



Galileo 03 Ltd.

Mynydd Ty-talwyn Energy Park - Environmental Statement Volume III

Appendix 10.1: Ecological Baseline Report

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RSK GENERAL NOTES

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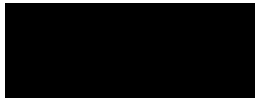
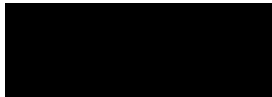
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This work has been undertaken in accordance with the quality management system of RSK Biocensus.

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Galileo 03 Ltd.

Mynydd Ty-talwyn- Environmental Statement III
663870

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1.0 INTRODUCTION

1.1 Purpose of this Report

- 1.1.1 This Ecological baseline report presents the findings of surveys undertaken at Mynydd Ty-talwyn Energy Park (Grid Ref SS 86327 86041) ('the Proposed Development'). The report comprises the results of a background data search and a UK Habitat Classification Assessment - with assessment for protected or otherwise notable species and species-specific surveys. The survey area included the land within the planning boundary, or 'the Site boundary', as illustrated in **ES Volume IV, Figure 1.2: Planning Application Boundary**, thereafter referred to as 'the Site'.
- 1.1.2 The report identifies ecological constraints relevant to the project, specifies any further survey or mitigation requirements (e.g., for any Ecological Impact Assessment), gives recommendations for avoidance and protection through design changes, and suggests opportunities for ecological enhancement for the purposes of Net Benefit for Biodiversity (NBB).
- 1.1.3 This report has been prepared by RSK Biocensus on behalf of Galileo 03 Ltd (part of Galileo Empower UK Ltd) (hereinafter referred to as 'Galileo' or the 'Applicant').

1.2 Landscape Context

- 1.2.1 The 578 hectares (ha) Site is located 4 km to the north of Bridgend and 8 km to the east of Port Talbot. The Site is dominated by other neutral and modified grassland, many of these fields bordered by hedgerows or fences, with areas of wet, broadleaved, other coniferous and mixed woodland, gorse and bramble scrub and fen marsh and swamp. The Site is also dissected by watercourses in several locations. Areas of modified grassland are actively grazed by both sheep and cows, with areas also being mown for silage.
- 1.2.2 The Site is predominantly bordered by further areas of agricultural land to the north, south and east, with the western border of the Site adjacent to both forested and agricultural areas. The surrounding area is generally made up of agricultural fields bordered by fences or hedges sparsely interrupted by forested areas with small residential areas immediately adjacent to the Site. A review of aerial photographs and Ordnance Survey maps show that there are 38 ponds located on or within 250 m of the Site. An additional two ponds were identified during the UK Habitat Classification Assessment,

1.3 Development Proposals

- 1.3.1 The Proposed Development comprises the construction and operation of six wind turbines, ground mounted solar photovoltaic (PV) modules, one project substation and ancillary infrastructure works.

2.0 METHODS

2.1 Background Data Search

2.1.1 A Background Data Search (BDS) was undertaken in May 2023 for relevant reference materials. A list of sources is given in **Table 1**.

Table 1 Data sources

Information Obtained	Available From
Protected and noteworthy species-records	South East Wales Biodiversity Records Centre (SEWBRc)
Designated site locations and citations	Natural Resources Wales (NRW) website
Designated site locations and citations	Joint Nature Conservation Committee (JNCC) website
Designated site locations and citations	Aderyn Local Environmental Record Centre (LERC) Wales
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Areas/Habitats of Strategic Significance	https://www.bridgend.gov.uk/media/8721/bridgendlbapandes_v2-1.pdf https://www.biodiversitywales.org.uk/Neath-Port-Talbot#:~:text=There%20are%20a%20wide%20range,the%20former%20Bryn%20Navigation%20Colliery.
Areas/Habitats of Strategic Significance	National Habitat Networks https://www.data.gov.uk/dataset/0ef2ed26-2f04-4e0f-9493-ffbdbfaeb159/habitat-networks-england
Areas/Habitats of Strategic Significance	National Priority Focus Areas https://www.data.gov.uk/dataset/c20a40c5-c975-43e1-9abd-d1257aa58432/natural-england-national-priority-focus-areas
Areas/Habitats of Strategic Significance	Nature Improvement Areas https://www.data.gov.uk/dataset/a19c95e3-9657-457d-825e-3d2f3993b653/nature-improvement-areas

- 2.1.2 A search was made for international and national statutory designated sites of ecological importance within 2 km of the Site boundary including Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Sites of Special Scientific Interest (SSSI), including consideration of SSSI risk zones. The search area was extended to 10 km for SAC, SPA and Ramsar sites. **Figure 1** illustrates international and nationally designated sites within 10 km.
- 2.1.3 A search was also made for non-statutory designated sites (often important in a local context) within 2 km of the Site boundary. **Figure 1** also illustrates these non-statutory sites.
- 2.1.4 The BDS also included a search for records within 2 km of the Site boundary of noteworthy species (**Annex A**), which might pose a constraint to the Proposed Development. Species included in the search were:
- European protected species (listed on Schedules 2 and 5 of The Conservation of Habitats and Species Regulations 2017 (as amended));
 - nationally protected species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 (as amended) and The Protection of Badgers Act 1992;
 - species listed as critically endangered, endangered or vulnerable based on the IUCN Red List Categories and Criteria 2001;
 - all species listed on the RSPB's Birds of Conservation Concern 5 (Stanbury *et al.*, 2021) as 'red' or 'amber';
 - nationally rare or nationally scarce species;
 - notable¹ invertebrates; and
 - species of principal importance listed under The Natural Environment and Rural Communities (NERC) Act 2006 or priority species under the relevant local biodiversity action plan.
- 2.1.5 Data collected as part of initial feasibility work was also reviewed.

2.2 Preliminary Ecological Appraisal

- 2.2.1 The Preliminary Ecological Appraisal (PEA) was undertaken in line with Guidelines for Preliminary Ecological Appraisal from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017).
- 2.2.2 The survey was carried out between 15 and 18 May 2023 by Anna Burnham. Anna is a suitably qualified and experienced ecological consultant, a member of CIEEM, and is experienced in carrying out preliminary ecological appraisals. Additional survey areas and access routes were surveyed between 12 April and 6 June 2024 by Kailey O'Brien. Kailey is also senior ecological consultant, an associate member of CIEEM, and is experienced in carrying out preliminary ecological appraisals.

¹ Appendix C includes a description of 'notable' as used in this context.

Phase 1 Habitat Survey

- 2.2.3 The field survey was based on the UK habitats (UKHab) survey methodology (Version 1.1; Butcher *et al.* 2020), as extended for use in environmental impact assessment (Institute of Environmental Assessment 1995). However, due to the timing of writing this report and requirement by the scoping direction for habitats to be reported using the JNCC Phase 1 Habitat methodology, the results from the UKHab survey have been transposed to Phase 1 habitats for this report.
- 2.2.4 The UKHab survey included:
- Classification of habitats using primary codes and numeric secondary codes;
 - Habitat mapping using a set of standard colour codes to indicate habitat types on a map (**Figure 2**); and
 - A description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the habitat map, called ‘target notes’ (**Figure 2**).
- 2.2.5 Vascular plant species were recorded during the survey, although no attempt was made to produce an exhaustive species list (additional species would almost certainly be found during more detailed surveys or repeat surveys at various times of the year).
- 2.2.6 Plant nomenclature in this report follows Stace (2019) for native and naturalised species of vascular plant. Introduced species and garden varieties were identified using relevant Floras. Plant names in the text are given with common names with the scientific name (in italics) immediately following the first time it is mentioned.

Invasive Non-native Species

- 2.2.7 A UK Habitat classification survey does not involve exhaustive surveying for individual plant species, and various invasive species may be little in evidence at various times of year (depending on the species). A survey seeking to identify habitat types cannot therefore be relied upon to provide firm information about the presence or extent of any invasive non-native species (INNS). However, any INNS that were encountered during the habitat survey were noted, including Japanese Knotweed (*Reynoutria japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Himalayan Balsam (*Impatiens glandulifera*), as well as any invasive non-native species of animals.

2.3 National Vegetation Classification

- 2.3.1 The National Vegetation Classification (NVC) is a system which aims to describe every broad plant community type in the British Isles, and standard methods are used in the field and for data analysis (Rodwell 1991a, 1991b, 1992, 1995, 2000).
- 2.3.2 Vegetation abundance is measured using the Domin-scale which gives a percentage-cover class for every species as shown in

2.3.3 **Table 2.**

Table 2 Domin scale

Domin scale	Range (%)
10	91 - 100
9	76 - 90
8	51 - 7
7	34 - 50
6	26 - 33
5	11 - 25
4	5 - 10
3	1 - 4
2	several individuals but less than 1 % cover
1	few individuals no measurable cover

- 2.3.4 The surveys were undertaken on 14 and 15 August 2023, led by Francesca Lemon BSc (Hons) MSc. MCIEEM, a principal ecology consultant and Kailey O'Brien BSc MSc. ACIEEM, a senior ecology consultant. Both Francesca and Kailey are ecologists with RSK Biocensus Ltd. and are experienced in botanical surveys. Anna Burnham and Nick Price acted as survey assistants and are both consultant ecologist. The locations of the quadrats are shown in **Figure 3**.
- 2.3.5 NVC surveys were also undertaken on additional areas of the Site that were not previously identified in 2023. These surveys were undertaken on the 3 and 4 July 2024 and led by Kailey O'Brien and assisted by sub-contractor of RSK Biocensus Ltd Julie Player BSc (Hons) MCIEEM. The locations of the quadrats are shown in **Figure 3**.
- 2.3.6 The surveys were undertaken during dry warm weather that was on average 18 °C.

2.4 Invertebrates

- 2.4.1 The Site was assessed for its suitability to support notable species and/or assemblages of invertebrates, but no specific surveys were undertaken. The habitat requirements of particular invertebrates are often species-specific, so consideration was given to the presence of features and habitats that might be suitable for the notable species identified in the BDS.

2.5 Fish

- 2.5.1 Watercourses within the Site were broadly assessed for their likely habitat and water quality, and consequent suitability to support fish (and other species), but no specific surveys were undertaken.

2.6 Great Crested Newts

- 2.6.1 Although standing water is essential for their breeding, great crested newts (GCN) (*Triturus cristatus*) are terrestrial for most of the year and have been recorded up to

500 m from their breeding ponds. Ordnance Survey maps and aerial imagery were reviewed to identify any ponds within 500 m of the Site boundary, and the Site was assessed for its suitability for both terrestrial and breeding GCN. Optimal breeding ponds tend to be well-vegetated, relatively clean and unpolluted, free of fish and wildfowl, and retentive of water throughout most summers (but not necessarily all). Highly suitable terrestrial habitats include woodland, scrub and tussocky grassland, although GCN can be found in a broad range of sub-optimal habitats as well. Habitat suitability for other amphibians was similarly assessed.

Habitat Suitability Index

- 2.6.2 The surveys were completed in April 2024 to assess each waterbody for their suitability to support GCN.
- 2.6.3 The Habitat Suitability Index (HSI) for GCN uses ten factors (suitability indices (SI) 1 to 10), which are thought to affect GCN, as follows:
- Geographic location (SI 1);
 - Pond area (SI 2);
 - Permanence (SI 3);
 - Water quality (SI 4);
 - Shade (SI 5);
 - Presence of water fowl (SI 6);
 - Presence of fish (SI 7);
 - Number of adjacent ponds (SI 8);
 - Terrestrial habitat (SI 9); and
 - Macrophyte cover (SI 10).
- 2.6.4 Each factor is scored, and the scores are converted to SI scores on a scale from 0.01 to 1 from graphs given in Oldham *et al.* (2000).
- 2.6.5 Further research by Brady (unpublished) has developed a system for using HSI scores to define pond suitability for GCN according to the following categories:
- HSI <0.5 = poor;
 - HSI 0.5 – 0.59 = below average;
 - HSI 0.6 – 0.69 = average;
 - HSI 0.7 – 0.79 = good; and
 - HSI > 0.8 = excellent.
- 2.6.6 There is a positive correlation between HSI scores and presence and abundance of GCN in ponds. Generally, ponds with high HSI scores are likely to support larger populations. However, the relationship is not sufficiently precise to conclude that a pond with a high HSI will definitely have a large newt population, or that a pond with a low HSI score will only have a small newt population or no newts at all.

Environmental DNA analysis

- 2.6.7 The presence/ likely absence of GCN in all of the waterbodies present within the Site was determined through the use of environmental DNA analysis (eDNA).
- 2.6.8 In accordance with good practice guidelines (Biggs, *et al.* 2014), 20 water samples were taken from the margins of the waterbodies included in the survey (where accessible) by an appropriately experienced and licensed surveyor using the correct methodology and equipment.
- 2.6.9 The samples were taken during the optimum survey period in April 2024. The samples were taken by Kailey O'Brien (NRW GCN licence number - S091652/1) and Julie Player (NRW GCN licence number - S094483/1).
- 2.6.10 The samples were taken from evenly spaced locations around the waterbodies and all areas of the waterbodies were surveyed (where accessible) in order to provide a complete overview of the diversification of the waterbody in the analysis.
- 2.6.11 The weather conditions and sedimentation levels were considered to be suitable for sampling.

GCN Population Size Class Assessment

- 2.6.12 In order to determine the estimated population size class assessment of GCN at the Site, a series of six survey visits (night and morning) were conducted according to current methodologies listed in the GCN Mitigation Guidelines (Natural England, 2001).
- 2.6.13 Survey visits were conducted in suitable weather conditions between mid-April and the June. A combination of the following survey methods were employed during each visit:
- Torch survey: involves walking the perimeter of water body shortly after dusk searching marginal areas for adult GCN with a powerful torch (e.g., Clulite 1 million candlepower torch);
 - Egg searches: involves an examination of both living and dead submerged vegetation (especially folded leaves), fallen twigs or on other debris (plastic bags) for newt eggs; and
 - Bottle trapping: involves setting traps made from empty plastic bottles around the margins of ponds in the evening and checking them early (before 10 am) the following day.
- 2.6.14 In order to carry out a population size class assessment, the highest count of adult newts obtained in each waterbody by any one method is summed for all waterbodies on one night. The peak total site count is then the highest of these figures. The figure which is obtained then determines whether the population of GCN at the Site is small (for maximum counts up to 10), medium (for maximum counts between 11 and 100) or large (for maximum counts over 100).

2.7 Reptiles

- 2.7.1 The Site was assessed for its suitability for the four most widespread reptile species, with particular attention given to those features that provide suitable basking areas (e.g., south-facing slopes), hibernation sites (e.g., banks, walls, piles of rotting vegetation) and opportunities for foraging (e.g., rough grassland and scrub).
- 2.7.2 Specific habitat requirements differ between species. Common lizards (*Zootoca vivipara*) and slow-worms (*Anguis fragilis*) favour rough grassland. Grass snakes (*Natrix helvetica*) have broadly similar requirements, with a greater reliance on ponds and wetlands. Adders (*Vipera berus*) use a range of fairly open habitats with some cover but are most often found in dry heath.

2.8 Birds

- 2.8.1 Birds nest, forage and roost in a wide variety of habitats including scrub, woodland, hedgerows, trees, arable and pastoral farmland.
- 2.8.2 Dedicated bird surveys were completed by Avian Ecology between November 2021 and November 2023. RSK Biocensus completed update surveys in winter 2024/2025 and 2025/2026 and spring/summer 2025. The findings of these surveys are reported on separately within **ES Volume II, Chapter 11: Ornithology**.

2.9 Bats

- 2.9.1 Habitats were assessed for their suitability for foraging and commuting bats, in line with guidance provided in Collins (2023). Areas of particular interest vary between species, but generally include sheltered areas and habitats with good numbers of insects, such as woodland, scrub, rivers and species-rich or rough grassland.
- 2.9.2 Trees and man-made structures were noted if they had potential suitability for roosting bats (Collins, 2023). This involved identifying features that roosting bats may favour (e.g., holes, cracks and cavities that might be used as bat access-points or roost sites).

Preliminary Bat Assessment

- 2.9.3 The preliminary bat roost assessment was carried out on 14 January 2022 by Alexandra Ellis (Principal Ecologist) and Kailey O'Brien. Alexandra holds a bat survey licence (NRW licence number - 2018-35858-CLS-CLS) is a full member of CIEEM and has over thirteen years' experience of undertaking bat work.
- 2.9.4 The survey followed Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition (Collins, 2016) and the Site was given a suitability classification in line with industry best practice guidelines (Collins, 2016). These categories are shown in **Table 3** below:

Table 3 Guidelines for assessing the potential suitability of Proposed Development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement (Collins, 2016)

Potential Suitability	Description	
	Roosting habitats in structures	Potential flight-paths and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e., a complete absence of crevices / suitable shelter at all ground / underground levels)	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e., no habitats that provide continuous lines of shade / protection for flight-lines, or generate / shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/ or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/ stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such

Potential Suitability	Description	
	Roosting habitats in structures	Potential flight-paths and foraging habitats
	maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	as trees, scrub, grassland or water.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of times due to their size, shelter, protections, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/ stable hibernation site.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High—quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
- o Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute). - o For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.		

Ground Level Tree Assessment

- 2.9.5 An initial survey of trees that may be affected by the works was conducted to assess their potential to support roosting bats on 29 and 30 January 2025 by Julie Player. Julie holds an NRW bat survey licence (SO92541/1) and is a full member of CIEEM. This involved the inspection of trees from ground-level using binoculars and a torch to identify any features which were considered to have potential as a bat roost and for any evidence of bats such as scratch marks, oil stains and droppings. Additional surveys by climbing were undertaken on 5 and 6 March, 21 June and 16 August 2025.
- 2.9.6 This included Potential Roost Features (PRF) for bats. PRFs can include, but are not limited to: woodpecker holes, rot cavities, cracks or splits, flaking bark, matted climbing plants, flutes, snapped limbs and helical splits. The surveyor performed the

survey from ground level using binoculars. Each tree was then given a roosting suitability classification in line with industry best practice guidelines (Collins, 2023). These categories are shown in **Table 4** and **Table 5**.

Table 4 Guidelines for assessing the suitability of trees on Proposed Development sites for bats, to be applied using professional judgement (Collins, 2023).

Suitability	Description
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF	A tree with at least one PRF present.

Table 5 Guidelines for categorising the potential suitability of PRFs on a Proposed Development site for bats, to be applied using professional judgement (Collins, 2023)

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Initial Site Risk Assessment for Bats

- 2.9.7 Wind turbines have the potential to cause risk of death to bats by direct collision or death through barotrauma (internal injury due to a sudden drop in air pressure near blades), although there is recent evidence indicating that injury through barotrauma is unlikely with impact trauma the likely cause of the majority of wind-turbine related bat fatalities (Lawson, *et al*, 2020).
- 2.9.8 Cumulative bat deaths have the potential to be significant to the local, regional and even national populations. This is because bats are long-lived, and their reproductive rate is low.
- 2.9.9 A risk assessment was carried out in line with the current NatureScot Guidance (NatureScot, *et al.*, 2021) in order to give an indication of the site risk to bats.

2.9.10 **Table 6** below presents the current NatureScot parameters to be considered when assessing a site for its potential risk to bats. This table uses the habitat threat and the size of the development in order to derive an overall site risk score. The overall site risk score is used to determine the overall site risk to high collision risk species.

Table 6 Initial Site Risk Assessment

Site Risk Level (1-5)	Project size			
Habitat Risk		Small	Medium	Large
	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
Habitat Threat	Description			
Low	• Small number of potential roost features, of low quality. • Low quality foraging habitat that could be used by small numbers of foraging bats. • Isolated site not connected to the wider landscape by prominent linear features			
Moderate	• Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.			
High	• Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the Site. • Extensive and diverse habitat mosaic of high quality for foraging bats. • Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. • At/near edge of range and/or on an important flyway. • Close to key roost and/or swarming site.			
Project Size	Description			
Small	• Small scale development (≤10 turbines). No other wind energy developments within 10 km. • Comprising turbines <50 m in height.			
Medium	• Larger developments (between 10 and 40 turbines). May have some other wind developments within 5 km. • Comprising turbines 50-100 m in height.			
Large	• Largest developments (>40 turbines) with other wind energy developments within 5 km. • Comprising turbines >100 m in height.			

Bat Activity Survey - Static Detector Monitoring

- 2.9.11 A map outlining the turbine areas was provided by the Applicant in 2023 this was then updated outlining solar areas in 2024. These were used to define the extent of the survey areas for static detector deployment.

- 2.9.12 Eight and four full spectrum Wildlife Acoustics Song Meter 4 (SM4) detectors with omnidirectional microphones were deployed within the bat study area in relation to turbine and solar areas, respectively. Each microphone was mounted at a minimum of 2 m as per the new guidance (NatureScot, *et al.*, 2021) either on wooden stakes or on standing conifer trees in clear fell in order to maximize the probability of recording bat calls, in addition to reducing the likelihood of noise interference from insects and moving vegetation.
- 2.9.13 Detectors were deployed across the bat study area to cover different habitats and topographical features including forestry edges, forestry rides, access routes, clear fell, watercourses, and immature plantation. Each detector recorded bats from dusk to dawn with detectors starting 30 minutes before dusk and finishing 30 minutes after dawn. The monitoring points of the detectors are shown in **Figure 5**.
- 2.9.14 NatureScot *et al.*, 2021 guidance stipulates that bat activity data for turbines be recorded for 10 consecutive nights of good weather. Therefore, detectors were deployed for a minimum of 14 nights in spring, summer and autumn (May to September 2023) in order to take into account fluctuations in weather patterns throughout the season. Survey dates were spaced out with a minimum gap of 14 nights between each deployment. In addition, detectors were deployed when the predicted weather forecast indicated suitable weather conditions for foraging and commuting bats (i.e., air temperature above 8°C, wind speed below 5 m/s and light or no precipitation).
- 2.9.15 The Bat Survey Guidelines (Collins 2023) states the minimum level of pre-application survey required using static detectors is 5 nights in each of: spring (April - May), summer (June - mid-August) and autumn (mid-August - October). Therefore, four detectors were deployed within the solar application boundary in Summer and Autumn 2024 and Spring 2025.
- 2.9.16 **Table 7** details the dates of the static detector deployments.

Table 7 Survey dates and timings for each static detector deployment

Month	Start Date	End Date	No of Nights
Turbines			
May	18/05/2023	01/06/2023	14
July	04/07/2023	24/07/2023	20
August	16/08/2023	31/08/2023	15
Solar			
July	18/07/2024	24/07/2024	6
September	13/09/2024	20/09/2024	7
April	07/04/2025	14/04/2025	7

- 2.9.17 The detectors were deployed for a total of 69 nights throughout the surveys (spring, summer and autumn inclusive). On 21 of these nights there were instances where

the weather conditions were deemed unsuitable for foraging bats (temperature below 8 °C, wind over 5 m/s and rainfall). In some cases, the weather was only considered unsuitable for a short period of time (one or two hours throughout the night) and therefore, unsuitable nights were calculated based on whether the majority of the night had suitable weather conditions for bat activity. Only eight nights had weather conditions that were deemed unsuitable for bats throughout the surveys. Due to the large amount of weather data collected, it has not been provided within this report but can be provided upon request.

