300 breeding pairs in UK;
- rare non-breeders; less than 900 individuals;
- localised; at least 50% of UK breeding or non-breeding population in 10 or fewer sites, but not applied to rare breeders or non-breeders; and,
- internationally important; at least 20% of European breeding or non-breeding population in UK (NW European and East Atlantic Flyway populations used for non-breeding wildfowl and waders respectively).

Green List:

- species that occur regularly in the UK but do not qualify under any or the above criteria.

1.3.6 Although the lists confer no legal status to those species they contain, they are useful in evaluating the conservation significance of bird assemblages, and for assessing the potential significance of impacts and informing appropriate levels of mitigation with respect to bird populations.

Species of Principal Importance

1.3.7 For the purpose of this assessment, notable bird species are defined as Species of Principal Importance for the conservation of biodiversity in Wales listed under Section 7 of the Environment (Wales) Act (2016); and species classified as Birds of Conservation Concern in Wales (included on the BoCC Red or Amber lists).

2 METHODS

2.1 Desk Study

2.1.1 A Preliminary Ecological Appraisal (PEA) was carried out by RPS on behalf of Lightsource bp at the site in 2019. As part of the PEA a desk study was carried out during which ecological records within a 2km radius of the site were requested from the Local Environmental Records Centre for North Wales, Cofnod. This data included ornithological records which informed the survey.

2.2 Breeding Birds Survey

2.2.1 The breeding bird survey was based on a standard 'walkover' methodology as outlined in Gilbert et al. (1998) and Bibby et al. (2000).

2.2.2 On all visits, the survey areas were fully covered along with land immediately adjoining the survey boundary. The survey area was defined to enable the likely impacts of the Proposed Development on the bird species breeding within the development site and immediate surroundings.

2.2.3 Four surveys visits were undertaken with each visit completed in one morning. Survey Dates and weather conditions are shown in Table 2-1.

2.2.4 The surveyors were Andrew Seth and Stuart Thomas both suitably qualified and experienced ornithologists.

Table 2-1. Breeding bird survey dates and weather conditions

Date	Cloud cover (oktas)	Wind (Beaufort Scale)	Temperature (˚C)	Visibility	Rain
12/04/2021	7 reducing to 4	1 (NW)	3 - 6	Good (sunny)	Dry
06/05/2021	6 reducing to 4	1-2 (ENE)	4 - 9	Excellent (sunny)	Dry after overnight rain
26/05/2021	7 reducing to 3	2-3 (NW)	9 - 12	Excellent (sunny spells)	Dry
22/06/2021	3 increasing to 4	1-2 NNE	13-17	Excellent (sunny)	Dry

2.2.5 During each visit the survey area was walked at a slow pace in order to locate and identify individual birds. The survey areas were fully covered during each visit, and all areas of the site were approached to within 50-100m where possible.

2.2.6 Surveys were undertaken in the morning, commencing after sunrise and finishing before midday. The transect was walked at a steady pace with brief pauses as necessary to listen for bird song/calls and to scan for birds. Binoculars were used throughout the survey visit to scan the open habitats, scrub, hedgerows and woodland edges.

2.2.7 Survey routes were mapped, and the direction walked alternated to ensure that all areas were covered at various times of day across the duration of the survey. All species encountered within the survey area were recorded and mapped.

2.2.8 On each visit, registrations were recorded by hand onto Ordinance Survey Maps. A fresh map was used for each survey. Registrations of birds were recorded using standard British Trust for Ornithology (BTO) two letter species codes (BTO, 2009). On completion of the surveys, the maps were digitised.

2.2.9 Although detailed territory mapping was not carried out, breeding behaviour was recorded and reviewed against the European Ornithological Atlas Committee (EOAC) criteria for categorising breeding status as defined below:

Confirmed Breeding

- Distraction-display or injury feigning
- Used nest or eggshells found (occupied or laid within period of survey)
- Recently fledged young or downy young
- Adults entering or leaving nest-site in circumstances indicating occupied nest (including high nest or nest holes, the contents of which cannot be seen) or adult seen incubating
- Adult carrying faecal sac or food for young
- Nest containing eggs
- Nest with young seen or heard

Probable Breeding

- Pair observed in suitable nesting habitat in breeding season
- Permanent territory presumed through recordings on at least two different survey dates at the same place
- Courtship and display
- Visiting a probable nest site
- Agitated behaviour or anxiety calls from adults
- Nest building or excavating nest-hole

Possible Breeding

- Singing male(s) present (or breeding calls heard) in breeding season

2.3 Breeding Bird Assemblage - Assessment of Importance

2.3.1 The importance of the breeding bird community was assessed and defined in a geographical context with reference to thresholds of national, regional, county, local and site importance with reference to the use by notable bird species are defined as Birds of Conservation Concern (BoCC) in Wales (Red or Amber lists), Species of Principal Importance and the level of legal protection.

2.3.2 The following geographical frames of reference and selection criteria (based on the Guidelines for Ecological Impact Assessment in the United Kingdom [CIEEM, 2018]) are used to ascribe nature conservation value or potential value to the bird populations within the survey area.

- International importance - a species which is cited as part of the designated interest of a SPA and occurs in internationally or nationally important numbers.
- National importance - a species which is cited as part of the designated interest of a SSSI and occurs in nationally important numbers.
- Regional importance – Species of Principal Importance, UK BAP Priority Species, BoCC Red List species that regularly occur in regionally important numbers.
- County importance - Species of Principal Importance, BoCC Red List species, UK or Local BAP Priority Species that regularly occur in numbers that are important on a county basis.

- Local importance - Species of Principal Importance, UK BAP Priority Species, BoCC Red or Amber List species which occur regularly in locally sustainable populations.
- Site - all common and widespread species.

2.4 Limitations

2.4.1 Surveys were carried out in suitable weather conditions. No notable limitations are considered to affect this survey.

2.4.2 The majority of ecological data remains valid for defined periods due to the inherently transient nature of the subject. The survey results contained in this report are considered to remain valid for up to two years if there are no significant changes to the site in that time.

3 RESULTS

3.1 Breeding Bird Survey

3.1.1 A total of 48 species were recorded during the survey over the four site visits (a list of all species recorded during the survey is provided in Appendix A.)

3.1.2 Of the 48 species recorded, 19 are birds of conservation concern and / or species of principal importance. These comprised

- 7 BoCC Red list species of high conservation in Wales, of which 5 are also species of principal importance (SPI) under Section 7 of the Environment (Wales) Act 2016.
- 12 BoCC Amber list species of moderate conservation in Wales of which 4 are also species of principal importance
- 3 BoCC Green list species in Wales but which are listed as Amber list species in the UK).

3.1.3 Three of these species of conservation concern also protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

3.1.4 The registrations of birds of conservation concern during each site visit are presented on the Figures 1–3 and listed in Table 3-1.

Table 3-1. Species of conservation concern (BoCC Amber and Red List species), and Schedule 1 species recorded during the 2021 Breeding Bird Survey

Species	Scientific Name	Summary	Breeding Status at the Site	Conservation Status
Herring gull	*Larus argentatus*	Two individual birds in arable fields in April, and a group of six in June plus small numbers of birds flying over arable fields in late May and June.	Not breeding on-site	Red / SPI
Kestrel	*Falco tinnunculus*	One bird calling in woodland / trees adjacent to the northern boundary	Possible breeding (one pair) in woodland / trees adjacent to the northern boundary.	Red / SPI
Linnet	*Carduelis cannabina*	One bird flying over the site in late May	Not breeding on-site	Red / SPI
Starling	*Sturnus vulgaris*	Two birds seen over southern arable field in late May.	Not breeding on-site.	Red / SPI
Whitethroat	*Sylvia communis*	Singing birds in three locations and one calling bird in adjacent off-site habitats.	Possible breeding (up to three pairs) in adjacent habitats (wooded verge of the A483 to the east and woodland to the northwest)	Red
Willow warbler	*Phylloscopus trochilus*	Two birds singing in off-site woodland to the northeast. At least three birds singing in woodland around the central pond. Further singing male in southern boundary hedgerow.	Probable breeding (two pairs) in off-site woodland by the pond. Possible breeding (up to three pairs) in southern boundary hedge, woodland by pond and woodland to the east.	Red
Bullfinch	*Pyrrhula pyrrhula*	One bird recorded on each visit in adjacent off-site woodland.	Possible breeding (one pair) in adjacent habitats	Amber / SPI
Goldcrest	*Regulus regulus*	Recorded on three of the four survey visits. Singing birds in off-site woodland adjacent to the north and west, and the off-site wooded stream corridor at the southern end of the site.	Possible breeding (up to four pairs) in off-site wooded stream corridor, and woodland to the north and west.	Amber

Species	Scientific Name	Summary	Breeding Status at the Site	Conservation Status
Grey wagtail	*Motacilla cinerea*	One singing bird in off-site wooded river corridor	Possible breeding (one pair) by the off-site River Clywedog	Amber
House sparrow	*Passer domesticus*	Recorded on all four visits, associated with adjacent off-site residential properties.	Probable breeding (one pair) at off-site farm adjacent to the northern boundary.	Amber / SPI
Lesser black-backed gull	*Larus fuscus*	A flock of seven birds recorded on one visit.	Not breeding on-site.	Amber
Long-tailed tit	*Aegithalos caudatus*	Recorded on three visits, in off-site woodland to the east, by the central pond; and the off-site wooded stream corridor at the southern end of the site. Family was recorded in June	Breeding in adjoining woodland.	Amber
Meadow pipit	*Anthus pratensis*	Recorded on three visits. Small numbers of birds flying over pasture and arable fields.	Probable breeding in pasture to the east (one pair).	Amber
Mistle thrush	*Turdus viscivorus*	Recorded on all four visits. Singing birds in off-site woodland to the east, north, around the central pond and along the River Clywedog.	Probable breeding (one pair) in off-site woodland to the northeast. Possible breeding (up to six pairs) in off-site woodland.	Amber
Skylark	*Alauda arvensis*	Recorded on all four visits. Two separate males singing over pasture in the east of the site with sightings of pairs if birds in June	Probable breeding (two pairs) in pasture to the east.	Amber / SPI
Song thrush	*Turdus philomelos*	Recorded on all four visits. Singing birds recorded in off-site woodland to the west, north southeast and centre of the site; and along the wooded River Clywedog corridor.	Probable breeding (three pairs) in off-site woodland to the west and north Possible breeding (up to four pairs) off-site woodland south and west.	Amber / SPI
Swift	*Apus apus*	Small numbers of birds flying over adjacent farm buildings on one survey visit	Not breeding on-site.	Amber
Dunnock	*Prunella modularis*	Recorded on all four visits. Most observations from woodland to the west of the site. Birds also singing in adjacent woodland at the southern end of the site and along the hedgerows and drain in the east.	Confirmed breeding (one pair) in off-site woodland to the west. Probable breeding (three pairs) southern boundary hedge and off-site woodland to the west. Possible breeding (up to six pairs) on-site hedge and scrub in the east and north east, off-site woodland to the west and north.	Amber (UK)
House martin	*Delichon urbicum*	Individual / very small numbers of birds associated with adjacent farm buildings on two visits. Three birds feeding over the northern part of site in June.	Not breeding on-site.	Amber (UK)
Stock dove	*Columba oenas*	Very small numbers of birds flying over arable fields and pasture over two visits.	Not breeding on-site.	Amber (UK)

3.2 Species Activity

Red List Species in Wales

Bullfinch

3.2.1 Bullfinch was recorded on the April and May survey visit with one bird (not singing) seen on each occasion. Adult bird also recorded in June. Records were from the narrow woodland strip in the centre of the site, and from woodland along the River Clywedog, to the west.

Herring Gull

3.2.2 Herring gull was recorded feeding in the fields in April (two birds) and June (six birds). Individual birds were seen in arable fields in two locations in late May. A flock of 16 birds were seen flying over the southern part of the site south of the River Clywedog.

Kestrel

3.2.3 Kestrel was recorded once, during the late May visit in the wooded verge of the A525 to the northeast.

Linnet

3.2.4 Linnet was recorded as a single bird flying over arable fields in the northwest of the site in late May.

Starling

3.2.5 Starling was recorded only in late May. Both observations were of single birds (one flying, one perched and calling) in the very southern part of the site.

Whitethroat

3.2.6 Whitethroat was recorded in May and June. In early May and June territorial singing was heard on the eastern boundary associated with the wooded verge of the A483. Further territories were recorded in the north-western site boundaries. Individual birds were seen flying over arable fields close to the eastern boundary in early May and in the west of the site in late May.

Willow Warbler

3.2.7 Willow warbler was recorded on all four site visits. Most activity was recorded in the central area of woodland surrounding the pond with one (territorial) singing bird in April, two in early May and three in late May. Two territorial singing birds were also recorded in April, in woodland around the traveller's site to the east and one to the south in late May and June.

Amber List Species in Wales

Goldcrest

3.2.8 Goldcrest was recorded on three of the four survey visits. A singing male was recorded in Cil Hendre woodland adjacent to the northern site boundary in April. A singing male and two non-singing individuals were seen close to this location in early May. Singing males were also recorded in the off-site woodland to the west in early May, and in late May in the wooded stream corridor separating the two fields at the southern end of the site

Grey Wagtail

3.2.9 One singing male was recorded in early may in woodland along the River Clywedog towards the southwest part of the site.

House Sparrow

3.2.10 House sparrow was recorded on all four site visits, the pair nesting in off-site residential properties close to the site boundary to the northeast and west and south. A breeding pair and three other birds were associated with the large residential property to the northeast in April. A small flock of 10 birds was observed over a farm to the south in early May. Other observations were of individual calling birds. Two flocks of house sparrow were recorded foraging in site boundary hedgerows in June.

Lesser Black-Backed Gull

3.2.11 A small flock of seven birds was seen in the small arable field at the southern end of the site in late May.

Long-tailed Tit

3.2.12 Long tailed tit was recorded in April with two birds in woodland on the eastern site boundary and by the pond in the centre of the site. Long tailed tit was also recorded in late May with two individual birds seen on the edge of the wooded stream corridor at the southern end of the site. A family was recorded on the western boundary in June.

Meadow Pipit

3.2.13 Meadow pipit was recorded in April with observations of individual and small numbers of birds flying over pasture in the south and northwest. One bird was recorded in pasture in early May. A group of four birds (family?) and a separate individual bird were recorded in eastern field in June.

Mistle Thrush

3.2.14 Mistle thrush was one of the most frequently recorded species with observation of singing birds across all four survey visits and in several locations including: the wooded verge of the A483 to the east (April), woodland beside the traveller's site to the east (April and late May), woodland along the River Clywedog (April and May), woodland by the central pond (April) and woodland on the northern site boundary (early May).

Skylark

3.2.15 Two separate individuals were recorded singing over pasture fields in the east of the site in Late May and June. One bird was singing in the same location in early May. Two pairs of skylark were observed in the eastern field during the June survey.

Song Thrush

3.2.16 Song thrush was one of the most frequently recorded species along with dunnock and mistle thrush. Singing birds were observed in multiple locations across all three site visits. Birds were recorded in several locations in the woodland along the River Clywedog with single records also from woodland to the west, north and southeast of the site. One bird was also recorded in the woodland strip in the centre of the site.

Swift

3.2.17 Swift was seen twice during the late May survey with both sightings (two birds and three birds flying) associated with the farmhouse and outbuildings to the north of the site.

Other Species

Dunnock

3.2.18 Dunnock was one of the most frequently recorded species along with song thrush and mistle thrush, with multiple singing birds recorded on all four survey visits. Most of these observations were from woodland to the west of the site including one adult bird with a juvenile in early May. Birds were also recorded singing in woodland around the arable field at the southern end of the site and along the hedgerows and drain in the east.

House Martin

3.2.19 House martin was recorded as individual / very small numbers of birds flying over adjacent farm buildings to the north and west in early May and a single calling bird at an adjacent farm building in late May. A group of three birds were recorded feeding over the northern fields in June.

Stock Dove

3.2.20 Stock dove was recorded as individual / very small numbers of birds flying over arable fields int he north west in April and two birds flying over pasture fields to the east in late May.

4 EVALUATION

4.1.1 Three species of conservation concern in Wales were confirmed or considered probably breeding on-site. These were:

- Skylark
- Willow warbler
- Meadow pipit

4.1.2 All were present in small numbers and none are locally uncommon or scarce; willow warbler is considered fairly common while meadow pipit and skylark common to very common.

4.1.3 The on-site habitat is fairly limited willow warbler comprising a few internal and boundary hedgerows. Most of the suitable habitat for these species is in the boundary hedgerows and adjoining off-site woodland. The larger pasture fields across much of the site provide a good extent of suitable breeding habitat for skylark and meadow pipit.

4.1.4 Dunnock is a Species of Principal Importance and an amber list species in the UK but not in Wales. There are a number of breeding pairs in the locality with one confirmed within the site. It is locally is common.

4.1.5 All other species of conservation concern recorded as possible / probable breeding in off-site habitats were associated with adjacent off-site farm buildings (house sparrow), and off-site adjacent woodland (kestrel, whitethroat, goldcrest, grey wagtail, song thrush and mistle thrush). Of these, kestrel and whitethroat are both of high conservation concern (BoCC Red List) while the others are of moderate conservation concern (BoCC Amber List). Kestrel, house sparrow and song thrush are also listed as Principal Importance for Conservation in Wales

4.1.6 The key off-site areas for breeding birds were:

- A narrow, wooded road verge along the A483 to the east which adjoins woodland surrounding a traveller's site to the north;
- Cil Hendre woodland to the northwest;
- A woodland block surrounding a pond to the east of the site;
- A woodland block to the west;
- The wooded river corridor of the River Clywedog which runs east -west separating the northern and southern parts of the site; and,
- A narrow, wooded stream corridor at the southern end of the site which separates a small arable field from several pasture fields (all within the site).

4.1.7 The assemblage of species breeding on-site is considered to be typical of similar sites locally given the limited range of habitats present (mostly intensively managed pasture and arable).

4.1.8 No regional or local population estimates were available for the species recorded to enable comparative quantification of the population at these geographic levels. Therefore, professional judgment and comparisons with population estimates at higher geographical levels have been used to inform this evaluation.

4.1.9 The breeding bird species were recorded within the survey area in low numbers and no count of any species forms a significant proportion (i.e. 1% or more) of the north-east Wales or UK populations. Therefore, populations across the survey area and immediate surroundings are considered to be of no more than local importance.

Species recorded as possible / probable / confirmed breeding within or adjacent to the site are listed in Table 4-1 along with their on-site breeding status and local and national status.

Table 4-1. Summary of breeding bird assemblage recorded during the 2021 breeding bird survey

Species	Scientific Name	Conservation Status	UK Population [1]	Northeast Wales Status[2]	Breeding Status at the Site	Geographical Importance of Site Population.
Kestrel	*Falco tinnunculus*	Red / SPI	46,000 Pairs	Breeding resident. Uncommon. 310 records. Occurred in 139 / 2569 1km squares.	Possible (one pair) in off-site woodland	No more than local
Whitethroat	*Sylvia communis*	Red	1.1 million Territories	Breeding summer visitor. Uncommon. 239 records. Occurred in 112 / 2569 1km squares.	Possible (up to three pairs) in off-site woodland.	No more than local
Willow warbler	*Phylloscopus trochilus*	Red	2.4 million Territories	Summer breeding visitor and passage migrant. Fairly common to common. 400 records. Occurred in 172 / 2569 1km squares.	Probable (two pairs) in off-site woodland. Possible (up to three pairs) in off-site woodland and a boundary hedge.	No more than local
Goldcrest	*Regulus regulus*	Amber	610,000 Territories	Breeding resident and winter visitor. 384 records. Occurred in 164 / 2569 1km squares.	Possible in adjacent off-site woodland (up to four pairs)	No more than local
Grey wagtail	*Motacilla cinerea*	Amber	38,000 Pairs	Breeding resident. Uncommon. 272 records. Occurred in 256 / 2569 1km squares.	Possible (one pair) in off-site woodland.	No more than local
House sparrow	*Passer domesticus*	Amber / SPI	5.3 million P	Breeding resident. Abundant. 2048 records. Occurred in 115 / 2569 1km squares.	Probable (multiple pairs) at off-site farm adjacent to the north.	No more than local
Mistle thrush	*Turdus viscivorus*	Amber	170,000 Territories	Breeding resident. Common. 594 records. Occurred in 220 / 2569 1km squares.	Probable (one pair) in off-site woodland. Possible (up to six pairs) in off-site woodland.	No more than local
Meadow pipit	*Anthus pratensis*	Amber		Breeding resident. Common.	Probable (one pair) in pasture field to east of site	No more than local
Skylark	*Alauda arvensis*	Amber / SPI	1.5 million Territories	Breeding resident and winter visitor. Common to very common. 377 records. Occurred in 121 / 2569 1km squares.	Probable on-site (two pairs) in pasture to the east.	No more than local
Song thrush	*Turdus philomelos*	Amber / SPI	1.2 million Territories	Breeding resident and possible winter visitor. Common. 810 records. Occurred in 236 / 2569 1km squares.	Probable (three pairs) in off-site woodland. Possible (up to an additional four pairs) off-site woodland.	No more than local
Dunnock	*Prunella modularis*	Amber (UK)	2.5 million Territories	Breeding resident. Common. 2009 records. Occurred in 256 / 2569 1km squares.	Confirmed (one pair) in off-site woodland. Probable (three pairs) southern boundary hedge and off-site woodland. Possible (up to six pairs) adjoining habitats	No more than local

1. Musgrove et al (2013).
2. From North East Wales Bord Report 2018, published by Clwyd Bird Recording Group November 2019.

5 CONCLUSION AND RECOMMENDATIONS

5.1.1 The survey recorded a relatively small assemblage of breeding birds within the site and its immediate surrounds. The assemblage was considered typical for the on-site habitats within the local area.

5.1.2 The assemblage comprised four species of conservation concern/importance: willow warbler a Red List (Wales) species, skylark and dunnock Amber (Wales) List and SPI species, and meadow pipit Amber (Wales) List species.

5.1.3 The site adjoins woodland habitats and the area immediately around the development supports a number of other breeding species including house sparrow, song thrush, whitethroat and kestrel all Red List (Wales) species, plus bullfinch, goldcrest and stock dove Amber list (Wales) species.

5.1.4 The hedgerows within the site will be part of the foraging areas for these species and will provide resources that contribute to breeding success.

5.1.5 The Proposed Development would result in the installation of solar panels on fields that are currently arable with smaller extents of pasture. Arable will be converted to grassland with the majority to be grazed by sheep.

5.1.6 The value of the grassland in the Proposed Development for ground nesting birds (skylark and meadow pipit) is affected by the structure of the grassland and grazing intensity. Where low stocking densities are employed tussocky grassland in solar farms has been shown to attract nesting skylark with good visibility of approaching predators beneath the panels. Although the development has the potential to result in the loss of skylark territories sensitive management practices could avoid this impact.

5.1.7 Boundary hedgerows and the internal hedgerows and scrub will be retained with a stand-off from the Proposed Development meaning habitats used by breeding willow warbler and dunnock within the site will be retained.

5.1.8 Off-site woodland and woodland boundary trees should be protected within a stand off from the solar arrays of at least 10m or the root petition zone of adjacent trees, whichever is the greater.

5.1.9 The retention of the field boundary network and protection of the context of woodlands would avoid any impacts on nesting pairs utilising habitats outside the site. The site will form part of the foraging habitat for many of species nesting in the vicinity. The hedgerows are the primary resource for most species and would remain unaffected. Most of the species that feed and forage on arable and pasture would be expected to continue to forage on the ground between and beneath solar arrays in the developed site.

5.1.10 Landscaping and grassland management within the Proposed Development should be used to minimise effects of the development and provide enhancements for biodiversity. Low intensity grazing should be adopted to create a tussocky sward, wild bird seed crops could be sown on the margins of arable fields to be provide an additional food resource for overwintering populations and a neutral grassland with wildflowers could be established along field boundaries to increase habitat connectivity, providing sources of nectar and pollen sources for invertebrates which in turn will increase prey abundance for birds.

5.1.11 Food resources for birds should also be promoted through adapting hedgerow management. Cut back a hedgerow only once every other year on rotation and many shrubs will only bear flowers and fruit on growth from the previous year.

5.1.12 Sensitive site design with stand offs and buffers from field margins and incorporating biodiversity enhancement into the long term management of the Proposed Development would help to maintain the breeding assemblage within and adjoining the site and has the potential to deliver benefits for breeding birds over the operational life of the Proposed Development.

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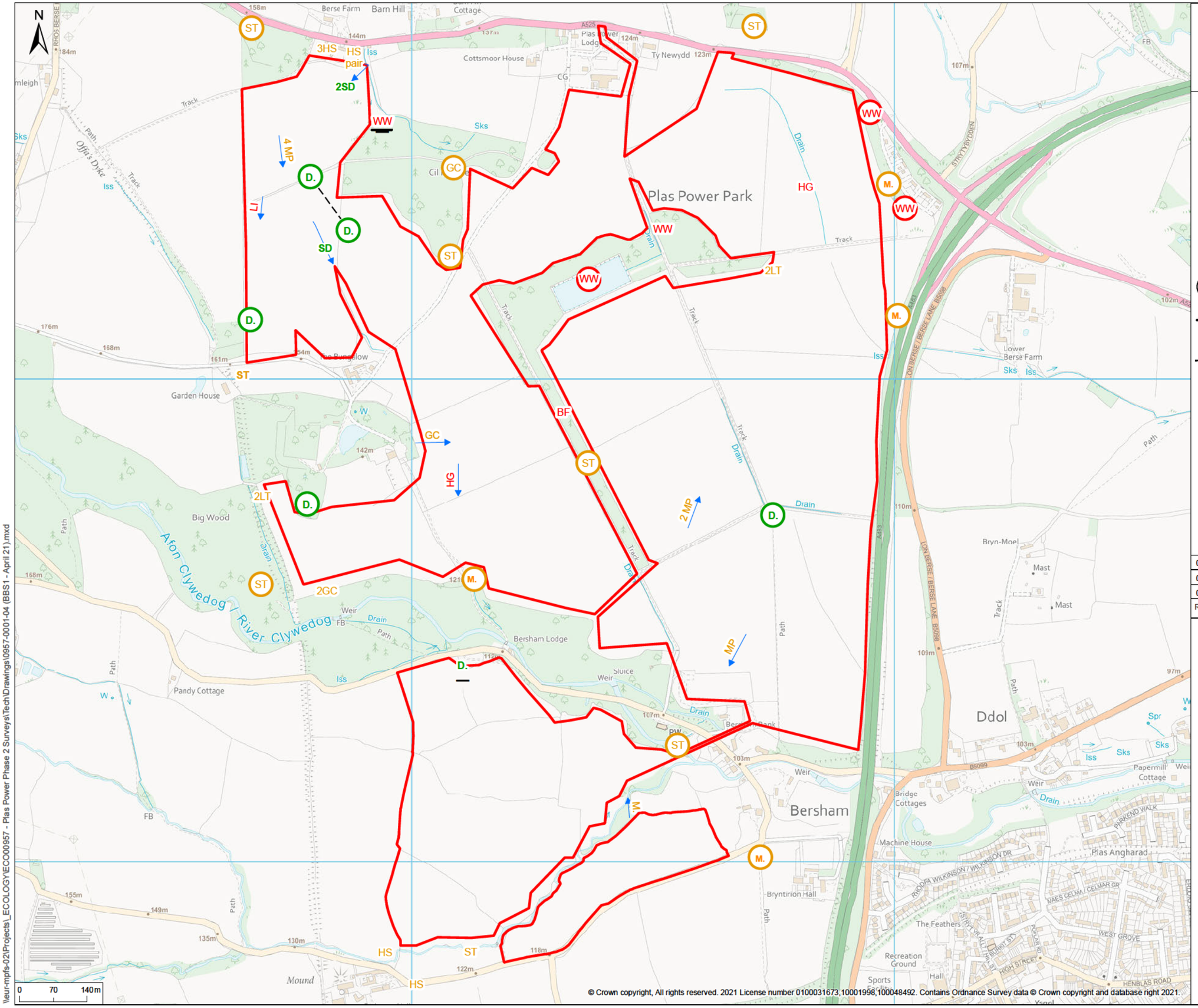
DRAWINGS

Figure 1 Breeding Bird Survey Results 12th April 2021

Figure 2 Breeding Bird Survey Results: 6th May 2021

Figure 3 Wintering Bird Survey Results 26th May 2021

Figure 4 Wintering Bird Survey Results 22nd June 2021



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Legend

- Site Boundary
- XX Wales Amber List Species
- XX Wales Red List Species
- XX Wales Green List (UK Amber List)
- Directional Flight Lines

Breeding Bird Survey Code

4 XX	Number of individuals
(XX)	Singing
XX	Calling
XX pair	Breeding pair
- - -	Simultaneous Registration: Two indiviuals in song at the same time

Bird Species

BF	Bullfinch
D.	Dunnock
GC	Goldcrest
HG	Herring gull
HS	House sparrow
LI	Linnet
LT	Long-tailed tit
M.	Mistle thrush
MP	Meadow pipit
SD	Stock dove
ST	Song thrush
WW	Willow warbler

Rev	Description	By	CB	Date
03	PM edits updated	LW	PT	SEPT 21
02	Surveyor edits updated	LW	PT	AUG 21
01	–	BG	TO	APR 21

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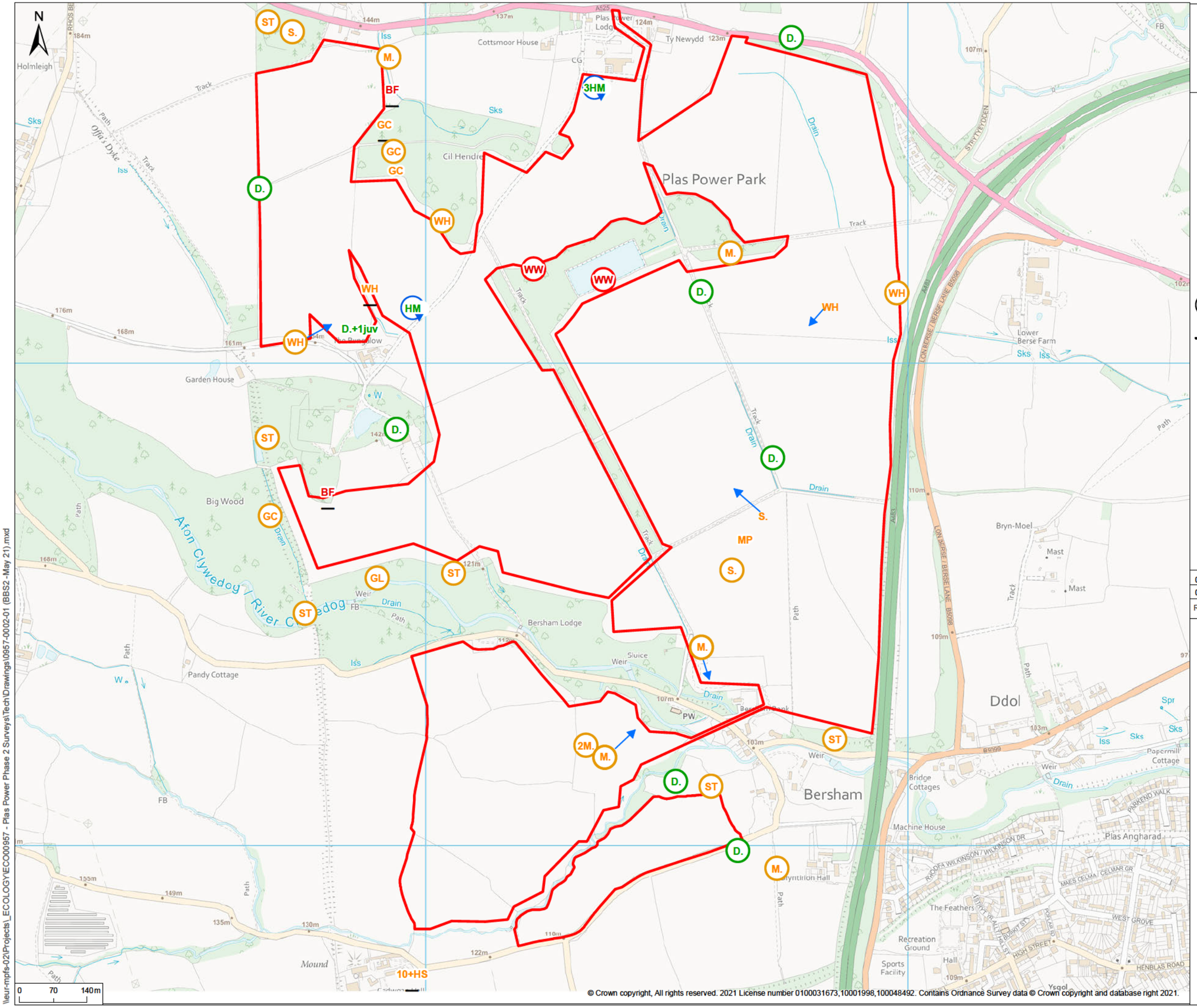
Title: Breeding Bird Results 26/04/2021

Status	Drawn By	PM/Checked By
Issue	BG	TO
Project Number	**Scale @ A3**	**Date Created**
ECO00957	1:7,500	SEP 2021
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1		03

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Legend

- Site Boundary
- XX Wales Amber List Species
- XX Wales Red List Species
- XX Wales Green List (UK Amber List)
- Directional Flight Lines

Breeding Bird Survey Code

4 XX	Number of individuals
(XX)	Singing
XX	Calling
XX+1 juv	More than 1 juvenile present

Bird Species

BF	Bullfinch
D.	Dunnock
GC	Goldcrest
GL	Grey wagtail
HM	House martin
HS	House sparrow
M.	Mistle thrush
MP	Meadow pipit
S.	Skylark
ST	Song thrush
WH	Whitethroat
WW	Willow warbler

Rev	Description	By	CB	Date
02	PM edits included	LW	PT	SEPT 21
01	–	LW	PT	JUL 21

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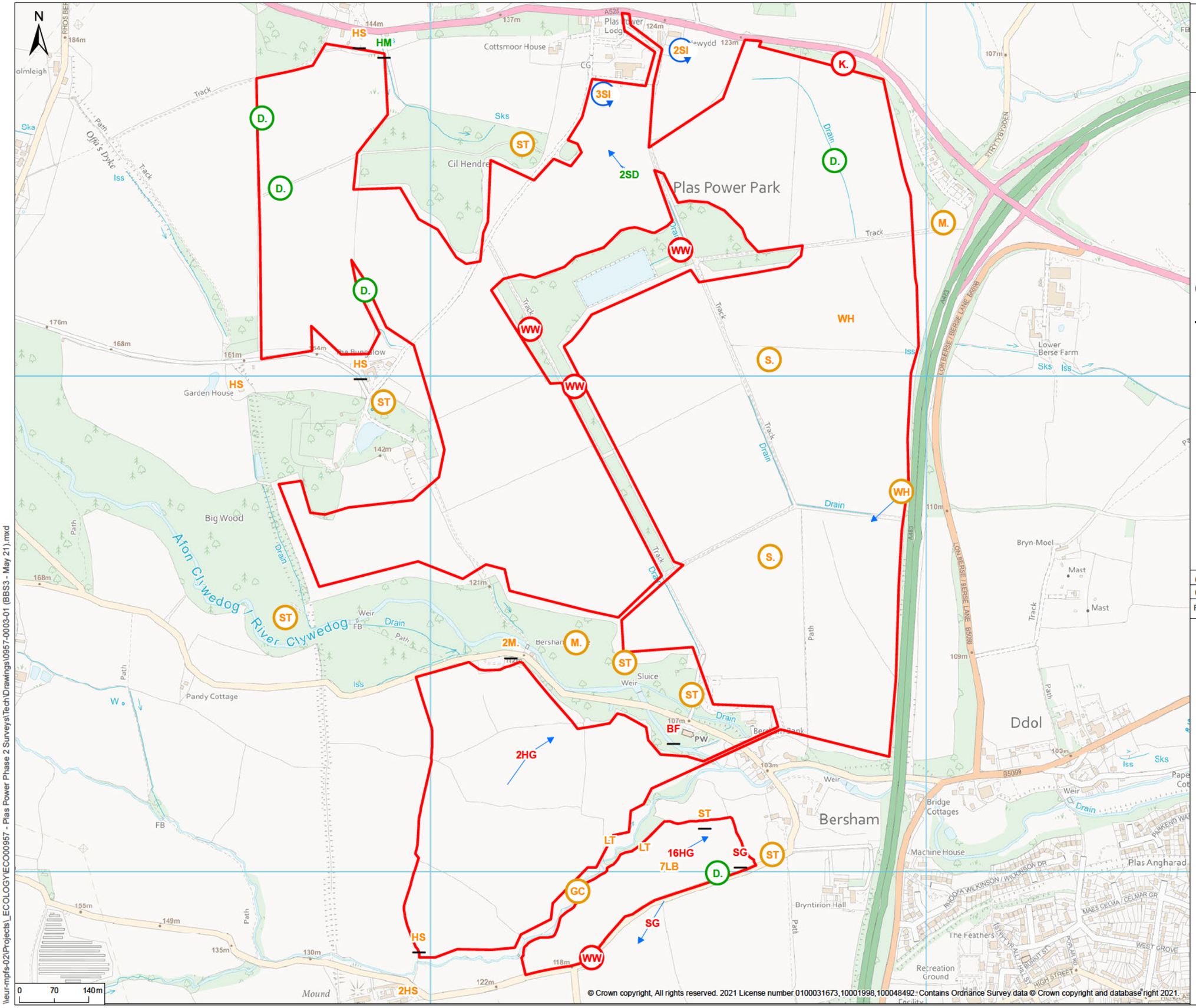
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Title: Breeding Bird Results 06/05/2021

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
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Figure Number		**Rev**
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Legend

- Site Boundary
- XX Wales Amber List Species
- XX Wales Red List Species
- XX Wales Green List (UK Amber List)
- Directional Flight Lines

Breeding bird Survey Code

4 XX	Number of individuals
(XX)	Singing
XX	Calling

Bird Species

BF	Bullfinch
D.	Dunnock
GC	Goldcrest
HG	Herring gull
HM	House martin
HS	House sparrow
K.	Kestrel
LB	Lesser black-backed gull
LT	Long-tailed tit
M.	Mistle thrush
S.	Skylark
SD	Stock dove
SG	Starling
SI	Swift
ST	Song thrush
WH	Whitethroat
WW	Willow warbler

Rev	Description	By	CB	Date
02	PM edits included	LW	PT	SEPT 21
01	--	LW	PT	JUL 21

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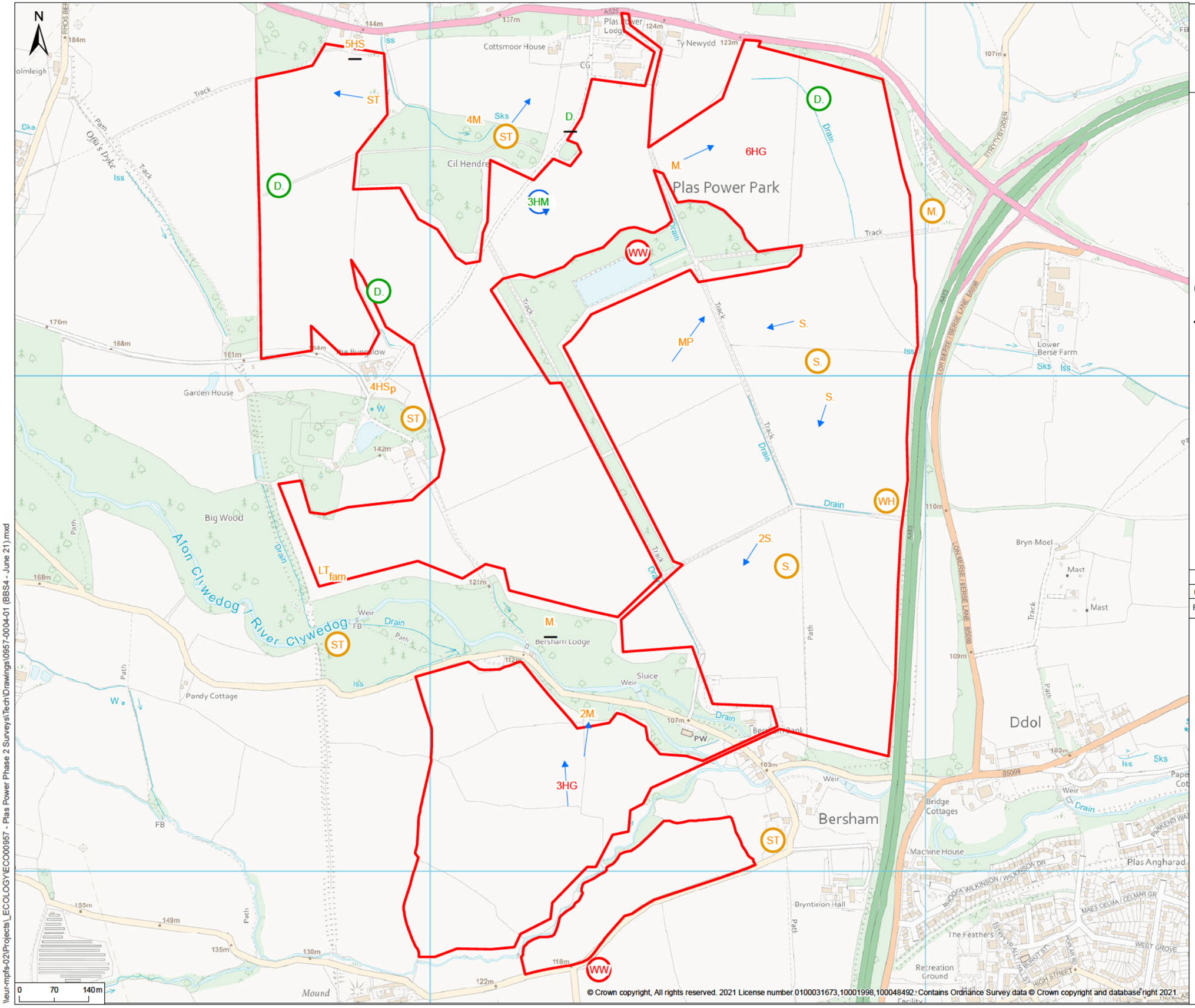
Title: Breeding Bird Results 26/05/2021

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Legend

- Site Boundary
- XX Wales Amber List Species
- XX Wales Red List Species
- XX Wales Green List (UK Amber List)
- Directional Flight Lines

Breeding bird Survey Code

4 XX	Number of individuals
(XX)	Singing
XX	Calling
XX_p	Adult pair (male and female)
XX_{fam}	Adult pair with juveniles/young

Bird Species

D.	Dunnock
HG	Herring gull
HM	House martin
HS	House sparrow
LT	Long-tailed tit
M.	Mistle thrush
MP	Meadow pipit
S.	Skylark
ST	Song thrush
WH	Whitethroat
WW	Willow warbler

Rev	Description	By	CB	Date
01	–	LW	PT	SEPT 21

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Title: Breeding Bird Results 22/06/2021

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APPENDICES

Appendix A

Bird species recorded on site in 2021

Species	Scientific Name	Conservation Status	Breeding Activity			
			26th April	6th May	26th May	22nd June
Blackbird	*Turdus merula*	*BoCC Green List*	2 singing	5 singing	11 singing	7 singing, 1 juvenile, 1 alarm calling
Blackcap	*Sylvia atricapilla*	*BoCC Green List*	10 singing	6 singing	11 singing	7 singing
Blue tit	*Cyanistes caeruleus*	*BoCC Green List*	12 singing	8 singing	3 singing	3 families, 1 bird collecting food
Bullfinch	*Pyrrhula pyrrhula*	*BoCC Red, SPI*	None	None	None	None
Buzzard	*Buteo buteo*	*BoCC Green List*	None	None	None	None
Carrion crow	*Corvus corone*	*BoCC Green List*	None	None	None	None
Chaffinch	*Fringilla coelebs*	*BoCC Green List*	6 singing	12 singing	9 singing	8 singing
Chiff chaff	*Phylloscopus collybita*	*BoCC Green List*	18 singing	11 singing	8 singing	5 singing
Coal tit	*Periparus ater*	*BoCC Green List*	None	None	None	None
Dunnock	*Prunella modularis*	*BoCC Green List (amber in the UK)*	4 singing	7 singing, 1 with juvenile	5 singing	3 singing
Goldcrest	*Regulus regulus*	*BoCC Amber List*	1 singing	2 singing	1 singing	None
Goldfinch	*Carduelis carduelis*	*BoCC Green List*	4 singing	8 singing	9 singing	2 singing
Great spotted woodpecker	*Dendrocopos major*	*BoCC Green List*	None	None	None	None
Great tit	*Parus major*	*BoCC Green List*	10 singing	4 singing	2 singing	2 families
Grey wagtail	*Motacilla cinerea*	*BoCC Amber List*	None	1 singing	None	None
Herring gull	*Larus argentatus*	*BoCC Red List, SPI*	None	None	None	None
House martin	*Delichon urbica*	*BoCC Green List, (amber in the UK)*	None	None	None	None
House sparrow	*Passer domesticus*	*BoCC Amber List, SPI*	1 pair	None	None	4 pairs
Jackdaw	*Coloeus monedula*	*BoCC Green List*	None	None	None	None
Jay	*Garrulus glandarius*	*BoCC Green List*	None	None	None	None
Kestrel	*Falco tinnunculus*	*BoCC Red List, SPI*	None	None	1 calling	None
Lapwing	*Vanellus vanellus*	*BoCC Red List, SPI*	None	None	None	None

Species	Scientific Name	Conservation Status	Breeding Activity			
Lesser black-backed gull	*Larus fuscus*	*BoCC Amber List*	None	None	None	None
Linnet	*Linaria cannabina*	*BoCC Red List, SPI*	None	None	None	None
Long-tailed tit	*Aegithalos caudatus*	*BoCC Amber List*	None	None	None	1 family
Magpie	*Pica pica*	*BoCC Green List*	None	None	None	None
Meadow pipit	*Anthus pratensis*	*BoCC Amber List*	None	None	None	None
Mistle thrush	*Turdus viscivorus*	*BoCC Amber List*	4 singing	7 singing	None	1 singing
Nuthatch	*Sitta europaea*	*BoCC Green List*	3 singing	None	None	None
Pied wagtail	*Motacilla alba*	*BoCC Green List*	None	None	None	None
Raven	*Corvus corax*	*BoCC Green List*	None	None	None	None
Redstart	*Phoenicurus phoenicurus*	*BoCC Green List*	None	1 singing	None	None
Reed warbler	*Acrocephalus scirpaceus*	*BoCC Green List*	None	None	None	None
Robin	*Erithacus rubecula*	*BoCC Green List*	30 singing	20 singing	22 singing	11 singing and one juvenile
Rook	*Corvus frugilegus*	*BoCC Green List*	None	None	None	None
Siskin	*Spinus spinus*	*BoCC Green List*	None	1 singing	None	None
Skylark	*Alauda arvensis*	*BoCC Amber List, SPI*	None	2 singing	2 singing	2 singing
Song thrush	*Turdus philomelos*	*BoCC Amber List r, SPI*	6 singing	5 singing	6 singing	4 singing
Starling	*Sturnus vulgaris*	*BoCC Red List, SPI*	None	None	None	None
Stock Dove	*Columba oenas*	*BoCC Green List (amber in the UK)*	None	None	None	None
Swallow	*Hirundo rustica*	*BoCC Green List*	None	None	None	None
Swift	*Apus apus*	*BoCC Amber List*	None	None	None	None
Wheatear	*Oenanthe oenanthe*	*BoCC Green List*	None	None	None	None
Whitethroat	*Sylvia communis*	*BoCC Red List*	None	3 singing	1 singing	1 singing
Willow warbler	*Phylloscopus trochilus*	*BoCC Red List*	3 singing	2 singing	4 singing	2 singing
Wood pigeon	*Columba palumbus*	*BoCC Green List*	None	None	None	None
Wren	*Troglodytes troglodytes*	*BoCC Green List*	27 singing	30 singing	33 singing	17 singing, 1 alarm calling

Appendix 6.3
Wintering Bird Survey

WINTERING BIRD SURVEY

Plas Power Solar and Energy Storage Project

ECO02166
Final
June 2023

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1		Georgia Kelly	Tim Oliver	Tim Oliver	05/06/23

Approval for issue

Tim Oliver	5 June 2023

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Prepared for:

Lightsource bp

EXECUTIVE SUMMARY

- RPS were commissioned by Lightsource bp to undertake a Wintering Bird Survey of the proposed Plas Power Solar and Energy Storage Project within the Plas Power Estate at Wrexham, North Wales.
- The survey area is approximately 145 ha in extent and comprises predominantly arable and pasture farmland. Mixed plantation and semi-natural broadleaved woodland blocks adjoin parts of the site.
- A total of 46 bird species were recorded within the site boundary, during the wintering bird surveys undertaken throughout winter 2022-2023.
- 24 species recorded during the surveys meet at least one of a range of criterion relating to nature conservation.
- The site is used by widespread and common bird species, with higher levels of activity recorded along hedgerows, scattered trees and woodland edges. The arable fields were used by fewer species but included farmland passerines (skylark and linnet).
- Black-headed gull, rook, meadow pipit and common gull were recorded using the site in high numbers. The site has up to county level importance for black-headed gull, rook and meadow pipit and local importance for common gull.
- The site has site-level importance for the remaining species recorded.
- Measures should be taken during the construction phase to prevent direct impacts on wintering birds. This should include stand-offs between woodland and the solar arrays.
- There will be no artificial lighting required during construction or operation and no increase in noise disturbance during operation.
- The development would result in a loss of arable habitat. In the context of the much wider extent of suitable habitat locally, it is considered unlikely that the Proposed Development would significantly impact on local populations of any species associated with the habitat and recorded within the site.
- Recommendations have been made in relation to the creation and management of habitat within the Proposed Development to maintain its value for wintering birds alongside the Proposed Development.

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Drawing 4 Wintering Bird Survey Results – February 2023

Appendices

Appendix A Full List of Species Recorded During the Wintering Bird Survey

1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS was commissioned by Lightsource bp to carry out a wintering birds survey within the Plas Power Estate at Wrexham, North Wales. The site is subject to proposals for the development of the proposed Plas Power Solar and Energy Storage Project.

1.1.2 This survey provides an update to the wintering bird survey undertaken by RPS in winter 2019-2020. The purpose of the wintering bird survey was to:

- Re-assess the assemblage of birds which use the site during the wintering months.
- Identify the range of species of conservation concern that were using the site which will be a consideration in design and installation of the Proposed Development.
- Identify potential impacts from the Proposed Development on the wintering bird assemblage and provide recommendations to avoid and mitigate potential adverse effects.

1.2 Site Description

1.2.1 The survey area is approximately 145 ha in extent and lies within the Plas Power Estate to the west of Wrexham. The National Grid coordinates for the centre of the survey area are SJ 3010 5013. The current land use is predominantly arable and pasture farmland.

1.2.2 The majority of the survey area is located to the south of the A525. Big Wood, a Wildlife Site (WS) through which the River Clywedog flows, adjoins the survey area to the south. To the west, the survey area adjoins arable fields within the wider estate and Big Wood WS. The A483 dual carriageway lies to the east.

1.2.3 This part of the site can be broadly divided into eastern and western sections, separated by a linear block of mixed plantation woodland.

1.2.4 The Proposed Development also includes a smaller area of land to the north of the A525 comprising arable fields, and a small central area of grassland/tall ruderal. This northern area adjoins arable fields to west and east. Higher Berse Marsh WS adjoins part of the eastern boundary and Higher Berse Road adjoins the northern boundary.

1.2.5 The arable land to the north and west is generally undulating and used as grass leys for silage production, while the fields in the eastern and southern sections is generally flat and used for sheep and cattle grazing. The fields are bounded by hedgerows. Ponds are present in the adjoining woodlands.

1.2.6 The wider landscape is primarily agricultural and rural to the south, north and west. The town of Wrexham lies approximately 1km to the east beyond the A483 dual carriageway. The Berwyn and South Clwyd Mountains Special Area of Conservation (SAC) lies approximately 1.8km to the west.

1.3 Development Proposals

1.3.1 The proposals involve the development of a solar photovoltaic electricity generating station (‘solar farm’), battery energy storage system (‘BESS’) and associated ancillary development. The main components of the solar farm will be solar panels and frames; inverters; transformers; cabling; a substation and perimeter fencing.

1.4 Legislation and policy

1.4.1 Relevant legislation, policy and guidance are referred to throughout this report where appropriate. Their context and application are explained in the relevant sections of this report.

1.4.2 The relevant articles of legislation are:

- Environment (Wales) Act 2016
- The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019;
- The Wildlife and Countryside Act 1981 (as amended); and

1.4.3 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.

1.4.4 Birds listed on Schedule 1 of the WCA 1981 are additionally protected from intentional or recklessly disturbance when nesting or rearing dependant young, and there are increased penalties for these offences

1.4.5 Sites which are important for the populations of species listed under Annex 1 of the Wild Birds Directive or Annex II of the Habitats Directive may be designated as a Special Protection Area (SPA) or Special Area of Conservation (SAC) respectively.

2 METHODS

2.1.1 The wintering bird survey was based on a standard 'walkover' methodology as outlined in Gilbert et al. (1998) and Bibby et al. (2000).

2.1.2 The survey comprised four survey visits undertaken by a suitably experienced ornithologist.

2.1.3 During each survey visit, the survey area was walked at a slow pace in order to locate and identify all individual birds using binoculars. The whole survey area was covered once during each visit with all areas approached to within 50-100m, where possible. The direction walked alternated between survey visits to ensure that all areas were covered at various times of day across the duration of the survey. All species encountered within the survey area were recorded and mapped.