Night-time Bat Walkover Surveys

- 2.9.18 The Site was assessed during the preliminary bat assessment when it was identified as offering moderate suitability to support foraging and commuting bats. This assessment confirmed that one Night-time Bat Walkover (NBW) survey is required per season in Spring (April/May), Summer (June/July/August) and Autumn (September/October).
- 2.9.19 NBW surveys commenced at sunset and lasted for at least two hours and covered all suitable habitats for foraging and/or commuting bats, with a focus on boundary features and areas of interest based on the bat static surveys.
- 2.9.20 Transects included walked sections within fields where possible and also driven sections along the narrow lane to confirm if there are any crossing points used favorably by commuting bats on Site. Surveyors continuously recorded any signs of bat activity on their detector, and stopped at pre-determined locations for longer periods, where activity was recorded before continuing along the transect. Monitoring locations were chosen to include areas of high-quality habitat where bats were likely to be encountered if present.
- 2.9.21 The transect route is shown in **Section 3.9**. On each visit, the set transect route was walked in suitable weather (above 10 °C, with little or no rain and no strong winds), using a Batlogger M2 handheld detector. The direction of each transect altered each month to sample different parts of the transect at different times after sunset. Bat passes were marked on a map so that statistics on passes and numbers could later be calculated.
- 2.9.22 Levels of bat activity were quantified by the number of bat passes recorded during each walking section or monitoring stop. A single pass by a bat was defined by a gap of one second or more between the end and beginning of the next bat call. Species were identified either in the field or through analysis of recordings.
- 2.9.23 **Table 8** details the dates and survey times of the activity surveys. Weather conditions at the beginning of the survey are provided in **Table 9**.

Table 8 Survey Dates and Timings for each NBW Survey

Month	Date	Sunset Time	Start Time	End Time
June	03/06/2024	21:22	21:15	23:25
August	06/08/2024	20:53	20:45	23:10

October	09/10/2024	18:33	18:15	20:30
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Table 9 Weather Conditions Recorded at the Beginning of each NBW Survey

Date	Temperature (°C)	Cloud (Octas)	Wind (Beaufort)	Rainfall
03/06/2024	15	1	3	None
06/08/2024	17	2	2	None
09/10/2024	12	4	2	None

Analysis of Sound Recordings

- 2.9.24 Full spectrum Wildlife Acoustics Song Meter 4 (SM4) detectors were split into five second files in spring and then set to record five second registration files in the subsequent deployment periods (summer and autumn), to facilitate the BTO Acoustic Pipeline analyses software.
- 2.9.25 All recordings were analysed using specialised software (The BTO Acoustic Pipeline). The pipeline automatically identifies bat calls to species level by comparing the echolocation pulses to an integrated library of bat calls which then assigns a species label to every five second registration file. Following the batch analysis, all non-pipistrellus calls (excluding *Pipistrellus nathusii*), no ID calls (which included noise), and low confidence calls were manually checked by an experienced bat ecologist using Kaleidoscope Viewer in order to confirm identification. A percentage of calls were also checked for quality assurance, with 10% of pipistrelle calls (*Pipistrellus pipistrellus* and *Pipistrelles pygmaeus*) also manually checked.
- 2.9.26 This method of analysis is in line with current guidelines (Collins, 2016) for data analysis which recommends the manual checking of all non-pipistrellus calls when using automated methods. Guidance on call parameters was taken from Russ (2012).
- 2.9.27 Echolocation calls were identified down to species or genus level depending on the type of bat encountered. It was not always possible to reliably identify species belonging to the genus groups *Myotis* and *Nyctalus*, with these groups only analysed to genus level.
- 2.9.28 The level of bat activity was quantified by the number of five second files (registrations) recorded for each recorded species for each night and monitoring period. As night length varies between months, the number of bat registrations recorded was divided by the number of recording hours, to provide an indication of bat activity – bat registrations per hour (B/h).
- 2.9.29 Following the batch analysis and manual identification the bat activity data at the turbine locations was also analysed by using the Ecobat online data processing tool². Ecobat allows the comparison of bat activity data with sites in a similar geographic

² Mammal Society (2017). Ecobat. Available at: <http://www.mammal.org.uk/science-research/ecostat> <http://www.ecobat.org.uk/>

location allowing calculations on whether bat activity levels are comparatively low, moderate or high to the other sites within the reference data set.

- 2.9.30 In order to do this, Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of activity recorded across the Proposed Development. These Ecobat percentiles can then be assigned to activity levels to provide a quantifiable measure of bat activity. Table 10 below describes the percentile scores taken from the current NatureScot Guidance (NatureScot *et al.*, 2021) and the corresponding Ecobat activity score.
- 2.9.31 The static surveys were carried out in spring, summer and autumn. The spring deployment period extended into June with nine nights recorded during this month. Therefore, there are site risk scores for May, June, July and September.
- 2.9.32 The reference range was stratified to include the following: records within 30 days, within 100 km of the bat study area and collected by any model of detector.

Table 10 Percentile Score and Categorised Level of Bat Activity

Ecobat Percentile	Ecobat Bat Activity	Ecobat Activity Score
81 - 100	High	5
61 - 80	Moderate to High	4
41 - 60	Moderate	3
21 - 40	Low to Moderate	2
0 - 20	Low	1
0	Nil	0

2.10 Dormice

- 2.10.1 Habitats were assessed for their general suitability for dormouse (*Muscardinus avellanarius*). Dormice generally use areas of dense woody vegetation cover (including hedgerows) and are more likely to be found where there is a wide diversity of woody species contributing to three-dimensional habitat complexity, a number of food sources, plants suitable for nest-building material, and good connectivity to other areas of suitable habitat.

2.11 Water Vole and Otter

General

- 2.11.1 The survey for water vole (*Arvicola amphibius*) and otter (*Lutra lutra*) was carried out between 30 May and 2 June 2023 by Anna Burnham and Dan Nicholas BSc (Hons). Anna and Dan were both consultant ecologists for RSK Biocensus. Additional surveys were undertaken on the 17 July and 18 July 2024 by Peter Walker BSc (Hons) MRes PhD MIFM CEnv and Nick Price BSc (Hons) ACIEEM.
- 2.11.2 The weather conditions are described in **Table 11** below:

Table 11 Water Vole and Otter Survey Weather Conditions

Date	Air Temperature	Cloud Cover	Wind Speed	Precipitation
30/05/2023	19 °C	20 %	F4	Dry
01/06/2023	18 °C	50 %	F3	Dry
02/06/2023	19 °C	10 %	F3	Dry
17/07/2024	20 °C	25 %	F2	Dry
18/07/2024	22 °C	15 %	F2	Dry

2.11.3 No weather liable to cause survey limitations, i.e., periods of heavy rain or storms, were experienced in the run up to the survey.

2.11.4 The locations of the ditches are shown in **Figure 6**.

Habitat Assessment

2.11.5 The suitability of the ditches was assessed using the following criteria (Dean *et al.* 2016):

1. Dry areas above water level for nesting, either in burrow or above ground woven nests.
Need to consider:
 - a. Burrow entrances do not need to be above water level;
 - b. Bank profile – steep banks are preferred as water voles can excavate burrow systems that are more adaptable to changing water levels (n.b. water voles can use banks with shallow profiles where water levels are stable);
 - c. Bank substrate – whether water voles can burrow into the banks (n.b. burrows can be formed behind stonework with suitably sized gaps, behind sheet piling, where water voles can access the banks behind by either corrosion or by climbing the sheet piling or adjacent vegetation, and water voles can also create burrows some distance back from the water's edge, where substrate at the toe of the bank is unsuitable);
 - d. Daily fluctuations in water level (such as on estuaries or tidal reaches of rivers); and
 - e. The availability of suitable above-ground nest sites, where there are no banks, or banks with a shallow profile, such as in extensive reed/sedge bed habitats or in tussocks within ponds.
2. Herbaceous vegetation to provide food and cover. Water voles will generally favour areas with herbaceous vegetation on the banks and (ideally) in the channel. However, it should be noted that:
 - a. The level of cover provided by vegetation will vary depending on the season and how recently management works has been undertaken;
 - a. The level of cover required by water voles will vary, with urban / sub-urban populations or those in intensively sheep-grazed uplands surviving in habitat with very little cover;
 - b. Water voles will eat a wide variety of plant species (as well as amphibians, invertebrates and fish) and can survive in areas where there is a low diversity of species and a lack of lush emergent vegetation; and

- c. Water voles are very capable climbers and will forage up into a hedgerow understorey for fruits and shoots where a watercourse is present as its base; they can also exist in low densities in the banks of watercourses shaded by woodland.
 - 3. Water, as a means to escape from predators:
 - a. Water voles will sometimes use very shallow watercourses that contain a few centimetres of water, and terrestrial populations have been recorded which are unconnected to wetland habitat.
- 2.11.6 In general, water voles require all three of these habitat 'preferences' in close proximity to each other, although there are circumstances where water voles survive in less favourable habitat. With these preferences in mind, classification of habitat suitability for each ditch was made as follows:
- Excellent – ideal or optimal habitat with good cover, food sources and other elements that would allow a population of water voles to thrive throughout the year.
 - Suitable – habitat that has all the elements required for water voles certainly in the summer, and probably through most winters.
 - Marginal – habitat that has some of the habitat features that are suitable for water vole, but with some constraints so that suitability throughout the year is not certain.
 - Unsuitable – habitat lacking one or more crucial element for use by water voles. This category does not necessarily preclude the habitat being used by commuting water voles, but it would not be able to support a resident population.

Presence / Likely Absence Survey

Water Vole

- 2.11.7 A search for field signs, including droppings (the principal evidence required), feeding remains, burrows and footprints, indicating presence was completed on the ditches suitable for water voles just outside of the breeding season. The breeding season for the majority of the UK is considered to be between mid-April to the end of September (though this can vary depending on season variation based on latitude and altitude) and this is when field evidence is more evident (Dean *et al.* 2016). Water vole rafts were deployed at locations along the ditches, where areas of open water were present. These rafts were checked for field signs during dormouse/reptile visits throughout the 2022 survey season.
- 2.11.8 The apparent size and distribution of water vole populations can be affected by changes in habitat suitability during the breeding season. Two surveys were undertaken as recommended according to published guidelines (Dean *et al.* 2016); one between mid-April to the end of June and one between July and September, inclusive (at least two months apart). In some cases, it may be possible to justify an assessment based on a single visit if a precautionary approach is followed.
- 2.11.9 Where water vole presence is confirmed, estimates of latrine density can be used to indicate the relative size of the population and highlight the areas of most value to the species (**Table 12**). Subdivision of the survey area into 'low', 'medium' or 'high' relative population densities could assist with interpretation of the Site (Dean *et al.* 2016):

Table 12 Approximate Latrine Numbers and Relative Population Density

Relative Population Density	Approximate number of latrines per 100 m of bank-side habitat	
	Mid-April to end of June	July to September (inclusive)
High	10 or more	20 or more
Medium	3 – 9	6 – 19
Low	≤ 2 (or none, but with confirmatory signs)	≤ 5 (or none, but with confirmatory signs)

Otter

- 2.11.10 Otter surveys were undertaken in tandem, and included searching for evidence of otter presence such as spraints, footprints, slides, holts, feeding platforms and resting places such as layup sites and couches.

2.12 Badger

- 2.12.1 An initial assessment was carried out to identify areas that might be used by badgers (*Meles meles*) for foraging or sett building within 30 m of all areas potentially affected by works (where access was possible). The area was systematically searched for signs of badgers including setts, foraging signs, paths (runs) and latrines where possible, and the category of sett and levels of activity visible at each sett was recorded.

2.13 Other Species of Principal Importance

- 2.13.1 The UK countries of England, Wales, Scotland and Northern Ireland are obliged by their individual laws to maintain lists of species and habitats of principal importance for biodiversity conservation. An assessment of the suitability and likelihood of the Site supporting such species was made (for example, hedgehog (*Erinaceus europaeus*)).

2.14 Constraints and Limitations

Preliminary Ecological Appraisal

- 2.14.1 Less conspicuous plant species (including INNS) may have been missed as a result of the survey being undertaken outside of the ideal survey season. However, the majority of plants present were confidently identified, and the survey was sufficient to make a broad assessment of the habitats present on the Site.
- 2.14.2 This preliminary appraisal as to whether protected or otherwise notable species might occur on the Site is based on the suitability of habitat, the known distribution of relevant species in the local area (from online sources and desk study), and any signs of the relevant species. It does not constitute a full and definitive survey of any protected species group.

- 2.14.3 Field signs for protected and valuable species are often difficult to find or absent from a Site. The surveys conducted were not intended to be a comprehensive presence/absence survey for all species, but rather to provide an indication of the likely presence of such species based on the field signs found, and the nature of the habitats present.
- 2.14.4 Access was not made to all adjacent land, and therefore it remains possible that a badger sett (or other evidence of protected or notable species) beyond the Site boundary could have been missed.
- 2.14.5 Some areas within the Site were not accessible by foot due to dense scrub, forest and waterways. However, it is considered that sufficient access was possible to describe the range of habitat types present and to inform the requirements for additional surveys.
- 2.14.6 Recording habitats in UKHab and since transposing to Phase 1 is not seen as a limitation due to the UKHab methodology being more involved and recording more information.

GCN

- 2.14.7 Dense vegetation around Pond 11 blocked access for further surveys. However, surveys were completed on Pond 12 within 100 m of the inaccessible pond, therefore if GCN were present, an assumption could be made that they would be present in both ponds. Therefore, this is not considered to be a limitation to the survey.
- 2.14.8 Nesting geese prevented eDNA sampling and two trapping visits at Pond 59. Trapping commenced when the geese left and identified a number of small newts, but not great crested. As trapping was completed during the optimum survey period and a pond within the same field was surveyed, it is highly unlikely that the presence of GCN was missed.

Bats

- 2.14.9 A map outlining the turbine locations was provided by the Applicant in 2022. This was used to place monitoring points close to proposed turbine locations (the locations are shown on **Figure 5**). The turbine layout has been revised since surveys were completed with monitoring points no longer adjacent to turbine locations. The revised turbine locations are not seen to be a limitation to the data collected as the monitoring points covered a range of habitats and topographical features typical to the Proposed Development.
- 2.14.10 Due to passive (static) monitoring methodologies depending on sound reaching the microphone, the detection rate of bat calls varies with a bias towards loud bat calls; with quieter calls, namely brown long-eared bats (*Plecotus auritus*), potentially being under-recorded.
- 2.14.11 Ecobat is a requirement of the guidance which uses third party data to determine the relative bat activity of the Proposed Development which is then used to calculate the overall site risk to bats. It is possible that third party data may contain species identification errors.

2.14.12 The Ecobat tool does not correct for the length of a registration file when uploading the data. Therefore, it is not known if the data sets (reference ranges) used to calculate the percentiles for the Proposed Development had longer or shorter registration files. Longer or shorter registration files could have resulted in the percentiles being overestimated or underestimated for the Proposed Development. However, this is still the most suitable methodology and is not anticipated to affect the findings of the assessment.

Water Vole and Otter

2.14.13 Areas of dense scrub and barbed wire fences across the survey area did limit access to some locations of the river/ditches across the Site. However, restricted areas were observed through binoculars so an assessment and survey of the habitat could be undertaken. It is considered that sufficient survey effort was completed within the restricted locations and the results provide a fair evaluation of the survey.

2.14.14 Access restrictions to large woodlands (within 30 m of the red line boundary) and steep slopes within areas of the Site did limit access to some woodland and dense bracken.

3.0 RESULTS

3.1 Background Data Search

International Statutory Designated Sites

- 3.1.1 There are three international statutory designated sites within 10 km of the Site boundary. These sites are listed in **Table 13** in order of proximity to the Site; short descriptions are given for the sites.

Table 13 International Statutory Sites within 10 km of the Site Boundary

Site name	Reasons for designation	Approximate distance and direction from Site
Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands SAC	<u>Annex I habitats that are a primary reason for selection of this site:</u> Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) <u>Annex II species present as a qualifying feature, but not a primary reason for site selection:</u> Marsh fritillary (<i>Euphydryas aurinia</i>)	1 km south
Blackmill Woodlands SAC	<u>Annex I habitats that are a primary reason for selection of this site:</u> Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	3.5 km east
Kenfig / Cynffig SAC	<u>Annex I habitats that are a primary reason for selection of this site:</u> - Fixed dunes with herbaceous vegetation ("grey dunes"). - Dunes with <i>salix repens</i> ssp. <i>argentea</i> (<i>Salicornia arenariae</i>) - Humid dune slacks - Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. <u>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</u> - Atlantic salt meadows	5.2 km south west

	<u>Annex II species that are a primary reason for selection of this site:</u> Fen orchid (<i>Liparis loeselii</i>) Petalwort (<i>Petalophyllum ralfsii</i>)	
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National Statutory Designated Sites

- 3.1.2 There are six nationally statutory designated site within 2 km of the Site Boundary, including Cwm Risca Meadow SSSI which lies adjacent to the south. The designated sites present within the study area is listed in **Table 14** along with their proximity to the Site.

Table 14 National Statutory Designated Sites within 2 km of the Site Boundary

Site name	Reasons for designation	Approximate distance and direction from Site
Cwm Risca Meadow SSSI	Old wet acidic meadow on coal measure rocks supporting over 80 species of herbaceous plants and supporting a colony of marsh fritillary butterfly (<i>Euphydryas aurinia</i>).	Adjacent to the south
Bryn-Bach Cefn Cribwr SSSI	Part of Cefn Cribwr Grasslands SAC, the SSSI is designated for marshy grassland and species-rich neutral grassland as well as a population of locally rare plant species.	1 km south
Caeau Cefn Cribwr SSSI	Part of Cefn Cribwr Grasslands SAC, the SSSI is designated for marshy grassland and species-rich neutral grassland as well as a population of locally rare plant species and nationally scarce butterfly.	1.3 km south
Bedford Park LNR	Broadleaved woodland with rush pastures, purple moor grass, scrub, bracken, rivers and ponds. A portion of the SINC, 'Waun Cimla' is a Site of Special Scientific Interest (SSSI) due to its marshy habitats, rare plants, and marsh fritillary butterflies. Dormice have been recorded here, which makes it one of only a few sites in Bridgend County Borough with this European protected species.	1.3 km south

Waun Cimla SSSI	Extensive area of wet lowland heath and grassland. The site supports a complex mosaic of plant communities of restricted distribution and represents an example of an assemblage which is notable in the context of Mid Glamorgan and South East Wales.	1.7 km south
Cwm Du Woodlands SSSI	An ancient sessile valley oak woodland.	1.7 km north

Non-Statutory Designated Sites

- 3.1.3 There are 30 non-statutory designated sites within 2 km of the Site boundary . The designated sites present within the study area are listed in **Table 15** along with their proximity to the Site.

Table 15 Non-statutory Designated Sites within 2 km of the Site Boundary

Site name	Reasons for designation	Approximate distance and direction from Site
Neath Port Talbot (NPT) Watercourses SINC	Not Available – all NPT watercourses are designated as SINCs	0 m
Cwn Nant Gwyn SINC	Broad leaved semi natural woodland	0 m
Nant Cwm-bach SINC	Broad-leaved semi-natural woodland, coniferous plantation, marsh/marshy grassland	0 m
Giffach Uchaf SINC	Marsh/marshy grassland, semi-improved acid grassland, acid dry dwarf shrub heath, natural acid/neutral rock exposure	0 m
NPT Ancient Semi-Natural Woodland SINC	No information available	Adjacent to the west
Coed Tondu SINC	Broad-leaved semi-natural woodland, unimproved neutral grassland, dry heath/acid grassland mosaic	Adjacent to the east
Nant Bryncynan Woods SINC	Broad-leaved semi-natural woodland	Adjacent to the north
Ton Phillip Farm SINC	No information available	Adjacent to the south

Site name	Reasons for designation	Approximate distance and direction from Site
Parc Slip Nature Park SINC	North of Site are three areas of unimproved neutral grassland and marshy grassland. Central part mixed plantation woodland and improved grassland. Small standing water areas in the south of the Site	22 m south
Parc Pond SINC	No information available	55 m south
Aberbaiden Farm Meadows SINC	Purple Moor-grass (<i>Molinia caerulea</i>) and rush pastures. Breeding lapwing (<i>Vanellus vanellus</i>)	384 m south
Ty'n-y-Waun SINC	Marsh/marshy grassland, semi-improved neutral grassland, broad-leaved semi-natural woodland along proposed community route	447 m north
Coed Pentwyn SINC	Broad-leaved semi-natural woodland	484 m east
Cwn Cefnydfa SINC	Broad-leaved semi-natural woodland, dense continuous scrub, man-made rain fed pools	485 m north east
Aberbainden Farm Small Meadow SINC	Purple moor-grass and rush pastures	568 m south
Waun-y-Gilfach woods SINC	Broad-leaved semi-natural woodland, marsh/marshy grassland	602 m north
Llywn-y-Brian SINC	Broad-leaved semi-natural Woodland	641 m north
Rifle Range Wood SINC	Broad-leaved semi-natural woodland, semi-improved neutral grassland	745 m east
Hafodheulog Wood North Meadow SINC	Purple moor-grass and rush pastures	771 m south
Lletty Brongu SINC	Ancient woodland, wet valley bottom, rare breeding birds	806 m north
Hafodheulog Wood East Meadow SINC	Purple moor-grass and rush pasture	903 m south
Coed Coytrahen SINC	Broad-leaved semi-natural woodland	950 m east
Nant-y-Castell Grasslands SINC	Unimproved neutral grassland, dense continuous bracken	958 m north west

Site name	Reasons for designation	Approximate distance and direction from Site
Cwm Ffos Farm SINC	Dense Continuous Scrub, Marsh/marshy Grassland, Semi-improved neutral grassland, broad-leaved semi natural woodland	1.2 km south
Nant Mwrth SINC	Broad-leaved semi-natural woodland, semi-improved neutral grassland, unimproved neutral grassland, marsh/marshy grassland, continuous bracken	1.2 km south
Bedford Park SINC	Marsh/marshy grassland, semi-improved neutral grassland, cultivates amenity grassland, dense continuous scrub, broad-leaved semi-natural woodland, scattered bracken	1.2 km south
Llan Road Woods SINC	Bracken, dense continuous scrub, marsh/marshy grassland, scattered broad-leaved trees	1.3 km north
Tylacoch South SINC	Rare breeding birds	1.4 km north east
Cwn Cerdin SINC	Broad-leaved semi-natural woodland, unimproved neutral grassland, tall herb fern interspersed in improved grassland	1.4 km north west
Bettws West SINC	Semi-improved acid grassland, broad-leaved semi-natural woodland, dense continuous scrub, acid neutral flush	1.8 km north east

Habitats

- 3.1.4 There are 29 areas of ancient semi-natural woodland, one area of ancient woodland of unknown category, nine areas of Plantation on ancient woodland and 12 areas of Restored ancient woodland within 1 km of the Site boundary . The closest area of ancient woodland is ancient semi-natural woodland that is within the Site boundary .