2.1.4 On each visit, registrations were recorded on a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land). A fresh map was used for each survey. Registrations of birds were recorded using standard British Trust for Ornithology (BTO) two letter species codes

2.1.5 On completion of the surveys, the data captured during the four survey visits were analysed to provide an estimate of the abundance and distribution of notable species present.

2.1.6 Surveys were undertaken on the following dates:

- Visit 1: 9th November 2022
- Visit 2: 5th December 2022
- Visit 3: 5th January 2023
- Visit 4: 3rd February 2023

2.1.7 The weather conditions during each of the survey visits is presented in Table 2.1.

Table 2.1 Survey Weather Conditions

Date	Cloud cover (oktas)	Wind (Beaufort Scale)	Temperature (˚C)	Visibility	Rain
09/11/2022	3-5	1	9-11	Good	Dry
05/12/2022	6-8	1-2	3-6	Good	Dry
05/01/2023	8	2	8-12	Good	Light drizzle for first hour at start then dry
03/02/2023	6-8	2-3	9-11	Good	Dry

Assessment Criteria

2.1.8 In assessing the importance of the wintering bird assemblage at The Site particular focus was given to species that are afforded special statutory protection or those included on one, or more lists of species of conservation interest.

2.1.9 The key legislation and conservation lists are described below. Protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) was a lesser consideration as the protections under this act only apply during the breeding season.

Annex 1 of the EC Birds Directive (Directive 2009/147/EC)

2.1.10 Annex 1 species are those for which the UK Government are required to take special measures, including the designation of Special Protection Areas, to ensure the survival and reproduction of these species throughout their area of distribution.

Section 7 of the Environment (Wales) Act 2016

2.1.11 Section 7 of the Environment (Wales) Act places a duty on every public authority (e.g. a local authority or local planning authority), in exercising its functions, to have regard to the purpose of conserving biodiversity.

2.1.12 In addition to the wider regard for biodiversity enshrined in this duty, certain species are listed under Section 7 of the act.as being of 'Principal Importance for Conservation in Wales'. For these species Welsh Ministers must:

(a) take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and

(b) encourage others to take such steps.

Birds of Conservation Concern (BoCC) in Wales Red and Amber Lists (Johnstone et al. 2022)

2.1.13 Species listed on the BoCC Red List are those that have declined in numbers by 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995 and species that are of global conservation concern. The species on the Red List are of the most urgent conservation concern.

2.1.14 Species listed on the BoCC Amber List include those that have shown a moderate decline in numbers (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.

2.1.15 The remaining species are placed on the Green List, indicating that they are of low conservation priority. These species still receive full protection through the provisions of the Wildlife and Countryside Act 1981, as amended.

Assessment of Importance

2.1.16 The Site was evaluated to give an overall importance for each species at a geographical scale with reference to thresholds of national, regional, county, local and site importance based on the Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2016) and as described below:

- **International importance** - a species which is cited as part of the designated interest of a SPA and occurs in internationally or nationally important numbers.
- **National importance** - a species which is cited as part of the designated interest of a SSSI and occurs in nationally important numbers.
- **Regional importance** – Section 7 Species of Principal Importance, BoCC Red List species or UK BAP Priority species that regularly occur in regionally important numbers.
- **County importance** - Section 7 Species of Principal Importance, BoCC Red List species or UK BAP Priority Species that regularly occur in numbers that are important on a county basis.
- **Local importance** - Section 7 Species of Principal Importance, BoCC Red or Amber List species or UK BAP Priority Species which occur regularly in numbers of potential importance at a local level.

- **Site importance** - Section 7 Species of Principal Importance, BoCC Red or Amber List species or UK BAP Priority Species which occur in regularly very small numbers or numbers unlikely to be of more than local importance; and, all common and widespread species.

2.1.17 The overall evaluation of geographical importance was based on professional judgement using the available population information compared against the survey results.

2.1.18 Peak survey counts for each species were compared against national wintering population estimates taken from Musgrove, et al. (2013) and county wintering population estimates taken from the North-East Wales Bird Report 2021 (Clwyd Bird Recording Group (2023)).

Limitations

2.1.19 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.

2.1.20 The survey visits provide snapshots of the use of the site by different species. Consequently, survey visits may not have recorded the full assemblage of wintering birds.

Accurate Lifespan of Ecological Data

2.1.21 The majority of ecological data remains valid for defined periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for up to two years.

3 RESULTS

3.1 Species Assemblage

3.1.1 In total 46 species were recorded during the survey. A list of all species recorded during the survey is provided in Appendix 1.

3.1.2 A total of 24 of the species recorded are of conservation concern and/or species of principal importance in Wales (Table 3.1). These comprised:

- 10 Red list species of high conservation in Wales, of which 6 are also species of principal importance under Section 7 of the Environment (Wales) Act 2016.
- 12 Amber list species of moderate conservation in Wales of which 3 are also species of principal importance and 1 of which is a Schedule 1 species,
- 2 Green species in Wales (Amber in the UK), 1 of which is a species of principal importance and 1 of which is a Schedule 1 species.

Table 3.1: Species of conservation interest and Schedule 1 species recorded during the wintering survey

Species	Scientific Name	W & C Act Schedule 1 species	Birds of Conservation Concern Status (Wales)	Species of Principal Importance - Environment (Wales) Act	UK Biodiversity Action Plan
Bullfinch	*Pyrrhula pyrrhula*	-	Amber	✓	-
Black-headed gull	*Chroicocephalus ridibundus*	-	Red	✓	-
Chaffinch	*Fringilla coelebs*	-	Amber	-	-
Coal tit	*Periparus ater*	-	Amber	-	-
Common gull	*Larus canus*	-	Amber	-	-
Dunnock	*Prunella modularis*	-	Amber	✓	-
Fieldfare	*Turdus pilaris*	-	Amber	-	-
Goldcrest	*Regulus regulus*	-	Red	-	-
Goshawk	*Accipiter gentilis*	✓	Amber	-	-
Great black-backed gull	*Larus marinus*	-	Amber	-	-
Grey heron	*Ardea cinerea*	-	Amber	-	-
Herring gull	*Larus argentatus*	-	Red	✓	✓
Kestrel	*Falco tinnunculus*	-	Red	✓	-
Lapwing	*Vanellus vanellus*	-	Red	✓	✓
Lesser black-backed gull	*Larus fuscus*	-	Red	-	-
Linnet	*Carduelis cannabina*	-	Red	✓	✓
Meadow pipit	*Anthus pratensis*	-	Red	-	-
Mistle thrush	*Turdus viscivorus*	-	Amber	-	-
Redwing	*Turdus iliacus*	✓	Green	-	-
Rook	*Corvus frugilegus*	-	Red	-	-
Skylark	*Alauda arvensis*	-	Amber	✓	✓
Starling	*Sturnus vulgaris*	-	Red	✓	✓
Snipe	*Gallinago gallinago*	-	Amber	-	-
Song thrush	*Turdus philomelos*	-	Green	✓	-

3.1.3 For each survey visit, the results are presented on the following plans:

- November Survey: Drawing 1;
- December Survey: Drawing 2;
- January Survey: Drawing 3; and
- February Survey: Drawing 4.

3.2 Species Activity

Red List Species in Wales

Black-headed Gull

3.2.1 Black-headed gulls were recorded during the November, December and January visits, with between 72 and 500+ gulls recorded. Black headed gull were recorded mainly in the pasture fields in the southern section of the site where they were foraging, loafing and flying over the site.

3.2.2 The peak count was in February when a flock of over 500 was recorded foraging in a pasture field in the eastern section of the survey area. A large flock of 255 was also recorded in December, foraging and loafing at a flooded area of pasture near the centre of the survey area.

Goldcrest

3.2.3 Goldcrest were recorded in low numbers around the site boundaries during several of the survey visits.

Herring Gull

3.2.4 Herring gull were recorded during each survey visit, typically recorded flying over the site.. The peak count was in November when a total of ten were recorded flying over the south of the site in small flocks. A single herring gull was recorded loafing in the south of the site in December.

Kestrel

3.2.5 Individuals were recorded flying over the south of the site in November and over the north of the site in January.

Lapwing

3.2.6 In December a flock of 127 lapwing were recorded in a pasture field at the south of the site, where they were mainly loafing with a few individuals foraging.

Lesser Black-backed Gull

3.2.7 A single lesser black-backed gull was recorded flying over the southern part of the survey area during the February visit.

Linnet

3.2.8 Linnet were recorded in low numbers around the site boundaries during several of the survey visits.

Meadow pipit

3.2.9 In December a flock of 38 meadow pipit was recorded flying over a field to the north-east of the site. A flock of 46 was recorded at the same location in January.

Rook

3.2.10 Flocks of 56 and 78 rooks were recorded foraging in pasture fields in the eastern sections of the survey area in February. A flock of 36 rook were recorded in the central woodland during the November visit.

Starling

3.2.11 A flock of 112 starling were recorded in a field in south of the site in December.

Amber List Species in Wales

Bullfinch

3.2.12 Bullfinch were recorded in low numbers around the site boundaries during several of the survey visits.

Chaffinch

3.2.13 Chaffinch were recorded in low numbers around the site boundaries during several of the survey visits.

Coal tit

3.2.14 In February, 11 coal tits were recorded in the plantation woodland adjoining the central section of the site.

Common Gull

3.2.15 Two common gulls were recorded in the south of the site in November compared to 39 common gulls in December, consisting of small flocks on foraging and loafing bird in the south and east of the site.

3.2.16 Two larger flocks (52 and 19) were recorded in February foraging and loafing in pasture fields in the eastern section of the site.

Dunnock

3.2.17 Dunnock were recorded in low numbers around the site boundaries during several of the survey visits.

Goshawk

3.2.18 Goshawk were recorded in low numbers around the site boundaries during several of the survey visits.

Great Black-backed gull

3.2.19 A single great black-backed gull was recorded within a large (500+) group of gulls in a pasture field in the eastern part of the site in February.

Grey Heron

3.2.20 Three grey heron were recorded loafing in a field at the south of the site in January.

3.2.21 Four grey heron were recorded in February but only one of which was observed within the site, in a pasture field to the east. The other birds were an individual observed at the off-site pond within the plantation woodland and two observed flying over the survey area.

Fieldfare

3.2.22 Flocks of fieldfare were recorded flying over the north of the site in November and December. The peak count was in November when a total of 16 were recorded.

Mistle Thrush

3.2.23 Mistle thrush were recorded in low numbers around the site boundaries during several of the survey visits.

Snipe

3.2.24 Three snipe were recorded foraging in fields off-site to the east in November. Two snipe were recorded flying over the south of the site in December and a single sipe was recorded in February.

Skylark

3.2.25 Skylark were recorded in low numbers around the site boundaries during several of the survey visits.

Other Species

Redwing

3.2.26 Flocks of redwing were recorded in November and December flying over the site. A peak count of 32 was recorded in November.

Song Thrush

3.2.27 Song thrush were recorded in low numbers around the site boundaries during several of the survey visits.

Additional species recorded in 2019 - 2020

3.2.28 The following species of conservation concern were recorded during the 2019 - 2020 wintering bird survey but were not present during the 2022 – 2023 survey.

Birds of Conservation Concern Status (Wales) Red list species

- Yellowhammer *Emberiza citronella*
- Greenfinch *Chloris chloris*

Birds of Conservation Concern Status (Wales) Amber list species

- Green Woodpecker *Picris picris*
- House sparrow *Passer domesticus*
- Teal *Anas crecca*

Schedule 1 species:

- Peregrine *Falco peregrinus*

3.2.29 Mallard *Anas platyrhynchos*, previously an Amber list species, has since been moved to the BoCC (Wales) Green list. The species was present on the pond at the centre of the site in both 2019 – 2020 and 2022 – 2023.

3.2.30 The following species were also previously Amber list species which have since been moved to the Green list and were recorded during 2019 – 2020 but not recorded during 2022 – 2023: kingfisher *Alcedo atthis*, long-tailed tit *Aegithalos caudatus*, reed bunting *Emberiza schoeniclus.*

3.2.31 There have been no significant changes to habitats within the site since the 2019 – 2020 survey. The site continues to provide suitable habitat for species recorded during the 2019 – 2020 survey but not recorded during the 2022 – 2023 survey.

4 EVALUATION

4.1 Geographical importance

4.1.1 The following geographical frames of reference and selection criteria (based on the Guidelines for Ecological Impact Assessment in the United Kingdom [CIEEM, 2018]) are used to ascribe nature conservation value or potential value to the bird populations within the survey area.

- International importance - a species which is cited as part of the designated interest of a SPA and occurs in internationally or nationally important numbers.
- National importance - a species which is cited as part of the designated interest of a SSSI and occurs in nationally important numbers.
- Regional importance – Species of Principal Importance, UK Biodiversity Action Plan (UK BAP) Priority Species, BoCC Red List species that regularly occur in regionally important numbers.
- County importance - Species of Principal Importance, BoCC Red List species or UK BAP Priority Species that regularly occur in numbers that are important on a county basis.
- Local importance - Species of Principal Importance, UK BAP Priority Species, BoCC Red or Amber List species which occur regularly in locally sustainable populations.
- Site - all common and widespread species.

4.1.2 Table 4.1 summarises the abundance of species of conservation interest recorded during the survey, the national population estimate and county status for these species and the geographical importance of the populations within the survey area as derived from the criteria outlined above. National wintering population estimate and county status have been informed by Musgrove et al. (2013) and CBRG (2022).

4.1.3 The following species were recorded in low numbers along the site boundaries and are not included in Table 4.1: bullfinch, chaffinch, dunnock, goldcrest, goshawk, linnet, mistle thrush, skylark and song thrush. The populations associated with the site have no more than site level importance.

Table 4.1: Species of conservation interest, mean and maximum counts and conservation and county status

Species	Peak Count within Survey Area	UK wintering population	County status	Level of importance of onsite population
Black-headed gull	500+	2.2 million	Uncommon breeding resident and abundant winter visitor	District/County
Coal tit	11	1.5 million*	Very common breeding resident	Site
Common gull	71	710,000	Abundant passage migrant and winter visitor	Local
Fieldfare	16	720,000	Common winter visitor	Site
Great black-backed gull	1	77,000	Uncommon breeding resident and common winter visitor	Site
Grey heron	4	63,000	Common sight and fairly-common resident, breeding at a few sites	Site
Herring gull	10	740,000*	Common breeding resident and abundant winter visitor	Site
Kestrel	1	92,000*	Uncommon breeding resident	Site
Lapwing	127	650,000	Declining breeding resident and abundant winter visitor	Site
Lesser black-backed gull	1	130,000*	Common breeding resident and very common winter visitor	Site

Species	Peak Count within Survey Area	UK wintering population	County status	Level of importance of onsite population
Meadow pipit	46	4 million	Fairly common breeding upland resident, passage migrant and winter visitor.	District/County
Redwing	32	690,000	Common winter visitor	Site
Rook	134	2.2 million*	Very common breeding resident	District/County
Starling	112	3.8 million*	Very common breeding resident and winter visitor	Site
Snipe	3	1.1 million	Rare upland breeding resident and common winter visitor	Site

* Strict GB/UK estimate excluding Isle of Man

4.1.4 Most of the wintering bird species were recorded within the survey area in low numbers and do not form a significant proportion (i.e. 1% or more) of the national wintering population estimates as detailed in Musgrove et al. (2013) or the county population (CBRG, 2022). Therefore for these species wintering populations across the survey area are considered to be of no more than local importance.

4.1.5 Over 500 black-headed gull were recorded at the site. The maximum count in 2021 across the county was 2,210 and the ten-year average maximum count between 2010-2020 is 1,442. The population within the site is considered to have up to county level importance.

4.1.6 A peak count of 134 rook were recorded at the site. The maximum count in 2021 across the county was 86 and the ten-year average maximum count between 2010-2020 is 246. The population within the site is considered to have up to county level importance.

4.1.7 A peak count of 46 meadow pipits was recorded in land adjoining the site. The maximum count in 2021 across the county was a flock of over 150 and the ten-year average maximum count between 2010-2020 is 102. The population within the site is considered to have up to county level importance.

4.1.8 A peak count of 71 common gull were recorded at the site. The maximum count in 2021 across the county was 700 and the ten-year average maximum count between 2010-2020 is 1,329. The population within the site is considered to have up to local importance.

4.1.9 The site continues to provide suitable habitat for the following species which were recorded during the 2019 – 2020 survey but were not present during the 2022 – 2023 survey: green woodpecker, greenfinch, house sparrow, kingfisher, long-tailed tit, mallard, peregrine, reed bunting, teal, yellowhammer.

4.1.10 Based on the populations recorded during the 2019 – 2020 survey and the absence of the above species during the 2022 – 2023 survey, wintering populations across the survey area are considered to be of no more than site level importance.

4.1.11 Overall the wintering bird assemblage recorded during the survey is considered typical for the habitats present within survey area. Whilst the majority of species recorded are common and widespread the survey area does provide wintering habitat for an assemblage of notable species.

4.1.12 The main habitats of ornithological value within the survey area were arable/pasture which is the predominant habitat type with the fields bounded by hedgerows and woodland blocks. Activity was also recorded at the woodland pond adjoining the central part of the survey area. The habitat associations of the bird species are summarised in Table 4.2.

Table 4.2 Species Habitat Associations

Habitat Type	Associate Wintering Bird Species
Arable farmland and pasture	Gull species, starling, snipe, lapwing, grey heron, meadow pipit
Hedgerows / field margins	Fieldfare, redwing
Woodland blocks (adjoining the site)	Rook
Ponds and waterbodies	Coal tit, grey heron

5 CONCLUSIONS AND RECOMMENDATIONS

5.1.1 The survey of wintering birds recorded an assemblage within the survey area of 46 species. A total of 24 species of conservation concern (Species of Principal Importance, Red listed BoCC, Amber Listed BoCC and/or WCA Schedule 1 species) were recorded within or adjacent to the Proposed Development area during the winter survey visits.

5.1.2 The majority of species of conservation interest were considered to be present in numbers that would have importance at site level. Black-headed gull, rook and meadow pipit were present in numbers which may have up to county level importance. Common gull were present in numbers which may have up to local level importance.

5.1.3 The retention of grassland, hedgerow, and ditch habitats within the Proposed Development will continue to support the majority of the wintering bird species assemblage. Planting mixes will use a variety of native species to providing nectar and pollen sources for invertebrates.

5.1.4 Minimum stand-offs will be implemented around off-site woodland (minimum 15m), hedgerows and ditches (minimum 5m) during the construction phase. Should hedgerow loss be required, this will be limited to small sections to widen existing access points. Hedgerows and ditches will be managed to ensure their long-term health so that they continue to provide habitat of value for wildlife.

5.1.5 Some species would be expected to continue to forage on the ground between and beneath solar arrays in the developed site, while others such as the gulls would be more likely to feed on grassland and arable land outside of the development boundary.

5.1.6 There were low levels of wintering bird activity in the arable fields at the north of the site. The species recorded on arable within the site will be foraging across a wide area with the site making up a small proportion of the total area of managed farmland in the locality.

5.1.7 The sowing of field margins with winter crop mixes would mitigate the loss of arable land. Suitable seed-bearing crops would include barley, triticale, quinoa, linseed, millet, mustard, fodder radish and sunflower. Areas should be c6m wide where possible and run along the southern side of hedgerows to minimise shading remaining in the ground in autumn and winter.

5.1.8 The management of grassland between the perimeter fence of the Proposed Development and field boundaries as tussocky grassland would/will provide additional foraging habitat of higher value than the existing habitat.

5.1.9 With habitat mitigation and enhancement measures built into the landscape design and management plan, there is potential for increases in the range of species and flock sizes of wintering birds using the site over the lifetime of the development.

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DRAWINGS

Drawing 1	**Wintering Bird Survey Results – November 2022**
Drawing 2	**Wintering Bird Survey Results – December 2022**
Drawing 3	**Wintering Bird Survey Results – January 2023**
Drawing 4	**Wintering Bird Survey Results – February 2023**



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Legend

- Survey boundary

Amber-listed species
- Number of birds: 1-3
- Number of birds: 11-50

Red-listed species
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Schedule 1 species
- Number of birds: 11-50

CM - Common gull
FF - Fieldfare
SN - Snipe
BH - Black-headed gull
HG - Herring gull
K. - Kestrel
RO - Rook
RE - Redwing

Rev	Description	By	CB	Date

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Project Number	**Scale @ A3**	**Date Created**
ECO02166	1:8,500	MAY 2023

Figure Number **1** Rev **-**

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Legend

- Survey boundary

Amber-listed species
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50

Red-listed species
- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Schedule 1 species
- Number of birds: 11-50

CM - Common gull
FF - Fieldfare
SN - Snipe
BH - Black-headed gull
HG - Herring gull
L. - Lapwing
MP - Meadow Pipit
SG - Starling
RE - Redwing

Rev	Description	By	CB	Date

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Legend

- Survey boundary

Amber-listed species

- Number of birds: 1-3

Red-listed species

- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

H. - Heron
BH - Black-headed gull
HG - Herring gull
MP - Meadow Pipit
K. - Kestrel

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Legend

Survey boundary

Amber-listed species

- Number of birds: 1-3
- Number of birds: 4-10
- Number of birds: 11-50
- Number of birds: 50+

Red-listed species

- Number of birds: 1-3
- Number of birds: 50+

CM - Common gull
CT - Coal tit
GB - Great black-backed gull
H. - Heron
HS - House sparrow
SN - Snipe
T. - Teal
BH - Black-headed gull
HG - Herring gull
LB - Lesser black-backed gull
RO - Rook

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ECO02166	1:8,500	MAY 2023
Figure Number		**Rev**
4		**-**

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APPENDICES

Appendix A

Full List of Species Recorded During the Wintering Bird Survey

Apx Table 1: Full list of species recorded during the wintering bird surveys and their conservation status

Species	Scientific Name	W & C Act Schedule 1 species	Birds of Conservation Concern Status (Wales)	Species of Principal Importance - Environment (Wales) Act	UK Biodiversity Action Plan
Blackbird	*Turdus merula*	-	-	-	-
Bullfinch	*Pyrrhula pyrrhula*	-	Amber	✓	-
Black-headed gull	*Chroicocephalus ridibundus*	-	Red	✓	-
Blue tit	*Cyanistes caeruleus*	-	-	-	-
Buzzard	*Buteo buteo*	-	-	-	-
Carrion crow	*Corvus corone*	-	-	-	-
Chaffinch	*Fringilla coelebs*	-	Amber	-	-
Coal tit	*Periparus ater*	-	Amber	-	-
Common gull	*Larus canus*	-	Amber	-	-
Dunnock	*Prunella modularis*	-	Amber	✓	-
Fieldfare	*Turdus pilaris*	-	Amber	-	-
Goldcrest	*Regulus regulus*	-	Red	-	-
Great crested grebe	*Podiceps cristatus*	-	-	-	-
Goldfinch	*Carduelis carduelis*	-	-	-	-
Goshawk	*Accipiter gentilis*	✓	Amber	-	-
Great spotted woodpecker	*Dendrocopos major*	-	-	-	-
Great tit	*Parus major*	-	-	-	-
Great black-backed gull	*Larus marinus*	-	Amber	-	-
Grey heron	*Ardea cinerea*	-	Amber	-	-
Herring gull	*Larus argentatus*	-	Red	✓	✓
Jackdaw	*Corvus monedula*	-	-	-	-
Kestrel	*Falco tinnunculus*	-	Red	✓	-
Lapwing	*Vanellus vanellus*	-	Red	✓	✓
Lesser black-backed gull	*Larus fuscus*	-	Red		-
Linnet	*Carduelis cannabina*	-	Red	✓	✓
Long-tailed tit	*Aegithalos caudatus*	-	-	-	-
Mistle thrush	*Turdus viscivorus*	-	Amber	-	-
Meadow pipit	*Anthus pratensis*	-	Red	-	-
Nuthatch	*Sitta europaea*	-	-	-	-
Pied wagtail	*Motacilla alba*	-	-	-	-
Robin	*Erithacus rubecula*	-	-	-	-
Raven	*Corvus corax*	-	-	-	-
Redwing	*Turdus iliacus*	✓	Green	-	-
Rook	*Corvus frugilegus*	-	Red	-	-
Skylark	*Alauda arvensis*	-	Amber	-	✓
Snipe	*Gallinago gallinago*	-	Amber	-	-

Song thrush	*Turdus philomelos*	-	Green	✓	-
Sparrowhawk	*Accipiter nisus*	-	-	-	-
Stock dove	*Columba oenas*	-	-		-
Starling	*Sturnus vulgaris*	-	Red	✓	✓
Woodpigeon	*Columba palumbus*	-	-	-	-
Wren	*Troglodytes troglodytes*	-	-	-	-

Appendix 6.4: GREAT CRESTED NEWT REPORT

Plas Power Estate

ECO02166
1
September 2023

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Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Issue	Georgia Kelly	Tim Oliver	Kerry Shakespeare	04 October 2023

Approval for issue

Kerry Shakespeare	4 October 2023

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Prepared for:

Lightsource BP

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Figure 1: Great Crested Newt Results Plan

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Appendix A: Habitat Suitability Index Results
Appendix B: eDNA Laboratory Results
Appendix C: Presence / Absence Survey Results

1 INTRODUCTION

1.1.1 RPS was commissioned by Lightsource BP to undertake a great crested newt survey of the Plas Power Estate at Wrexham, North Wales. The site is subject to proposals for development as a solar farm and Battery Energy Storage System facility.

1.1.2 The Preliminary Ecological Appraisal (PEA) for the site identified the presence of habitat suitable for great crested newt (GCN) within the site (RPS, 2023, ES Appendix 6.1).

1.1.3 A previous GCN survey undertaken by RPS in 2021 included the majority of ponds within 600 m of the site. The planning application boundary has been updated since the 2021 survey and the 2023 surveys have been undertaken of additional ponds within the 600m buffer which were not included in the 2021 survey. The locations of the waterbodies are shown on Figure 1.

1.1.4 The HSI and eDNA surveys have been undertaken to determine the suitability of the habitat and the presence or likely absence of great crested newts within the Proposed Development site and assess the potential impact of the Proposed Development on the species.

1.2 2021 Survey

1.2.1 The 2021 survey recorded the presence of a small-sized GCN population within pond P3, 60 m west of the Proposed Development.

1.2.2 A medium-sized metapopulation was recorded in ponds P8 and P9, 710m west of the Proposed Development.

1.2.3 P5, 100 m north of the Proposed Development was dry during 2021 but was considered to have potential to periodically support a small population of GCN when water levels are higher (following discussions with NRW).

1.2.4 The likely absence of GCN from the remaining three waterbodies (WB1, P2 and P4) included in the 2021 survey was concluded.

1.3 Site Description

1.3.1 The Proposed Development is approximately 145 ha in size located to the west of Wrexham, North Wales, centred at grid reference SJ 301 501.

1.3.2 The site comprises two sections of land located to the north and south of the A525. The majority of the survey area lies to the south of the A525 and covers 125 ha of farmland, most of which is pasture. A 20 ha section of the survey area lies to the north of the A525 and largely comprises arable farmland (grass ley fields). Small sections of amenity grassland and tall ruderal are present.

1.3.3 The fields are bounded by hedgerows, mature and semi-mature trees and woodland.

1.3.4 Big Wood Wildlife Site (WS) adjoins the survey area to the south with the River Clywedog flowing through this block of woodland. Higher Berse Marsh WS adjoins the survey area at the north and Afon Gwenfro WS lies beyond the B5430 (Higher Berse Road) to the north of the survey area.

1.3.5 The A483 dual carriageway is located to the east of the survey area, adjoining the site boundary to the south-east.

1.3.6 The wider landscape comprises farmland, the city of Wrexham to the east and smaller villages to the north and east.

1.4 Legislation and policy

1.4.1 Great crested newts *Triturus cristatus* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (and as amended), which affords the species protection under Section 9. The species is also listed on Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. In combination, this makes it an offence to:

- intentionally kill, injure or take (capture etc.) a great crested newt;
- possess a great crested newt; or,
- intentionally or recklessly damage, destroy, obstruct access to any structure or place used by great crested newt for shelter or protection, or disturb any animal occupying such a structure or place; and sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

1.4.2 Great crested newts are also a UK Biodiversity Action Plan (UKBAP) priority species and listed as Species of Principal Importance under Section 7 of the Environment (Wales) Act 2016. This legislation requires the conservation of great crested newt and their habitats to be given consideration in planning decisions.

2 METHODS

2.1 Waterbody Locations

2.1.1 An OS base map and a walkover survey of the Proposed Development were used to locate waterbodies within a 600 m buffer of the Proposed Development.

2.2 Habitat Suitability Index Assessment

2.2.1 A HSI survey was undertaken on ponds on 5th April 2023 by a suitably experienced ecologist. The HSI assessment methodology followed that prepared by the Kent Amphibian and Reptile Group (ARGUK 2010) based on the original HSI methodology (Oldham et al, 2000).

2.2.2 The method ascribes a score for 10 habitat parameters, based on field observations for each including pond size, water quality, presence/absence of fish, and the surrounding terrestrial habitats.

2.2.3 The final HSI index score of all the attributes gives a qualitative assessment of the suitability for GCN.

- Poor - HSI score of less than 0.50
- Below Average - HSI score of between 0.50 and 0.59
- Average - HSI score of between 0.60 and 0.69
- Good - HSI score of between 0.70 and 0.79
- Excellent - HSI score of greater than 0.80

2.3 Environmental DNA Survey

2.3.1 The eDNA survey was undertaken on ponds P1 and P6.

2.3.2 The eDNA survey was undertaken on 17th April 2023. The surveyors followed sterile collection procedures and treatment of sample kits (Biggs et al, 2014a).

2.3.3 When GCN are present in a waterbody, traces of their DNA are left in the water, remaining in the water column for up to three weeks. The eDNA testing uses multiple samples of water from each waterbody which are tested for traces of GCN DNA to assess presence / absence.

2.3.4 The eDNA laboratory testing was conducted by Surescreen Nature Metrics, a company which scored 100% in the 2023 proficiency testing. Laboratory analysis was consistent with the methods described in the DEFRA WC1067 Technical Note, including control analyses for DNA degradation during sample transport and inhibition of the detection of DNA from chemicals in the collected water sample.

2.4 Presence / Absence Survey

2.4.1 Three presence / absence survey visits were undertaken at ponds P1 and P10 to supplement the eDNA survey results. The surveys were undertaken on the following dates:

- 16/05/2023 – 17/05/2023
- 25/04/2023 – 26/05/2023
- 30/04/2023 – 31/05/2023

2.4.2 Torch surveying, bottle trapping and egg searching were used at pond P1. Due to the shallow depth of the pond, egg searching was the only survey technique which could be used at pond P10.

2.4.3 The survey techniques were undertaken as described below:

- **Torch surveying:** Torching was undertaken from 30 minutes after sunset using 1,000,000 candlepower torches. GCN were searched for by shining the torch into the water column around all the accessible margins of each pond. Other aquatic amphibian fauna seen during the survey was also recorded, along with details of water clarity and weather conditions (e.g. rain or heavy wind) that could impact upon the effectiveness of the search.
- **Bottle trapping:** Traps (modified two-litre water bottles) were set along the edge of the accessible pond. The traps were placed out before sunset and were checked early the next morning. Each trap was placed in the pond partially below the water line and secured in place with a cane.
- **Egg searching:** Newt eggs are laid underwater singly on suitable material (often the pliable leaves of marginal plants, although dead leaves, leaf litter and even discarded litter can also be used) with the egg enclosed in a fold created by the female GCN to protect it from predation and UV light. Vegetation and debris throughout all the accessible areas of the pond were checked for the presence of GCN eggs, which can be distinguished from the eggs of other native newt species by their colour and size.

2.5 Limitations

2.5.1 The eDNA and Presence / Absence surveys were undertaken during the optimal survey period, with the Presence / Absence survey being undertaken over a three-week period. The surveys were undertaken following a dry winter. The weather during the survey period was variable with some colder than average days in early and mid-April, however the overall weather conditions during the survey period were not significantly different to previous years. As such the results of the 2023 surveys are considered to provide an accurate representation of the status of GCN within the surveyed ponds.

2.5.2 Ponds P6 and P7 are located within private land and were not accessed during the survey.

2.5.3 Ponds P5 was dry throughout the 2023 survey period and neither eDNA testing nor traditional presence / absence survey could be undertaken on the pond.

2.5.4 Pond P1 is located in a depression within a woodland and is surrounded by marshy ground. Due to the ground conditions only 10% of the margin was accessible during the survey.

2.5.5 Pond P10 comprises a shallow wet area at the edge of a stream. The area was too shallow to deploy bottle traps or use a net and deeper areas could not be accessed for torching due to the surrounding marshy ground. Egg searches were conducted of accessible vegetation at the edge of the pond.

3 RESULTS

3.1 Waterbody Locations

3.1.1 A total of five previously unsurveyed waterbodies were identified within 500 m of the Proposed Development:

- P1: A pond located in a depression on the eastern edge of a block of broadleaved woodland within Higher Berse Marsh Wildlife Site, 60 m east of the site. The pond is approximately 20 m by 40 m in size and is estimated to be up to 1 m in depth. Willow trees shade 90% of the pond margin. Patches of emergent vegetation are present at the edges and include yellow flag iris, bulrush, water mint, pendulous sedge, brooklime and fool's watercress. The water is turbid. A few coots were present on the pond during the survey visit. The surrounding ground is waterlogged. In the wider woodland are patches of bramble, bracken, nettle and scrub.
- P5: A dry pond fringed by scrub, located in a field 80 m north of the site. The pond was unsurveyed in 2021 as it was dry.
- P6: A small garden pond 430 m east of the site. The pond measures 8 m by 3 m.
- P7: The pond is located 550 m east of the site within a belt of broadleaved woodland between Heritage Way and an industrial landholding. Based on aerial photography, the pond measures approximately 40 m by 30 m in size.
- P10: The pond is located at the edge of a pasture field 270 m north of the site, separated from the site by the Higher Berse Road. The ponds comprises a shallow area of still water on low lying ground at the edge of a stream, approximately 12 m by 30 m. A dense cover of emergent aquatic species are present including fool's watercress, water mint, common reed, brooklime and bulrush. Willow and alder are present at the margins. There is a deep layer of soft mud at the base of the pond. Small pockets of deeper water have a maximum depth of 0.2 m.

3.1.2 The locations of each of the waterbodies are shown on Figure 1.

3.2 Habitat Suitability Index Survey

3.2.1 Pond P1 was found to have 'good' suitability for GCN with a HSI score of 0.73.

3.2.2 Pond P10 was found to have 'average' suitability for GCN with a HSI score of 0.65.

3.2.3 The full results are provided in Appendix A.

3.3 Environmental DNA Survey

3.3.1 The eDNA results for P1 and P10 were negative indicating that great crested newts are absent. The full eDNA laboratory results are provided in Appendix B.

3.4 Traditional Presence / Absence Survey

3.4.1 No GCN were recorded during the traditional presence / absence survey of P1 and P10. The full survey results are provided in Appendix C.

4 EVALUATION

4.1 GCN populations in ponds surveyed in 2023

4.1.1 The eDNA results for ponds P1 and P10 indicate the likely absence of GCN from these ponds.

4.1.2 Although the presence / absence survey of both ponds P1 and P10 was constrained, in combination with the eDNA results it provides further evidence of the likely absence of GCN from the ponds. The surveys were undertaken over three weeks within the optimal survey period for GCN and are considered to accurately represent the status of GCN within the ponds during 2023.

4.1.3 As pond P5 was dry during the 2023 the presence of small population will be assumed in any years when it holds open water in spring and summer.

4.1.4 Under a precautionary approach, as access to ponds P6 and P7 was not possible, the presence of GCN in these pond should be assumed. Both ponds are over 430 m from the site and movement of individuals between the site and these ponds would be expected to be limited.

4.2 Implications for development

4.2.1 Pond P3, which supports a small population, is 60m east of the Application Site boundary and terrestrial habitats in the western part of the solar park have the potential to be regularly used by GCN.

4.2.2 Ponds P8 and P9 which support a medium-sized GCN meta-population are located 710 m west of the solar park development. The majority of individuals within ponds P8 and P9, and P6 and P7 if they support GCN, will utilise terrestrial habitats outside of the proposed solar park.

4.2.3 Should the dry pond (P5) support breeding GCN during wetter springs the arable and pasture habitats within the site would fall within the range GCN can travel.

4.2.4 Ponds within the survey area which support or are assumed to support GCN are bounded by broadleaved woodland or separated from the site by extensive broadleaved woodland. The majority of the GCN populations in each pond would be expected to remain within the higher quality habitats close to the ponds.

4.2.5 The solar arrays and associated infrastructure will largely be installed within grass leys and pasture, which are not optimal terrestrial newt habitat.

4.2.6 The installation of solar parks is typically a low impact activity compared to many other types of development, however vehicle and equipment movement and storage, solar panel and perimeter fence installation, infrastructure installation and ground preparation has the potential to harm newts if they are present within the working area.

5 MITIGATION AND ENHANCEMENT

5.1.1 The development would be carried out under a European Protected Species (EPS) Mitigation licence for GCN. A separate GCN Mitigation Strategy will be prepared and submitted with details of:

- Species protection measures during enabling works and construction / installation
- Mitigation for any habitat loss as a result of the development to ensure the favourable conservation status of GCN is maintained at The Application Site
- Enhancement measures to provide overall benefit for GCN within the Application Site as a result of the development

5.1.2 The mitigation strategy would form the basis of the method statement which will be submitted with the EPS mitigation licence application.

5.1.3 Habitats of highest value for GCN (ponds, hedgerows, woodland and long grass field margins) will be retained. The development will be limited to loss / disturbance of short pasture and arable fields.

5.1.4 Species protection will be based on seasonal timing of works to avoid periods when GCN are more likely to be present. Where necessary ecological supervision by a licensed GCN surveyor would be provided to ensure that a suitable working method is followed and that higher risk areas are avoided.

5.1.5 Replacement habitats and enhancement would be provided to create an overall gain in the extent of suitable habitat for GCN. Retained field margins would be allowed to grow longer increasing the extent of longer grassland alongside hedgerows enhancing foraging opportunities and connectivity across the site.

5.1.6 Areas of longer tussocky grassland and ponds would be created within Biodiversity Enhancement Areas that are currently short pasture or arable. This would further increase the extent of suitable terrestrial foraging habitat.

6 CONCLUSIONS

6.1.1 Pond P3 to the west of the site supports a small sized GCN population. A medium-sized metapopulation is present in Ponds P8 and P9 660m west of the site.

6.1.2 GCN are also presumed to be present in ponds P5, P6 and P7 under a precautionary basis.

6.1.3 Surveys in 2021 and 2023 have confirmed the likely absence of GCN from the remaining ponds within 600 m of the development (P1, WB1, P2, P4 and P10).

6.1.4 Habitats of highest value for GCN (hedgerows, woodland and long grass field margins) will be retained within the development.

6.1.5 There is a low risk GCN using lower value habitats where the solar panels and associated infrastructure will be installed and therefore being harmed during enabling works and construction / installation.

6.1.6 The development would be carried out under a European Protected Species Mitigation licence for GCN which would specify species protection measures during enabling works and construction, mitigation for habitat loss and enhancement / habitat creation. Species protection measure will be based on seasonal timing of works to avoid periods when GCN are more likely to be present, with ecological supervision by a licensed GCN surveyor where necessary.

6.1.7 New ponds and longer / tussocky grassland will be created within Biodiversity Enhancement Areas to provide additional habitat for GCN.

6.1.8 The creation of tussocky grassland along retained field margins will provide additional cover and foraging habitats for GCN and the management of grassland field boundaries will enhance connectivity across the solar park.

6.1.9 Landscape management of the operational solar park will be designed to deliver benefits for biodiversity over the lifetime of the development with the conservation of the GCN population influencing the timing and specification of habitat management actions.

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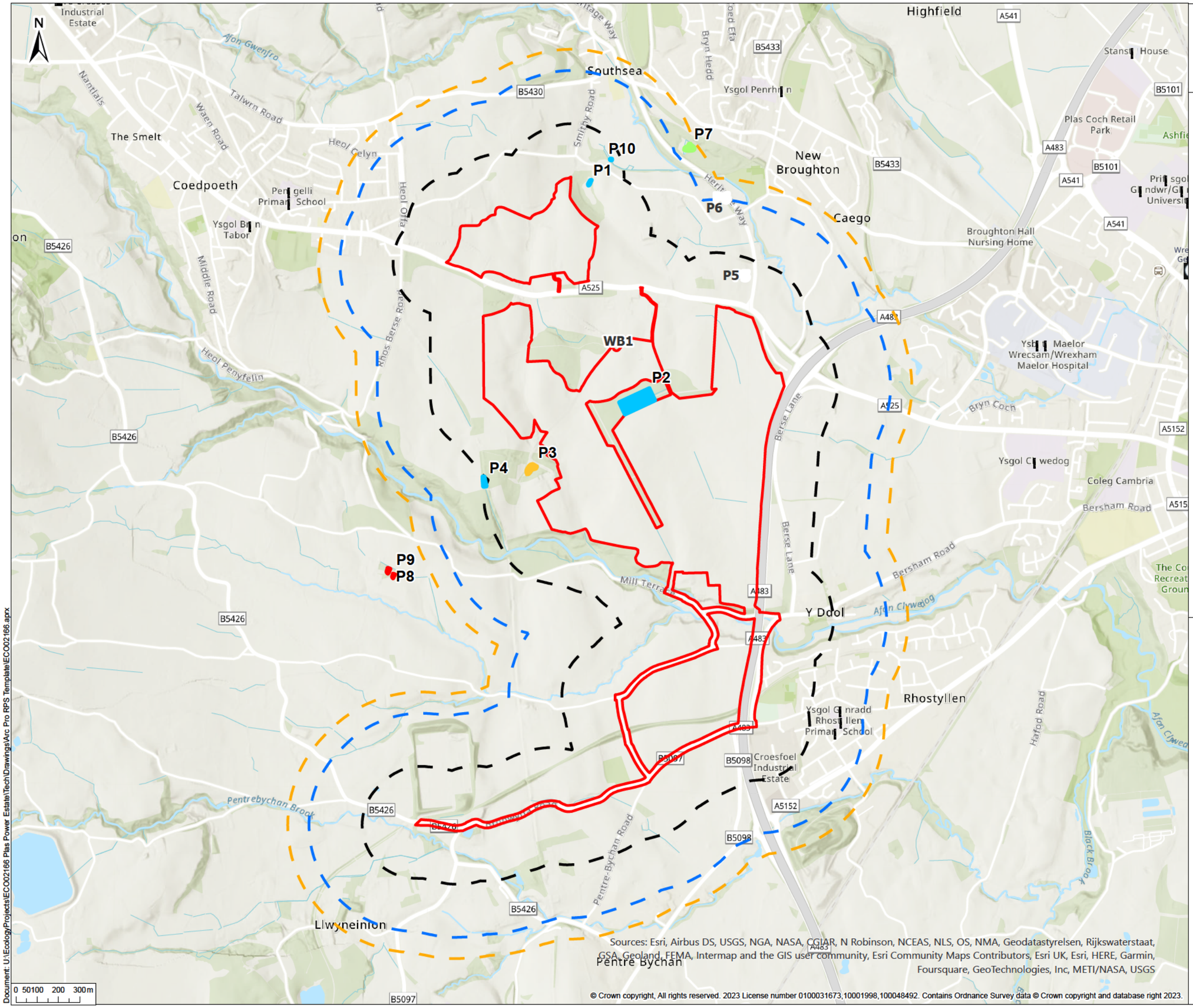
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FIGURES



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

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Legend

- Site Boundary
- 250m buffer
- 500m buffer
- 600m buffer

waterbodies

GCN population

- Medium
- Small
- Assumed present
- Absent

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Client	RPS Cardiff
Project	Plas Power Solar Park
Title	Waterbodies GCN population

Status	Drawn By	PM/Checked By
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APPENDICES

Appendix A

Habitat Suitability Index Results

Suitability Index	Suitability Index Value	
	P1	P10
Geographic location	1.00	1.00
Pond area	0.99	0.72
Pond permanence	0.90	0.10
Water quality	0.67	0.67
Shade	0.40	0.70
Waterfowl effect	0.67	0.67
Fish presence	1.00	1.00
Pond Density	0.78	0.75
Terrestrial habitat	0.67	1.00
Macrophyte cover	0.50	0.80
HSI score	0.73	0.65
Pond suitability	**Good**	**Average**

Appendix B

eDNA Laboratory Results

SureScreen Scientifics

Folio No: E17552
Report No: 1
Purchase Order: PO 2255
Client: ENFYS ECOLOGY
Contact: Keymar Wake

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 23/05/2023
Date Reported: 30/05/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3826	Plas Power - Pond 1 RPS 4075	SJ 30151 51226	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Chelsea Warner

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

SureScreen Scientifics

Folio No: E17553
Report No: 1
Purchase Order: PO 2254
Client: ENFYS ECOLOGY
Contact: Keymar Wake

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

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Date Reported: 30/05/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3828	Plas Power - Pond 10 RPS	SJ 30318 51306	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Chelsea Warner

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Appendix C

Presence / Absence Survey Results

Pond P1

Date	Weather	Air temp	Presence of GCN eggs	GCN recorded during torching	GCN recorded during bottle trapping	Other species recorded during bottle trapping
16/05/2023 – 17/05/2023	Dry, calm in evening and light breeze in morning, 40-90% cloud cover	13.5 - 16	-	-	-	-
25/05/2023 – 26/05/2023	Dry, light breeze, 30% cloud cover	13-17	-	-	-	-
30/05/2023 – 31/05/2023	Dry, 5-60% cloud cover, light breeze	10-18	-	-	-	1 x male palmate; 1 x male smooth

Percentage of shoreline accessible: 10%

Number of bottle traps used: 16

Pond P10

Date	Weather	Air temp	Presence of GCN eggs
16/05/2023 – 17/05/2023	Dry, light breeze, 90% cloud cover	13.5	-
25/05/2023 – 26/05/2023	Dry, light breeze, 30% cloud cover	13	-
30/05/2023 – 31/05/2023	Dry, 60% cloud cover, light breeze	10	-

Percentage of shoreline accessible: 30%

Appendix 6.5 GREAT CRESTED NEWT SURVEY

Plas Power Estate

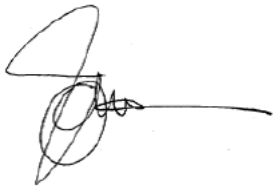


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EXECUTIVE SUMMARY

- RPS were commissioned by Lightsource BP to undertake a great crested newt (GCN) survey of all accessible and suitable waterbodies within 600m of the Application Site boundary of the proposed solar park at the Plas Power Estate, Wrexham, North Wales. Lightsource BP propose to install a solar park at the site. The GCN surveys will be used to inform the Environmental Impact Assessment (EIA) for the proposed development.
- A total of seven water bodies (six ponds and a stream) were identified from OS maps and aerial photographs for inclusion in the survey.
- The waterbodies were located from aerial imagery and site walkovers.
- Habitat Suitability Index (HSI) assessment, Environmental DNA (eDNA) survey, standard presence / absence surveys and population size class assessments were all undertaken.
- The surveys concluded the following:
    - Waterbody 3 – confirmed to support a small population of GCN
    - Waterbodies 8 and 9 – confirmed to support medium metapopulation of GCN.
    - Waterbodies 5 (which was dry) – having the potential to periodically support a small population of GCN when water levels are higher (following discussions with NRW).
    - Waterbody 1 is a stream (dry at the time of the survey) is considered unsuitable for GCN.
    - Waterbodies 2 and 4 – GCN confirmed very likely absent after eDNA and presence / absence surveys.
- The development will retain the habitats of highest value for GCN (hedgerows, woodland and long grass field margins).
- There will be temporary disturbance of grazed pasture and arable fields/grass leys during the installation and decommissioning of the solar arrays.
- There will be very localised loss of habitat from the construction of associated infrastructure and internal roads.
- A section of the cable route will be installed in an unclassified road immediately to the south of Ponds 8 and 9.
- In the absence of species protection measures, there is a risk of GCN being harmed during enabling works and construction / installation and ultimately during decommissioning.
- The solar park development would be carried out under a European Protected Species Mitigation licence for GCN with a detailed method statement setting out the species protection measures, mitigation for habitat loss and enhancement.
- Species protection during installation and decommissioning will be based on avoidance and seasonal timing of works, supported by ecological supervision by a licensed GCN surveyor where necessary.
- In the operational solar park, longer / tussocky grassland will be created within retained field margins and beneath the solar arrays to provide additional foraging habitats and enhance connectivity across the site for GCN. The creation and management of grassland field margins across the solar park will improve the level of habitat connectivity compared the existing site conditions and promote the wider dispersal of individual GCN.
- The GCN strategy will set out the ongoing actions that will be adopted to maintain the conservation status of the species alongside the operation of the solar park.

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1 INTRODUCTION

1.1 Purpose and Scope of this Report

1.1.1 RPS was commissioned by Lightsource BP to undertake a great crested newt (GCN) survey of ponds at the Plas Power Estate, Wrexham, North Wales. Lightsource BP propose to install a solar park at the site. The proposed development site is referred to in this report as The Application Site.

1.1.2 A Preliminary Ecological Appraisal (PEA – RPS, 2020) identified several waterbodies close to the site and recommended GCN surveys. The following surveys were carried out in spring / summer 2021:

- Environmental DNA (eDNA) surveys of all accessible and suitable waterbodies.
- Habitat Suitability Index (HSI) assessment of all accessible and suitable waterbodies.
- Population Size Class surveys of all waterbodies testing positive for GCN DNA.

1.1.3 This report presents the findings of the eDNA, HSI and population assessment surveys undertaken in spring / summer 2021.

1.1.4 The survey methodologies used are described with reference to the best practice guidance. Any limitations to the surveys are clearly identified along with their implications for interpreting the survey results.

1.1.5 The report will inform the Environmental Impact Assessment (EIA) of the scheme and will be included as a technical appendix to the Ecology and Nature Conservation Chapter of the Environmental Statement.

1.1.6 A brief overview of the implications of the survey findings for the development is included in the report. However, detailed discussion of impacts of the development on GCN, and any proposed avoidance, mitigation or compensation measures will be included in the main text of the ES.

1.1.7 This report pertains to these results only; recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS.

1.2 Study Area

Site Description

1.2.1 The Application Site is located in the Plas Power Estate, to the west of Wrexham, North Wales, centred at grid reference SJ 301 501. The existing land use is primarily arable and pasture (sheep and cattle grazed). Other habitats within the site include hedgerows, mature and semi-mature trees, a stand of tall ruderal and managed amenity grassland. The Application Site is described in detail in the Preliminary Ecological Appraisal (RPS, 2020).

Ponds Surveyed

1.2.2 In discussion with the Local Planning Authority (Wrexham Borough Council) it was agreed to survey all accessible suitable waterbodies within 600m of the Application Site. Seven waterbodies were identified from OS maps and aerial photographs. The location of the waterbodies is shown in Figure 3.1 (WB1 – 5, WB8 and WB9)

1.3 Legislation

1.3.1 Great Created Newts *Triturus cristatus* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (and as amended), which affords the species protection under Section 9. The species is

also listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017. In combination, this makes it an offence to:

- intentionally kill, injure or take (capture etc.) a Great Crested Newt;
- possess a Great Crested Newt;
- intentionally or recklessly damage, destroy, obstruct access to any structure or place used by Great Crested Newt for shelter or protection, or disturb any animal occupying such a structure or place; and sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

1.3.2 Great Crested Newts are also listed on the UKBAP as a Priority Species and are listed as a species of principal importance for biodiversity in Wales under Section 7 of the Environment (Wales) Act (2016).

2 METHODS

2.1 Survey Personnel

2.1.1 The surveys were undertaken by Tobias Hodnett and Ash Payne both of whom are experienced GCN surveyors. Tobias is an accredited agent on Tim Hodnetts NRW licence (no. S089587/1), while Ash is an accredited agent on Rhian Hughes licence (no. S087351/1).

2.2 HSI Assessment

2.2.1 The HSI assessment was carried out during a site walkover on 23rd April 2021. HSI assessments were carried out of waterbodies 2, 3, 4, 8 and 9. Waterbodies 1 and 5 were dry and not surveyed. Waterbodies 6 and 7 were located over 600m from the site boundary and excluded from the survey.

2.2.2 The HSI assessment was undertaken following the method described in the Amphibian and Reptile Group (ARG) for the UK Advice Note 5 (ARGUK, 2010). This is a modified version of the original HSI methodology devised by Oldham et al (2000).

2.2.3 Following the HSI methodology, each pond is scored for 10 parameters that are known to have a significant impact on the likelihood of great crested newts utilising a water body. Those parameters are:

- **Geographic location:** scored based on regions defined in the methodology relating to likelihood of GCN presence based on their known distribution in Britain.
- **Pond size (m^2)**: estimated from field observations
- **Pond permanence:** score based on the estimated no of years in 10 that the pond is dry
- **Water quality** - estimated from field observations – e.g. clarity, aquatic invertebrate species, algae and other signs of eutrophication, or obvious pollution such as oil, refuse etc)
- **Shade:** scored based on the percentage of the pond perimeter which is shaded.
- **Waterfowl:** scored based on no of waterfowl per $1000m^2$.
- **Fish:** scored based on field observation of presence / absence, density and fish species.
- **Pond Density:** scored based on the no of ponds within 1km of the pond being assessed.
- **Terrestrial Habitat:** scored based on the extent of suitable terrestrial habitat for GCN with 1km of the pond.
- **Macrophyte cover:** scored based on the percentage of the pond surface covered by aquatic plants.