Protected and Notable Species

- 3.1.5 At least 243 noteworthy species were recorded within 2 km of the Site boundary . Noteworthy species include species of principal importance that are listed under Section 7 of the Environment (Wales) Act 2016.
- 3.1.6 Of these, five are amphibians, 110 are birds, 79 are invertebrates, 21 are mammals (of these, 14 are bats) and 18 are plants. Species that are protected by law under Schedules 2 and 5 of The Conservation of Habitats and Species Regulations 2017

(as amended), Schedules 1, 2, 5 and 8 of The Wildlife and Countryside Act 1981 (as amended) or The Protection of Badgers Act 1992 that have been recorded in the search area are highlighted in the full species list is given in **Annex A**. Those of relevance to the Site and the current proposals are discussed in **Sections 4.2 and 4.3**.

3.2 Preliminary Ecological Appraisal

Rare and Notable Plant Species

- 3.2.1 The BDS identified two plant species protected under Schedule 8 of the Wildlife and Countryside Act located within 2 km of the Site boundary . The first was for Viper's-grass (*Scorzonera humilis*) which was recorded in 2014 and is offered full protection under Schedule 8. The second for Bluebell (*Hyacinthoides non-scripta*) in 2019 which is partially³ protected under Schedule 8. Vipers-grass is generally restricted to damp, unimproved grassland, fen meadows, on mildly acidic soils and is only present within three sites in the UK and therefore, as the Site is not one of the known locations, is not thought to be located within the Site boundary . Bluebell was recorded within the Site during the PEA survey.
- 3.2.2 Of the other notable plants identified from the BDS Welsh Poppy (*Meconopsis cambrica*) may occur within the Site, Northern Yellow Cress (*Rorippa islandia*) and Smooth Cats Ear (*Hypochaeris glabra*) are unlikely to be present but may occur.

Phase 1 Habitat Survey

- 3.2.3 The Site comprises of a range of habitats that have developed over time due to the differing land uses of each section of habitat, with much of the Site being used as agricultural land this has influenced the habitats that are now present. Habitat types include (shown in Phase 1 habitat terminology):
- Broadleaved woodland – semi-natural and plantation;
 - Coniferous woodland – plantation;
 - Mixed woodland – semi-natural and plantation;
 - Scrub;
 - dense/continuous; and
 - scattered,
 - Acid grassland – semi-improved;
 - Neutral grassland – semi-improved;
 - Improved grassland;
 - Marshy grassland;
 - Bracken – continuous;

³ Protection in relation to sale only.

- Standing water;
- Running water;
- Cultivated/ disturbed land – arable;
- Buildings;
- Bare ground; and
- Hardstanding.

3.2.4 The Phase 1 habitat map is provided as **Figure 2**, and the location of the target notes referred to in the text below are shown in **Figure 2**. A full description for each of the target notes is given in **Annex C**.

Woodland

- 3.2.5 The Site is also made up of varying woodland areas; broadleaved, coniferous and mixed with the woodlands either being semi-natural or plantation.
- 3.2.6 There were five small areas of plantation conifer woodland to the South and East made up of Sitka spruce (*Picea sitchensis*) plantation with an Ash (*Fraxinus excelsior*) and Elder (*Sambucus nigra*) understory and a mainly bare floor consisting of Common Ivy (*Hedera helix*), Common Nettle (*Urtica dioica*), Foxglove (*Digitalis purpurea*), Cocks Foot (*Dactylus glomerata*) and a number of ferns.
- 3.2.7 Four areas of other broadleaved woodland were located throughout the Site. These were predominantly made up of Oak (*Quercus* sp.), Ash, Sycamore (*Acer pseudoplatanus*), Birch (*Betula* sp.) with Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Elder. Other species present included Holly (*Ilex aquifolium*), Bluebell, Lesser Celandine (*Ficaria verna*), Common Nettle, Lady-fern (*Athyrium filix-femina*), Himalayan Balsam, Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*) and Common Ivy.
- 3.2.8 Two areas of wet woodland were present within the Site, the canopy was dominated by Willow (*Salix* sp.) and Alder (*Alnus glutinosa*) with some Rowan (*Sorbus aucuparia*) and Birch. The ground floor was generally bare and boggy in places, made up of sparse vegetation including Creeping Buttercup (*Ranunculus repens*), Soft-rush (*Juncus effusus*), Cleavers (*Galium aparine*), Common Nettle, Meadowsweet (*Filipendula ulmaria*), Yellow Pimpernel (*Lysimachia nemorum*), Marsh Thistle (*Cirsium Palustre*), Timothy (*Phleum pratense*), Yorkshire-fog (*Holcus lanatus*), Sweet Vernal-grass (*Anthoxanthum odoratum*) and Dog Violet (*Viola riviniana*).
- 3.2.9 There were four areas of mixed woodland, these were found mainly within the north of the Site and comprised Willow, Oak, Birch, Alder, Beech (*Fagus sylvatica*), Sitka spruce and Rowan with Gorse (*Ulex* sp.), Hawthorn, Willowherb (*Epilobium* sp.), Bramble (*Rubus* sp.) and Common Nettle.

Scrub – Dense/continuous and Scattered

- 3.2.10 Several areas of scrub were recorded within the Site boundary. These areas were dominated by species such as Bramble (*Rubus fruticosus*) and Gorse. Some areas

of scrub had additional species present such as Willowherb (*Chamerion spp.*), Common Nettle and Bracken (*Pteridium aquilinum*).

Improved Grassland

- 3.2.11 The majority of the Site is made up of improved grassland, much of this due to active management by agricultural practices on the land such as grazing livestock (sheep, cattle and horses). These areas are dominated by Perennial rye-grass (*Lolium perenne*) and White Clover (*Trifolium repens*), other plant species present include Creeping Buttercup, Thyme-leaved Speedwell (*Veronica serpyllifolia*), Broad-leaved Plantain (*Plantago major*), Common Nettle, Creeping Thistle (*Cirsium arvense*), Rush (*Juncus spp.*), Marsh Thistle, Dandelion (*Taraxacum officinale*), Sweet vernal-grass and Yarrow (*Achillea millefolium*). Many of these fields also have scattered rushes present.

Poor Semi-improved Grassland

- 3.2.12 The second largest grassland type present was poor semi-improved grassland; species included: Yorkshire-fog, Crested Dog's-tail (*Cynosurus cristatus*), Perennial Rye-grass, Sweet vernal-grass, Rough Meadow-grass (*Poa trivialis*), Timothy, a Foxtail species (*Alopecurus sp.*), Creeping Bent (*Agrostis stolonifera*), Creeping Buttercup, Common Nettle, Creeping and Marsh Thistle, Annual Meadow-grass (*Poa annua*), White and Red Clover (*Trifolium pratense*). Grasslands were either unmanaged or grazed by livestock.

Neutral Grassland – Semi-improved

- 3.2.13 Two areas comprised semi-improved neutral grassland, both located in the north of the Site one larger than the other. Species present included Yorkshire-fog, Soft-rush, Compact Rush (*Juncus conglomeratus*), Sharp-flowered rush (*Juncus acutiflorus*), Tufted hair-grass (*Deschampsia cespitosa*), Crested Dog's-tail (*Cynosurus cristatus*), Water-pepper (*Persicaria hydropiper*), Tormentil (*Potentilla erecta*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*), Creeping buttercup, Common Knapweed (*Centaurea nigra*), Sneezewort (*Achillea ptarmica*), Common mouse-ear (*Cerastium fontanum*), Perennial rye-grass, Marsh thistle, Sweet Vernal-grass, Himalayan Balsam and Springy Turf moss (*Rhytidiadelphus squarrosus*). A small amount of Devil's-bit Scabious (*Succisa pratensis*) was present in the larger northern field (see **Annex C and Figure 2**).

Acid Grassland – Semi-improved

- 3.2.14 Four areas of acid grassland were identified, all located to the west of the Site. Species present included: Common Bent (*Agrostis capillaris*), Sweet vernal-grass, Yorkshire-fog, Perennial Rye-grass, Barren Strawberry (*Potentilla sterilis*), Sheep's-fescue (*Festuca ovina*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Mouse-ear-hawkweed (*Pilosella officinarum*) and a bedstraw (*Galium sp.*). These areas were located on a south-facing slope of a valley.

Marshy Grassland

- 3.2.15 Four small areas of marshy grassland were identified within a valley located to the west of the Site. Species included: Purple Moor-grass, a Fescue (*Festuca* sp.), Soft-rush, Sweet Vernal-grass, Yorkshire-fog, Cuckooflower (*Cardamine pratensis*), Star Sedge (*Carex echinata*), Common Sedge (*Carex nigra*), Sharp-flowered Rush, Marsh Thistle, Greater Bird's-foot-trefoil and a woodrush (*Luzula* spp.). Due to dense bramble vegetation, three areas of marshy grassland were inaccessible and observed through binoculars.

Bracken – Continuous

- 3.2.16 Bracken dominated fields were also present mostly to the south of the Site but also within an area located to the north, adjacent to an area of wet woodland. In the bracken to the south scattered trees were present including Birch, Sycamore, Rowan and Hawthorn all these being of young growth. Other vegetation present in this area includes Bluebells, Wood-sorrel (*Oxalis acetosella*), Creeping Cinquefoil (*Potentilla reptans*), Sweet Vernal-grass, a Milkwort (*Polygala* sp.), a Fescue (*Festuca* sp.) and Foxglove. The northern area of Bracken was interspersed with scattered Gorse.

Standing Water

- 3.2.17 Sixteen waterbodies were identified within the Site. Descriptions of the waterbodies can be found in **Annex E** and are shown on **Figure 2**.

Running Water

- 3.2.18 Ten watercourses were identified within the Site. Descriptions of the watercourses can be found in **Annex G** and are shown on **Figure 6**.

Cultivated/ Disturbed Land – Arable

- 3.2.19 Three arable fields were identified within the south-east of the Site. One had recently been ploughed and two were being utilised for silage.

Buildings

- 3.2.20 All buildings present within the Site were associated with farm yards. The buildings were either residential dwellings or barns for housing livestock or equipment.

Bare Ground

- 3.2.21 One area of bare ground was present in the west of the Site, this was a motorcross track interspersed with poor semi-improved grassland.

Hardstanding

- 3.2.22 Farm yards, access tracks and roads were present throughout the Site.

Invasive Non-native Species

- 3.2.23 Himalayan Balsam was found throughout the Site, there was an especially high concentration around access tracks and within wetter habitats. Japanese Knotweed

(TN1) was identified at eight locations within the these have been target noted on **Figure 2**. A single stand of Montbretia (*Crocsmia* sp.) was identified along the edge of the access road to the north of the Site (TN13).

Protected and Notable Animals

- 3.2.24 Overall, due to the diversity and extent of the habitats on Site, as well as their connectivity within the Site and with the habitats off-site, there is a high likelihood of a range of legally protected and/or notable animals to be present on Site. The species groups for which there is potential to be present on Site are discussed below.
- 3.2.25 **Figure 2** shows the location of the target notes referred to in the text below, which highlight particular features with suitability for protected and notable animals. A full description for each of the target notes is given in **Annex C**.

3.3 National Vegetation Classification

Lolium Perenne-Cynosurus Cristatus Grassland

- 3.3.1 Quadrats were sampled in agricultural sheep grazed fields at the center, south-eastern and south-western area of the Site. The grasslands were bordered predominately by stockproof fencing, scattered scrub and trees.

Series 1 Q1-5

- 3.3.2 The fields sampled contained, on average, 12.8 species in each 2x2 m quadrat. No notable species were recorded during the survey. The fields sampled supported a short and tight sward dominated by grass species such as Perennial Rye-grass (*Lolium perenne*), Sweet-vernal grass (*Anthoxanthum odoratum*), Yorkshire-fog (*Holcus lanatus*), and Crested Dog's-tail (*Cynosurus cristatus*). Other species present but in lower abundance include Common Mouse-ear (*Cerastium fontanum*), White Clover (*Trifolium repens*) Common Bent (*Agrostis capillaris*) Grasses were present in lower abundance, with Cock's-foot (*Dactylis glomerata*), Creeping Buttercup (*Ranunculus repens*) and Marsh Thistle (*Cirsium palustre*). **Table 16** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 16 NVC data for Series 1

Species		Quadrats					Freq	Range
Scientific name	Common name	1	2	3	4	5		
<i>Anthoxanthum odoratum</i>	Sweet-vernal grass	3	4	6	9	1	V	1-9
<i>Holcus lanatus</i>	Yorkshire-fog	7	2	2	4	4	V	2-7
<i>Cynosurus cristatus</i>	Crested dog's-tail	1	6	7	4	4	V	1-7
<i>Agrostis stolonifera</i>	Creeping Bent	7	3	6	-	6	IV	3-7
<i>Trifolium repens</i>	White Clover	2	5	3	-	1	IV	1-5
<i>Cerastium fontanum</i>	Common Mouse-ear	2	-	1	1	1	IV	1-2
<i>Lolium perenne</i>	Perennial Rye-grass	1	8	-	3	-	III	1-8

Species		Quadrats					Freq	Rang
Scientific name	Common name	1	2	3	4	5	.	e
<i>Ranunculus repens</i>	Creeping Buttercup	2	-	-	4	2	III	2-4
<i>Cirsium palustre</i>	Marsh Thistle	-	1	1	2	-	III	1-2
<i>Rhytidiadelphus squarrosus</i>	Springy Turf moss	-	-	2	5	-	II	2-5
<i>Achillea millefolium</i>	Yarrow	-	-	2	4	-	II	2-4
<i>Phleum pratense</i>	Timothy	3	-	-	-	2	II	2-3
<i>Rumex acetosa</i>	Common Sorrel	-	-	-	1	3	II	1-3
<i>Plantago lanceolata</i>	Ribwort Plantain	-	-	1	-	1	II	0-1
<i>Agrostis capillaris</i>	Common Bent	-	-	-	5	-	I	0-5
<i>Luzula campestris</i>	Field Wood-rush	-	-	-	5	-	I	0-5
<i>Vicia cracca</i>	Tufted Vetch	-	-	-	-	4	I	0-4
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	3	-	-	I	0-3
<i>Poa trivialis</i>	Rough Meadow-grass	3	-	-	-	-	I	0-3
<i>Ranunculus acris</i>	Meadow Buttercup	-	-	-	-	3	I	0-3
<i>Poa annua</i>	Annual Meadow-grass	-	2	-	-	-	I	0-2
<i>Prunella vulgaris</i>	Self-heal	-	-	2	-	-	I	0-2
<i>Trifolium dubium</i>	Lesser Trefoil	-	-	2	-	-	I	0-2
<i>Alopecurus geniculatus</i>	Marsh Foxtail	1	-	-	-	-	I	0-1
<i>Dactylis glomerata</i>	Cock's-foot	1	-	-	-	-	I	0-1
<i>Potentilla erecta</i>	Tormentil	-	-	-	1	-	I	0-1
<i>Rumex crispus</i>	Curled Dock	-	-	-	-	1	I	0-1
<i>Sagina procumbens</i>	Procumbent Pearlwort	-	-	1	-	-	I	0-1
<i>Taraxacum officinale</i>	Dandelion	-	-	-	-	1	I	0-1
<i>Trifolium pratense</i>	Red Clover	-	-	-	-	1	I	0-1
<i>Veronica officinalis</i>	Heath Speedwell	-	-	-	1	-	I	0-1
N/A	Bare ground	-	-	1	-	-	I	0-1
Matching coefficients: MG6b 64.47 %, MG6a 63.72 %, MG6 62.32 %, MG10a 59.81 %, MG6d 56.37 %, MG7 56.36 %, MG10 56.29 %, MG8d 56.17 %, MG8v2 55.27 %, MG4c 53.59 %.								

- 3.3.3 Modular Analysis of Vegetation Information System (MAVIS) analysis suggests affinities with MG6 *Lolium perenne*-*Cynosurus cristatus* grassland, which is plausible. The short tight sward, grass dominated fields and low frequency of herbaceous species are all characteristics of this community, and symptomatic of intensive grazing.

Series 2

- 3.3.4 The fields sampled contained, on average, 11.6 species in each 2x2 m quadrat. No notable species were recorded during the survey. The fields sampled supported a

varied sward dominated by species such as Common Bent (*Agrostis capillaris*), Sweet Vernal-grass (*Anthoxanthum odoratum*) and Sheep's Sorrel (*Rumex acetosella*). Other species present but in lower abundance include Heath-grass (*Danthonia decumbens*), Perennial Rye-grass (*Lolium perenne*), Common Mouse-ear (*Cerastium fontanum*), Mouse-ear-hawkweed (*Pilosella officinarum*) and White Clover (*Trifolium repens*). **Table 17** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 17 NVC Data for Series 2

Species		Quadrats					Freq	Range
Scientific name	Common name	1	2	3	4	5	.	e
<i>Agrostis capillaris</i>	Common Bent	8	6	8	8	7	V	6-8
<i>Rumex acetosella</i>	Sheep's Sorrel	6	7	6	4	4	V	4-7
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	6	7	7	6	3	V	3-7
<i>Danthonia decumbens</i>	Heath-grass	4	6	4	4	5	V	4-6
<i>Lolium perenne</i>	Perennial Rye-grass	2	3	5	3	2	V	2-5
<i>Trifolium repens</i>	White Clover	4	4	5	3	1	V	1-5
<i>Hypochaeris radicata</i>	Cats-ear	3	3	1	2	1	V	1-3
<i>Polytrichum</i> species	Haircap moss species	3	2	2	1	-	IV	1-3
<i>Cerastium fontanum</i>	Common Mouse-ear	1	-	-	2	1	III	1-2
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	1	1	2	-	-	III	1-2
<i>Sagina procumbens</i>	Procumbent Pearlwort	-	1	-	3	-	II	1-3
<i>Holcus lanatus</i>	Yorkshire-fog	2	-	-	-	1	II	1-2
<i>Peltigera canina</i>	A Dog lichen	-	-	1	-	-	II	0-1
<i>Pilosella officinarum</i>	Mouse-ear-hawkweed	1	-	1	-	-	II	0-1
<i>Luzula campestris</i>	Field Wood-rush	4	-	-	-	-	I	0-4
<i>Cynosurus cristatus</i>	Crested Dog's-tail	-	-	-	-	3	I	0-3
<i>Galium saxatile</i>	Heath Bedstraw	2	-	-	-	-	I	0-2
<i>Achillea millefolium</i>	Yarrow	-	-	-	-	1	I	0-1
<i>Digitalis purpurea</i>	Foxglove	-	1	-	-	-	I	0-1
N/A	Bare ground	1	1	3	1	1	V	1-3
Matching coefficients: MG6b 44.54 %, SD12a 38.44 %, U4b 38.18 %, W23b 37.68 %, MG6 37.62 %, SD12 36.75 %, MG6a 36.47 %, U1b 34.48 %, U1f 34.45 %, MC9e 34.25 %.								

- 3.3.5 MAVIS analysis suggested that there was a close affiliation between MG6, SD12a and U4b communities (see table below for species, range and frequency). SD12a and U4b communities have been ruled out as being present on Site as the field does not support any Sheep's Fescue (*Festuca ovina* (dominant in the U4b and SD12a

community)) and Sand Sedge (*Carex arenaria* (dominant in SD12a community)), SD12a is also a community is found on acidic sands around the coasts of Britain, which the quadrants sampled were not. The grassland in these quadrats is more closely associated with MG6b *Anthoxanthum odoratum* sub-community of MG6.

***Juncus Effusus/acutiflorus-Galium palustre* Rush-pasture**

- 3.3.6 Five quadrats were undertaken across two fields in the north-eastern area of the Site (HJQ1-5), the most northern field was approximately 3 hectares in size and bordered by hedgerows and bracken, the south-eastern field is located adjacent to the northern field and is also bordered by hedgerow and bracken and is approximately 1 hectare in size.
- 3.3.7 The fields sampled supported on average 12.4 species in each 2x2 m quadrat and therefore are not considered to be species-rich and no notable species were recorded. The fields sampled supported a range of species including three rush species. Compact Rush (*Juncus conglomeratus*), and Soft-rush (*Juncus effusus*) were present in all quadrats with varying frequency and Sharp-flowered Rush (*Juncus acutiflorus*) was the dominant rush species located within quadrat 2, and was also present in quadrat 4 but at a low frequency. Other species present include Yorkshire-fog (*Holcus lanatus*), Creeping Bent (*Agrostis stolonifera*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*) and Wild Angelica (*Angelica sylvestris*) which were present in all quadrats. Other herbaceous species present include Creeping Cinquefoil (*Potentilla reptans*), Creeping Buttercup (*Ranunculus repens*), Common Knapweed (*Centaurea nigra*), Marsh-bedstraw (*Galium palustre*) and Sneezewort (*Achillea ptarmica*) albeit at a lower frequency than the rush and grass species. **Table 18** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 18 NVC Data for Series 3

Species		Quadrats					Freq.	Range
Scientific name	Common name	1	2	3	4	5		
<i>Agrostis stolonifera</i>	Creeping Bent	8	7	8	6	6	V	6-8
<i>Holcus lanatus</i>	Yorkshire-fog	3	7	7	8	8	V	3-8
<i>Juncus conglomeratus</i>	Compact Rush	7	6	5	8	1	V	1-8
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	6	5	7	4	5	V	4-7
<i>Juncus effusus</i>	Soft-rush	7	5	3	1	7	V	1-7
<i>Angelica sylvestris</i>	Wild Angelica	3	3	2	5	3	V	2-5
<i>Potentilla reptans</i>	Creeping Cinquefoil	-	2	3	3	4	IV	2-4
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	3	3	-	2	-	III	2-3
<i>Calliergonella cuspidata</i>	Pointed Spear-moss	-	3	-	1	1	III	1-3
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	-	8	-	1	-	II	1-8
<i>Ranunculus repens</i>	Creeping Buttercup	-	2	-	3	-	II	2-3

Species		Quadrats					Freq.	Range
Scientific name	Common name	1	2	3	4	5		
<i>Athyrium filix-femina</i>	Lady-fern	1	-	-	2	-	II	1-2
<i>Cirsium palustre</i>	Marsh Thistle	-	-	-	2	1	II	1-2
<i>Pseudoscleropodium purum</i>	Neat Feather-moss	-	-	2	-	2	II	0-2
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	-	-	2	-	2	II	0-2
<i>Carex nigra</i>	Common Sedge	-	-	-	1	1	II	0-1
<i>Luzula multiflora</i>	Heath Woodrush	-	1	-	-	1	II	0-1
<i>Atrichum undulatum</i>	Common Smoothcap	-	-	-	4	-	I	0-4
<i>Rumex acetosa</i>	Common Sorrel	3	-	-	-	-	I	0-3
<i>Centaurea nigra</i>	Common Knapweed	-	-	-	2	-	I	0-2
<i>Galium palustre</i>	Marsh Bedstraw	-	2	-	-	-	I	0-2
<i>Plantago lanceolata</i>	Ribwort Plantain	-	-	-	2	-	I	0-2
<i>Achillea ptarmica</i>	Sneezewort	-	1	-	-	-	I	0-1
<i>Carex leporina</i>	Oval Sedge	-	-	-	1	-	I	0-1
<i>Eupatorium cannabinum</i>	Hemp-agrimony	-	-	-	1	-	I	0-1
<i>Ranunculus flammula</i>	Lesser Spearwort	-	1	-	-	-	I	0-1
<i>Rumex species</i>	Dock species	1	-	-	-	-	I	0-1
Matching coefficients: M23b 54.05 %, M23 52.26 %, M27c 50.57 %, M23a 48.68 %, M25c 46.62 %, M27 43.01 %, M25 42.91 %, M25b 42.52 %, MG10a 41.70 %, M24 39.40 %								

- 3.3.1 The matching coefficients in MAVIS analysis showed a strong affinity with M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, which was borne out by community descriptions. M23 is characterised by an assemblage of vegetation with abundant Soft Rush (*Juncus effusus*) and/or Sharp-flowered Rush (*Juncus acutiflorus*) and the constant presence of Marsh-bedstraw (*Galium palustre*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*) and Yorkshire-fog (*Holcus lanatus*). Species identified within these quadrats occur within moister agricultural grasslands which would support the habitat identified on Site.

***Lolium Perenne* Leys and Related Grasslands**

- 3.3.2 Five quadrats were undertaken in five separate agricultural fields to the north, south, east and west of the Site (MQ1-5). The most northern field was approximately 9 hectares in size and was bordered by stockproof fencing to the east, south and west and a tree line to the north. The second northern field was approximately 3 hectares in size and was bordered by stockproof fencing. The most eastern field sampled was 4 hectares in size and bordered by scattered scrub also supporting a small pond and ditch. The southern field was approximately 6 ha in size and bordered by stockproof fencing, scattered scrub (along the northern boundary) and scattered trees within the south-western corner of the field. The western field sampled was

approximately 3 hectares in size and was bordered by plantation woodland to the east and scattered scrub and stock proof fencing to the north, south and west.

- 3.3.3 The fields were species-poor and supported on average 8.2 species per 2x2m quadrat. The two dominant species which were observed in all quadrats and higher frequency than other species were Perennial Rye-grass (*Lolium perenne*) and White Clover (*Trifolium repens*). Other species recorded across at least four quadrats were Annual Meadow-grass (*Poa annua*), Creeping Buttercup (*Ranunculus repens*) and Common Mouse-ear (*Cerastium fontanum*).
- 3.3.4 **Table 19** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 19 NVC Data for Series 4

Species		Quadrats					Freq	Rang
Scientific name	Common name	1	2	3	4	5	.	e
<i>Lolium perenne</i>	Perennial Rye-Grass	9	10	9	9	7	V	7-10
<i>Trifolium repens</i>	White Clover	7	7	7	4	5	V	4-7
<i>Poa annua</i>	Annual Meadow-grass	6	4	1	-	2	IV	1-6
<i>Ranunculus repens</i>	Creeping Buttercup	-	3	1	5	1	IV	1-5
<i>Cerastium fontanum</i>	Common Mouse-ear	3	1	1	-	4	IV	1-4
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-	5	4	III	1-5
<i>Achillea millefolium</i>	Yarrow	2	-	3	-	-	II	2-3
<i>Agrostis capillaris</i>	Common Bent	1	-	-	-	1	II	0-1
<i>Cardamine species</i>	Bittercress species	1	1	-	-	-	II	0-1
<i>Cynosurus cristatus</i>	Crested Dog's-tail	-	-	3	-	-	I	0-3
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	2	-	-	-	-	I	0-2
<i>Bellis perennis</i>	Daisy	-	-	-	2	-	I	0-2
<i>Sagina procumbens</i>	Procumbent Pearlwort	-	-	2	-	-	I	0-2
<i>Taraxacum officinale</i>	Dandelion	-	-	-	2	-	I	0-2
<i>Cirsium arvense</i>	Creeping Thistle	-	1	-	-	-	I	0-1
<i>Cirsium palustre</i>	Marsh Thistle	-	-	-	-	1	I	0-1
<i>Cirsium vulgare</i>	Spear Thistle	-	-	1	-	-	I	0-1
<i>Polytrichum species</i>	Haircap moss species	1	-	-	-	-	I	0-1
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell	-	-	1	-	-	I	0-1
Matching coefficients: OV23c 57.48 %, MG7b 54.11 %, MG6a 53.31 %, MG7a 53.30 %, MG7 52.00 %, OV21 51.72 %, MG7f 51.69 %, MG6 51.42 %, OV21b 51.41 %, MG11a 50.88 %.								

- 3.3.1 MAVIS analysis suggests high affinities with OV23c and MG7b. OV23c is not plausible, this is the *Lolium perenne-Dactylis glomerata* community and would support a dominant population of Perennial Rye-grass (*Lolium perenne*) and Cock's-foot (*Dactylis glomerata*). The matching coefficient of the MG7 *Lolium perenne-Trifolium repens* leys community supports the characteristics of the habitats found on Site. Perennial Rye-grass (*Lolium perenne*) was the only constant species in a species-poor short sward, with White Clover (*Trifolium repens*) frequent, and there was often little to no Cock's-foot (*Dactylis glomerata*) present within the MG7 *Lolium perenne-Trifolium repens* leys community.

***Festuca Ovina-Agrostis Capillaris-Galium Saxatile* Grassland**

- 3.3.2 Seven quadrats were undertaken within three fields at the center of the Site (AGQ1.1-1.5, AGQ2.1 and AGQ3.1). The fields are approximately 8 hectares in size (combined) and bordered by stockproof fencing. The field supported on average 18 species per 2x2m quadrat. The two dominant species throughout the quadrats were Common Bent (*Agrostis capillaris*) and Sweet Vernal-grass (*Anthoxanthum odoratum*) with Sheep's Fescue (*Festuca ovina*) and Western Gorse (*Ulex gallii*) also dominant. Other species identified include Heath Bedstraw (*Galium saxatile*), Tormentil (*Potentilla erecta*), White Clover (*Trifolium repens*), Field Wood-rush (*Luzula campestris*), Heath Speedwell (*Veronica officinalis*), Common Milkwort (*Polygala vulgaris*) and Crested Dog's-tail (*Cynosurus cristatus*).

Series 5

- 3.3.3 **Table 20** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 20 NVC Data for Series 5

Species		Quadrats					Freq	Rang
Scientific name	Common name	1	2	3	4	5	.	e
<i>Agrostis capillaris</i>	Common Bent	5	5	5	5	5	V	5
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	5	5	5	5	5	V	5
<i>Festuca ovina</i>	Sheep's Fescue	5	5	5	4	5	V	4-5
<i>Ulex galli</i>	Western Gorse	5	5	5	5	4	V	4-5
<i>Galium saxatile</i>	Heath Bedstraw	3	2	3	4	4	V	2-4
<i>Potentilla erecta</i>	Tormentil	4	3	2	4	3	V	2-4
<i>Trifolium repens</i>	White Clover	3	3	3	3	3	V	3
<i>Luzula campestris</i>	Field Wood-rush	1	1	1	3	3	V	1-3
<i>Veronica officinalis</i>	Heath Speedwell	1	3	3	3	3	V	1-3
<i>Polygala vulgaris</i>	Common Milkwort	1	1	1	1	1	V	1
<i>Cynosurus cristatus</i>	Crested Dog's-tail	3	1	-	2	2	IV	0-3
<i>Taraxacum</i> species	Dandelion species	3	-	2	2	2	IV	0-3
<i>Viola</i> species	Violet species	3	3	3	1	-	IV	0-3
<i>Cirsium arvense</i>	Creeping Thistle	2	2	-	-	1	III	0-2

Species		Quadrats					Freq	Range
Scientific name	Common name	1	2	3	4	5	.	
<i>Cirsium palustre</i>	Marsh Thistle	-	2	2	1	-	III	0-2
<i>Potentilla sterilis</i>	Barren Strawberry	2	-	1	2	-	III	0-2
<i>Ranunculus repens</i>	Creeping Buttercup	2	-	-	1	1	III	0-2
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	-	1	2	II	0-2
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	-	-	2	2	-	II	0-2
<i>Cerastium fontanum</i>	Common Mouse-ear	1	1	-	-	-	II	0-1
<i>Cirsium dissectum</i>	Meadow Thistle	1	-	-	-	1	II	0-1
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	-	-	5	-	-	I	0-5
<i>Pilosella officinarum</i>	Mouse-ear Hawkweed	-	3	-	-	-	I	0-3
<i>Achillea millefolium</i>	Yarrow	-	-	-	-	2	I	0-2
<i>Carex binervis</i>	Green-ribbed Sedge	-	-	-	2	-	I	0-2
<i>Lolium perenne</i>	Perennial Ryegrass	-	-	-	-	2	I	0-2
<i>Rumex acetosella</i>	Sheep's Sorrel	-	2	-	-	-	I	0-2
<i>Dactylis glomerata</i>	Cock's-foot	-	-	-	-	1	I	0-1
<i>Potentilla reptans</i>	Creeping Cinquefoil	-	-	1	-	-	I	0-1
Matching coefficients: U4b 44.03%, U4a 43.90%, U4 43.17%, U20a 41.69%, MG6b 41.50%, MG5c 38.10%, MG6a 37.59%, MG6 37.08%, CG10a 36.93%, SD12a 36.89%.								

- 3.3.4 MAVIS analysis suggests affinities with U4 *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* grassland. The MAVIS analysis is plausible due to the dominant presence of Common Bent, Sweet Vernal-grass and Sheep's Fescue and the presence of Heath Bedstraw (albeit in lower frequency than other dominant species) within the Site, all of which are constant dominant species within the U4 community.

Series 6

- 3.3.5 **Table 21** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 21 NVC Data for Series 6

Species		Quadrat	Freq	Range
Scientific name	Common name	1		
<i>Agrostis capillaris</i>	Common Bent	6	I	6
<i>Festuca ovina</i>	Sheep's Fescue	5	I	5
<i>Potentilla erecta</i>	Tormentil	5	I	5

<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	4	I	4
<i>Galium saxatile</i>	Heath Bedstraw	3	I	3
<i>Hypochaeris radicata</i>	Cat's-ear	3	I	3
<i>Plantago lanceolata</i>	Ribwort Plantain	3	I	3
<i>Trifolium repens</i>	White Clover	3	I	3
<i>Viola</i> species	Violet species	3	I	3
<i>Carex binervis</i>	Green-ribbed sedge	2	I	2
<i>Cynosurus cristatus</i>	Crested dog's-tail	2	I	2
<i>Luzula campestris</i>	Field Wood-rush	2	I	2
<i>Rumex acetosa</i>	Common Sorrel	2	I	2
<i>Taraxacum</i> species	Dandelion species	2	I	2
<i>Veronica officinalis</i>	Heath Speedwell	2	I	2
<i>Cirsium palustre</i>	Marsh Thistle	1	I	1
<i>Dactylis glomerata</i>	Cock's-foot	1	I	1
<i>Pilosella officinarum</i>	Mouse-ear Hawkweed	1	I	1
<i>Polygala vulgaris</i>	Common Milkwort	1	I	1
<i>Pteridium aquilinum</i>	Bracken	1	I	1
<i>Ranunculus repens</i>	Creeping Buttercup	1	I	1
<i>Rhytidiadelphus squarrosus</i>	Springy Turf moss	1	I	1
<i>Rumex acetosella</i>	Sheep's Sorrel	1	I	1
Matching coefficients: MG5c 40.91 %, U20a 40.82 %, U4b 39.67 %, U4a 38.72 %, MG6b 38.46 %, CG10a 36.32 %, U4 36.29 %, U4c 34.93 %, MG5 34.87 %, U20 34.56 %.				

- 3.3.1 MAVIS analysis suggests affinities with MG5, U20, CG10 and U4 communities, however it is considered that these close affiliations between the communities are due to a small sample size and just one quadrat being undertaken in the field. The dominant species recorded, and habitat on-site support the same characteristics with other U4 communities identified on Site.

Series 7

- 3.3.2 **Table 22** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 22 NVC Data for Series 7

Species		Quadrat	Freq	Range
Scientific name	Common name	1		
<i>Agrostis capillaris</i>	Common Bent	4	I	4
<i>Festuca ovina</i>	Sheep's Fescue	4	I	4
<i>Potentilla erecta</i>	Tormentil	4	I	4
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	3	I	3

Species		Quadrat	Freq	Range
Scientific name	Common name	1		
<i>Cynosurus cristatus</i>	Crested Dog's-tail	3	I	3
<i>Galium saxatile</i>	Heath Bedstraw	3	I	3
<i>Trifolium repens</i>	White Clover	3	I	3
<i>Viola species</i>	Violet species	3	I	3
<i>Carex binervis</i>	Green-ribbed Sedge	2	I	2
<i>Hypochaeris radicata</i>	Cat's-ear	2	I	2
<i>Luzula campestris</i>	Field Wood-rush	2	I	2
<i>Plantago lanceolata</i>	Ribwort Plantain	2	I	2
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	2	I	2
<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	2	I	2
<i>Taraxacum species</i>	Dandelion species	2	I	2
<i>Veronica officinalis</i>	Heath speedwell	2	I	2
<i>Achillea millefolium</i>	Yarrow	1	I	1
<i>Cirsium arvense</i>	Creeping thistle	1	I	1
<i>Polygala vulgaris</i>	Common milkwort	1	I	1
<i>Prunella vulgaris</i>	Selfheal	1	I	1
Matching coefficients: MG5c 44.98 %, U4b 42.98 %, U4a 41.86 %, MG6b 41.62 %, CG10a 40.50 %, MG5 40.00 %, U4 38.24 %, MG5b 38.03 %, MG5a 37.59 %, U20a 37.29 %.				

- 3.3.3 MAVIS analysis suggests affinities with MG5, MG6, CG10, U20 and U4 communities, however it is considered that these close affiliations between the communities are due to a small sample size and just one quadrat being undertaken in the field. The dominant species recorded, and habitat on-site support the same characteristics with other U4 communities identified on Site.

***Molinia Caerulea-Potentilla Erecta* Mire**

- 3.3.4 Three quadrats were sampled in a field at the Site's center (MGQ1-3). The field supported on average 14 species per 2x2m quadrat. The most dominant species in all quadrats was Purple Moor-grass (*Molinia caerulea*) with Compact Rush (*Juncus conglomeratus*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*), Tormetil (*Potentilla erecta*), Common Sorrel (*Rumex acetosa*), Yorkshire-fog (*Holcus lanatus*) following closely behind and found in all three quadrats. **Table 23** shows the data collected during the survey and **Figure 3** shows the quadrat locations.

Table 23 NVC Data for Series 8

Species		Quadrats			Freq	Range
Scientific name	Common name	1	2	3		
<i>Molinia caerulea</i>	Purple Moor-grass	8	8	8	III	8-8
<i>Juncus conglomeratus</i>	Compact Rush	4	5	4	III	4-5

Species		Quadrats			Freq	Range
Scientific name	Common name	1	2	3		
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	3	4	4	III	3-4
<i>Potentilla erecta</i>	Tormentil	3	4	4	III	3-4
<i>Rumex acetosa</i>	Common Sorrel	3	4	2	III	2-4
<i>Holcus lanatus</i>	Yorkshire-fog	1	3	3	III	1-3
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	4	3	-	II	0-4
<i>Cirsium palustre</i>	Marsh Thistle	2	3	-	II	0-3
<i>Agrostis canina</i>	Velvet Bent	1	2	-	II	0-2
<i>Anagallis tenella</i>	Bog Pimpernel	2	-	1	II	0-2
<i>Galium palustre</i>	Marsh Bedstraw	2	1	-	II	0-2
<i>Veronica scutellata</i>	Marsh Speedwell	2	1	-	II	0-2
<i>Cirsium dissectum</i>	Meadow Thistle	1	1	-	II	0-1
<i>Epilobium</i> species	Willowherb species	1	1	-	II	0-1
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	-	-	4	I	0-4
<i>Erica cinerea</i>	Bell Heather	-	-	3	I	0-3
<i>Ranunculus flammula</i>	Lesser Spearwort	-	2	-	I	0-2
<i>Carex flava</i>	Yellow Sedge	-	1	-	I	0-1
<i>Digitalis purpurea</i>	Foxglove	1	-	-	I	0-1
<i>Impatiens glandulifera</i>	Indian balsam	1	-	-	I	0-1
<i>Luzula campestris</i>	Field wood-rush	-	-	1	I	0-1
<i>Polytrichum</i> species	<i>Polytrichum</i> species	1	-	-	I	0-1
<i>Sphagnum</i> species	<i>Sphagnum</i> species	1	-	-	I	0-1
Matching coefficients: M25c 43.70 %, M23 43.36 %, M23a 43.10 %, M25 41.97 %, M23b 41.88 %, M25b 41.38 %, M24c 40.54 %, M24 36.08 %, M6d 32.86 %, M24b 30.28 %.						

- 3.3.5 MAVIS analysis suggests affinities with M25 *Molinia caerulea*-*Potentilla erecta* mire. The MAVIS analysis is plausible due to the dominant presence of Purple Moor-grass (*Molinia caerulea*) and Tormentil (*Potentilla erecta*) (constant species for M25 community) being present within all three quadrats.

3.4 Invertebrates

- 3.4.1 The BDS returned records of one protected and 57 notable invertebrate species within 2 km of the Site, indicating the presence of locations within the local areas (Parc Slip SINC) that are rich with invertebrate species, including many scarce species. Records of small blue (*Cupido minimus*) were recorded within Parc Slip, approximately 300 m south of the Site. Forty-five species were listed on Section 7 of the Environment (Wales) Act 2016; of these violet oil-beetle (*Meloe violaceus*) was recorded within the Site. Twelve species were listed within red data books; of these orange-legged robberfly (*Dioctria oelandica*) was recorded within the Site.
- 3.4.2 There were no recent records of marsh fritillary, however, historic records were present within 2 km of the Site. The most recent record was in 2003 and associated

with Cefn Cribwr Grasslands SAC/SSSIs. There were records of marsh fritillary within the Site between 1978 and 1998.

- 3.4.3 Cwm Risca Meadows SSSI (designated for marsh fritillary butterfly) is adjacent to the south of the Site. One field located to the north of the Site had a small amount of the marsh fritillary larval food plant (Devil's Bit Scabious), however, there was no other suitable habitat for the species within the Site and so they are considered absent from the Site.
- 3.4.4 Although much of the Site is covered by species poor grassland, conifer plantations and scrub areas dominated by bramble which present poor habitat for invertebrate assemblages. The Site also holds habitats that have the potential to be rich in invertebrate species such as mature woodland, streams, ponds and fen marsh and swamp. An exposed earth bank (TN5) within a steep valley could provide suitable burrowing opportunities for solitary bees or other hymenoptera species.

3.5 Fish

- 3.5.1 The BDS returned no records of fish within 2 km of the Site.
- 3.5.2 No fish surveys have been carried out. This is because the watercourses/waterbodies were present within the Site, were either dry or contained shallow water, and are unlikely to support a diverse assemblage of fish species. In addition to this, no impacts on watercourses are anticipated and embedded and additional mitigation would safeguard water quality.

3.6 Great Crested Newt

- 3.6.1 The BDS returned 32 records of GCN within the search area, the closest of which was located 150 m south of the Site. All records were within Parc Slip SINC. Through our initial survey and reviews of aerials imagery and maps, 38 ponds were identified as being located both within and 250 m from Site (15 and 23, respectively). An additional 32 ponds were located within 500 m of the red line boundary, these were not surveyed at the time of the survey due to access restrictions.
- 3.6.2 The Site comprises of terrestrial habitat that may be used by GCN, including areas of scrub and woodland that are likely to be used by GCN for foraging, refuge and hibernation.
- 3.6.3 Features such as the log piles, old tree stumps, and drystone revetment walls could provide suitable refuges and hibernation sites for GCN.

HSI

- 3.6.4 During the HSI survey, two additional ponds were identified, one on Site and one within 250 m, bringing the total within the Site and within 250 m to 40 ponds.
- 3.6.5 The results of the HSI assessments are given in **Table 24** below. Full results including pond descriptions are given in **Table 41** in **Annex E** and shown on **Figure 2**.

Table 24 Habitat Suitability Index Assessment Results

Ponds within the red line boundary				Ponds within 250 m of the red line boundary			
Pond Number	HSI Score	Suitability	Further survey required?	Pond Number	HSI Score	Suitability	Further survey required?
11	0.52	Below Average	Y	5	No access		N
12	0.40	Poor	Y	6	No access		N
35	0.81	Excellent	Y	7	No access		N
57	0.57	Below Average	Y	8	No access		N
58	0.62	Average	Y	9	No access		N
59	0.44	Poor	Y	10	No access		N
60	0.39	Poor	Y	33	0.52	Below Average	Y
61	0.49	Poor	Y	40	0.33	Poor	N
64	0.34	Poor	N	41	0.33	Poor	N
65	0.62	Average	Y	62	0.58	Below Average	N
66	0.46	Poor	Y	63	Not a pond		N
71	0.42	Poor	Y	67	Not a pond		N
72a	0.57	Below Average	Y	73a	0.55	Below Average	Y
72b	0.73	Good	Y	73b	No access		N
75	0.43	Poor	N (not enough still water)	74	No access		N
90	0.41	Poor	N	77	0.37	Poor	Y
				78	0.48	Poor	N
				79	0.43	Poor	N
				80	0.44	Poor	N
				81	Not a pond		N
				83	Not a pond		N
				84	No access		N
				86	No access		N
				91	0.63	Average	N

Environmental DNA Analysis

3.6.6 EDNA tests were undertaken on 27 waterbodies.

3.6.7 Of these, 12 were subsequently not surveyed, as they were found to be completely dry, too shallow or inaccessible.

- 3.6.8 One pond within 250 m of the Site tested positive for GCN. The details of the eDNA survey results are shown in **Table 25** below and shown on **Figure 4**.

Table 25 eDNA Survey Results

Ponds within the red line boundary		Ponds within 250 m of the red line boundary	
Pond Number	eDNA results	Pond Number	eDNA results
11	No access due to dense vegetation around perimeter	33	Negative
12	Negative	40	Negative
35	Too shallow for sampling	41	Negative
57	Negative	62	Negative
58	Negative	73a	Negative
59	Not surveyed - geese nesting	77	Positive
60	Negative	78	Dry
61	Negative	79	Dry
64	Dry	80	Dry
65	Negative	91	Dry
66	Too shallow for sampling		
71	Too shallow for sampling		
72a	Negative		
72b	Negative		
75	Not enough still water		
90	Dry		

GCN Population Size Class

- 3.6.9 Those water waterbodies found to have HSI scores of 'Poor' or above were subject to population estimate survey techniques including torching, egg searches and bottle trapping.
- 3.6.10 No GCN were identified within the surveys. Palmate or unidentified small newts were present in the majority of ponds. Common frog (*Rana temporaria*) was also noted during surveys. Full survey results are shown in **Table 42** in **Annex E**.

3.7 Reptiles

- 3.7.1 There are records of all four common reptile species, adder, common lizard, grass snake and slow-worm, within 2 km of the Site boundary .

- 3.7.2 Common lizard were observed during the habitat survey (TN3). The Site contains large areas of appropriate habitat for reptiles, which are well connected within and beyond the Site boundary . Areas of grassland and scrub provide good foraging habitat, with hedgerows on Site providing movement corridors for reptiles. In addition, the remnants of stone walls (TN7), log piles (TN12) and piles of silage (TN6) present throughout much of the Site provide optimal basking opportunities for reptiles.