2.2.4 For each pond, each parameter is ascribed a score between 0.01 and 1 with the scores used to calculate the overall HSI for the pond. The HSI score can range from 0.01(completely unsuitable) to 1 (optimally suitable). The HSI is then compared against a range of values to give a qualitative assessment of the suitability of the water body to support GCN ranging as shown Table 2-1

Table 2-1. HSI assessment ratings (from ARGUK, 2010).

HSI Score	Rating
<0.50	Poor
0.50 – 0.59	Below Average
0.60 – 0.69	Average
0.70 – 0.79	Good

>0.80	Excellent

2.3 eDNA Survey

2.3.1 Separate water samples were collected from waterbodies WB2, WB3, WB4, WB8 and WB9 on 23rd April 2021 and were subsequently analysed for traces of GCN DNA. WB1 and WB5 were dry and were not subject to eDNA or presence/absence surveys.

2.3.2 For each pond the water samples were collected following the survey methodology set out in the DEFRA project WC1067 (Biggs et al, 2014). Ten samples were taken from each pond following the standard collection method using a sterile collection kit provided by the laboratory. The samples are then sent for laboratory analysis.

2.3.3 The laboratory testing includes an extraction process where all the samples from one pond are pooled together to acquire as much eDNA as possible. The pooled sample is tested via real time polymerase chain reaction (or q-PCR) to amplify part of mitochondrial DNA specific to GCN. The primers used in this process are specific to GCN to ensuring the DNA from other species is not amplified.

2.3.4 Testing of the pooled sample is replicated twelve times to ensure results are accurate. A positive result relates to one or more of the twelve replicates contain GCN DNA.

2.4 Presence / Absence Survey and Population Size Class Assessment

Survey Method

2.4.1 A presence / absence survey using standard survey techniques over four survey visits were undertaken for WB2 and WB4 as a precaution against false negative results from eDNA surveys.

2.4.2 The population size class assessment survey was a carried out on three waterbodies which tested positive for GCN DNA (WB3, WB8 and WB9).

2.4.3 The surveys followed the presence / likely absence survey method set out in the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

2.4.4 The first four survey visits of WB2, WB3, WB4, WB8 and WB9 were carried out on 13th, 23rd, 27th May and 2nd June. The fifth and six visits for the population size class assessment of WB3, WB6 and WB7 were carried out on 5th and 10th June.

2.4.5 In accordance with the guidelines, surveys were undertaken during suitable weather conditions (i.e. when night-time air temperatures are above 5°C and avoiding heavy rain or strong winds that could constrain torchlight surveys).

2.4.6 The six surveys were carried out between mid-March and mid-June with at least two survey visits conducted between mid-April and mid-May. During each survey visit three survey methods were used of the following methods: torch survey, bottle trapping, egg search and netting. Survey methods are described below.

Torch Surveying

2.4.7 Torch surveying was conducted at least 30 minutes after dark using 1,000,000 candlepower torches. The pond was searched by shining the torch into the water column around all the accessible margins. Other aquatic amphibian fauna seen during the survey was also recorded, along with details of water clarity and weather conditions that could impact upon the effectiveness of the search such as rain or wind disturbance of the water surface.

Bottle Trapping

2.4.8 Great crested newt traps were set in shallow marginal water of the pond before sunset and were checked early the next morning. Each trap was placed in the pond partially below the water line and secured in place with a cane. The traps were positioned so that an air bubble was present within them, allowing any captured newts to breath. The traps were placed throughout all accessible areas of the pond margins spaced at approximately 2m intervals.

Egg Searching

2.4.9 Visual searches were made for newt eggs which are laid singly on material that is then folded around the egg to provide protection from predation and UV light. Searches were made for aquatic vegetation on which great crested newts will often lay eggs if present (sweet grass *Glyceria* sp., water mint *Mentha aquatica* and water forget-me-not *Myosotis scorpioides*). When marginal vegetation was absent, visual searches were made for folded dead leaves and any suitable litter such as crisp packets in the edge of the pond as these materials can be used for egg laying where there is very limited suitable vegetation.

2.4.10 The inspections searched for characteristic folds indicative of great crested newt eggs; 'unwrapping' an egg to confirm species identification. Because exposed eggs can be prone to predation and the effects of UV radiation, once a great crested newt egg was identified the search was terminated with breeding confirmed.

Netting

2.4.11 Netting was used on occasions where bottle trapping could not be used because it was too cold or when water shrews had been previously trapped and there was a risk of harm if trapping was used.

Estimating Population Size Class

2.4.12 The population size class estimate is based on the maximum adult newt count per pond in a single night through either torch survey or bottle-trapping. (English Nature, 2001)

2.4.13 Where there is reasonable certainty that there is regular interchange of animals between ponds (typically, within 250m and with an absence of barriers to dispersal) peak counts are summed together across ponds for counts during the same visit.

2.4.14 Based on the peak counts, population size classes are classified as follows:

- 'small population' for peak counts up to 10;
- 'medium population' for peak counts between 11 and 100;
- 'large population' for peak counts over 100.

2.5 Limitations

Presence / Absence and Population Size Class Estimate Surveys

2.5.1 There were some constraints to the presence / absence and population size class assessment surveys affecting four waterbodies (WB2, WB4, WB8 and WB9). Specifically, the limitations were:

- Obstacles (barbed wire fences and dense scrub) limited access to the margins of WB2 and WB4 on the first and second of four visits.
- Vegetation limited access to the water margin of WB8 and WB9 on the first of six visits

- Water turbidity caused by rain hindered torchlight surveys of WB4 and WB7 on one visit.
- Duckweed cover limited the effectiveness of torch surveys on WB3 and on two of the four survey visits prevented torching and netting (meaning only 2 methods – trapping and egg search were used).

2.5.2 None of these limitations were a constraint on confirming the presence or likely absence of GCN. The presence GCN was confirmed in WB6 and WB7. For WB2 and WB4 the combination of negative eDNA results and the presence absence surveys give string confidence in the absence of GCN despite some survey limitations.

2.5.3 The surveys were carried out between mid-May and mid-June during suitable weather conditions following several cold periods throughout April and early-May. The survey was carried out within the optimal survey period for GCN during a period when weather conditions were within normal ranges. As such the weather and timing of surveys is not considered a constraint on the validity of the survey results.

2.5.4 Where GCN were present, the limitations are unlikely to have affected the population size class estimates. WB6 and WB7 had peak counts of 20 and 13 GCN (medium population). A “large” population requires a peak count of 100 or more GCN. The survey constraints were in no way so severe that they could have resulted in an underestimate of GCN numbers by 80 or more newts and would therefore not have affected the result of the population size class assessment. In this respect the constraint was not significant.

General Survey Limitations

2.5.5 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.

Accurate Lifespan of Ecological Data

2.5.6 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for up to two years, assuming no significant changes to the site conditions.

3 RESULTS

3.1 HSI Assessment

3.1.1 Each of the waterbodies is located on Figure 3.1 labelled WB1 to WB9.

3.1.2 Of the nine waterbodies identified on the OS map and aerial photographs, one was a dry pond (WB5) and one was a dry stream (WB1).

3.1.3 The HSI scores were calculated for the remaining five waterbodies (WB2, WB3, WB4, WB8 and WB9). WB3 had an HSI score of 0.82 (excellent suitability) while WB2, WB4, WB8 and WB9 scored respectively 0.77, 0.78, 0.70 and 0.70 (good suitability).

3.1.4 The full HSI parameter scores and calculations are given in Appendix A and summarised in Table 3-1 at the end of the results section alongside the eDNA and population size class assessment results.

3.2 eDNA Survey

3.2.1 The eDNA surveys were undertaken on accessible water bodies which were not dry i.e. waterbodies WB2, WB3, WB4, WB8 and WB9.

3.2.2 Waterbodies WB3, WB8 and WB9 tested positive, indicating the presence of GCN DNA confirming recent presence of GCN.

3.2.3 Waterbodies WB2 and WB4 tested negative for GCN DNA indicating GCN no recent presence of GCN and that GCN are unlikely to breed in the waterbody.

3.2.4 The eDNA laboratory report is included in Appendix B and the results are summarised in Table 3-1

3.3 Traditional GCN Survey

3.3.1 The four visit presence / absence survey of waterbodies WB2 and WB4 found no GCN on any of the visits and it was concluded with high confidence that GCN do not breed in these ponds.

3.3.2 Of the waterbodies where GCN presence was confirmed waterbody WB3 had a small population with a peak count of 3 GCN. The two adjoining waterbodies WB6 and WB7 had peak counts of 20 and 13 GCN respectively and support a medium sized metapopulation.

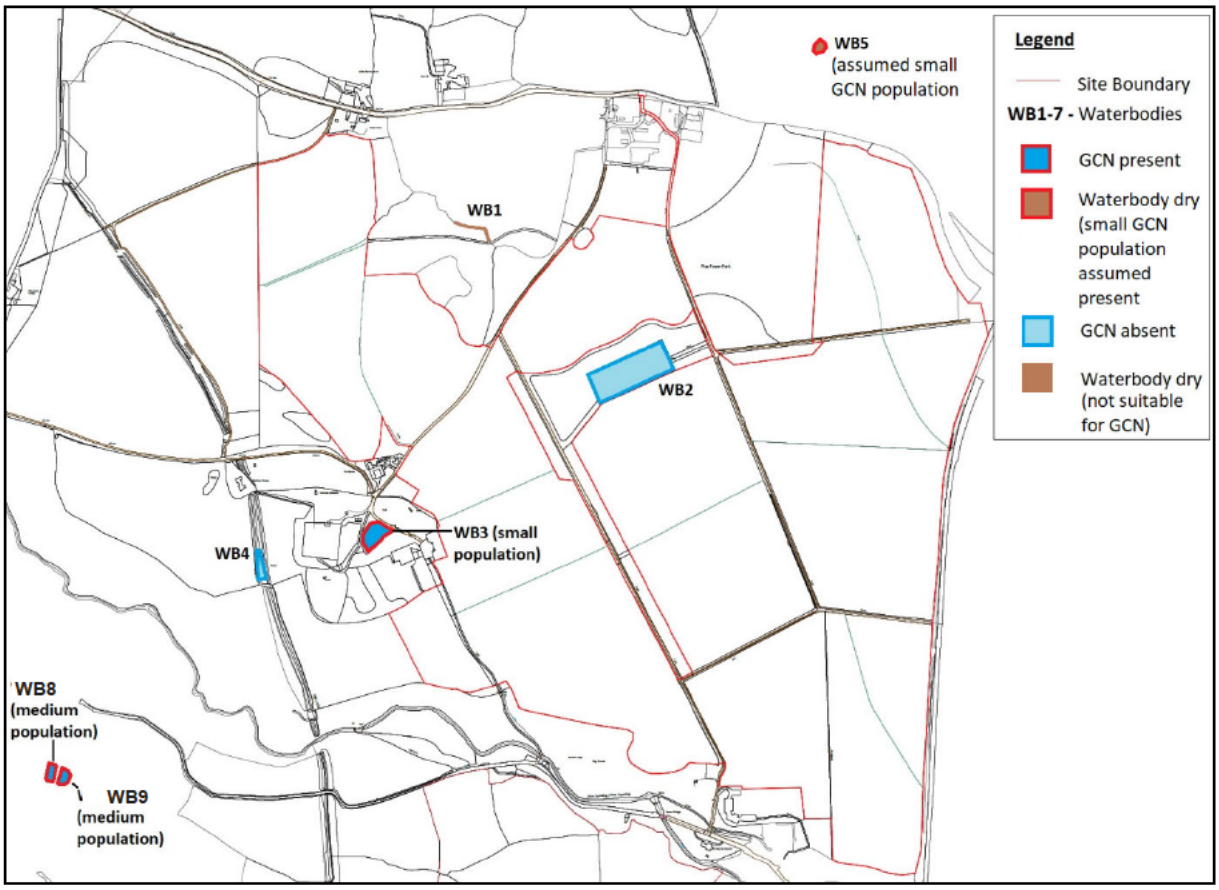
3.3.3 The full results of the presence / absence and population size class surveys are given in Appendix C. The results are summarised alongside the HSI and eDNA assessments in Table 3-1.

Table 3-1: Summary of HSI, eDNA and GCN Population Size Class Assessments of Ponds within 250m of the Application Site Boundary.

Water Body	Description	Location	HSI score	eDNA Result	Presence /Absence Survey	Population Size Class r
1	Brook running through woodland	55m west	N/A (dry stream)	N/A	N/A	N/A
2	Large rectangular lagoon in broadleaf woodland. Bull rush present. Waterfowl present, coot, moorhen, mute swan.	25m from Application Site boundary and encircled by the Application Site	0.77 (good suitability)	Negative	No GCN found	N/A
3	Large pond surrounded by mature trees and adjoining woodland. Duckweed covering 60% + shading from canopy 40% cover. 80% of pond accessible	Within the Application Site	0.82 (excellent suitability)	**Positive**	**Present**	**Small (peak count of 3 newts)**

Water Body	Description	Location	HSI score	eDNA Result	Presence /Absence Survey	Population Size Class r
4	Oblong pond in broadleaf woodland. Steep banks, canopy cover shading, dry low-level south section pond. Deep level with vegetation cover north aspect of pond. 90% pond accessible.	40m west	0.77 (good suitability)	Negative	No GCN found	N/A
5	Dry depression in centre of arable field surrounded by mature trees.	150m north	N/A - Dry	N/A	N/A	N/A
8	Rectangular pond bounded by scrub and adjacent to farmyard and orchard. Thick vegetation surrounding pond. Looks suitable for amphibians. Tadpoles in water column. Bull rush cover 30% of pond. 60% pond accessible.	590m southwest	0.70 (good suitability)	**Positive**	**Present**	**Medium (peak count of 20 newts)**
9	Adjacent to Pond 8 and bounded by scrub in pasture field corner. Thick vegetation surrounding pond inc. bramble & willow. Looks suitable for amphibians. Tadpoles in water column. 60% pond accessible.	580m southwest	0.70 (good suitability)	**Positive**	**Present**	**Medium (peak count of 13 newts)**

Figure 3.1: Locations of Waterbodies within 600m of the Application Site Boundary



4 EVALUATION AND POTENTIAL IMPACTS

4.1.1 The combination of HSI, eDNA and presence absence surveys confirmed the presence of GCN in three water bodies within 600m of the Application Site.

- Waterbody WB3 located within the Application Site supports a small GCN population.
- Waterbody WB8 located 590m southwest of the Application Site supports a medium GCN population.
- Waterbody WB9 located 580m southwest of the Application Site supports a medium GCN population.

4.1.2 There were no significant constraints during the survey of ponds WB3, WB8 and WB9 which would affect the validity of the results. Following discussion with NRW, under a precautionary approach waterbody W5, is assumed to support a small GCN population in any years when it holds open water in spring and summer.

4.1.3 Ponds which occasionally dry out can still support breeding populations used by GCN in years when they hold sufficient water. Under a precautionary approach, WB5 is assumed to support a small GCN population in any years when there is open water in spring and summer. Ponds were more likely to be dry in 2021 than in ana average year due to the very dry April and May. The stream WB1 was also dry but as a watercourse it is considered unsuitable for GCN.

4.2 Implications for Development

4.1 The solar arrays and associated infrastructure will be installed application site largely comprises grass leys and pasture, which are not optimal terrestrial newt habitat, but WB3, which supports a small population, lies just over 50m from the Application Site boundary and terrestrial habitats in the central western part of the solar park have the potential to be regularly used by GCN.

4.2 The two medium GCN populations are located 600m from the solar park development and the majority of individuals thee two adjoining breeding ponds will utilise terrestrial habitats outside of the proposed solar park.

4.3 The dry pond (WB5) is located over 170m to the north of the application site. Should this waterbody support breeding GCN during wetter springs the arable and pasture habitats affected by the development would fall within the core terrestrial habitat associated with this pond.

4.4 Within the Plas Power Estate, six of the seven ponds are bounded by broadleaf woodland or separated from the site by extensive broadleaf woodland. The majority of the GCN populations in each pond would be expected to remain within the higher quality habitats close to the ponds. While the installation of solar parks is typically a low impact activity compared to many other types of development, vehicle and equipment movement and storage, solar panel and perimeter fence installation, infrastructure installation and ground preparation has the potential to harm newts if they are present within the working area.

5 MITIGATION AND ENHANCEMENT

5.1 The development would be carried out under a European Protected Species (EPS) Mitigation licence for GCN. A separate GCN Mitigation Strategy will be prepared and submitted with details of:

- Species protection measures during enabling works and construction / installation
- Mitigation for any habitat loss as a result of the development to ensure the favourable conservation status of GCN is maintained at The Application Site
- Enhancement measures to provide overall benefit for GCN within the Application Site as a result of the development

5.1.1 The mitigation strategy would form the basis of the method statement which will be submitted with the EPS mitigation licence application.

5.1.2 Habitats of highest value for GCN (ponds, hedgerows, woodland and long grass field margins) will be retained. The development will be limited to loss / disturbance of short pasture and arable fields.

5.1.3 Species protection will be based on seasonal timing of works to avoid periods when GCN are more likely to be present. Where necessary ecological supervision by a licensed GCN surveyor would be provided to ensure that a suitable working method is followed and that higher risk areas are avoided.

5.1.4 Replacement habitats and enhancement would be provided to create an overall gain in the extent of suitable habitat for GCN. Retained field margins would be allowed to grow longer increasing the extent of longer grassland alongside hedgerows enhancing foraging opportunities and connectivity across the site.

5.1.5 Areas of longer tussocky grassland would also be created beneath the solar panels in areas that are currently short pasture or arable. This would further improve connectivity and increase the extent of suitable terrestrial foraging habitat.

6 CONCLUSIONS

6.1.1 A combination of HSI, eDNA and presence absence surveys and population size class assessments confirmed the following GCN populations in three water bodies within 600m of the Application Site.

- Waterbody WB3 located within the Application Site supports a small GCN population.
- Waterbody WB8 located 590m southwest of the Application Site supports a medium GCN population.
- Water body WB9 located 580m southwest of the Application Site supports a medium GCN population.

6.1.2 On pond was dry in late spring 2021 (WB5) but under a precautionary basis could support GCN populations should it typically hold sufficient water in other years. A stream (WB1) was dry 2021 but not considered suitable as breeding habitat for GCN.

6.1.3 No GCN DNA, adults or eggs were not found in waterbodies WB2 and WB4.

6.1.4 Habitats of highest value for GCN (hedgerows, woodland and long grass field margins) will be retained. There is a low risk GCN using these lower value habitats and therefore being harmed during enabling works and construction / installation.

6.1.5 The development would be carried out under a European Protected Species Mitigation licence for GCN which would specify species protection measures during enabling works and construction, mitigation for habitat loss and enhancement / habitat creation. Species protection measure will be based on seasonal timing of works to avoid periods when GCN are more likely to be present, with ecological supervision by a licensed GCN surveyor where necessary.

6.1.6 Longer / tussocky grassland will be created within retained field margins and beneath the solar panels to provided additional foraging habitats and enhance connectivity across the site for GCN.

6.1.7 Within the arable landscape, the creation and enhancement of grassland habitats around the breeding pond will provide additional cover and foraging habitats for GCN and the management of grassland field boundaries will enhance connectivity across the solar park.

6.1.8 Landscape management of the operational solar park will be designed to deliver benefits for biodiversity over the lifetime of the development with the conservation of the GCN population influencing the timing and specification of habitat management actions.

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APPENDICES

Appendix A

HSI Survey Results

SI No.	SI Description.	Water-body 1	Water-body 2	Water-body 3	Water-body 4	Water-body 5	Water-body 8	Water-body 9
1	Geographic location	N/A (dry)	1	1	1	N/A (dry)	1	1
2	Pond area	N/A (dry)	0.8	0.95	1	N/A (dry)	0.6	0.6
3	Pond permanence	N/A (dry)	0.9	0.9	0.9	N/A (dry)	0.9	0.9
4	Water quality	N/A (dry)	0.67	0.67	0.67	N/A (dry)	0.67	0.67
5	Shade	N/A (dry)	1	0.6	1	N/A (dry)	1	1
6	Waterfowl effect	N/A (dry)	0.67	0.67	0.67	N/A (dry)	0.67	0.67
7	Fish presence	N/A (dry)	1	1	1	N/A (dry)	1	1
8	Pond Density	N/A (dry)	0.6	0.65	0.65	N/A (dry)	0.7	0.7
9	Terrestrial habitat	N/A (dry)	1	1	1	N/A (dry)	0.33	0.33
10	Macrophyte cover	N/A (dry)	0.4	0.9	0.3	N/A (dry)	0.5	0.5
HSI Score		**N/A**	**0.77**	**0.82**	**0.78**	**N/A**	**0.70**	**0.70**
Pond suitability		**N/A**	**Good**	**Excellent**	**Good**	**N/A**	**Good**	**Good**

Appendix B

eDNA Survey Laboratory Report

SureScreen Scientifics

Folio No: E9678
Report No: 1
Purchase Order: 883
Client: ENFYS ECOLOGY
Contact: Lucy Boyett

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 26/04/2021
Date Reported: 29/04/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1085	Plas Power - Pond 2	SJ30375020	Pass	Pass	Pass	Negative	0
1086	Plas Power - Pond 3	SJ29874988	Pass	Pass	Pass	Positive	4
2792	Plas Power - Pond 9	SJ29224939	Pass	Pass	Pass	Positive	6
2796	Plas Power - Pond 4	SJ29644984	Pass	Pass	Pass	Negative	0
2797	Plas Power - Pond 8	SJ29204940	Pass	Pass	Pass	Positive	12

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Chris Troth

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Appendix C

Presence / Absence and Population Size Class Assessment Results

Waterbody No.	Visit No.	Date (2021)	Weather	GCN Eggs?	No. of Bottle Traps	Torch GCN	Torch Other Amphibians	Bottle Trap GCN	Bottle Trap Other	Netted GCN	Netted other	Limitations
2	1	6 May	5 - 7 °C, light breeze, 20- 60% cloud.	No	Too cold	0	Smooth (1♀)	N/A	N/A	No	Stickleback + invertebrates	Limited access to water edge
	2	13 May	9 - 12 °C, light rain, 80-100% cloud, moderate breeze	No	40	0	Smooth (2 ♀, 1 ♂)	0	Smooth (1♀)	No	Invertebrates	Restricted access (barbed wire fence, dense scrub)
	3	23 May	7 - 11 °C, light rain, 50-90% cloud, light breeze	No	40	0	Palmate (1 ♀), smooth (2♂, 1♀), 1 unidentified newt.	0	Smooth (2♂, 1 ♀)	n/a	n/a	None
	4	27 May	15 - 18 °C, 50% cloud light air.	No	40	0	Smooth (5 ♂) smooth / palmate (2 ♀)	0	0	n/a	n/a	None
3	1	6 May	6 - 7 °C, light breeze, 20- 60% cloud.	No	Too cold	**4** ♂	0	N/A	N/A	no	Invertebrates	Duckweed limits visibility
	2	13 May	10 - 12 °C, light rain, 80-100% cloud, moderate breeze	No	20	0	0	**2** ♀	Palmate 3♂, 2 ♀)	no	Invertebrates	Duckweed limits visibility
	3	23 May	8 - 11 °C, light rain, 50-90% cloud, light breeze	No	20	0	0	0	0	n/a	n/a	Duckweed covers most of water
	4	27 May	16 - 18 °C, 50% cloud light air.	No	20	n/a	n/a	0	0	n/a	n/a	100% duckweed cover, torching and netting not possible

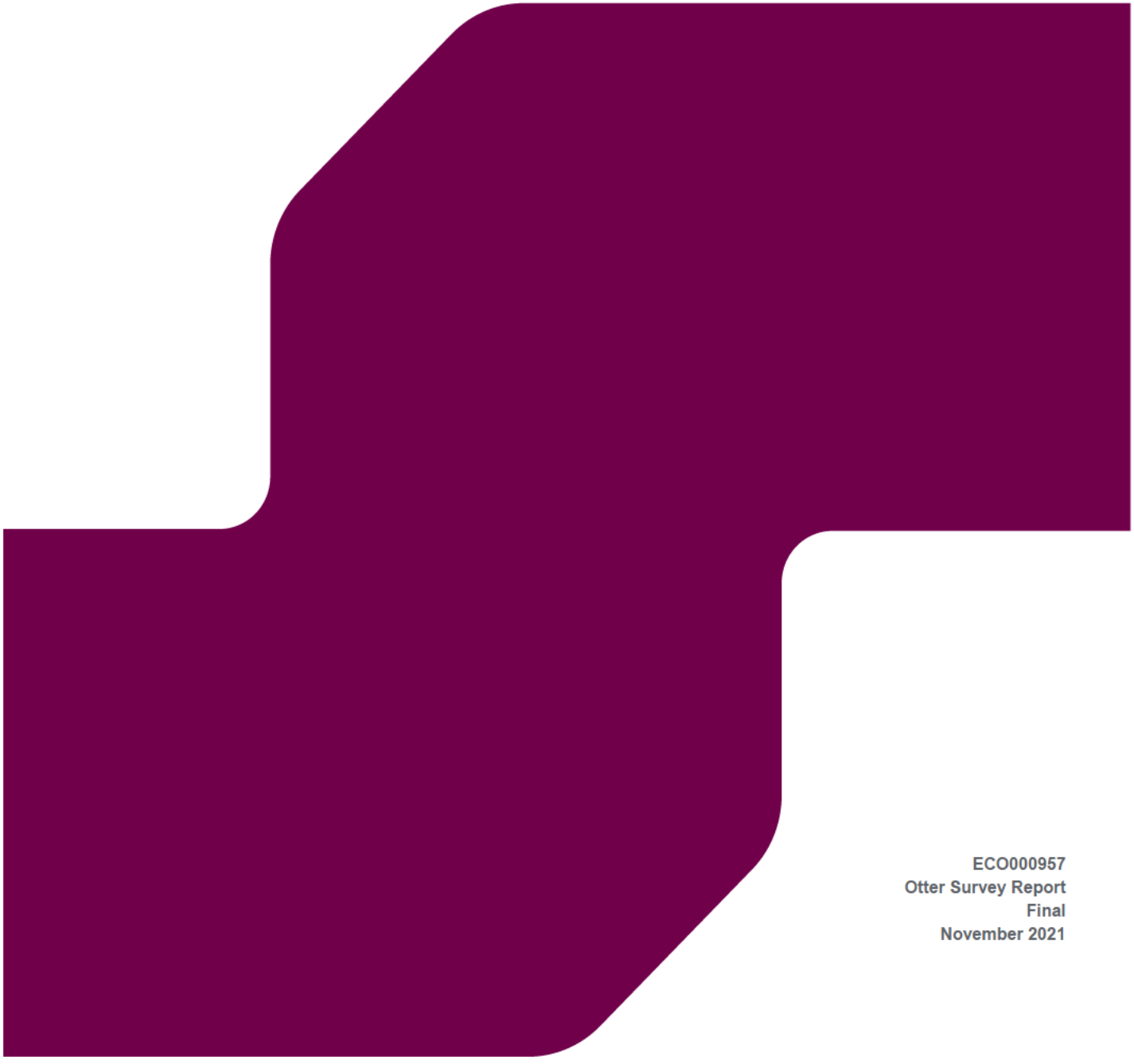
Waterbody No.	Visit No.	Date (2021)	Weather	GCN Eggs?	No. of Bottle Traps	Torch GCN	Torch Other Amphibians	Bottle Trap GCN	Bottle Trap Other	Netted GCN	Netted other	Limitations
	5	2 June	21-17 °C, 40-80% cloud, rain, light air	No	20	0	0	0	0	n/a	n/a	duckweed limits visibility
	6	10 June	14 -16°C, 30-70% cloud, light air	No	20	0	0	**1**♀	0	n/a	n/a	duckweed limits visibility
4	1	6 May	7 - 7 °C, light breeze, 20- 60% cloud.	No	Too cold	0	Smooth (1 ♂)	N/A	N/A	no	Invertebrates & sticklebacks	Limited access to water edge (high banks and dense vegetation
	2	13 May	11 - 12 °C, light rain, 80-100% cloud, moderate breeze	No	20	0	Smooth (1 ♀, 1 ♂)	0	1 palmate ♀	no	Invertebrates & sticklebacks	Limited access to water edge (high banks and dense vegetation
	3	23 May	9 - 11 °C, light rain, 50-90% cloud, light breeze	No	20	0	0	0	2 water shrews	n/a	n/a	Water turbid during torch counts.
	4	27 May	17 - 18 °C, 50% cloud light air.	No	n/a	0	Smooth (4 ♂) smooth / palmate (2 ♀), 3 unknown gender)	n/a	n/a	0	0	None
8	1	6 May	8 - 7 °C, light breeze, 20- 60% cloud.	No	Netting	**1** ♀	0	N/A	N/A	no	Invertebrates	Vegetation restricting access to one side of pond.
	2	13 May	12 - 12 °C, light rain, 80-100% cloud, moderate breeze	No	10	**1** ♀	0	**4**♀, **2**♂		no	Invertebrates	None
	3	23 May	10 - 11 °C, light rain, 50-90% cloud, light breeze	No	10	0	1 unidentified newt	0	0	n/a	n/a	None