3.8 Birds

- 3.8.1 The BDS returned records of 110 species of bird within 2 km of the Site in the past 10 years. The majority of records are associated with Parc Slip SINC, however, there is reasonable coverage across the area.
- 3.8.2 As mentioned above, Avian Ecology undertook surveys between November 2021 and 2023 with RSK Biocensus undertaking update surveys in 2024 and 2025. Results of these surveys can be found in the below reports, and birds will not be discussed further in this report.
- **ES Volume III, Appendix 11.1: 2021 – 2023 Ornithology Report;** and
 - **ES Volume III, Appendix 11.2: Wintering Bird Survey Report.**

3.9 Bats

Background Data Search

- 3.9.1 The BDS returned 49 records of bats within 2 km of the Site in the past 10 years.
- 3.9.2 The scientific and common names for species are given as well as their level of designation. If a species is not included in **Table 26** below it does not necessarily mean the species is absent from the search area, but rather that the data-holding organisations do not have records of it in these locations.

Table 26 Bat Records within 2 km

Scientific Name	Common Name	Designation (abbreviations shown in Annex B)	Most Recent	No of Records	Roost (Y/N) (distance from Site)
<i>Eptesicus serotinus</i>	Serotine	EPS, HDir, WCA5, RD2 (UK)	2016	2	N
<i>Myotis daubentonii</i>	Daubenton's bat	EPS, HDir, WCA5, RD2 (UK)	2020	4	N
<i>Myotis mystacinus</i>	Whiskered bat	EPS, HDir, WCA5, RD2 (UK)	2015	1	N

Scientific Name	Common Name	Designation (abbreviations shown in Annex B)	Most Recent	No of Records	Roost (Y/N) (distance from Site)
<i>Myotis nattereri</i>	Natterer's bat	EPS, HDir, WCA5, RD2 (UK)	2015	1	N
<i>Myotis sp.</i>	Myotis bat	EPS, HDir, WCA5	2020	3	Y 1.1 km north
<i>Nyctalus noctula</i>	Noctule bat	EPS, HDir, WCA5, RD2 (UK), S7	2018	8	N
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	EPS, HDir, WCA5, RD2 (UK), S7	2018	10	Y 2 km north east
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	EPS, HDir, WCA5, RD2 (UK), S7	2020	9	Y 250 m south
<i>Pipistrellus sp.</i>	Pipistrelle bat	EPS, WCA5	2016	5	Y Two roosts both 1.4 km north
<i>Plecotus auritus</i>	Brown long-eared bat	EPS, HDir, WCA5, RD2 (UK), S7	2015	3	Y Cwm Nant Gwyn ⁴
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat	EPS, HDir, WCA5, RD2 (UK), S7	2015	1	N
<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat	EPS, HDir, WCA5, RD2 (UK), S7	2015	2	N

- 3.9.3 The UK Renewable Energy Map⁵ was accessed in February 2025 to search for operational wind farm developments within 10 km of the Proposed Development. This provides a baseline for the current collision risk pressure on the local bat populations.
- 3.9.4 There are eight operational wind farm developments within this radius, however there are an additional four sites which are either awaiting construction or have submitted their application. Details on these developments are provided in

⁴ No specific location within Cwm Nant Gwyn provided

⁵ <https://data.barbour-abi.com/smart-map/repd/desnz/?type=repd>

3.9.5 **Table 27.**

Table 27 Proposed Wind Farm Developments within 10 km

Wind Farm	Number of turbines	Location and distance from the Proposed Development	Operational	Size
Y Bryn	18	~1.78 km north-west	No – application submitted	130 MV
Llynfi Renewable Energy Park, Land at Mynydd Caerau	12	~5.6 km north	Yes	24 MV
Llynfi Afan Renewable Energy Park	3	~10 km north	Yes	6 MV
Foel Trawsnant	11	~6 km north	No -awaiting construction	0.9 MWh
Mynydd Brombil Wind Farm	5	~7 km north-west	Yes	8 MV
Longlands Lane	1	8 km west	Yes	1.5 MV
Kenfig Industrial Estate, Margam	1	~5.3 km south	Yes	1.5 MV
Parc Stormy, Stormy Down	1	~5 km south	Yes	2.5 MV
Newton Down	2	~5.15 km south	Yes	5 MV
Pant y wal extension	11	~9 km north-east	Yes	20 MV
Pant y Wal (extension)	2	~9 km north-east	No – awaiting construction	5 MV
Upper Ogmor Wind Farm	7	~6.7 km north-east	No – awaiting construction	25.5 MV

Preliminary Bat Assessment

- 3.9.6 The area surrounding the Site features large areas of habitat suitable for both roosting (scattered trees and woodland), flight-paths (river valleys, streams, hedgerows and woodland edges) and foraging (broadleaved woodland, tree lined watercourses and grassland) by a range of bat species. The presence of hedgerows and ponds upon the Site also improve foraging opportunities. In addition, the Site is close to and connected to the known roosts at Margam Park. The Site itself, however, is comprised of sheep grazed fields primarily boarded by fencing with some scattered trees and hedgerows.

- 3.9.7 Therefore, the Site was assessed as offering moderate potential suitability to support both roosting and commuting/foraging bats.

Initial Site Risk Assessment (Turbines)

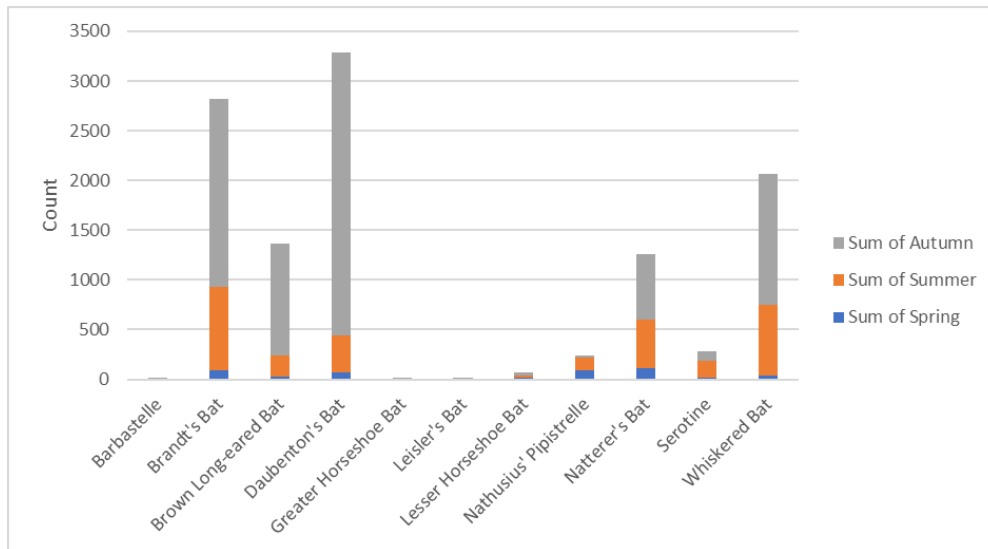
- 3.9.8 The Proposed Development collision risk level is determined by project size and habitat risk (see

- 3.9.9 **Table 6).** The development consists of six turbines with a blade tip height of 200 m, and so the Proposed Development risk level falls within the 'Small' project size category. Although this definition in guidance also states such a project comprises turbines of <50 m in height (which does not reflect the size of turbines used in contemporary wind farms), the "*Small*" category is considered more appropriate than the "*Medium*" category (between 10 and 40 turbines), as number of turbines is likely to determine the effect on bats more than turbine size above or below 100 m.
- 3.9.10 The habitat risk level of the Proposed Development is determined by the availability of roosts, the suitability of foraging and commuting habitats and the connectivity to the proposed development to the wider landscape bats. The majority of the Proposed Development is open grazed fields, which is not suitable for roosting bats. The large woodland to the western boundary of the Site and the other smaller areas of broadleaved woodland scattered throughout the Site offer suitable foraging and roosting habitats for bats.
- 3.9.11 There are farms and residential buildings in the surrounding area which could offer roosting potential for bats and Margam Park 3.3 km to the south-west is known to support several bat roosts.
- 3.9.12 Considering these factors, the habitat risk of the Proposed Development falls under the category of 'High'.
- 3.9.13 Using **Table 6 (Section 2.9)** a 'Small' project size combined with a 'High' habitat risk level results in an overall Site risk assessment of '3'.

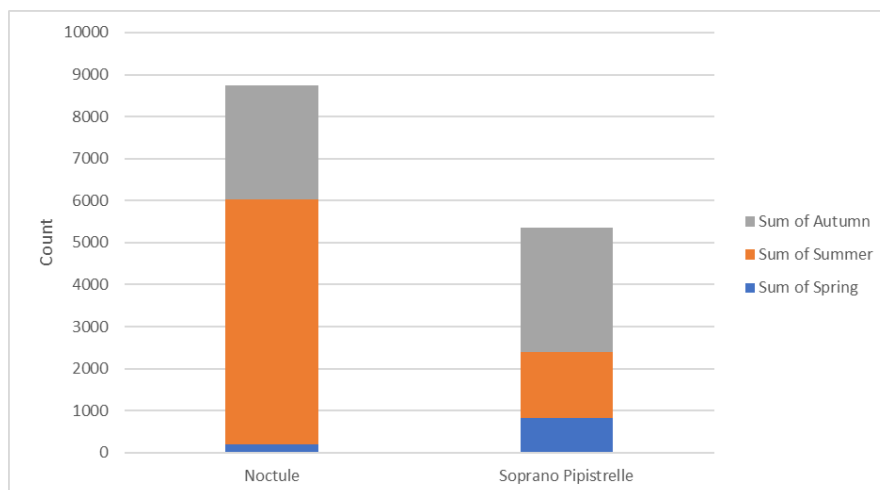
Static Monitoring (Turbines)

- 3.9.14 A total of 100,687 bat registrations were recorded for the study area. Throughout this period, 14 species were recorded. The assemblage of bats recorded within the Proposed Development is provided in **Graph 1 The total** passes per species recorded during the total deployment and the share of those passes recorded in each season.

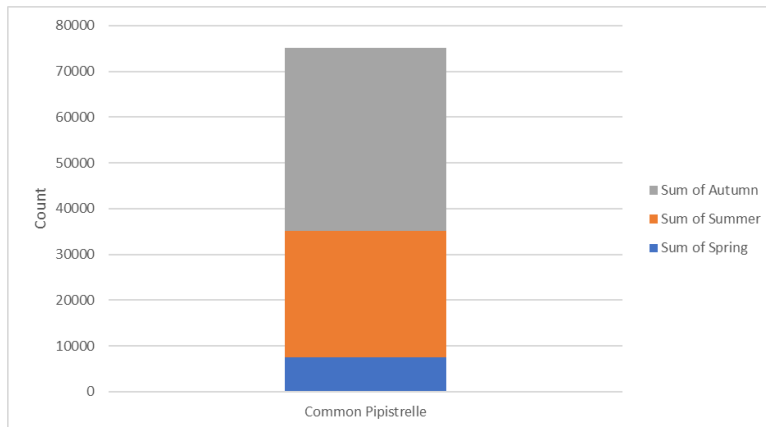
Graph 1 The total passes per species recorded during the total deployment and the share of those passes recorded in each season.



Graph 2 The total passes per species recorded during the total deployment and the share of those passes recorded in each season. Noctule, Soprano Pipistrelle and Common Pipistrelle have been removed to provide clarity on the less recorded species.



Graph 3 The total passes for Noctule and Soprano Pipistrelle recorded during the total deployment and the share of those passes recorded in each season.



Graph 4 The total passes for Common Pipistrelle recorded during the total deployment and the share of those passes recorded in each season.

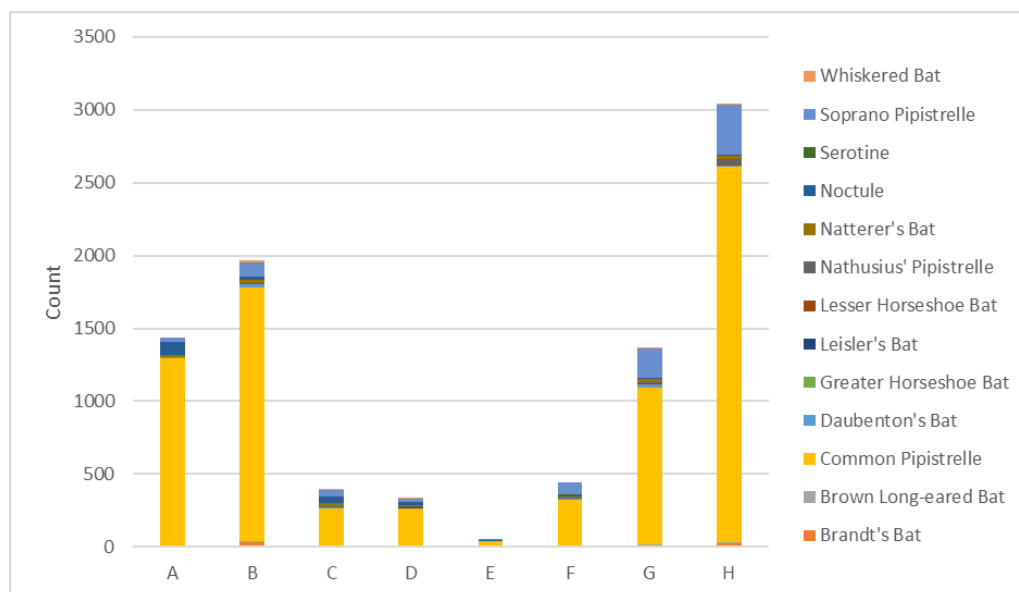
Spring Detector Deployment (Turbine locations)

3.9.15 **Table 28** provides an overview of the number of calls recorded across the 10 nights of the spring deployment. A total of 14 species were identified to species level, with common pipistrelle accounting for the large majority of records.

Table 28 number of calls recorded across the 10 nights of the spring deployment

Species / species group	Total number of passes	Percentage of total (%)
Barbastelle (<i>Barbastella barbastellus</i>)	1	0.01
Brandt's (<i>Myotis brandtii</i>)	86	0.95
Brown Long-eared	30	0.33
Common Pipistrelle	7551	83.57
Daubenton's	70	0.77
Greater Horseshoe	2	0.02
Leisler's (<i>Nyctalus leisleri</i>)	2	0.02
Lesser Horseshoe	16	0.18
Nathusius' Pipistrelle (<i>Pipistrellus nathusii</i>)	86	0.95
Natterer's (<i>Myotis nattereri</i>)	116	1.28
Noctule	208	2.30
Serotine	12	0.13
Soprano Pipistrelle	820	9.07
Whiskered	35	0.39
Grand TOTAL	9035	

3.9.16 **Graph 5** below presents the passes per species per detector for the spring deployment. Detector locations A, B, G and H located at the western and eastern extents of the red line boundary recorded the highest levels of bat activity (see **Figure 5**).



Graph 5 Passes per species per detector for the spring deployment

Summer Detector Deployment (Turbine Locations)

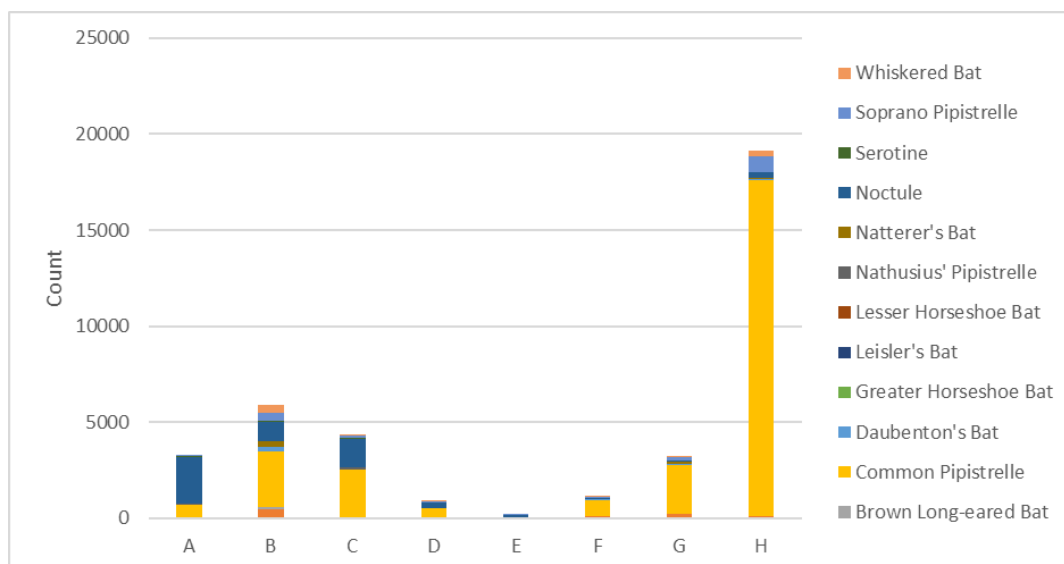
3.9.17 **Table 29** provides an overview of the number of calls recorded across the 10 nights of the summer deployment. A total of 14 species were identified to species level, with common pipistrelle accounting for the large majority of records.

Table 29 Number of calls recorded across the 10 nights of the summer deployment

Species / species group	Total number of passes	Percentage of total (%)
Barbastelle	4	0.01
Brandt's	848	2.23
Brown Long-eared	211	0.56
Common Pipistrelle	27508	72.65
Daubenton's	372	0.98
Greater Horseshoe	1	0.002
Leisler's	3	0.007
Lesser Horseshoe	27	0.07
Nathusius' Pipistrelle	127	0.34
Natterer's	480	1.27
Noctule	5820	15.37
Serotine	172	0.45

Soprano Pipistrelle	1576	4.16
Whiskered	713	1.88
Grand TOTAL	37862	

3.9.18 **Graph 6** presents the passes per species per detector for the summer deployment. Detector location H located at the western edge of the red line boundary recorded the highest levels of bat activity.



Graph 6 Passes per species per detector for the summer deployment

Autumn Detector Deployment (Turbine Locations)

3.9.19 **Table 30** provides an overview of the number of calls recorded across the 10 nights of the autumn deployment. A total of 14 species were identified to species level, with common pipistrelle accounting for the large majority of records.

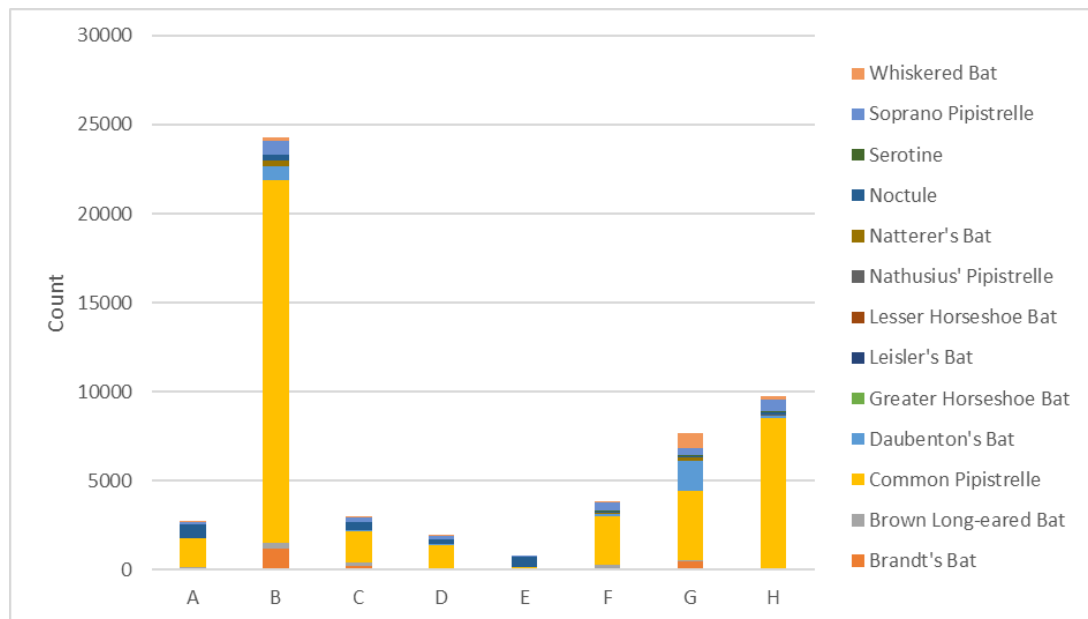
Table 30 Number of calls recorded across the 10 nights of the autumn deployment

Species / species group	Total number of passes	Percentage of total (%)
Barbastelle	8	0.01
Brandt's	1884	3.50
Brown Long-eared	1121	2.08
Common Pipistrelle	40094	74.54
Daubenton's	2850	5.30
Greater Horseshoe	18	0.03
Leisler's	8	0.01
Lesser Horseshoe	25	0.05
Nathusius' Pipistrelle	30	0.06
Natterer's	667	1.24
Noctule	2711	5.04

Serotine	102	0.19					
Soprano Pipistrelle	2952	5.49					
Whiskered	1320	2.45					
Grand TOTAL	53790						
A	B	C	D	E	F	G	H

3.9.20

Graph 7 presents the passes per species per detector for the autumn deployment. Detector location B, located at the eastern edge of the red line boundary recorded the highest levels of bat activity (see **Figure 5**).



Graph 7 Passes per species per detector for the autumn deployment

Bat Risk Assessment (Turbines)

3.9.21 Bat activity data for each season was also analysed using Ecobat. This online data processing tool allows the comparison of bat activity data with data collected from other similar sites in the same geographical region. This helps to provide some level of context to the results, i.e., whether activity levels are comparatively high, moderate or low in comparison to the reference dataset.

3.9.22 **Table 31** shows the key metrics for each bat species recorded within the bat study area. The reference range is the number of nights for each species that the data was compared to using Ecobat's database.

Table 31 Ecobat Percentiles and Bat Activity Levels

Species	Median Percentile	Median Activity Level	95% CI	Maximum Percentile	Maximum Activity Range	Nights recorded
Spring						

Species	Median Percentile	Median Activity Level	95% CI	Maximum Percentile	Maximum Activity Range	Nights recorded
<i>Barbastella barbastellus</i>	100	High	0	100	High	1
<i>Plecotus auritus</i>	60	Moderate	88 - 88	100	High	18
<i>Pipistrellus pipistrellus</i>	43	Moderate	36.5 - 92	100	High	112
<i>Rhinolophus ferrumequinum</i>	100	High	0	100	High	1
<i>Rhinolophus hipposideros</i>	62	Moderate to High	68.5 – 68.5	100	High	15
<i>Pipistrellus nathusii</i>	52	Moderate	88 - 88	100	High	36
<i>Pipistrellus pygmaeus</i>	50	Moderate	34.5 - 81	100	High	87
<i>Nyctalus spp.</i>	34	Low - Moderate	8 – 73.5	100	High	43
<i>Myotis spp.</i>	55	Moderate	49.5 – 49.5	100	High	74
Summer						
<i>Barbastella barbastellus</i>	50	Moderate	50 – 50	100	High	3
<i>Plecotus auritus</i>	60	Moderate	69.5 – 69.5	100	High	65
<i>Pipistrellus pipistrellus</i>	41	Moderate	35 – 64	100	High	159
<i>Rhinolophus ferrumequinum</i>	100	High	0	100	High	1
<i>Rhinolophus hipposideros</i>	55	Moderate	57 – 57	100	High	15
<i>Pipistrellus nathusii</i>	54	Moderate	54 – 54	100	High	26
<i>Pipistrellus pygmaeus</i>	35	Low - Moderate	8.5 – 65	100	High	114
<i>Nyctalus spp.</i>	42	Moderate	36.5 – 75	100	High	142
<i>Myotis spp.</i>	25	Low - Moderate	17.5 – 65	100	High	101
Autumn						
<i>Barbastella barbastellus</i>	100	High	100 -100	100	High	5
<i>Plecotus auritus</i>	51	Moderate	43 – 75.5	100	High	107

Species	Median Percentile	Median Activity Level	95% CI	Maximum Percentile	Maximum Activity Range	Nights recorded
<i>Pipistrellus pipistrellus</i>	50	Moderate	33.5 – 72	100	High	126
<i>Rhinolophus ferrumequinum</i>	61	Moderate - High	5 – 100	100	High	4
<i>Rhinolophus hipposideros</i>	40	Low - Moderate	28 – 78	100	High	15
<i>Pipistrellus nathusii</i>	71	Moderate - High	71 – 71	100	High	9
<i>Pipistrellus pygmaeus</i>	54	Moderate	38 – 72	100	High	127
<i>Nyctalus spp.</i>	46	Moderate	35.5 – 73	100	High	119
<i>Myotis spp.</i>	28	Low - Moderate	4 – 69.5	100	High	106

- 3.9.23 The overall risk assessment is undertaken for high collision risk species (i.e., common pipistrelle, soprano pipistrelle, Nathusius pipistrelle and *Nyctalus* spp.) and medium collision risk species (Barbastelle) which were identified within the bat study area only. Low risk species (*Myotis* spp., brown long-eared bat, greater horseshoe and lesser horseshoe) are low collision risk and low-medium population vulnerability species and are not considered in the overall risk assessment.
- 3.9.24 The overall risk assessment involves multiplying the site's risk level with the median and the maximum Ecobat activity levels to calculate both the typical site risk level, and the maximum site risk level.
- 3.9.25 The overall risk scores are shown in **Table 32**. Based on the maximum percentiles the Ecobat activity levels were 'High' (15) for common, soprano and Nathusius' pipistrelle, *Nyctalus* spp. and Barbastelle. This would suggest that at certain peak times of activity the collision risk for these species was 'High'.

Table 32 Overall Risk Scores for High and Medium Collision Risk Species

Species	Risk Score based on Median Percentile	Risk Score based on Max. Percentile
<i>Pipistrellus</i>	Medium (9)	High (15)
<i>Pipistrellus</i>	Medium (9)	High (15)
<i>Pipistrelle nathusii</i>	Medium (12)	High (15)
<i>Nyctalus spp.</i>	Medium (9)	High (15)
<i>Barbastellus</i>	High (15)	High (15)

- 3.9.26 A summary of the 'High monthly risk scores' are shown in **Table 33**. This table shows that a 'High' risk score was recorded in May, July and August at monitoring points A, B, C, D, E, F, G, H with May recording the highest number of high-risk scores.

Table 33 High Monthly Risk Scores for High Collision Risk Species

Monitoring Points	Species	Month	Median Percentile	Ecobat Bat Activity	Max Percentile	Median Risk Score
A	<i>Plecotus auritus</i>	May	88	High	100	High (15)
A	<i>Rhinolophus ferrumequinum</i>	May	100	High	100	High (15)
D	<i>Pipistrellus nathusii</i>	May	81	High	100	High (15)
E	<i>Nyctalus</i>	May	100	High	100	High (15)
E	<i>Pipistrellus nathusii</i>	May	88	High	100	High (15)
F	<i>Pipistrellus nathusii</i>	May	100	High	100	High (15)
G	<i>Rhinolophus hipposideros</i>	May	81	High	100	High (15)
H	<i>Barbastellus barbastellus</i>	May	100	High	100	High (15)
C	<i>Rhinolophus ferrumequinum</i>	Jul	100	High	100	High (15)
F	<i>Pipistrellus nathusii</i>	Jul	100	High	100	High (15)
G	<i>Barbastellus barbastellus</i>	Jul	100	High	100	High (15)
H	<i>Pipistrellus nathusii</i>	Jul	100	High	100	High (15)
A	<i>Rhinolophus hipposideros</i>	Aug	100	High	100	High (15)
B	<i>Barbastellus barbastellus</i>	Aug	100	High	100	High (15)
C	<i>Rhinolophus ferrumequinum</i>	Aug	100	High	100	High (15)
D	<i>Pipistrellus nathusii</i>	Aug	100	High	100	High (15)
G	<i>Barbastellus barbastellus</i>	Aug	100	High	100	High (15)
G	<i>Pipistrellus nathusii</i>	Aug	100	High	100	High (15)

Static Bat Detector Monitoring (Solar)

- 3.9.27 A total of 45,366 bat registrations were recorded for the study area (see **Figure 5** for the detector locations). Throughout this period, 13 species were recorded.

Summer Detector Deployment (Solar locations)

- 3.9.28 **Table 34** provides an overview of the number of calls recorded across the nights of the summer deployment. A total of 13 species were identified to species level, with Common pipistrelle accounting for the large majority of records.

Table 34 Number of calls recorded across the summer deployment

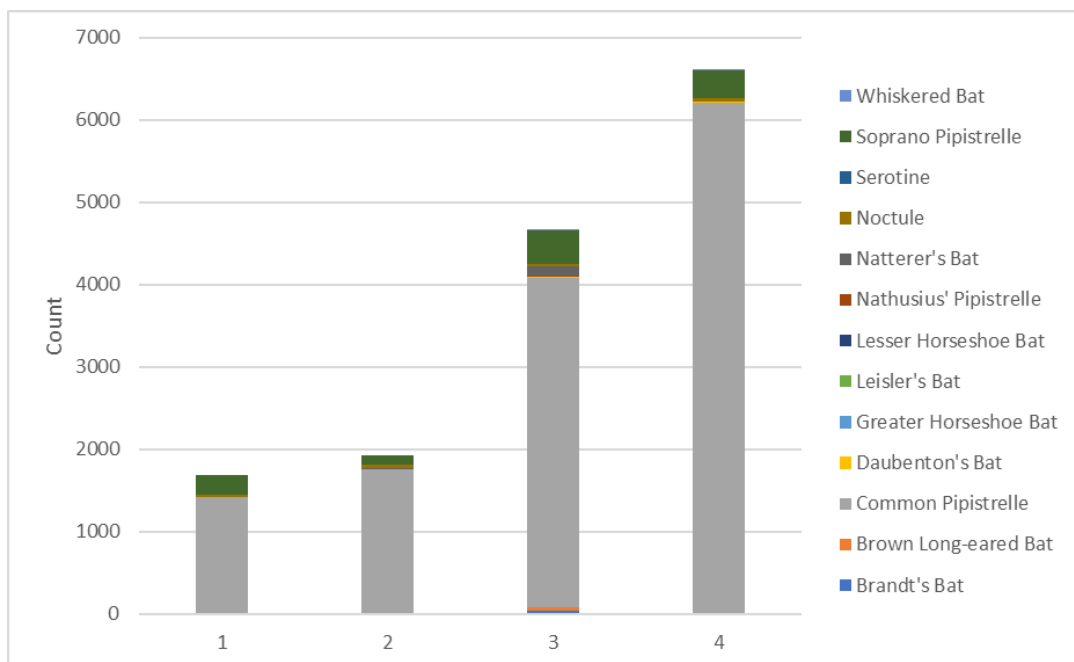
Species / species group	Total number of passes	Percentage of total (%)
Brandt's	43	0.29
Brown Long-eared	45	0.30

Common Pipistrelle	13369	89.68
Daubenton's	38	0.25
Greater Horseshoe	4	0.03
Leisler's	2	0.01
Lesser Horseshoe	1	0.01
Nathusius' Pipistrelle	17	0.11
Natterer's	119	0.80
Noctule	128	0.86
Serotine	7	0.05
Soprano Pipistrelle	1103	7.40
Whiskered	32	0.21
Grand TOTAL	14908	

3.9.29

3.9.30 **Graph 8** Passes per species per detector for the summer deployment

3.9.31 presents the passes per species per detector for the summer deployment. Detector locations 3 and 4 located at the south – east extent of the red line boundary recorded the highest levels of bat activity.



Graph 8 Passes per species per detector for the summer deployment

Autumn Detector Deployment (Solar locations)

3.9.32 **Table 35** provides an overview of the number of calls recorded across the nights of the autumn deployment. A total of 11 species were identified to species level, with common pipistrelle and soprano pipistrelle accounting for the large majority of records.

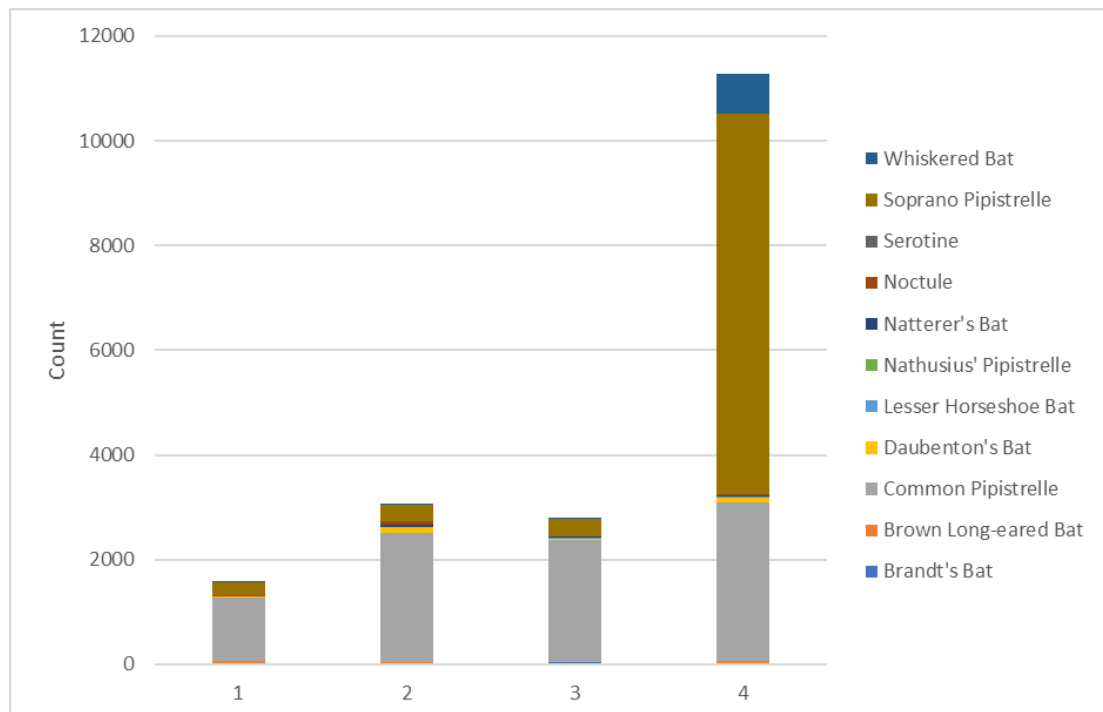
Table 35 Number of calls recorded across the autumn deployment

Species / species group	Total number of passes	Percentage of total (%)
Brandt's	68	0.36
Brown Long-eared	148	0.79
Common Pipistrelle	9045	48.39
Daubenton's	254	1.36
Lesser Horseshoe	19	0.10
Nathusius' Pipistrelle	1	0.01
Natterer's	101	0.54
Noctule	116	0.62
Serotine	3	0.02
Soprano Pipistrelle	8138	43.54
Whiskered	800	4.28
Grand TOTAL	18693	

3.9.33

3.9.34 **Graph 9** Passes per species per detector for the autumn deployment

3.9.35 presents the passes per species per detector for the autumn deployment. Detector location 4 located at the southern extent of the red line boundary recorded the highest levels of bat activity.



Graph 9 Passes per species per detector for the autumn deployment

Spring Detector Deployment (Solar locations)

- 3.9.36 **Table 35** provides an overview of the number of calls recorded across the spring deployment. A total of 12 species were identified to species level, with common pipistrelle and soprano pipistrelle accounting for the large majority of records.

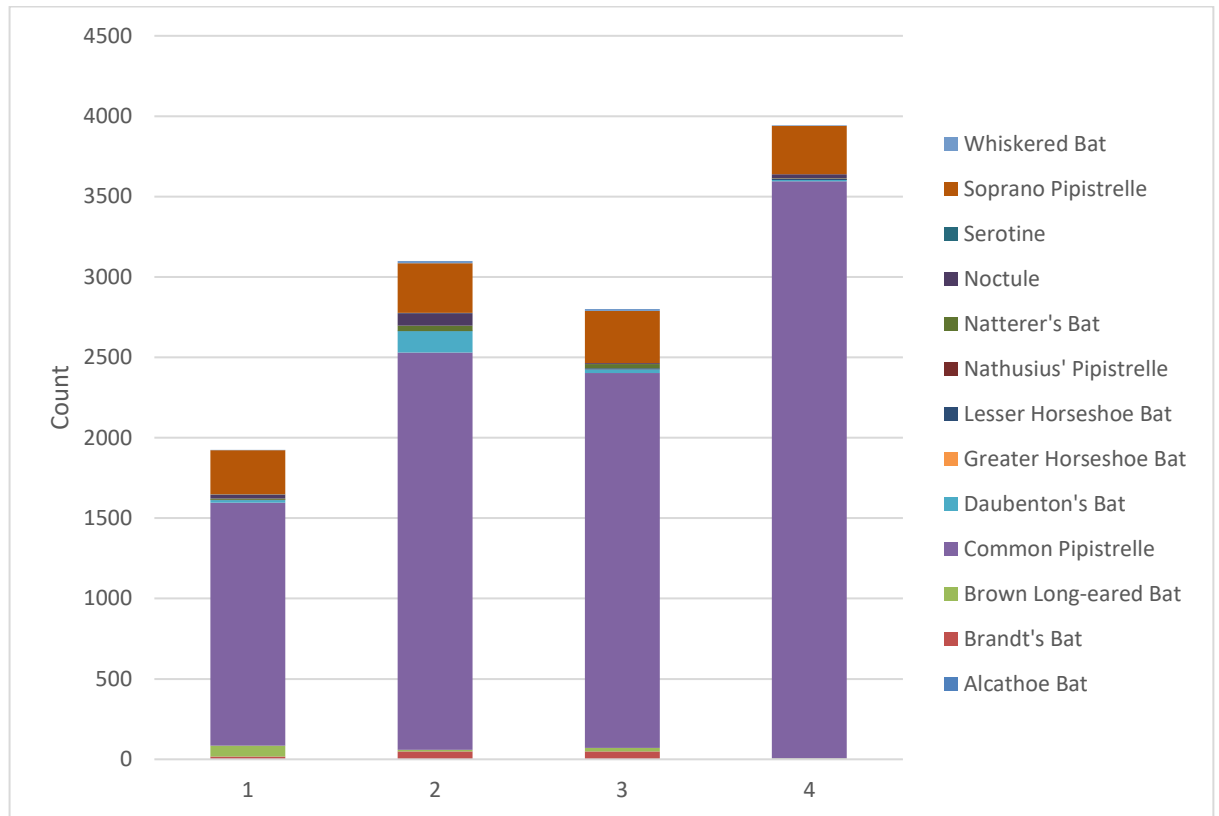
Table 36 Number of calls recorded across the autumn deployment

Species / species group	Total number of passes	Percentage of total (%)
Brandt's	114	0.97
Brown Long-eared	107	0.91
Common Pipistrelle	9902	84.16
Daubenton's	180	1.53
Greater Horseshoe	1	0.01
Lesser Horseshoe	18	0.15
Nathusius' Pipistrelle	2	0.02
Natterer's	69	0.59
Noctule	132	1.12
Serotine	3	0.03
Soprano Pipistrelle	1207	10.26
Whiskered	30	0.25
Grand TOTAL	11765	

3.9.37

Graph 9 Passes per species per detector for the autumn deployment

- 3.9.38 **Graph 10** presents the passes per species per detector for the spring deployment. Detector location 4, located at the southern extent of the red line boundary, recorded the highest levels of bat activity.



Graph 10 Passes per species per detector for the spring deployment

Night Bat Walkover Survey (NBW)

- 3.9.39 Bats recorded during the night-time walkover surveys were predominately pipistrelle species (common and soprano recorded) commuting across the Site, along hedgerows, adjacent to the lane and over the lane located through the centre of the Site. Foraging pipistrelles were also observed within the grassland fields and woodland block located south of the lane. A Greater horseshoe bat was heard (but not seen) towards the end of the June 2024 NBW survey, adjacent to a large coniferous woodland plantation located immediately adjacent to the lane. No horseshoe bats were recorded during the August and October 2024 surveys. Noctule bats was heard but not seen during the August and October 2024 survey.
- 3.9.40 All bats were recorded approximately 30 mins after dusk, indicating that there were no bat roosts within the immediate surveyed area, all bats had emerged elsewhere and commuted to Site to forage.
- 3.9.41 **Image 1** below provides a summary of the bat transect route and where bat activity was observed in August 2024.

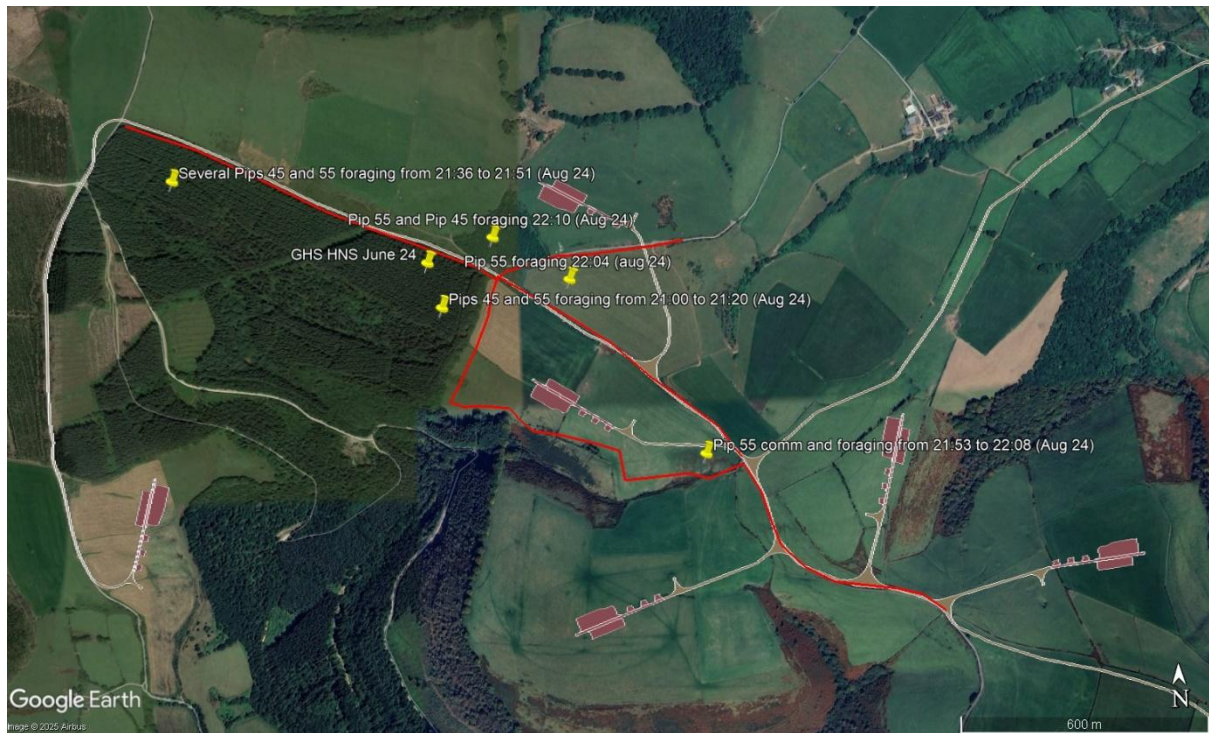


Image 1 Bat transect route and location of bat activity in August 2024

3.9.42 **Image 2** below provides a summary of the bat transect route and where bat activity was recorded during the October 2024 survey.

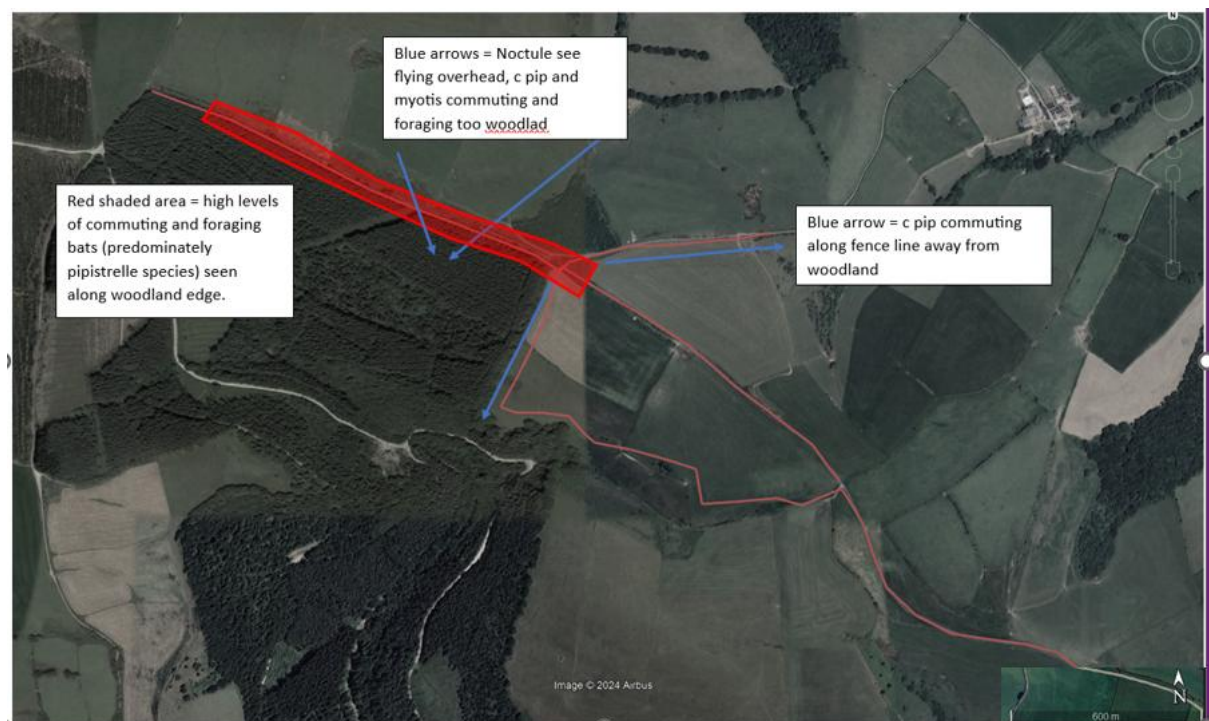


Image 2 Bat transect route and location of bat activity in August 2024

Ground Level Tree Assessment

- 3.9.43 A total of 104 trees were identified as being directly impacted by the Proposed Development and therefore surveyed for their potential to support roosting bats. Of these 81 were determined to not be suitable for roosting bats. Of the remaining 16 were assessed as PRF-I (the feature is suitable for one bat (or a very small number of bats) and therefore no further survey are required, and six were assessed as PRF-M (the feature is suitable for multiple bats).
- 3.9.44 Further climbing inspections were undertaken, the results of which are shown in **Table 37** below.