Waterbody No.	Visit No.	Date (2021)	Weather	GCN Eggs?	No. of Bottle Traps	Torch GCN	Torch Other Amphibians	Bottle Trap GCN	Bottle Trap Other	Netted GCN	Netted other	Limitations
	4	27 May	18 - 18 °C, 50% cloud light air.	No	10	**5 ♀, 14 ♂, 1 unknown gender**	Smooth (1 ♂) Smooth / palmate (1 ♀)	**6♀, 4♂**	Palmate (1♂)	n/a	n/a	None
	5	02/06/2021	21-17 °C, 40-80% cloud, rain, light air	No	10	**6♀, 11♂**	Palmate (3 ♀).Smooth / palmate unknown gender	**8♀**	1 water stick insect	n/a	n/a	None
	6	06/10/2021	16 -16°C, 30-70% cloud, light air	No	10	**5♀, 2♂, 1 unknown gender**	Palmate (2 ♀.,1 ♂)	**1♀, 2♂**		n/a	n/a	None
9	1	6 May	9 - 7 °C, light breeze, 20- 60% cloud.	No	Netting	**2♀**	0	N/A	N/A	no	Invertebrates	Vegetation restricting access to one side of pond.
	2	13 May	13 - 12 °C, light rain, 80-100% cloud, moderate breeze	No	10	0	Smooth / palmate (1 ♀)	**3♀, 6♂**		no	Invertebrates	None
	3	23 May	11 - 11 °C, light rain, 50-90% cloud, light breeze	No	10	**5♂**	Smooth (1♀)	**2♂**		n/a	n/a	None
	4	27 May	19 - 18 °C, 50% cloud light air.	No	10	**4 ♀, 2 ♂ 3 gender unknown**	0	**2♀**	1 palmate ♀	n/a	n/a	None
	5	2 June	21-17 °C, 40-80% cloud, rain, light air	No	10	**5 ♀, 5 ♂, 3 unknown gender**	Smooth (2♂)	**2♂**	0	n/a	n/a	None
	6	10 June	15 -16°C, 30-70% cloud, light air	No	10	0	0	**5♀**	0	n/a	n/a	Water turbid during torch count

Appendix 6.6
Otter Survey

OTTER SURVEY REPORT - PLAS POWER SOLAR AND ENERGY STORAGE PROJECT

On Behalf of Lightsource bp



ECO000957
Otter Survey Report
Final
November 2021

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Issue	Georgia Kelly	Tim Oliver	Georgia Kelly	05/11/21

Approval for issue

Tim Oliver	5 November 2021

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Prepared for:

Lightsource bp

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Appendix A Site Photographs

1 INTRODUCTION

1.1 Purpose and scope of this report

1.1.1 RPS was commissioned by Lightsource bp to undertake an otter *Lutra lutra* survey broadly at the Plas Power Estate, to the west of Wrexham in North Wales.

1.1.2 The Proposed Development is approximately 145 ha in extent and is located on land that is primarily arable and pasture farmland with central grid reference SJ 301 501. The Proposed Development comprises a larger northern part and smaller southern area which are divided by Big Wood, an extensive linear broadleaved woodland.

1.1.3 The survey objectives were to record otter activity along the watercourse and assess the potential for the wooded terrestrial habitats in the vicinity of the Proposed Development to be used by otters.

1.1.4 The survey covered the section of the River Clywedog to the west of the village of Bersham, the adjoining part of Big Wood and a tributary stream. Systematic searches were made for signs of otter activity alongside the watercourse and immediate surroundings.

1.1.5 All the areas of woodland connected to the watercourse and situated adjacent to a Proposed Development were broadly assessed in terms of the potential for holts or resting places (couches) to be present in undisturbed locations. Any mammal paths or slides alongside the watercourses were followed back into woodland to look for signs of holts and couches.

1.2 Survey Area and Context

1.2.1 Approximately 700m of the surveyed section of river lies within 200m of the boundary of the Proposed Development. Approximately a 2km length of the River Clywedog was covered by the survey: divided into three main sections: eastern, central and western. The majority of the survey area is located within Big Wood, a designated Wildlife Site (WS) of country importance. The citation states it is a mixture of conifer plantation, beech plantation and patches of semi-natural broadleaved woodland. The woodland is owned by The Woodland Trust as is open access.

1.2.2 Towards the eastern end of Big Wood there is a stepped weir approximately 5m high and the river is culverted beneath the unclassified road (Mill Terrace). The section of river to the south of the Mill Terrace flows through a 50m wide woodland corridor located close to the boundary of the Proposed Development. To the south of Mill Terrace a tributary of the river flows through a wooded field boundary within the Proposed Development.

1.2.3 To the north of Big Wood, there is c5ha block of broadleaved woodland with a pond with indirect connectivity to the river. The western boundary of the woodland block lies 160m from the course of the river at the closest point. The eastern boundary of the woodland adjoins the Proposed Development for approximately 100m.

1.2.4 At the eastern end of Big Wood, a dry channel (a former leate with engineered banks runs west-east) and is bridged by an access track into the Plas Power Estate. The proposed cable route follows this track and the cable is to be installed on the bridge structure where it spans the leate. A second access track bridge within the central section of the river will also be used.

1.2.5 Approximately 10km downstream of the site (measured as a straight line) the River Clywedog flows into the River Dee but the length of watercourse is significantly greater because of the numerous meanders. The River Dee is designated as a Site of Special Scientific Interest (SSSI) and is part of the River Dee and Bala Lake Special Area of Conservation (SAC) with otter a qualifying feature of the SAC designation.

1.3 Local Status of Otter

1.3.1 The desk study undertaken as part of the Preliminary Ecological Appraisal (RPS, 2019) included a number of recent records of otter in the local area including from the section of the River Clywedog running through Big Wood. The records confirmed that the section of river close to the site falls within an otter territory. Otters have also been recorded on a nearby watercourse, the River Gwenffro, on the south-western side Wrexham.

1.4 Legislation

1.4.1 Otters and their breeding / sheltering places, are protected under the Wildlife and Countryside Act 1981 (as amended). Under this legislation otter are protected against:

- intentional killing, capture or injury;
- intentional or reckless destruction of a shelter/structure that an otter is occupying and
- intentional or reckless disturbance, obstruction, damage or destruction to their holts or places of shelter

1.4.2 Otters are also listed as a European Protected Species (EPS) under Conservation of Habitats and Species Regulations 2017. In addition to the above, this also makes it 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);
- deliberately or recklessly disturb an otter while it is rearing or otherwise caring for its young;
- 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; or,
- 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.

1.4.3 Otters are listed on Section 7 of the Environment (Wales) Act 2016 which lists species and habitats considered to be of key significance to sustain and improve biodiversity in relation to Wales

1.4.4 Otters are also listed on the UK Biodiversity Action Plan (UKBAP) and the Local Biodiversity Action Plan (LBAP) as a Priority Species.

2 METHODS

2.1 Survey Area

2.1.1 The survey covered all sections of the River Clywedog within a minimum of 150m of the site, along with the tributary and connected woodland habitat.

- Eastern section - River Clywedog South of Mill Terrace
- Central Section - River Clywedog and Big Wood
- Western Section - River Clywedog and Big Wood
- Southern tributary stream
- Broadleaved woodland block (to the north of Big Wood)

2.1.2 A total length of 2.5km of the watercourses was surveyed. All accessible areas of the watercourse and adjoining bankside habitat within the survey area were covered by the survey in accordance with best practice guidance by the Mammal Society.

2.1.3 The survey coverage and locations of features are shown on Figure 1 Otter Survey Results (Drawing ECO000957-0004).

2.2 Survey Method

2.2.1 The otter survey was undertaken on 2nd August 2021 led by an ecologist experienced in the identification of the field signs of otter. The surveyors walked along top of the banks of the watercourses, and within the channel where safely accessible.

2.2.2 Searches were made for all potential field signs of otter including:

- **Spraints** - otter droppings often deposited at key features to indicate territories, such as elevated points in or beside the water course (rocks, logs, large tufts of vegetation) and regularly used entry exit points in the water.
- **Slides -** entry exit points into the water on banks
- **Footprints** - left in soft ground and very distinctive to otter.
- **Feeding remains** - prey items such as fish remains or amphibian skins which are often distinctive to otter feeding behaviour.
- **Paths / runways / tracks** - paths associated with ditch crossings or entry exit points into bankside vegetation and scrub.

2.2.3 Searches were made for features with the potential to be used as a holt including large holes (or tunnels) in the banksides, cavities beneath the root-plates of large trees, cavities in boulders, and man-made structures such as disused drainage pipes. The survey also looked for potential above ground resting sites (couches) which can sometimes consist of no more than an area of flattened grass or earth.

2.2.4 A wider habitat assessment was completed alongside the survey of the watercourse. During the survey the overall suitability of the bankside vegetation and wider woodland habitat was made. Areas of dense cover were inspected for signs of path. Notes were made on any dense cover with the potential to be used as a couches or in which a holt could be present.

2.2.5 Dense shrub and ground vegetation with the potential to provide secure undisturbed lying up places, or cover breeding sites adjacent to a watercourse with good fish populations is considered optimal habitat for otter.

2.3 Limitations

2.3.1 The majority of the watercourse was surveyed from the bank or channel without constraint, with only very few areas that could not be safely accessed.

2.3.2 The potential for these areas to be used by otter was assessed based on habitat suitability and the presence / absence of field signs in the adjoining upstream and downstream sections.

2.3.3 Areas with very limited areas of dense vegetation which could be comprehensively searched from the edges. None of the minor survey limitations were considered to have affected the findings or conclusions.

Accurate Lifespan of Ecological Data

2.3.4 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject.

2.3.5 Information on water vole and otter field signs would not be considered current for more than one season. Patterns of animal activity can vary through the season due to breeding timing and changes in food availability.

3 Results

3.1 Otter Activity and Woodland Habitat Assessment

3.1.1 Multiple otter fields signs were recorded along the River Clywedog including a couch, feeding stations, spraint and tracks. No signs of otter were recorded along the tributaries or adjoining woodland.

3.1.2 The field signs of otter activity are detailed in Table 3.1. The locations of the field signs are mapped on the Figure 1 Otter Survey Results Plan (Drawing ECO000957-0004). Photographs of the survey area are provided in Appendix A.

River Clywedog - Eastern Section

3.1.3 The eastern section of watercourse extends for 445m between Big Wood and the village of Bersham to the south of Mill Terrace. The river adjoins the boundary of the southern section of the site for approximately 210m.

3.1.4 The river channel is c5m wide with very shallow fast-flowing water and a stony substrate. An otter feeding station and possible daytime resting place was recorded under the root plate of a bankside tree approximately 15-20m of the boundary of the southern area of the Proposed Development (Figure 2). A few spraints and footprints were also recorded along this section including at the culvert beneath Mill Terrace.

3.1.5 The river flows through a 50m wide woodland corridor with mature alder, ash, sycamore and pedunculate oak the principal canopy species. There are maturing trees and some shrubs along the banks and this section of river has very low levels of human disturbance with no footpaths (Plate 1, Appendix A). The river is culverted beneath Mill Terrace at the western end of this section (Plate 2).

3.1.6 The broadleaved woodland adjoining the southern area supports mature and semi-mature trees away from the watercourse, the woodland has moderate potential to be used as a resting place by otters during the daytime, although no significant cover was present in the narrow strip of woodland between the watercourse and boundary of the Proposed Development.

River Clywedog - Central Section

3.1.7 The central section is approximately 890m in length flowing through Big Wood, an open access woodland owned by the Woodland Trust. Big Wood is an extensive linear woodland varying in width from 80m to 200m in the vicinity of the Proposed Development.

3.1.8 The river channel is typically 5m across (varying from 4 to 8m wide) with a slow to moderate flow. The water depth is shallow along its length with only a few deeper pools. The substrate is stony and the banks are rocky in places with steep banks up to 10m high in places.

3.1.9 Spraints were recorded in four locations along the central section of watercourse and footprints visible in soft mud at one of these.

3.1.10 The wider woodland has a very open structure. The broadleaved canopy is dominated by sycamore and beech creating dense shade. The shrub understorey is generally very sparse with ivy covering parts of the woodland floor.

3.1.11 A frequently used public footpath running parallel to the river is part of the recreational walking route known as Clywedog Trail. A footpath leads from the adjacent road and runs alongside the northern bank of watercourse (Plate 3) with localised areas of bankside cover close to the weir at the eastern end of Big Wood (Plate 4). A waterfall in the middle of the central section attracts many visitors and is subject to recreational activity during the day. Upstream of the waterfall stepping stones span the

river where the river is shallowest. This open woodland structure extends up to the northern woodland edge adjacent to the boundary of the Proposed Dvelopment (Plate 5). The non-native species, cherry laurel *Prunus laurocerasus* is present in eastern part of Big Wood, but these patches of shrub vegetation generally lacking cover for otters at ground level.

3.1.12 No potential otter paths lead from the watercourse into the woodland and there was no evidence of otters using the open woodland during the day and there were no signs of otter activity associated with the dry channel of the former leate at the eastern end of Big Wood beyond the weir (Plate 11).

3.1.13 Consequently, the woodland habitat has a low to negligible likelihood of use by otter for resting up during the day.

River Clywedog - Western Survey Section

3.1.14 The western part of the surveyed watercourse and woodland comprised a c700m section of watercourse. The river channel had areas of still water, deep pools supporting fish and is relatively undisturbed by human activity (Plate 6).

3.1.15 A large hollow was recorded in the river bank below the exposed roots of a bankside tree (Plate 7). Otter tracks, pathways, trial holes, spraint and scratch marks were all noted in immediate surroundings with the potential for this feature to be a holt or frequently used resting place. This feature lies at the western end of a c200m long section of river where the adjoining woodland has a greater extent of ground cover. This area is not crossed by footpaths and should be largely undisturbed by human activity. A feeding station was present close to the potential holt which lies 470m from boundary of the Proposed Development at closest point.

3.1.16 To the west of the potential holt, a 550m long section of watercourse flows through woodland with an open structure primarily comprising canopy trees. It is easily accessible to walkers with parking spaces on the adjoining road and this section of river will be subject to relatively high levels of recreational activity and has low suitability as a resting place for otters during the day. Despite the lack of cover, the survey confirmed foraging and territory marking in this area, with a feeding station c200m upstream of the holt and two sprainting sites; one a couple of hundred metres upstream in the vicinity of the Nant Mill Visitor Centre.

3.1.17 The localised areas of dense woodland habitat have confirmed use by otter with likely presence during the daytime. Additional laying up places could be present in dense cover close to the watercourse.

Broadleaved Woodland Block

3.1.18 A block of broadleaved woodland c5ha in size with a pond has direct connectivity to Big Wood. The woodland block comprises a canopy of semi-mature to mature trees including pedunculate oak, sycamore, ash and beech and a sparse shrub layer of hawthorn with patchy low bramble. Ground flora species included dog's mercury *Mercurialis perennis*, tufted hair-grass *Deschampsia cespitosa*, mosses, and ferns.

3.1.19 There is a large pond (25m by 50m) in the eastern part of the woodland which is bounded by mature trees (Plate 8). A small population of great crested newts was recorded in the pond in spring 2021 indicating the likely absence of fish populations. No otter slides or paths were found during searches of the pond margin which has very few areas that were not accessible.

3.1.20 A small, steeply banked stream, with a shallow depth, flows southwards from the woodland block and into the main river. This channel has minimal water depth and provides negligible foraging opportunities for otter (Plate 9).

3.1.21 As with most of the woodland habitat in the survey area, the woodland block lacked areas of dense cover and there were no signs of otter activity within the woodland or adjoining section of Big Wood. Overall the woodland has a very low to negligible likelihood of use by otters during the day.

Southern Tributary

3.1.22 The tributary channel ranges from 1m to 4m in width. The water depth was shallow (5-20cm) and the flow was moderately fast with a stony substrate. Trees and shrubs line the tributary creating a further wooded corridor which has an average width of 30m narrows to 10m wide at the southern end. The streamside trees create an open canopy with some areas of grassland and patches of dense bramble on the low banks (Plate 10).

3.1.23 No signs of otter activity were recorded along the channel of the tributary indicating that this feature is unlikely to be frequently traversed by otters. Based on the limited extent of cover and absence of signs, the potential for otters to be resting up alongside the tributary is considered to be negligible.

Table 3.1: Otter field signs

Area	Field sign	Approximate grid reference	Approximate distance from boundary of Proposed Development
River Clywedog Eastern Section	Spraint and otter tracks	SJ 30698 49194	100m
	Feeding station and possible daytime resting place located under the exposed roots of a bankside tree	SJ 30491 49252	15-20m
	Spraint and otter tracks	SJ 30440 49337	50m
River Clywedog Central Section	Spraint	SJ 30178 49480	50m
	Spraint and otter tracks	SJ 30013 49528	100m
	Spraint	SJ 29903 49532	100m
River Clywedog Western Section	Spraint and pathways through bankside vegetation into river	SJ 29555 49575	390m
	Possible holt location under root plate of fallen trees Otter tracks, pathways, trial holes, spraint and scratch marks in surrounding area	SJ 29418 49732	460m
	Feeding station	SJ 29427 49721	470m
	Spraint	SJ 29310 49758	560m
	Feeding station	SJ 29246 49804	540m
	Spraint and otter tracks	SJ 29104 50014	570m

4 CONCLUSION AND RECOMMENDATIONS

4.1 Otter Activity

4.1.1 Otters are active along the surveyed section of River Clywedog with multiple signs of activity.

4.1.2 This section of river will fall within at least one active otter territory. Otters are a wide-ranging species and have large territories. Adult males have very large ranges covering up to 40km while females will hold less extensive territories that will often overlap a larger territory of a male.

4.1.3 The presence of three separate feeding stations and spraints, relatively evenly distributed along the watercourse, indicates frequent use. The survey area has the potential to fall with the territory of a female and male otter.

4.1.4 A potential holt has been identified in the western section of the survey area over 450m from the closest solar array. Feeding stations were also recorded within the western survey section, the closest being over 470m from the site boundary. These features will not be affected by development activities.

4.1.5 A further feeding station and possible daytime resting place were recorded in the eastern section of the river, to the south of Mill Terrace, close to the boundary of the Proposed Development. The feeding station was recorded under the rootball of a bankside tree approximately 15-20m from the site with nearby spraint and footprints.

4.1.6 This section of river is not associated with recreational activities and is situated in dense ground cover on the side of the river c50m south of Mill Terrace. As such this location would remain sufficiently undisturbed to be used during the day. No potential resting places were identified closer to the Proposed Development.

4.1.7 In this location the Proposed Development boundary and development activities will be set back from the river and woodland habitat to create a buffer zone and protect them from potential indirect disturbance habitat.

4.1.8 Otters will be active close to the Proposed Development during night time hours and potentially resting up during the day.

4.1.9 The construction working methods in this location should avoid the potential for disturbance of otter, if at all possible. Where there is potential for otters using a resting place to be disturbed then a European Protected Species Licence would need to be obtained from Natural Resources Wales. with the licence covering the installation of solar panels in the vicinity of the couch.

4.1.10 No holts or resting places were recorded in the central section of the river where footpaths run parallel to the river and human activity is higher. The cable route will be installed along an existing access track bridge over the river in this section.

4.2 Woodland Habitat

4.2.1 The survey of woodland between the watercourse and covered all areas of woodland connected to the river corridor within at least 150m of the Proposed Development.

4.2.2 The surveyed habitats varied in their suitability for otter and include higher value habitat along undisturbed sections of the River Clywedog with deeper pools and cavities in the banks. Away from the watercourse, the wider woodland has very limited extents of cover and there is very low potential for features to be used by otter as a place of shelter during the day. No otter tracks were recorded leading from the river into Big Wood within 100m of the Proposed Development.

4.2.3 Big Wood and the connected woodland block to the north comprise open woodland with footpaths extending through Big Wood and running parallel to the river with regular use by dog walkers which would further deter otter from sheltering during the daytime.

4.2.4 No signs of otter activity were recorded along the southern tributary indicating that any use by otter for commuting through the landscape would be infrequent. The small stream had very low value for foraging.

4.2.5 It is concluded that secure places of shelter for otter are restricted to the sections of bankside habitat adjoining the watercourse where there is negligible public access in locations that would be unlikely to be found by dogs being walked through the woodland.

4.2.6 There were no signs of otter activity around the dry former leate. The cable will be installed to the bridge which spans this feature.

4.3 Recommendations

4.3.1 Species protection measures will need to be implemented during the construction phase to protect the river habitat and adjoining woodland and avoid disturbance to otters during construction.

4.3.2 All the woodland, scrub and waterbodies are located outside of the Proposed Development and should be fully protected from effects.

4.3.3 Six months prior to construction, the use of areas of the River Clywedog in close proximity to the site boundary should be assessed through an updated otter survey and / or the use of remote camera recording as required over a period of at least two months.

4.3.4 In the event that the area in close proximity to the construction area are used as a daytime resting place and indirect disturbance cannot be avoided (for example noise/human activity), then a European Protected Species Licence would need to be obtained from Natural Resources Wales. The licence would cover disturbance of otters while using a resting place during construction works nearby.

4.3.5 Activities within the operational site will consist of low intensity maintenance of the solar arrays. There is considered negligible potential for these activities to impact on the use of the river by otter or adversely affect the use of holts, couches, feeding stations, or territory markers.

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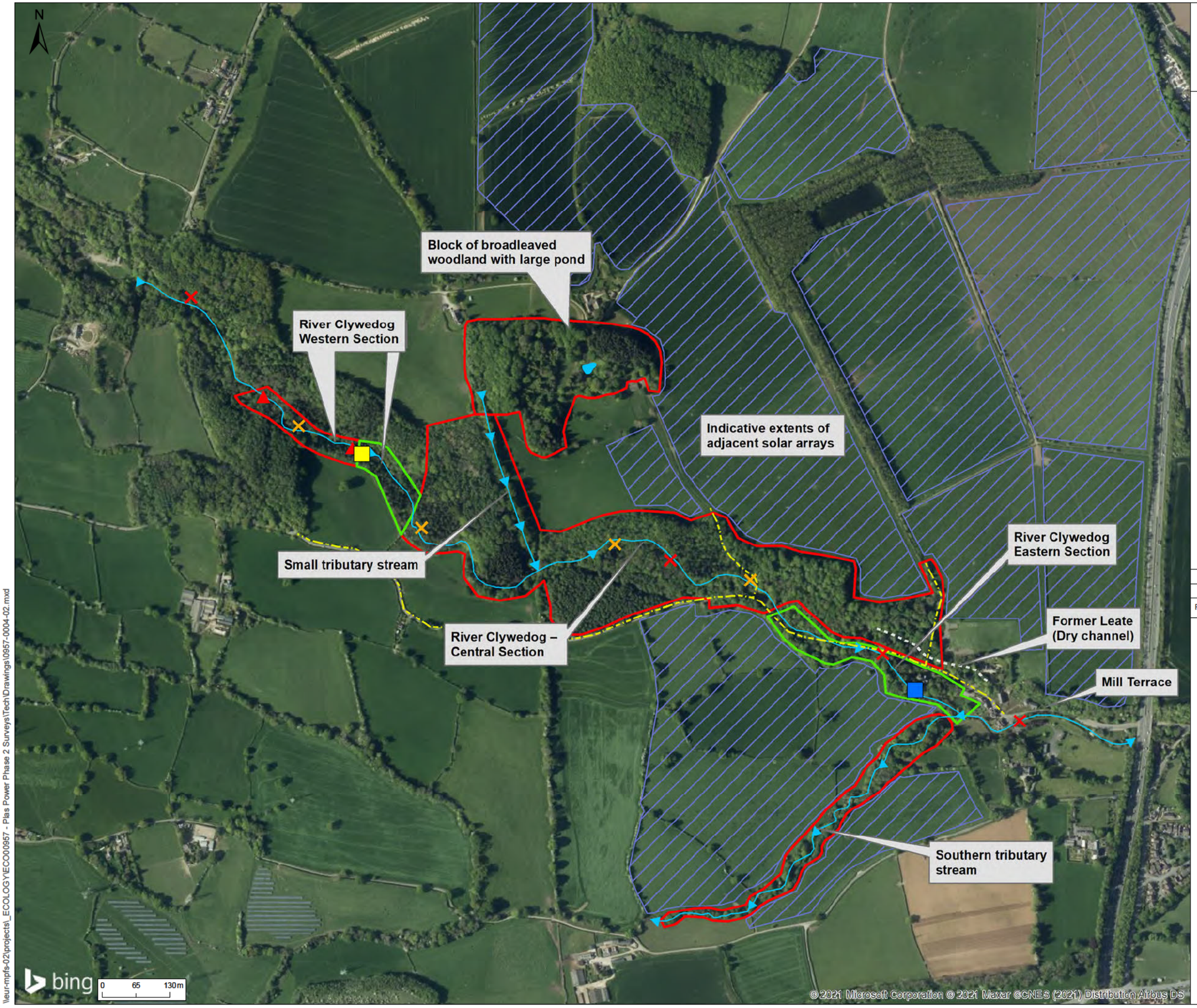
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JNCC (2004) Common Standards Monitoring Guidance for Terrestrial Mammals

FIGURES

Figure 1 Otter Survey Results Plan



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Legend

Survey Results

- Feeding station and possible daytime resting place
- Feeding station
- Potential holt location
- Spraint and otter footprints
- Spraint
- Waterbodies
- Pond
- Existing access track
- Solar arrays
- Woodland with shrub layer and areas of dense ground cover located away from public footpaths and recreational activities
- Woodland with open structure comprising canopy trees and a generally sparse shrub layer and limited ground cover

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APPENDICES

Appendix A

Site Photographs



Plate 1: River Clywedog – Eastern Section



Plate 2: River Clywedog – Top of weir with culvert beneath Mill Terrace



Plate 3: Weir at eastern end of Big Wood looking west



Plate 4 Central section of river with footpath through woodland



Plate 5: Open structure woodland on bank on northern side of Big Wood



Plate 6: River Clywedog - Western section with deeper pools where otter tracks and spraint were recorded



Plate 7: River Clywedog - Western section with possible holt location beneath exposed roots circled in yellow



Plate 8: Large pond within block of broadleaved woodland



Plate 9: Tributary stream flowing north-south through Big Wood linking to broadleaved woodland block



Plate 10: Tributary with streamside trees and shrubs dissecting the southern section of the Proposed Development



Plate 11: Dry channel – former leate at eastern end of Big Wood

Appendix 6.7
Shadow Habitat Regulations Assessment HRA

SHADOW HABITATS REGULATIONS ASSESSMENT

Plas Power Solar and Energy Storage Project

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Document status

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Prepared for:

Lightsource bp

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Figure 2 Cumulative Schemes Location Plan

1 INTRODUCTION

1.1.1 This report provides information for a Habitats Regulations Assessment (HRA) for the Plas Power Solar and Energy Storage Project at Plas Power Estate at Wrexham, North Wales.