Table 37 Climbing Inspection Results

Tree ID	Potential Roost Feature Description	Survey 1	Survey 2	Survey 3
T3	Cavity in cut limb (South-west)	PRF-M	PRF-I	
	Knot hole in stem over stream (South)	PRF-M	PRF-I	
	Knot hole on dead lower branch (West)	PRF-I	PRF-I	
T72	Long narrow entrance to cavity in stem (North)	PRF-M	PRF-M	PRF-M
	Wound near base of small steam (North-west)	PRF-M	PRF-M	PRF-M
T83	Cavity in stem at base of cut branch (East)	PRF-I		
	Cavity extending upwards main stem (West)	PRF-I		
	Cavity extending up stem (South-west)	PRF-I		
T88	No PRFs			
T97	Ivy plating on stem 0.5 – 5m	PRF-I		
T98	Shallow knothole cavity (South)	PRF-I		

3.10 Dormice

- 3.10.1 The BDS search returned one record of Hazel dormice (*Muscardinus avellanarius*) within 2 km of the Site boundary; located south of the Site within Parc Slip.
- 3.10.2 The hedgerows and woodland on Site provides suitable habitat for dormice with the hedgerows providing connectivity out of the Site into the wider landscape. As dormice are known to be present in the adjacent woodland which is connected to the Site via the hedgerow and woodland network, it has been assumed that dormice are present with the Site.
- 3.10.3 Dormouse surveys will be completed during the 2025 survey season in order to inform the licence application with NRW.

3.11 Otter and Water Vole

- 3.11.1 The BDS search returned 16 records of otter within 2 km of the Site boundary, the nearest record being 1 km from the Site boundary. The BDS returned six records of water vole within 2 km of the Site boundary with the closest record being 1.1 km from Site.
- 3.11.2 The Site has numerous watercourses running through its area (as shown on **Figure 6**), many of these only consist of slow running streams but the high level of connectivity these streams have to the wider landscape increase the likelihood of their utilisation by either otter or water vole.
- 3.11.3 The ponds and their associated vegetation on Site could also provide suitable foraging opportunities for otter and water vole.
- 3.11.4 No otter or water vole, or signs of these species were recorded at any of the sixteen sites surveyed in 2023 and 2024. Survey notes can be found in **Table 44** in **Annex G**.

3.12 Badger

- 3.12.1 Over 52 records of badger were returned during the BDS, with the closest being located 100 m from Site in the forested area to the west. Another record was also located 150 m from Site to the north-east in the area of wet woodland.
- 3.12.2 A disused badger hole (TN11) and badger footprint (TN10) were identified during surveys. The Site provides suitable foraging habitat with areas of open grassland and woodland areas, and hedgerows on Site provide suitable sett building opportunities for badgers. It is possible that additional setts were located in areas that were inaccessible and that badgers use the Site for foraging purposes.

3.13 Other Species of Principal Importance

- 3.13.1 During the field survey brown hare (*Lepus europaeus*; TN4) were identified using the Site on several occasions. The Site provides the mosaic of arable fields, grassland and woodland edges that brown hare favour. The BDS also returned two records of brown hare within the Site.
- 3.13.2 Multiple records of hedgehogs within 2 km of the Site were identified during the BDS. Hedgehogs occupy a range of habitats with enough cover to allow nesting; they are common in parks in urban and suburban environments, farmland and gardens. Scrub, hedgerows, woodland and grassland on the Site provide suitable foraging habitat for hedgehogs.
- 3.13.3 Harvest mouse (*Micromys minutus*) was also identified within the woodland to the west of the Site.
- 3.13.4 Pine marten (*Martes martes*), and polecat (*Mustela putorius*) were also identified with 2 km of the Site boundary.
- 3.13.5 The BDS returned eight records of American mink (*Neovision vision*).

4.0 EVALUATION

- 4.1.1 This section provides an evaluation of the habitats and species identified.

Internationally Designated Sites

- 4.1.2 SACs and SPAs are part of the 'national site network' and are afforded protection under the provisions of The Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') or their equivalents in the devolved administrations. These sites are designated as being of international importance for ecology and nature conservation.
- 4.1.3 Glaswelltiroedd Cefn Cribwr/Cefn Cribwr Grasslands SAC is located over 2 km from the Site boundary. The designation of this site is due to the presence of Molinia meadows.
- 4.1.4 Blackmill Woodlands SAC and Kenfig/Cynffig SAC are both located over 4 km from the Site.
- 4.1.5 Internationally designated sites are considered to be of International importance.

Sites of Special Scientific Interest

- 4.1.6 The Site is adjacent to one SSSI, Cwm Risca Meadows.
- 4.1.7 Bryn-bach Cefn Cribwr, Caeau Cefn Cribwr, Waun Cimla, Cwm Du Woodlands SSSIs and Bedford Park LNR are all over 1 km from the Site.
- 4.1.8 Nationally designated sites are considered to be of National importance.

Non-statutory Designated Sites

- 4.1.9 NPT Watercourses SINC, Cwn Nant Gwyn SINC, Nant Cwm-bach SINC and Gilfach Uchaf SINC are all located within the Site boundary. Due to this some impacts to these SINC's are anticipated.
- 4.1.10 Non-statutory designated sites are considered to be of County importance.

Habitats and Plants

- 4.1.11 The Site has a range of habitats with varying levels of botanical value.
- 4.1.12 Semi-improved acid grassland, purple moor grass and rush pasture and hedgerows qualify as habitats of principal importance, being listed under Section 7 of the Environment (Wales) Act 2016.
- 4.1.13 The linear habitats such as hedgerows and running water sources provide good connectivity across the Site and to the wider landscape. These linear features, along with the broadleaved woodland, dense/ continuous scrub, rough grassland and ponds, provide good-quality habitat that is likely to be of ecological importance in a local context.
- 4.1.14 The habitats on Site are considered to be of Local importance.

- 4.1.15 Japanese Knotweed, Himalayan Balsam and Montbretia are present on Site and are listed on Schedule 9 of the Wildlife and Countryside Act (1981) as amended. These plants are considered to have no value within the Site.

Invertebrates

- 4.1.16 The Site provides suitability for both terrestrial and aquatic invertebrates and a number of notable invertebrate species were recorded in the BDS.
- 4.1.17 Male marsh fritillary can disperse up to 1.3 km with females dispersing up to 510 m (Sazer, 2016). The distance between the SSSI and northern field is approximately 2.8 km which is outside of the dispersal range for any marsh fritillary present within Cwm Risca Meadows SSSI.
- 4.1.18 Therefore, the Site is considered to be of Local value for marsh fritillary, if indeed they are still present given the limited availability of its foodplant.

Great Crested Newt

- 4.1.19 Ponds on Site and adjacent suitable habitats for GCN may be indirectly affected by the development. The Site is potentially suitable for GCN and records of GCN were identified within 2 km of the site. GCN are a European protected species and are afforded protection under the Conservation of Habitats and Species Regulations 2017 (as amended) as well as the Wildlife and Countryside Act 1981 (as amended).
- 4.1.20 GCN surveys confirmed the absence of GCN within the Site, however a pond within 250 m of the Site returned a positive eDNA result. In addition, the BDS reported a stronghold of GCN within Parc Slip which has better quality habitat for GCN.
- 4.1.21 Therefore, the Site is considered to be of Local value for GCN.

Reptiles

- 4.1.22 The Site provides areas of suitable habitat for reptiles and there were records of slow-worm, adder, common lizards and grass snake within 1 km of the Site and common lizard was observed during surveys. There is potential that reptiles are present on the Site at a high density, since the potentially suitable areas of vegetation are so large and connected to other suitable habitat. All species of reptiles in the UK are afforded protection through domestic legislation.
- 4.1.23 As the Site has connectivity to other habitats with better quality habitat (Parc Slip and Margam Opencast mine) the Site is considered to be of Local value for reptiles.

Bats

- 4.1.24 The Site provides areas suitable for roosting and foraging bats. All species of bat in the UK are European protected species and are afforded protection under the Conservation of Habitats and Species Regulations 2017 (as amended) as well as the Wildlife and Countryside Act 1981 (as amended).
- 4.1.25 The Site provides areas of suitable habitat for roosting and commuting/foraging bats and there were records within 1 km of the Site.

- 4.1.26 As the Site has connectivity to other habitats with better quality habitat the Site is considered to be of Local value for both roosting and commuting/foraging bats.

Dormice

- 4.1.27 Woodland and hedgerows within the Site provide suitable habitat for dormice. Small sections of hedgerows within the Site will be impacted as part of the Proposed Development. Dormice are a European protected species and are afforded protection under the Conservation of Habitats and Species Regulations 2017 (as amended) as well as the Wildlife and Countryside Act 1981 (as amended).
- 4.1.28 As the Site has connectivity to other suitable dormouse habitats within the wider landscape such as Parc Slip the Site is considered to be of Local value for dormice.

Otter and Water Vole

- 4.1.29 Waterbodies are present throughout the Site. They are potentially suitable for supporting water voles and historic records of water vole were identified within 2 km of the Site. Water voles are a European protected species and are afforded protection under the Conservation of Habitats and Species Regulations 2017 (as amended) as well as the Wildlife and Countryside Act 1981 (as amended). It is therefore likely that the Proposed Development could affect water voles and further surveys are required to confirm this.
- 4.1.30 The Site is considered to be of Local value for otter and water vole.

Badger

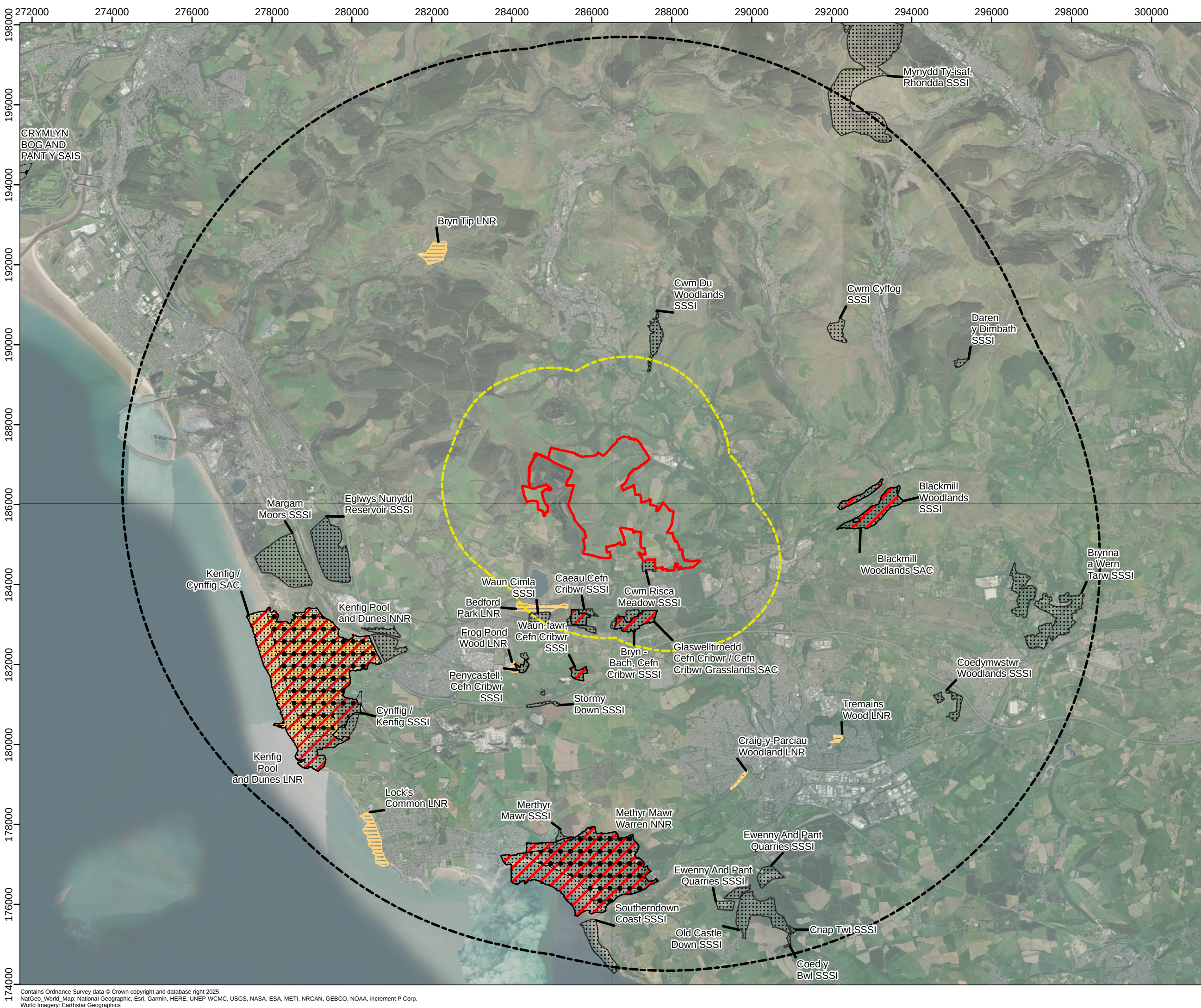
- 4.1.31 The Site was found to be suitable for supporting outlier badger setts and for foraging purposes, however no badger setts were identified on Site when surveys were carried out. Badgers are afforded protection through domestic legislation.
- 4.1.32 The Site is considered to be of Local value for badger.

Other Species of Principal Importance

- 4.1.33 The Site provides extensive suitable habitat for hedgehogs and it is well connected to other suitable habitat.
- 4.1.34 The Site is also known to support brown hare and contains extensive suitable habitat.
- 4.1.35 The Site is considered to be of Local value for other species of principal importance such as brown hare and hedgehogs.

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- Legend:
- Site boundary
 - 2km site buffer
 - 10km site buffer
 - Special Areas of Conservation
 - Site of Special Scientific Interest
 - National Nature Reserve
 - Local Nature Reserve

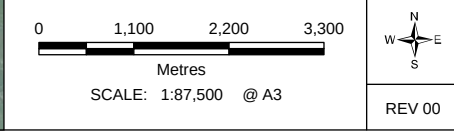


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Mynydd Ty-talwyn



TITLE: Figure 1:
Internationally and Nationally
Designated Sites within 10km



NatureScot (2021) Bats and onshore wind turbines – survey, assessment and mitigation. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments> [Accessed 13 January 2025]

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FIGURES

Figure 1 Internationally designated sites within 10 km

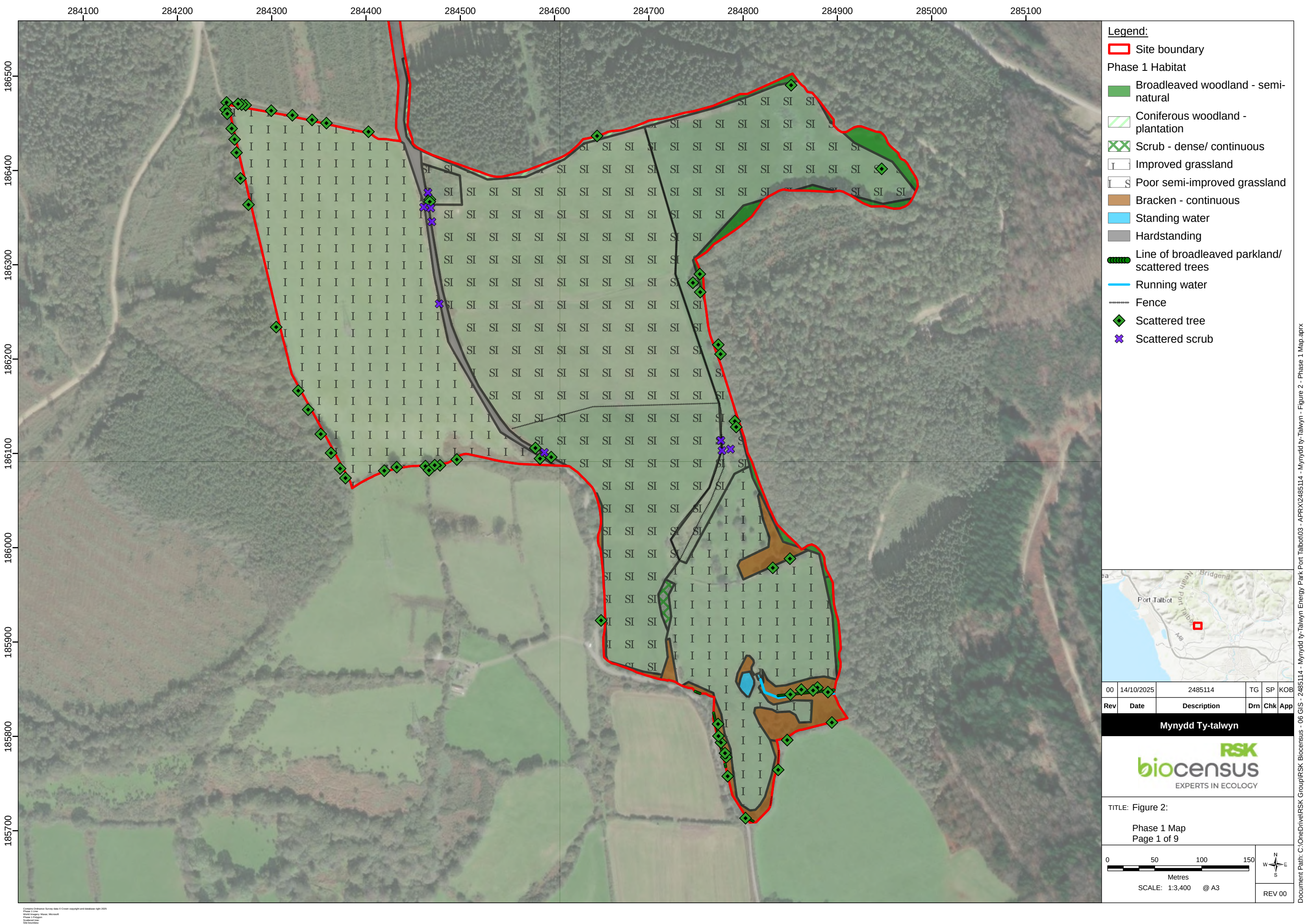
Figure 2 Phase 1 habitat plan

Figure 3 National vegetation classification quadrat locations

Figure 4 GCN eDNA results

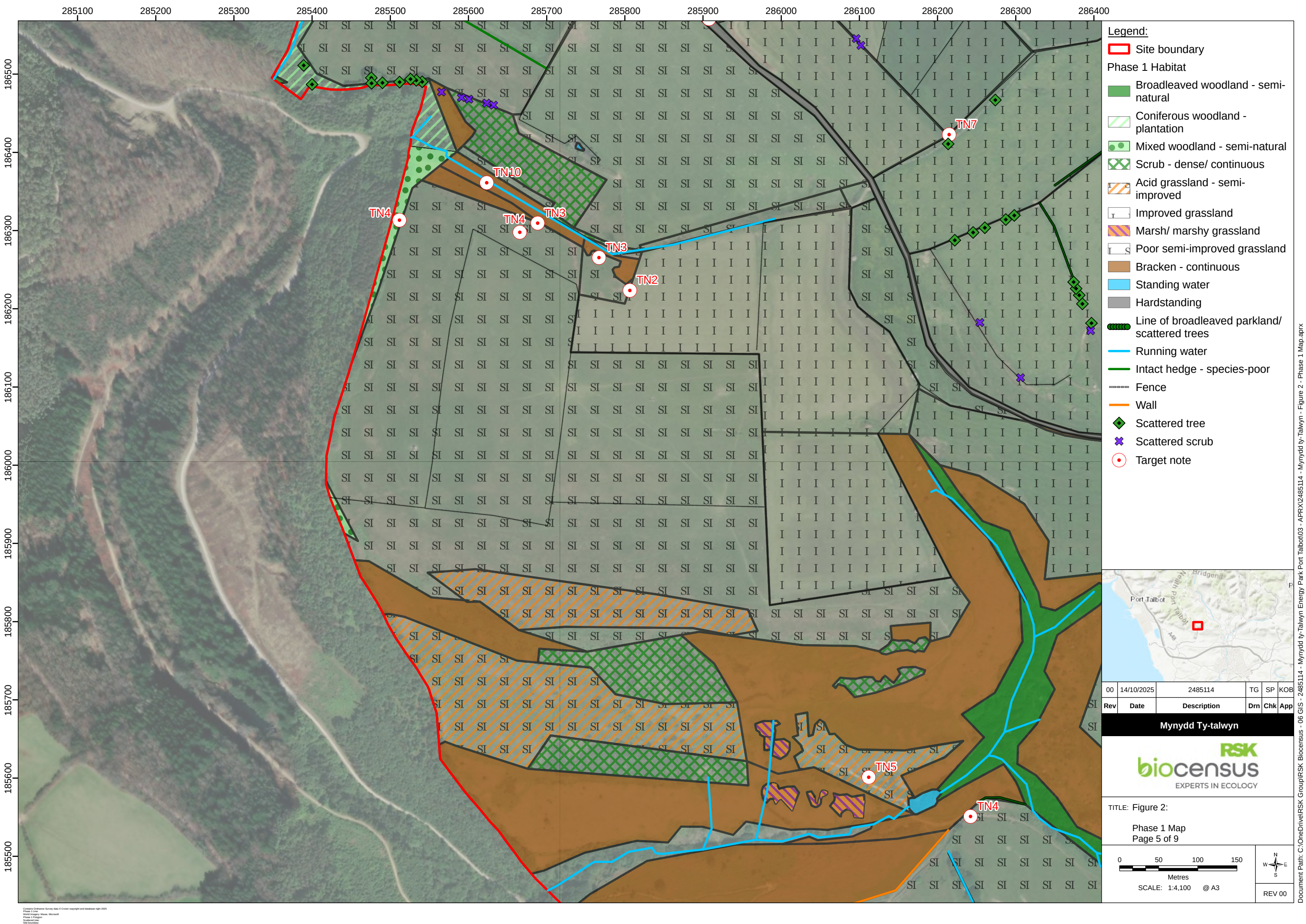
Figure 5 Bats static and tree locations

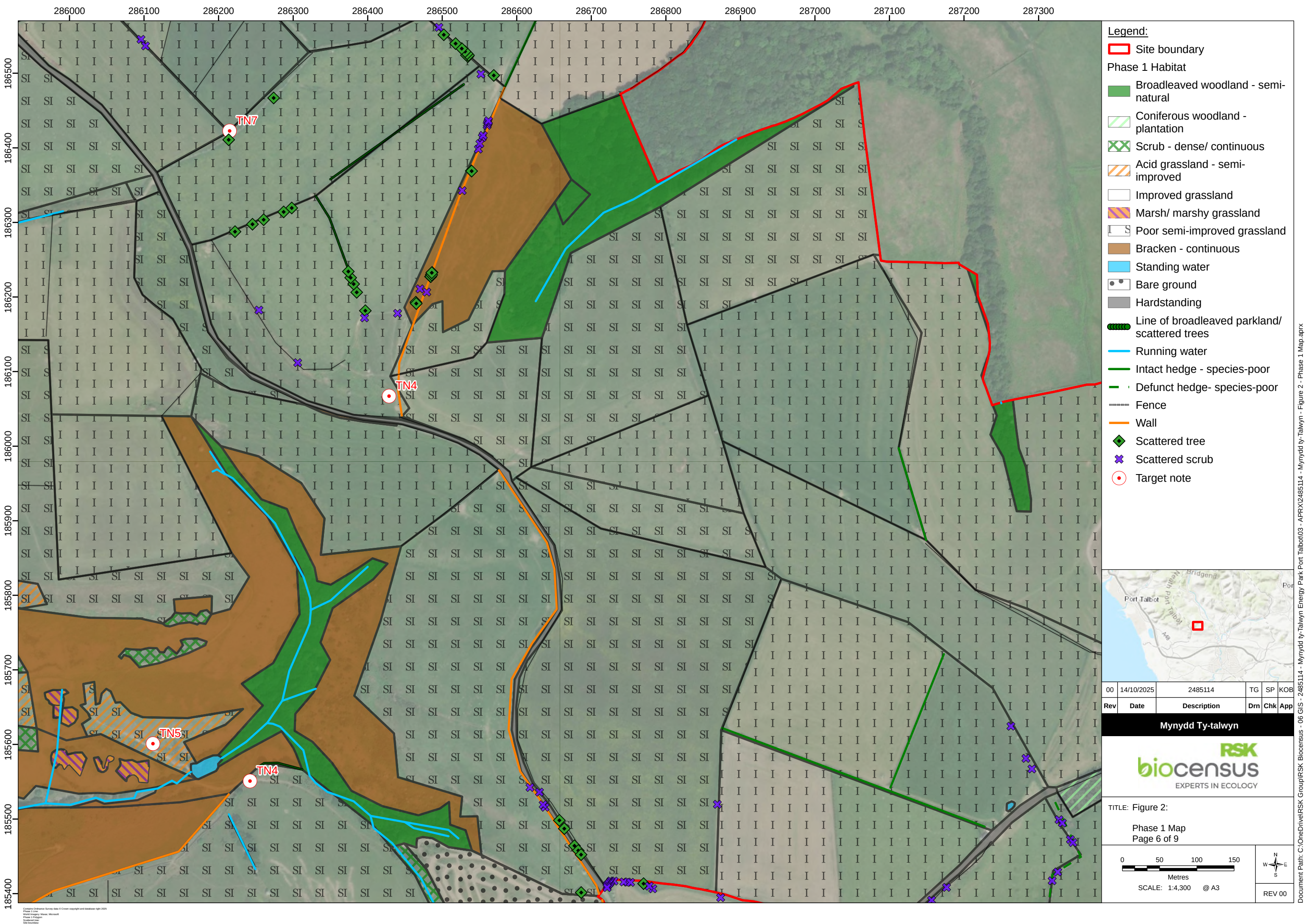
Figure 6 Otter and water vole waterbodies