1.1.2 The need for an Appropriate Assessment is established by Article 6(3) of the Habitats Directive, as transposed into UK law by regulation 63 of the Conservation of Species and Habitats Regulations 2017.

1.1.3 The EU Habitats Directive (92/43/EEC), on the conservation of natural habitats and of wild fauna and flora together with the Wild Birds Directive (2009/147/EC) aim to protect and improve Europe's most important habitats and species. These Directives are transposed into UK law by the Habitats Regulations. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are protected under the Habitats Regulations.

1.1.4 In addition to Sites designated under European legislation, UK Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar Sites) should be offered the same protection. Under Government advice, Proposed SPAs (pSPA) and potential SACs (pSACs) should also be treated as having protection under the Habitats Regulations.

1.1.5 Planning Policy Wales (2024) states that where a land use plan which is likely to have a significant effect on a SAC or SPA, an appropriate assessment must be undertaken of the implications for the designated features and NRW consulted, and regard shown to NRW's representations. Ramsar sites and Proposed Special Areas of Conservation, Special Protection Areas and Ramsar sites should also be subject to this treatment.

1.2 The Process

1.2.1 Regulation 63 of the Habitats Regulations 2017 require that a competent authority, before deciding to authorise a plan or project, must consider whether the plan or project is likely to have a significant effect on a Designated European Site, either alone, or in combination with other plans or projects. If it is considered that such an effect is likely, then a competent authority must then undertake an 'appropriate assessment' of the implications of the plan or project for the Site, in view of the Site's conservation objectives.

1.2.2 In undertaking an assessment, competent authorities (in this case the Welsh Ministers) must have regard to both direct and indirect effects on an interest feature of the National Site Network (NSN), as well as cumulative effects. This may include consideration of features and issues outside the boundary of an NSN.

1.2.3 Consequently supporting habitat in areas beyond the boundary of a SAC or SPA which are connected with or 'functionally linked' to the life and reproduction of a population for which a Site has been designated or classified should be taken into account in HRA.

1.2.4 This report provides information on the methodology and conclusions of the shadow HRA assessment for the Proposed Development on Designated Sites. This enables the competent authority to determine whether an appropriate assessment is required and where so to undertake an appropriate assessment by considering whether a plan or project will adversely affect the integrity of the Site.

1.2.5 The Habitats Directive applies the precautionary principle to relevant designated areas, in so much as plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of a SPA or SAC, collectively termed NSNs. This is in contrast to Environmental

Impact Assessment requirements where the findings (as documented in an Environmental Statement) should be 'taken into account' during preparation of the plan or project and a 'reasoned conclusion' reached on the likely significant effects on the environment during the determination of the project's authorisation.

1.2.6 In undertaking an assessment, competent authorities (in this case the Welsh Ministers) must have regard to both direct and indirect effects on an interest feature of the NSN, as well as cumulative effects. This may include consideration of features and issues outside the boundary of an NSN.

1.2.7 Plans and projects for which it is not possible to conclude that there would be no adverse effect on the integrity of NSNs may still be permitted if there are no alternatives and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the Site network.

1.3 Development Proposals

1.3.1 Lightsource bp proposes to develop a solar photovoltaic electricity generating station ('solar farm'), battery energy storage system ('BESS') and associated ancillary development, with a generation capacity of up to 57MWac.

1.3.2 The main components of the Proposed Development are:

- Solar panels and frames;
- Inverters;
- Transformers;
- BESS
- Cabling; and
- Substation.

1.3.3 The majority of the Site will continue to be managed as sheep-grazed pasture. Arable fields will be sown with grassland and grazed by sheep.

1.3.4 Tussocky grassland will be created between the perimeter fencing and field boundaries.

Construction and Decommissioning

1.3.5 The solar panels are arranged in series of rows up to 3 m high and tilted southwards at an angle of 10-25 degrees. The panels will typically cover between 25% and 40% of the land which they occupy. The support frame uprights are pile driven into the ground, with 'string' inverters mounted onto the support frames. Some excavation is required for the transformer foundations.

1.3.6 Most of the cabling will be laid underground in surface dug trenches approximately 1 m deep and 50 cm wide and backfilled. Trenches will be dug where practicable in existing tracks and roads to avoid sensitive habitats or archaeology, such as through Plas Power Wood and Big Wood, both of which lie within Bersham Conservation Area.

1.3.7 Where surface dug trenches are not practical within existing tracks and roads horizontal directional drilling (HDD) will be used to reduce environmental impacts (e.g. beneath hedgerows, watercourses, woodland and highways).

1.3.8 The Proposed Development will be enclosed by a 2 m tall post and wire fence with 3 m tall security cameras in selected locations.

1.3.9 Several existing access points will be used for vehicle access for the construction, maintenance and decommissioning of the Proposed Development. If necessary, some minor modifications to enable access to the Site by all vehicles anticipated to visit it will be undertaken. Existing farm tracks will be used for internal access within the Site wherever possible. New access tracks, where required, will be formed using a layer permeable crushed stone.

1.3.10 Construction is anticipated to take approximately 12-18 months for the solar farm and 6-9 months for the BESS.

1.3.11 The Proposed Development is a temporary and fully reversible use with all equipment removed from Site at the end of the installation's operational life (approximately 40 years). The construction methods mean that remediation works following the removal of the panels and associated infrastructure are relatively minor and will return the Site to its previous greenfield character.

Operation

1.3.12 The Proposed Development will be designed to accommodate sheep grazing beneath and between the rows of panels, providing an efficient dual use of land for renewable energy generation and agriculture.

1.3.13 The Proposed Development will be unlit during operation.

2 ASSESSMENT METHOD

2.1.1 Whilst it is the responsibility of the competent authority to determine whether it can be concluded there is no adverse effect on integrity, it is the responsibility of applicants to submit sufficient information to enable such a determination to be made.

2.1.2 The stages of HRA are described below, adapted from Government guidance (MHCLG 2019b) and in-line with DNS procedural guidance (Planning and Environment Decisions Wales, 2019).

2.1.3 The process has four distinct stages:

- Stage 1 – Likely Significant Effect;
- Stage 2 – Appropriate Assessment;
- Stages 3 and 4 – Assessment of Alternatives & Consideration of IROPI

2.1.4 Professional judgement was used in the carrying out of this work where specific guidance was not available, and in the interpretation of results. Where there was insufficient information regarding the likelihood of qualifying interests being present, or of the risk of impacts, the assessment used the precautionary principle to inform the judgement. The precautionary principle has been applied to ensure that any assessment errs on the side of caution, without being unreasonably cautious. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary.

2.1.5 The report draws upon relevant information within the Environmental Statement (ES) prepared for the Proposed Development, notably Chapter 6 Biodiversity (RPS, 2023a). Detailed information is not repeated in this report. Instead the report is intended to provide sufficient stand-alone information to inform the HRA. Reference is made to more detailed information in the ES where necessary.

2.2 Stage 1 - Likely Significant Effect

Step 1: Qualifying Interest Features

2.2.1 The assessment takes into account Designated Sites within 10 km of the Proposed Development. Locations of Designated Sites were accessed via the government 'MAGIC' website (https://www.magic.defra.gov.uk). More detailed information including site descriptions and features of interest were obtained from the Joint Nature Conservation Committee website (http://jncc.defra.gov.uk).

2.2.2 Once Designated Sites were identified, the conservation objectives and qualifying interest features for each Site were identified, through review of the citations with which identified Sites were designated. In addition, subsequent reviews undertaken by the UK Joint Nature Conservation Committee (JNCC) and NRW were also considered to ensure that suitable assessment was undertaken.

Step 2: Likely Significant Effect

2.2.3 The screening assessment looks to identify whether the Proposed Development could potentially cause significant effects on the features and/or conservation objectives of the identified designated Sites.

2.2.4 Activities from the Proposed Development were identified that could impact on Site features and conservation objectives by assessing the magnitude of each impact pathway on the features of the

designated Site. Direct and indirect disturbance, damage or harm, and discharges, and emissions from the Proposals were considered.

2.2.5 Through the assessment of each impact pathway, project activities or features of each Site were screened out accordingly if it was identified there would unlikely be a significant effect from the activity or the feature would not be significantly affected, taking a precautionary approach. At this step, in line with recent case-law, assessments are made without consideration of mitigation/avoidance measures.

2.2.6 The assessment was based on sound reasoning and on the various ways in which the Proposed Development could impact on the interest features of the relevant NSNs. If it could not be concluded with confidence that adverse effects are unlikely, then under the precautionary principle, it was assumed that the issue required more detailed consideration and was progressed to the Appropriate Assessment Step.

2.3 Stage 2 - Appropriate Assessment

Step 3: Appropriate Assessment

2.3.1 For impact pathways that were not screened out as part of Step 2, an appropriate assessment of the implications of the Proposed Development for that site in view of that site's conservation objectives was undertaken.

2.3.2 The appropriate assessment was undertaken using specialist knowledge of the impact pathways and understanding of the sensitivities of the features of the Designated Site that could be affected by the Proposals. Using scientific published information to assess the tolerance of Designated Site features to the identified impact, a conclusion as to the overall effect has been provided.

2.3.3 Following assessment of each impact a judgement was undertaken to determine whether the conservation objectives for each qualifying feature was maintained in its current condition and a conclusion reached as to whether or not the Proposed Development may adversely affect the integrity of a Designated Site. The likely potential for in-combination effects is considered at this stage, and a conservative approach is taken to screening out ahead of Step 4 being undertaken. At this step, assessments are made with consideration of mitigation/avoidance measures.

Step 4: In-combination

2.3.4 The Habitats Regulations require that a decision to grant permission can only be made once the Competent Authority is satisfied that there would be no adverse effects on the integrity of the NSNs in question both alone and in-combination with other plans and projects. Therefore, Step 4 of the HRA process requires the identification of other plans and projects that might affect the interest features of the relevant NSNs in combination with the Proposed Development and decide whether there any adverse effects that might occur in-combination that did not occur when considered alone.

2.4 Stage 3 and 4 - Assessment of Alternatives & Consideration of IROPI

2.4.1 As this Assessment concludes that there will be no effects on the integrity of NSNs, Stages 3 and 4 of the HRA Assessment are not required for the Proposed Development.

3 STEP 1 – QUALIFYING INTEREST FEATURES

3.1.1 The report considers all NSNs shown to be linked to the Proposed Development through a known 'pathway'.

3.1.2 No NSNs or Ramsar Sites lie wholly or partly within the site.

3.1.3 Based on the nature of the Proposed Development and consultation responses, the following Designated Sites require consideration as to whether they could be affected by the Proposed Development:

- River Dee and Bala Lake SAC;
- Johnstown Newt Sites SAC;
- Berwyn and South Clwyd Mountains SAC; and
- Midland Meres & Mosses Phase 2 Ramsar.

3.1.4 The locations of the Nature 2000 Sites in relation to the application boundary can be seen on **Figure 1**.

3.1.5 The assessment included all Nature 2000 Sites within a 10 km radius of the Site. There are no known pathways for potential effects on sites beyond this radius.

3.2 River Dee and Bala Lake SAC

Features of Interest

3.2.1 The River Dee and Bala Lake SAC comprises of a watercourse and natural lake which has its source in Snowdonia and extend to the Dee estuary. The SAC covers over 1300 ha. The River Clywedog is a tributary following into the River Dee and SAC designation 7.11 km downstream of the Site in a straight line; and approximately 17.57 km downstream in terms of length of channel.

3.2.2 Water-crowfoot forms extensive beds along the whole length of the Dee where flow conditions are suitable.

3.2.3 The banksides of the river and tributaries are lined with trees, primarily alder and willow, along much of its length.

3.2.4 The Annex I habitat that is a primary reason for the Site designation is water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Annex II species that are a primary reason for Site selection include Atlantic salmon *Salmo salar* and floating water-plantain *Luronium natans*. Annex II species that are qualifying features for Site selection include sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, bullhead *Cottus gobio* and otter *Lutra lutra*.

3.2.5 The River Dee is recognised as one of North Wales' premier rivers for Atlantic salmon. The otter *Lutra lutra* is well established throughout the river system, especially where appropriate bank side cover exists.

3.2.6 Additional SSSI features present on the Site include saltmarsh/freshwater transition habitats and the following species: slender hare's-ear *Bupleurum tenuissimum*, sea barley *Hordeum marinum*, hard-grass *Parapholis strigose*, club tailed dragonfly *Gomphus vulgatissimus*, a stonefly *Isogenus nubecula*, and a weevil *Baris lepidii*.

Conservation Objectives

3.2.7 The Core Management Plan for the SAC (CCW, 2008a) defines the Site's conservation objectives as maintaining or restoring the favourable conservation status of the following eight features of the SAC:

- Feature 1: Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
- Feature 2: Atlantic salmon *Salmo salar*
- Feature 3: Floating water-plantain *Luronium natans*
- Features 4, 5, and 6: Sea lamprey *Petromyzon marinus*, Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis*
- Feature 7: Bullhead *Cottus gobio*
- Feature 8: European otter *Lutra lutra*

Current Condition

3.2.8 The Core Management Plan for the SAC classified the status of each of the Features as below.

3.2.9 The status of Feature 1 was unfavourable unclassified based on a survey undertaken in 2003.

3.2.10 Feature 3 was classified as being in favourable status.

3.2.11 The status of Features 2 and 4-7 was unfavourable unclassified based on a survey undertaken in 2007.

3.2.12 A reliable estimate of otter (Feature 8) population size could not be made from surveys undertaken to inform the Core Management Plan and its status was unclassified.

3.3 Johnstown Newt Sites SAC

Features of Interest

3.3.1 Johnstown Newt Sites SAC lies 1.94 km south of the solar arrays and 1.58km south of the site boundary at the closest point. The SAC is designated for its population of great crested newts *Triturus cristatus* (GCN) which is one of the largest known breeding populations of in Great Britain.

3.3.2 This designation covers 69 ha and comprises two post-industrial coal and clay extraction Sites in the small settlement of Johnstown to the southwest Wrexham.

3.3.3 The population of great crested newts has been the focus of much conservation management. The breeding Sites include a mining subsidence pool, natural water-filled hollows on clay and ponds created as part of nature conservation management. Terrestrial habitat includes marshy grassland, grazed farmland, swamp, scrub and broad-leaved woodland.

Conservation Objectives

3.3.4 The Conservation Objective for the SAC, as defined in the Core Management Plan (CCW, 2008b) is for the Site's GCN population to have a favourable conservation status. The favourable conservation status is measured by factors including GCN population size, number of breeding ponds, presence and extent of other species including fish, vegetation and invasive plants, and the presence of Amphibian *Chytridiomycosis* disease.

Current Condition

3.3.5 The most recent GCN population monitoring for the Site was reported in 2003[1], pre-dating the Core Management Plan. The most recent condition assessment (reported the Core Management Plan) was undertaken in 2007 and assessed the GCN population as unfavourable and declining with a population count below 300 individuals and with larvae found in low numbers.

3.3.6 The principal reasons for the unfavourable status were identified as the presence of fish in the breeding ponds, and the non-native invasive water plant New Zealand pigmyweed *Crassula helmsii* covering large areas of the pond surfaces. *Crassula helmsii* can reproduce rapidly, reducing the extent of open water habitat required for newts to breed. The excessive growth also causes an accumulation of decaying vegetation and can eventually choke the pond completely.

3.3.7 The condition assessment also identified, the potential risk of oil from off-road vehicles entering the water bodies in some management units although this was not considered a significant pressure on the GCN population. Recreational pressures were identified as risks to other habitats within the SAC including terrestrial habitat used by GCN.

3.4 Berwyn and South Clwyd Mountains SAC

SAC Features of Interest

3.4.1 The Berwyn and South Clwyd Mountain SAC has a total extent of over 27,200ha across three upland areas with: Berwyn SSSI, Llandegla Moor SSSI and Ruabon and Llantysilio Mountains and Minera SSSI. The closest part of the SAC to the Proposed Development is Ruabon / Llantysilio Mountains and Minera SSSI located 2.36 km to the west.

3.4.2 The SAC is designated for two Annex 1 habitats:

- European dry heath – of which the Site supports the largest stands in Wales; and,
- Blanket bogs – of which the Site supports the most extensive tracts in Wales.

3.4.3 The designation comprises a mosaic of dry heath and blanket bog vegetation with patches of transition mires and quaking bogs vegetation. It supports the largest area of blanket bog and European dry heath in Wales.

3.4.4 Other Annex I habitats present as qualifying features are: semi-natural dry grasslands and scrubland facies on calcareous substrates, transition mires and quaking bogs, calcareous and calcshist screes of the montane to alpine levels, and calcareous rocky slopes with chasmophytic vegetation.

3.4.5 Colonies of Welsh clearwing moth *Synanthedon scoliaeformis* are found in several localities, this being the strongest of only three populations on Wales.

Conservation objectives

3.4.6 The Core Management Plan for the SAC (CCW, 2008c) defines the Site's conservation objectives as maintaining or restoring the favourable conservation status of the following six features of the SAC:

- Feature 1: Blanket bog;
- Feature 2: European dry heaths;

[1] https://registry.nbnatlas.org/public/show/dr907 (accessed 1st August 2023).

- Feature 3: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*);
- Feature 4: Transition mires and quaking bogs;
- Feature 5: Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*); and
- Feature 6: Calcareous rocky slopes with chasmophytic vegetation.

Current Condition

3.4.7 Monitoring undertaken in 2005 found that each of the habitat features 1 – 6 were unfavourable declining, with likely contributing factors being: inappropriate grazing, burning and drainage.

3.5 Midland Meres and Mosses Phase 2 Ramsar

3.5.1 The Midland Meres and Mosses Phase 2 Ramsar Site is 2,365 ha and is located 5.87 km to the west of the Site. It has a diverse range of habitats from open water to raised bog and supports a number of rare species of plants and bryophytes associated with wetland habitats, as well as rare invertebrate species and nationally important bird populations.

3.5.2 The Meres and Mosses are a series of lowland open water and peatland Sites which have developed in natural depressions left by receding ice sheets. The 18 component Sites include open water bodies (meres), the majority of which are nutrient-rich with associated fringing habitats, reed swamp, fen, carr and damp pasture.

3.5.3 Peat accumulation has resulted in the nutrient-poor peat bogs (mosses) forming in some Sites on the fringes of the meres or completely infilling basins. In a few cases the result is a floating quaking bog or schwingmoor.

3.5.4 The majority of the Site comprises peatlands including peat bog swamps and fens (66.1%). 14.4% of the Site is permanent freshwater lakes. Forest peatland (4.7%), shrub-dominated wetlands (2.1%) and other habitats (12.7%) are also present.

3.5.5 The Site supports populations of the following bird species at levels of national importance: Northern shoveler *Anas clypeata*, great cormorant *Phalacrocorax carbo carbo*, great bittern, *Botaurus stellaris stellaris* and Water rail *Rallus aquaticus*.

3.5.6 Nationally important species present on the Site include higher plants such as *Elatine hexandra*, *Eleocharis acicularis*, *Cicuta virosa*, *Thelypteris palustris*, and *Carex elongata*. The nationally scarce bryophytes *Dicranum affine* and *Sphagnum pulchrum* are also present.

3.5.7 Nationally important invertebrate species include *Limnophila fasciata*, *Cararita limnaea*, *Lathrobium rufipenne*, *Donacia aquatica*, *Prionocera pubescens*, *Gonomyia abbreviata*, and *Sitticus floricola*. There are 16 insect species in the British Red Data Book listed for this Site including the following endangered species: the moth *Glyphipteryx lathamella*, the caddisfly *Hagenella clathrata* and the sawfly *Trichiosoma vitellinae*.

4 BASELINE INFORMATION

4.1 Overview

4.1.1 The Proposed Development site and adjoining habitat supports otter and great crested newts, features of the River Dee and Bala Lake SAC and Johnstown Newt Sites SAC. The status of these species within the Proposed Development is described below.

4.1.2 Otter are a wide-ranging species and there is potential for otters which form part of the population using the River Dee and Bala Lake SAC to use the River Clywedog to the south of the Site.

4.1.3 There is limited potential for the GCN population within the Johnstown Newt Sites SAC to use habitat within the Site, however potential impacts on this feature have been assessed on a precautionary basis.

4.2 Otter, River Clywedog

Evidence of Otter

4.2.1 An otter survey was undertaken in 2021 covering all sections of the River Clywedog within a minimum of 150 m of the Site (RPS, 2021a).

4.2.2 The section of river will fall within at least one active otter territory. The survey area has the potential to fall with the territory of a female and male otter.

4.2.3 The presence of three separate feeding stations and spraints, relatively evenly distributed along the watercourse, indicates frequent use.

4.2.4 A possible daytime resting place was identified beneath a rootball of a tree to the south-east of the Site. Feeding remains, spraint and footprints were recorded in the area. This section of river is not associated with recreational activities and is situated in dense ground cover on the side of the river c50m south of Mill Terrace. The possible daytime resting place is located 40 m from the Site boundary at the closest point at the Site access, 150 m from the solar arrays and 190 m from the cable route.

4.2.5 A potential holt was identified to the south-west of the Site, 490 m from the solar arrays and 950 m from the cable route.

4.2.6 Two feeding stations were identified west of the holt, over 500 m from the solar arrays and over 960 m from the cable route.

4.2.7 No holts or resting places were recorded in the central survey section where footpaths run parallel to the river and human activity is higher.

Woodland Habitat

4.2.8 Woodland along the surveyed section of river varies in suitability for otter.

4.2.9 Big Wood and the connected woodland block to the north comprise open woodland with footpaths extending through Big Wood and running parallel to the river with regular use by dog walkers which would further deter otter from sheltering during the daytime.

4.2.10 To the south of the Proposed Development, the area is frequented by dog walkers and lacks large areas of dense scrub and bankside features which could provide shelter for otter. No otter tracks were recorded leading from the river into Big Wood within 100 m of the Proposed Development.

4.2.11 Secure places of shelter for otter are restricted to the sections of bankside habitat adjoining the watercourse where there is negligible public access in locations that would be unlikely to be found by dogs being walked through the woodland.

4.2.12 There were no signs of otter activity around the dry former leat where the cable will be installed onto the bridge.

4.3 Great Crested Newt, Plas Power Estate

4.3.1 The presence of GCN has been confirmed or assumed at several ponds within a minimum 600 m buffer of the Site (RPS 2023b, RPS 2021b):

- A small population of GCN is present in a pond 50 m west of the Site. The pond is located at the edge of the block of broadleaved woodland adjoining the Site.
- A medium sized metapopulation of GCN is present in two ponds 760 m west of the Site. The ponds are adjacent to farmyard and orchard and surrounded by dense scrub.
- A small pond 100 m north-east of the Site was dry during both 2021 and 2023 though under a precautionary basis is assumed to support a small GCN population.
- A pond 560 m east of the Site was not included in the survey and may also support GCN. The presence of GCN within the pond has been assumed under a precautionary basis.

4.3.2 The likely absence of GCN at four ponds within 600 m of the Site was confirmed by eDNA analysis. No GCN were recorded during traditional presence / absence surveys of these ponds.

4.3.3 The majority of the Site comprises short, grazed pasture and arable and are not optimal terrestrial newt habitat.

4.3.4 The highest value habitats for GCN within the site are ponds and broadleaved woodland which adjoin the Site and hedgerows within and adjoining the Site. Areas of taller grassland provide suitable habitat but are small in extent and lack connectivity to GCN breeding ponds.

5 STEP 2 - LIKELY SIGNIFICANT EFFECT

5.1.1 This section deals with the screening of likely significant negative effects on the qualifying feature and sub-features of the relevant Natura 2000 and Ramsar Sites as a result of the construction, operation and decommissioning of the Proposed Development.

5.1.2 The possibility of the Proposed Development having a likely significant effect on any of the designated Sites identified in Section 4 is discussed for each impact pathway in turn below.

5.1.3 The key aspects of the Proposed Development that need to be assessed are:

- Site preparation and enabling works;
- construction;
- operation and maintenance of the Proposed Development; and,
- decommissioning.

5.1.4 The environmental pathways that could lead to a significant effect due to the Proposed Development may be summarised as:

- habitat loss and fragmentation, reduced connectivity;
- direct loss or damage of habitats used by interest species;
- change in management regimes (e.g. grazing / mowing) of habitats used by interest species;
- changes in water quality and / or hydrology;
- entrapment/ obstruction during construction / decommissioning;
- disturbance during construction / decommissioning (from human activity, noise and lighting);
- disturbance during operation (from human activity, noise and lighting); and
- accidental introduction of invasive non-native species.

5.1.5 Berwyn and South Clwyd Mountains SAC and Midland Meres & Mosses Phase 2 Ramsar are both designated for the habitats they support. As they are located over 2.36 km and 5.87 km from the Proposed Development, there are no impact pathways identified between the Proposed Development and these NSNs. There are no Likely Significant Effects of the Proposed Development on the Berwyn and South Clwyd Mountains SAC and Midland Meres & Mosses Phase 2 Ramsar are the are therefore excluded from Stages 2 and 3 of the assessment.

5.2 Habitat loss and fragmentation, reduced connectivity

5.2.1 The Proposed Development is over 1.94 km from all Natura 2000 designations.

5.2.2 Given the distance between the Natura 2000 Designations and Proposed Development, there is no anticipated loss, fragmentation or reduced connectivity of habitats within the Natura 2000 Designations.

5.3 Direct loss or damage of habitats used by interest species

5.3.1 The Proposed Development activities will be located within short-grazed grassland and arable and will involve the installation of solar arrays and associated infrastructure. The arable land will be stripped and seeded as grassland.

5.3.2 Stand-offs will be implemented around boundary woodland, hedgerows, field drains, ditches and ponds. Areas of hedgerow removal, if required to widen access points, will be limited in extent.

Otter – River Dee and Bala Lake SAC Feature

5.3.3 The construction / decommissioning activities will not have any potential to result in direct damage to habitats used by otter.

5.3.4 The grassland and arable do not provide any areas of potential cover for otter. The boundary features of fields will be retained and protected during construction / decommissioning with any localised work having negligible potential to affect otter.

5.3.5 Woodland, the River Clywedog and streams adjoining the Site provide higher quality habitat for otters moving through the landscape and it is unlikely that otter use the Site.

5.3.6 All habitats with potential to be used by otter will remain freely accessible to the local otter population. The connectivity between rivers, streams and woodland will remain unchanged.

5.3.7 For all cable route options, the cable route will be installed via horizontal directional drilling beneath the River Clywedog, at a location over 190 m from the closest otter resting place.

5.3.8 The preferred cable route would be installed along a roadside close to a small stream. The works would be undertaken within the roadside and will not encroach on the stream habitat.

5.3.9 Other cable route options would not adjoin any further watercourses.

5.3.10 Therefore there is no likely significant effect on the habitats of importance used by otter and this feature has been screened out.

GCN – Johnstown Newt Sites SAC Feature

5.3.11 The Proposed Development is 1.5 km from the SAC and the proposal will not result in any direct loss of any designated habitat within the designation.

5.3.12 Occasional movement of individual GCN between the SAC and ponds located close to the Proposed Development is possible.

5.3.13 Given the low value of the majority of habitat within the Site and the location of higher value habitat within the 50m radius considered to be the ‘core range’ for the species of ponds where GCN are known to be or could be present, the potential for GCN to use habitat within the development is limited.

5.3.14 Higher value habitat for GCN in, primarily the ponds and woodland adjoining the Site, will be protected with stand-offs.

5.3.15 There is potential for GCN to use the narrow margins of taller grassland around field boundaries. These will be retained within the development with potential effects limited to temporary localised habitat loss at access points into fields.

5.3.16 The arable and short-grazed grassland where the Proposed Development will be constructed have negligible value for GCN.

5.3.17 The connectivity of GCN habitats within the local area will be unaffected by the Proposed Development.

5.3.18 The potential for Likely Significant Effect on the habitats of importance used by GCN has been carried through to the Appropriate Assessment stage.

5.4 Change in management regimes (e.g. grazing / mowing) of habitats used by interest species

GCN – Johnstown Newt Sites SAC Feature

5.4.1 During operation, grassland beneath the solar arrays will continue to be sheep grazed. The Site will continue to be sheep-grazed where construction / decommissioning activities are not undertaken during the construction / decommissioning phases.

5.4.2 Grassland between the perimeter fencing and field boundaries will be cut once to twice per year, with the aim of creating a tussocky sward.

5.4.3 The field margins lie outside of the core habitat range of the nearest pond and a significant distance from waterbodies within Johnstown Newt Sites SAC, limiting the likelihood of GCN being present within the habitat. While there is potential for adverse impacts on individual GCN during management, given the low intensive management of the field margins and distance to the Johnstwon Newts SAC there are no significant adverse effects anticipated on the overall status of the GCN population. There is potential for the development of tussocky field margins to result in a beneficial effect on GCN.

5.4.4 There are no potential Likely Significant Effects on this feature and it has been screened out from further assessment.

Otter – River Dee and Bala Lake SAC Feature

5.4.5 Given the lack of suitable habitat for otter within the Site, there is negligible potential for the proposed management to affect otter and likely significant effects as a result of the Proposed Development can be screened out for all phases.

5.5 Water quality and hydrology

5.5.1 The quality of the water entering the Natura 2000 and Ramsar Sites is an important determinant of habitat condition and hence the species they support. Poor water quality can have a range of ecological impacts.

5.5.2 The Proposed Development will be installed on grassland, with extensive areas of grassland and woodland providing a buffer between the Site and River Clywedog.

5.5.3 Water run-off associated with the Proposed Development will be minimal and will infiltrate into the surrounding grassland.

5.5.4 There is potential for disturbance to the River Clywedog in the location where the cable route crosses the river.

5.5.5 Given the length of the watercourse between the site and the SAC, and the environmental controls during construction, there would not be any affect from hydrological connectivity between the working areas and the River Dee and Lake Bala SAC. Any soil or silt in surface water run off would be deposited in the river channel before it reaches the SAC.

5.5.6 There is negligible potential for the operational site to adversely affect any of the qualifying features of the River Dee and Bala Lake SAC.

5.5.7 The potential for Likely Significant Effects from changes to water quality on all qualifying features in the NSNs can be screened out.

5.6 Entrapment / obstruction during construction / decommissioning

GCN – Johnstown Newt Sites SAC Feature

5.6.1 There is limited potential for GCN to be present within the Site with the narrow field margins being the only areas of the Site with taller grassland.

5.6.2 Works within the field margins will be localised and limited in extent and there are no works proposed which would result in open excavations being left in these areas. The overall connectivity of the habitat will be maintained.

5.6.3 There is negligible potential for GCN to become entrapped or obstructed within the Site during construction / decommissioning. Potential entrapment/ obstruction of GCN within the Site can be screened out with no Likely Significant Effects on the otter population.

Otter – River Dee and Bala Lake SAC Feature

5.6.4 The habitat within the Site provides negligible cover and foraging opportunities for otter and does not connect areas of otter habitat. The Site does not form an important corridor for otter and there will be negligible otter movement through the habitats that will fall within the Proposed Development construction / decommissioning area. Following the start of construction / decommissioning activities there should be no movement through this area with continued use of the established foraging areas and corridors in the wider vicinity.

5.6.5 There is negligible potential for otter to become entrapped or obstructed within the Site during construction / decommissioning. Potential entrapment/ obstruction of otter within the construction / decommissioning Site can be screened out with no Likely Significant Effects on the otter population.

5.7 Disturbance during construction / decommissioning (from human activity, noise and lighting)

GCN – Johnstown Newt Sites SAC Feature

5.7.1 With stand-offs implemented around all ponds which may support GCN along with higher value terrestrial habitat there is limited potential for construction / decommissioning works to affect GCN.

5.7.2 The main working area will be short-grazed grassland and arable with negligible value for GCN.

5.7.3 Work within the taller grassland around field margins which could result in disturbance to GCN if present will be limited in extent and duration.

5.7.4 The potential for Likely Significant Effects on the GCN feature of the Johnstown Newt Sites SAC via disturbance during construction has been carried through to the Appropriate Assessment stage.

Otter – River Dee and Bala Lake SAC Feature

5.7.5 The installation of a cable via horizontal directional drilling under the River Clywedog will result in elevated noise and vibration in the adjoining habitat.

5.7.6 The cable route will cross the River Clywedog over 190 m from the closest otter resting place. The crossing has been aligned to an existing bridge, at a location where residential properties and Bersham Road adjoin the river and where there is minimal cover for otter.

5.7.7 Given the distance between the cable installation area and areas of cover, potential impacts on otter are limited.

5.7.8 The preferred cable route runs parallel to a small stream which is a tributary to the River Clywedog. Given the lack of areas of cover near the stream, the potential for disturbance to otter at the location during the cable installation is limited.

5.7.9 All other areas of construction are over 200 m from the closest otter resting places and there is negligible potential for impacts.

5.7.10 The potential for Likely Significant Effects on the otter feature of the River Dee and Bala Lake SAC via disturbance during construction has been carried through to the Appropriate Assessment stage.

5.8 Disturbance during operation (from human activity, noise and lighting)

GCN – Johnstown Newt Sites SAC Feature

5.8.1 During operation there will be limited activity within the Proposed Development, mainly associated with maintenance of the solar arrays and infrastructure, and habitat management.

5.8.2 Field margins will be subject to a low intensity management regime which is expected to increase their value for fauna and would have potential to benefit GCN. The continued use of sheep grazing will result in no changes to impacts on GCN in the fields.

5.8.3 There will be no new lighting installed within the development.

5.8.4 There are no potential Likely Significant Effects of disturbance during operation and this has been screened out from further assessment.

5.9 Accidental introduction or spread of invasive non-native species

5.9.1 The movement of people and traffic, as well as importation of material and plants to a Site, can result in the introduction of non-native species to a Site.

5.9.2 There are no proposed works within 10m of the single small stand of Japanese knotweed *Fallopia japonica* located at the Site boundary.

5.9.3 Any vegetation / seed mixes will be acquired from suppliers who implement control measures to prevent the potential spread of non-native invasive species.

5.9.4 Given the above and the distance between the Site and Designated Sites, there is negligible potential for invasive non-native species to be introduced or spread to Designated Sites.

5.9.5 The issue of the introduction and spread of invasive non-native species is therefore screened out from further consideration in this assessment on the grounds of there being no Likely Significant Effect.

6 STEP 3 – APPROPRIATE ASSESSMENT

6.1 Stage 2 Summary

6.1.1 A summary of the outcomes of Stage 2 is presented below in Table 6.2, and Appropriate Assessment for the relevant impact pathways provided below this.

Table 6.2 Summary of Stage 2 Conclusions – Plas Power Solar and Energy Storage Project

Impact Pathway	Screening Outcome	Designated Site	SAC Qualifying Feature
Habitat loss and fragmentation, reduced connectivity	No Likely Significant Effect	All Designated Sites	-
Direct loss or damage of habitats used by interest species	Likely significant effect cannot be excluded	Johnstown Newt Sites SAC	GCN
Change in management regime of habitats used by interest species	No Likely Significant Effect	All Designated Sites	-
Water quality and hydrology	No Likely Significant Effect	All Designated Sites	-
Entrapment / obstruction during construction / decommissioning	No Likely Significant Effect	All Designated Sites	-
Disturbance during construction / decommissioning	Likely significant effect cannot be excluded	River Dee and Lake Bala SAC	Otter
	Likely significant effect cannot be excluded	Johnstown Newt Sites SAC	GCN
Disturbance during operation (from human activity, noise and lighting)	No Likely Significant Effect	All Designated Sites	-
Accidental introduction or spread of invasives non-native species	No Likely Significant Effect	All Designated Sites	-

6.2 Direct loss or damage of habitats used by interest species

6.2.1 Suitable habitat for GCN within the Site is limited in extent. With stand-offs from higher value habitats and ponds the potential for impacts on GCN is low.

6.2.2 GCN typically travel up to 500 m and their 'core range' habitat is typically within 50m of a breeding pond. Given the distance between the Site and Johnstown Newt SAC (1.58 km), the movement of individual GCN between Johnstown Newt Sites SAC and the Site will be very limited.

6.2.3 All works with potential to affect GCN will be undertaken under a GCN Mitigation Licence and will follow a GCN Mitigation Strategy. This will include the use of phased vegetation clearance and fingertip searches for GCN by an Ecological Clerk of Works where works are undertaken in habitats where GCN may be present.

6.2.4 The loss of areas of taller grassland will be temporary and the disturbed areas left to regrow after clearance. The loss will be limited in extent to allow field entrances to be widened for access during construction.

6.2.5 The potential effects on the status of the local GCN population and Johnstown Newt Sites SAC are therefore considered to be negligible.

6.2.6 There will be no effect on the integrity of the Johnstown Newt Sites SAC GCN feature as a result of direct loss or damage of Habitats used by interest species.

6.3 Construction / Decommissioning Disturbance

GCN – Johnstown Newt Sites SAC Feature

6.3.1 Movement of vehicles and machinery through the Site during the construction / decommissioning phase would have potential to impact upon GCN in the absence of mitigation measures. There will be up to 1,200 HGV movements over the construction period. The majority of works being undertaken in arable and short-grazed improved pasture. GCN are unlikely to be in these habitats.

6.3.2 GCN typically remain within 50m of their breeding pond and the number of GCN expected to be within suitable habitat within the site is therefore very low. Numbers of GCN within the main working areas would be lower. Given the distance between the Proposed Development and Johnstown Newt SAC (1.58 km), the limited extent of GCN habitat within the Proposed Development, and the limited works to be undertaken within suitable GCN habitat within the site, the potential for adverse impacts on GCN is limited. The integrity of the NSN will be unaffected.

6.3.3 The implementation of measures outlined in the GCN Mitigation Strategy including ecological supervision and pre-works inspections under a GCN Mitigation Licence will protect GCN during the construction phase.

6.3.4 The potential effects on the status of the local GCN population and Johnstown Newt Sites SAC as a result of construction / decommissioning disturbance are considered to be negligible.

6.3.5 There will be no effect on the integrity of the Johnstown Newt Sites SAC GCN feature as a result of disturbance during construction / decommissioning.

Otter – River Dee and Bala lake SAC

6.3.6 The distance between the proposed cable route crossing and both known otter resting areas and areas of cover reduces the potential for impacts on the species.

6.3.7 As the stream along the preferred cable route option is small in size and lacks areas of cover, potential disturbance would be limited to otters travelling through the area. Other cable route options avoids potential otter habitat.

6.3.8 If disturbed during the works, otters would be displaced into adjoining habitat further from the works. Any disturbance would be temporary, only lasting through the duration of the cable installation.

6.3.9 The potential effects on the status of the local otter population and the River Dee and Bala Lake SAC as a result of construction / decommissioning disturbance are considered to be negligible.

6.3.10 There will be no effect on the integrity of the River Dee and Bala Lake SAC otter feature as a result of disturbance during construction / decommissioning.

7 STEP 4 – IN-COMBINATION ASSESSMENT

7.1.1 The purpose of this section is to assess the in-combination effects of the Proposed Development with other developments near the Site that are currently in the planning process, have been approved but are not yet constructed or have sufficient information available for assessment and have a reasonable chance of coming forward. Government and DNS procedural guidance has been followed in the assessment of the in-combination effects.

7.1.2 All nearby developments have been reviewed for relevance to ecology. This includes the following developments:

- **Land South Of, Berse Road, Caego, Wrexham, LL11 6TP (P/2023/0221) – erection of 47 dwellings and associated infrastructure**. This application Site is approximately 500m to the north of the Site (north of the A525). A planning application for the proposal is currently under determination and as of November 2023 consultation responses in respect of the Proposed Development had been received from NRW, WCBC Affordable Housing, WCBC Public Protection, WCBC Education, Welsh Water, WCBC Contaminated Land and Welsh Government Highways. Given that the planning application for Land South of Berse Road has been submitted and is currently pending determination, it is likely that a decision will be made by the end of 2023. Allowing a further 6 months for approval of reserved matters and discharge of conditions, work is likely to commence on site Q3 2024. It is therefore likely that there will be some overlap between the construction of this cumulative development and the Plas Power Solar and Energy Storage Project.

- **Lower Berse Farm, Ruthin Road (A525), Wrexham (pre-application) – strategic development of 1,500 homes**. Redrow is currently proposing a new strategic development east of the A483 and south of the A525. The Proposed Development is for a new community-led neighbourhood, delivering in the region of 1,500 homes. The Site is draft allocated for housing in Wrexham Borough Council's Emerging Development Plan. The Proposed Development is currently at consultation stage. Further information is available on the consultation website: https://lowerbersefarmconsultation.co.uk/. It is not expected that the forthcoming planning application will be submitted during Q3/Q4 2023. Allowing for a 6-month determination period and then allowing a further 18 months for approval of reserved matters and discharge of conditions, work is unlikely to start on site until Q3/Q4 2025. It is therefore likely that the overlap of construction periods of the Redrow scheme and Plas Power Solar and Energy Storage Project will be minimal.

- **Legacy National Grid Substation, Bronwylfa Road, Talwrn, Wrexham, LL14 4HY (P/2023/0175) – Installation and operation of battery storage facility and ancillary development.** On 24 July 2023, permission was granted for the installation and operation of a battery storage facility and ancillary development at the legacy National Grid Substation, Bronwylfa Road. The legacy National Grid Substation is the proposed point of connection for the Proposed Development. The development provides for 30 battery banks (single stacked), 15 battery inverters, 1 switch gear unit, 1 auxiliary transformer compound and 1 client control room. It is a revised proposal of a previous larger scheme. This development was approved in July 2023. There are no pre-commencement conditions and therefore it can be assumed that construction will have either commenced or will commence imminently. Allowing a 6-12-month construction period, it is likely that the development will be operational at the commencement of the construction of the Plas Power Solar and Energy Storage Project.

- **Legacy National Grid Substation, Bronwylfa Road, Talwrn, Wrexham, LL14 4HY (preapplication) – 1,025 MW Energy Storage System.** Innova is currently running a public consultation exercise for a proposed Energy Storage System (ESS) to be connected to the existing National Grid legacy substation. The development Site covers approximately 37 acres located in fields to the east of the Legacy National Grid substation and west of the A483. It is currently proposed that the development will be situated across two fields either side of the B5097. The Proposed Development is currently at pre-application stage. Further details can be found at the consultation website: https://innova.co.uk/projects/legacy-ess/.

It is anticipated that a planning application will be submitted in Q3/Q4 2023. Allowing 12 weeks for determination, and then an additional 12 weeks for discharge of any pre-commencement conditions, it is likely that construction will commence in Q3 2024. Assuming a 6-12 month construction period, it is likely that there will be some overlap between the construction of this cumulative development and the Plas Power Solar and Energy Storage Project.

- **DNS/3237973 – Bersham Energy Plant**. The Bersham Energy Plant is a 30 MW energy plant and reclamation scheme currently at the preapplication stage. It is registered as a Development of National Significance and a Screening Direction was issued by the Planning Inspectorate (now PEDW) in October 2019. The Screening Direction confirmed that the Proposed Development is EIA development. There is no further publicly available information in respect of this Proposed Development since the issuing of the Screening Direction. A Scoping Direction Request has not yet been submitted for this development. It can therefore be assumed that there would be at least 12-months before submission of DNS application would be possible. Assuming a further 12-month determination period, it is unlikely that construction would commence until Q4 2025. There is therefore the potential for some overlap of construction periods.

7.1.3 The locations of nearby Proposed Developments are shown on Figure 2.

7.1.4 Given the distance from the application site to the surrounding Natura 2000 sites and the separation between the Proposed Development and other nearby developments, there are no pathways for effects to occur in combination with other plans or projects as a result of:

- Habitat loss and fragmentation, reduced connectivity
- Change in management regime of habitats used by interest species
- Water quality and hydrology
- Entrapment / obstruction during construction / decommissioning
- Disturbance during operation
- Accidental introduction or spread of invasive non-native species

7.2 Direct loss of habitats

7.2.1 The nearby Proposed Developments will result in the loss of areas of terrestrial habitat which may be suitable for GCN.

7.2.2 With GCN typically travelling up to 500 m and their ‘core range’ habitat typically within 50m of a breeding pond, the potential for individuals which form part of the Johnstown Newt Sites SAC to use habitat within the SAC, Proposed Development and nearby Proposed Developments is limited.

7.2.3 Given the low impact nature of the Proposed Development and distance between the SAC, Proposed Development and nearby developments, the potential for in-combination impacts is negligible and will not adversely affect the status of the local populations of GCN or the integrity of the Johnstown Newt Sites SAC.

7.3 Disturbance during construction

Otter – River Dee and Lake Bala SAC Feature

7.3.1 Otter are a wide ranging species and will use watercourses which flow through the local area in proximity to the Proposed Development and the nearby Proposed Developments identified above.

7.3.2 In the absence of control measures, there is potential for nearby proposals to result in disturbance to otters using watercourses adjacent to the Sites, which may be part of the otter feature of the River Dee and Lake Bala SAC.

7.3.3 Given the low potential for the Proposed Development to result in disturbance to otter and the limited time frame during which work will be undertaken alongside otter habitat, as part of the Proposed Development the potential for cumulative impacts with nearby developments is limited.

7.3.4 Should in-combination impacts occur, the impact of these would be low and will not adversely affect the status of the local populations of otter or the integrity of the River Dee and Lake Bala SAC.

GCN – Johnstown Newt Sites SAC Feature

7.3.5 Given the distance between the Proposed Development and Johnstown Newt Sites SAC, the potential for GCN associated with the SAC to be disturbed is very minimal.

7.3.6 There is no overlap between GCN habitat within the Proposed Development which could be disturbed by the development and nearby developments. If disturbed during construction, individual GCN would be expected to move into adjacent habitat nearby. Given the distance between the Proposed Development and other sites, there would be no overlap between habitat which GCN may move between.

7.3.7 As such there is no potential for in-combination affects between the Proposed Development and nearby developments.

8 CONCLUSIONS

8.1.1 There are no potential environmental pathways that could lead to a significant effect on the Berwyn & South Clwyd Mountains SAC the Midland Meres and Mosses Ramsar or their qualifying features.

8.1.2 It has been concluded that there are no potential Likely Significant Effects on any interest features within Berwyn & South Clwyd Mountains SAC, Midland Meres and Mosses Ramsar during the construction, operational or decommissioning phases of the Proposed Development either alone or in combination.

8.1.3 The Proposed Development will have no impacts upon the habitats within the River Dee and Bala Lake SAC and Johnstown Newt Sites SAC.

8.1.4 There is potential for the development to result in minor disturbance to otter, a qualifying feature of the River Dee and Bala Lake SAC, during the construction / decommissioning phase though this will not result in a likely significant effect.

8.1.5 The assessment has concluded that during the construction, operational or decommissioning phases of the Proposed Development there will be no adverse effects on the integrity of the River Dee and Bala Lake SAC.

8.1.6 Johnstown Newt Sites SAC is designated due to its population of GCN and there is limited potential for movement of individual GCN between the designation and Proposed Development. There will be a limited and temporary loss of GCN habitat during construction and there is potential for minor disturbance to GCN during the construction, operational and decommissioning phases. This will not result in a likely significant effect on Johnstown Newt Sites SAC.

8.1.7 The assessment has concluded that there will be no adverse effects on the integrity of the Johnstown Newt Sites SAC.

9 GLOSSARY

9.1 Glossary of Terms

Table 7.1: Glossary of Terms

Term	Description
EIA	Environmental Impact Assessment
ES	Environmental Statement
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
NSN	National Site Network
SAC	Special Area of Conservation
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest

REFERENCES

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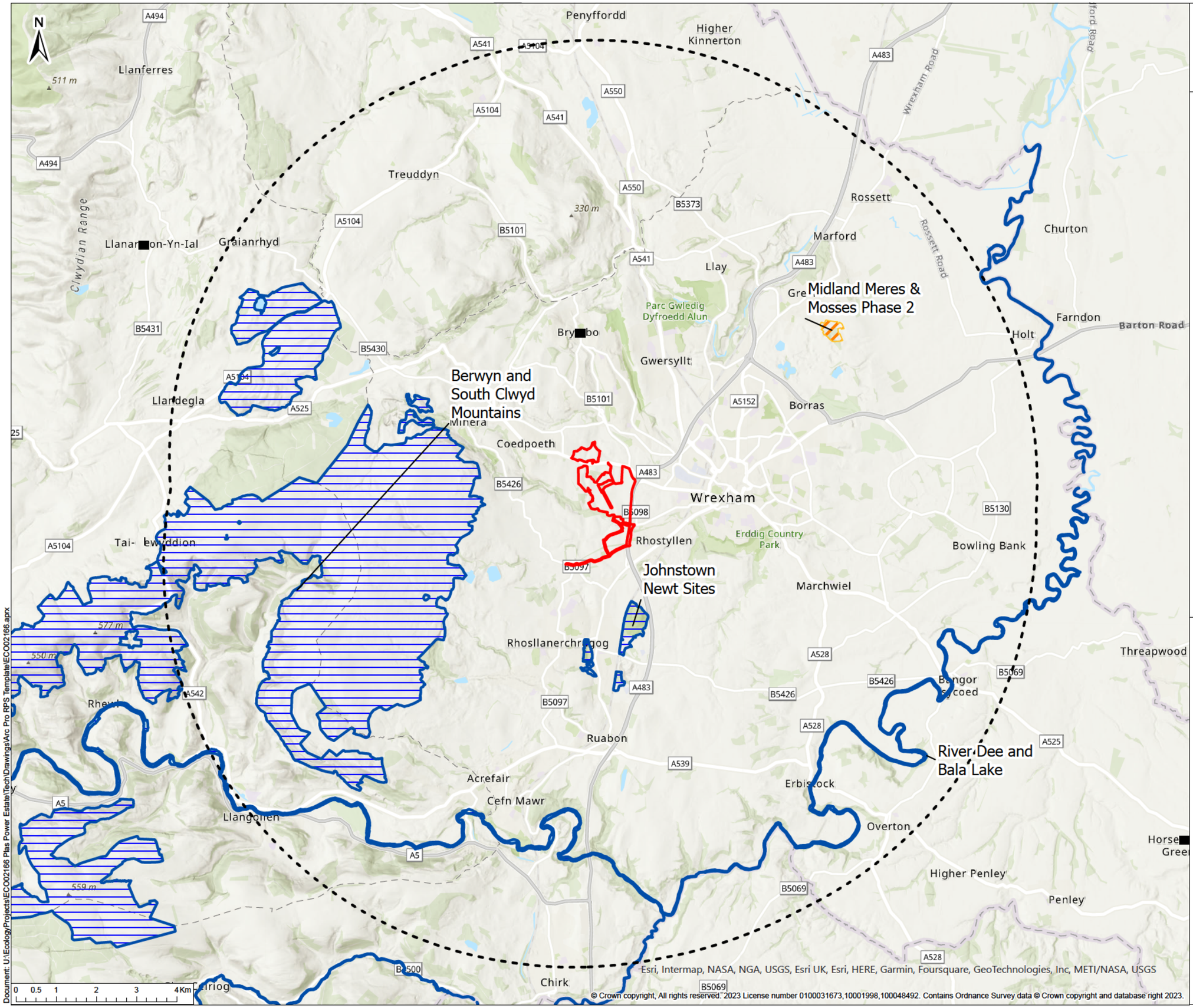
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FIGURES

Figure 1 NSNs Location Plan

Figure 2 Cumulative Schemes Location Plan



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Legend

- Site Boundary
- 10km Buffer
- Ramsar
- SAC

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Title	Natura 2000 Sites Location Plan

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Legend

- Residential Development - Lower Berse Farm (Redrow) (Pre-Application Consultation)
- BESS 30no. units - Legacy Substation (Pelagic Energy) (P/2023/0175 - Approved)
- BESS 1,025 MW - Land at Bersham (Innova) (Pre-Application Consultation)
- Residential Development - Land South of Berse Road (P/2023/0221 - Pending Consideration)
- Bersham Energy Plant (30MW) - Bersham Bank Colliery Tip (Bersham (Glenside) Ltd) (Pre-Application Consultation)
- Plas Power Solar Farm

NOTES

All site boundaries are approximate

N

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Project Plas Power Solar Farm

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