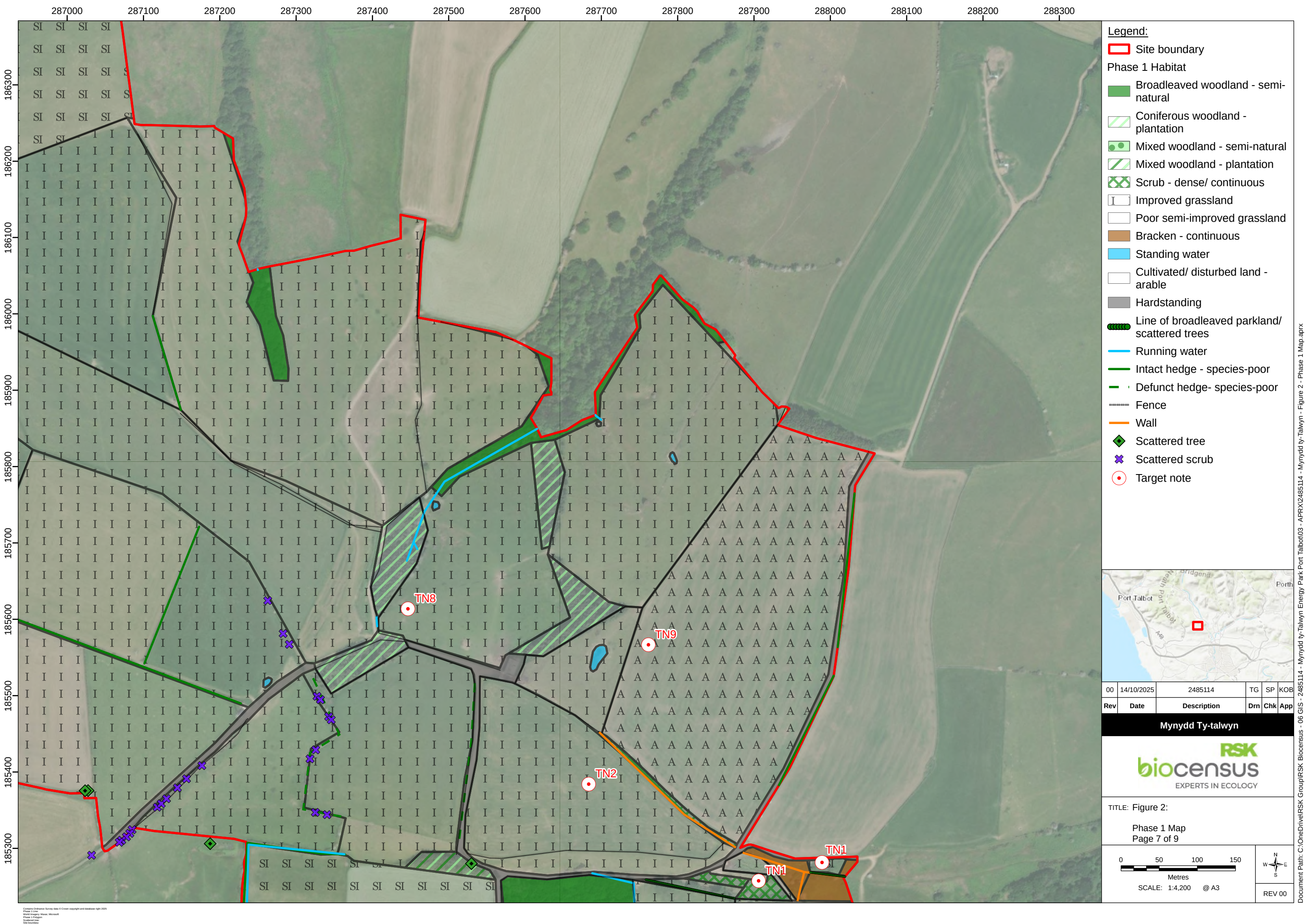


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Phase 1 Map
Aerial Imagery: Microsoft
Phase 1 Habitat
Scattered tree
Scattered scrub
Site boundary
Phase 1 Point
Aerial Topographic Map: Ordnance Survey, Esri, HERE, Garmin, USGS, NOAA









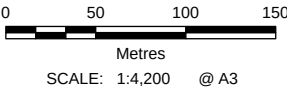
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Rev	Date	Description	Drn	Chk	App

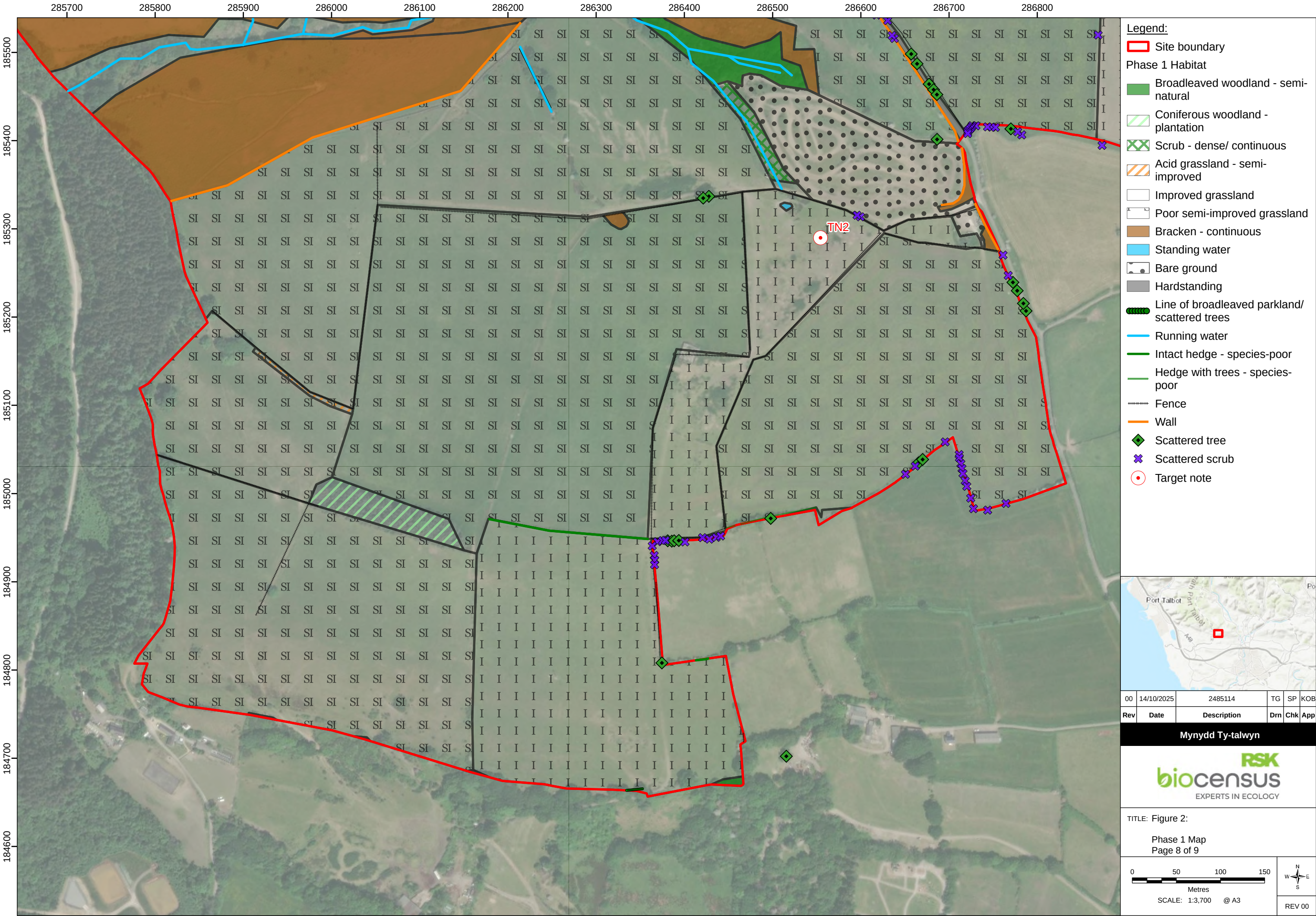
Mynydd Ty-talwyn

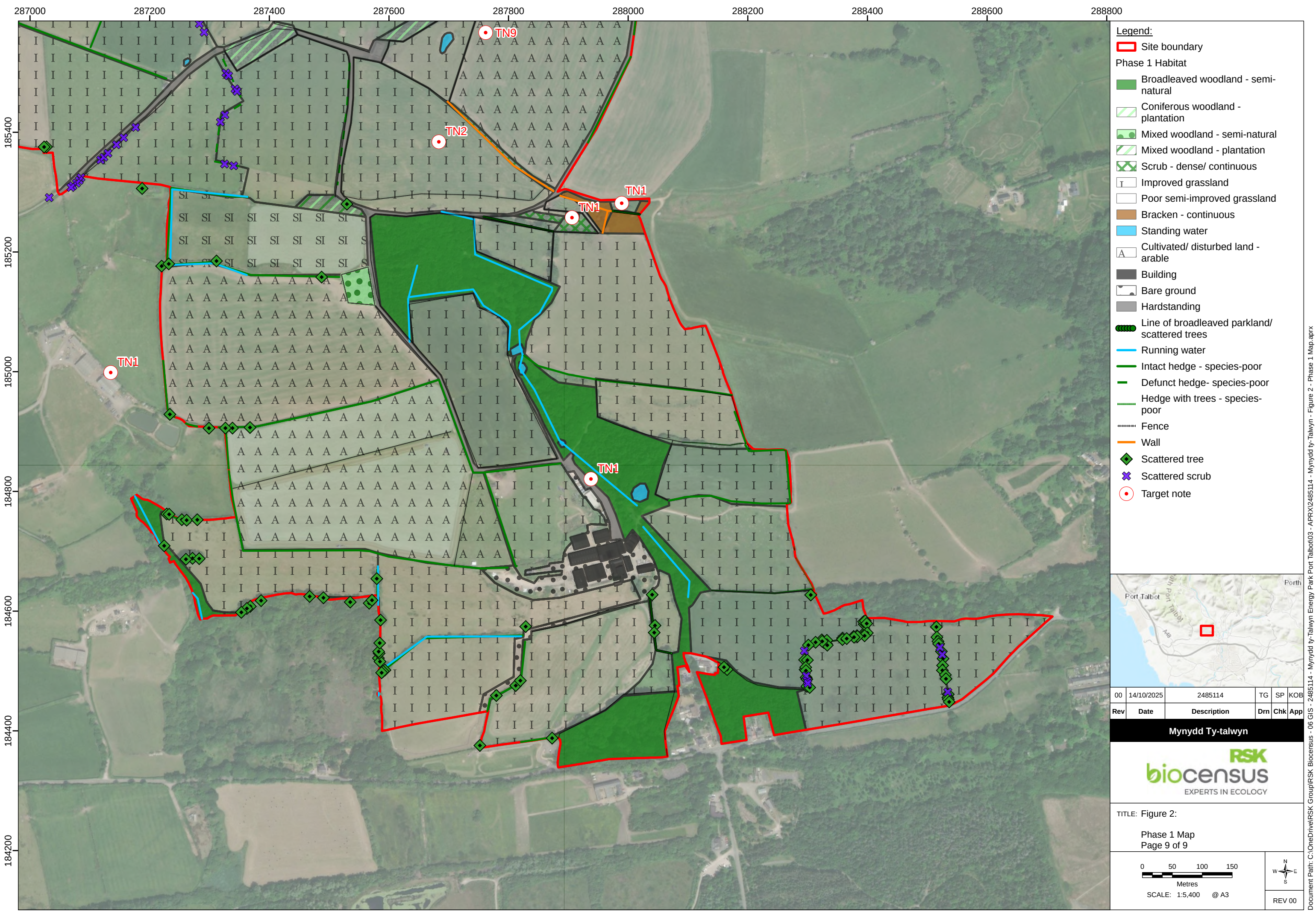


TITLE: Figure 2:

Phase 1 Map
Page 7 of 9







- Legend:**
- Site boundary
 - Phase 1 Habitat**
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - plantation
 - Mixed woodland - semi-natural
 - Mixed woodland - plantation
 - Scrub - dense/ continuous
 - Improved grassland
 - Poor semi-improved grassland
 - Bracken - continuous
 - Standing water
 - Cultivated/ disturbed land - arable
 - Building
 - Bare ground
 - Hardstanding
 - Line of broadleaved parkland/ scattered trees
 - Running water
 - Intact hedge - species-poor
 - Defunct hedge- species-poor
 - Hedge with trees - species-poor
 - Fence
 - Wall
 - Scattered tree
 - Scattered scrub
 - Target note



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Rev	Date	Description	Drn	Chk	App

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TITLE: Figure 2:

Phase 1 Map
Page 9 of 9

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Metres

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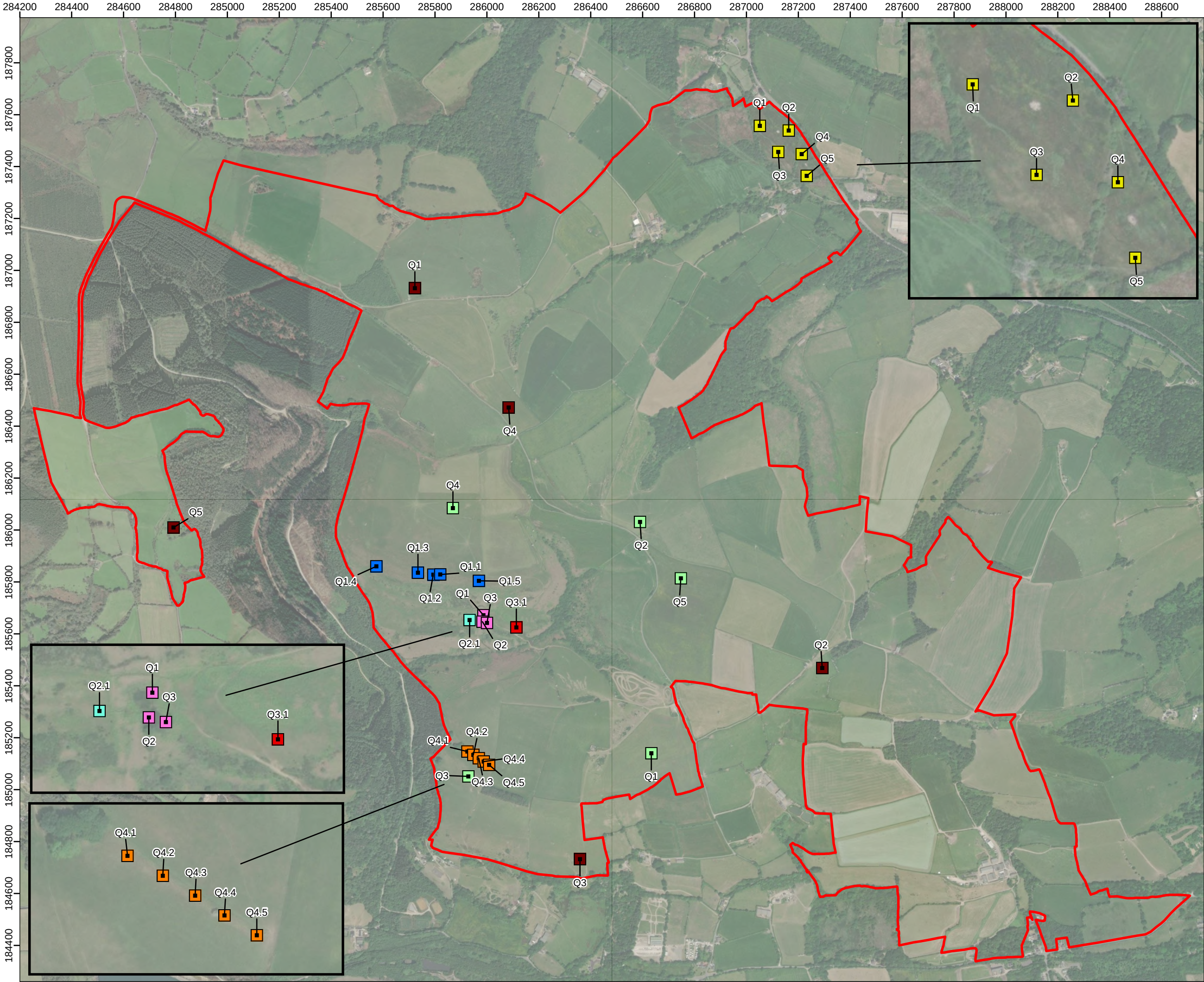
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REV 00



Legend:

Site boundary

2024 Quadrats

- Series 1
- Series 2
- Series 3
- Series 4

2023 Quadrats

- Series 5
- Series 6
- Series 7
- Series 8



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Rev	Date	Description	Drn	Chk	App

Mynydd Ty-talwyn



EXPERTS IN ECOLOGY

TITLE: Figure 3:
National Vegetation Classification
Quadrat Locations

0

150

300

450

Metres

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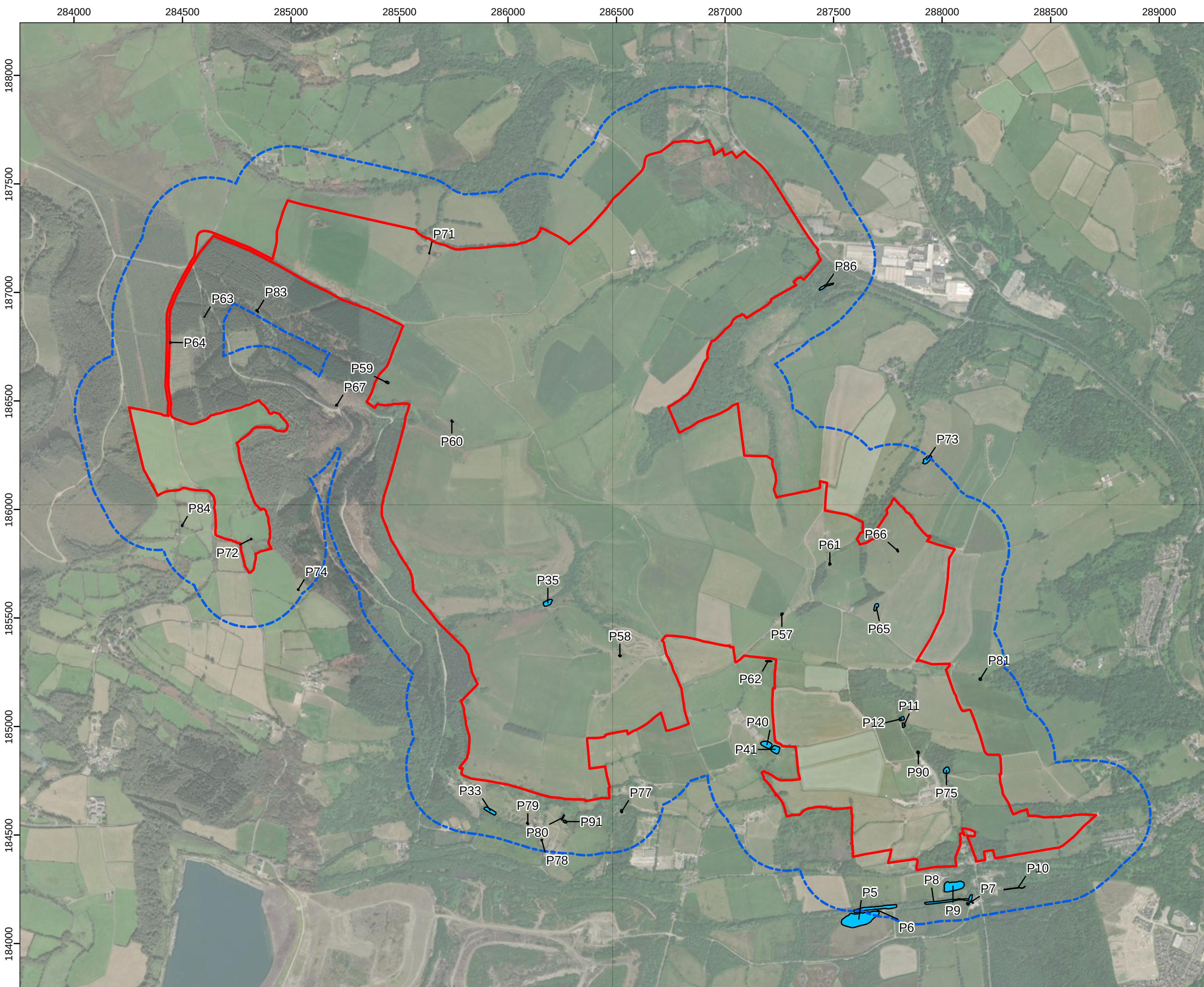
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Legend:

- Site boundary
- 250m site buffer
- Pond within 250m

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Rev	Date	Description	Drm	Chk	App

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EXPERTS IN ECOLOGY

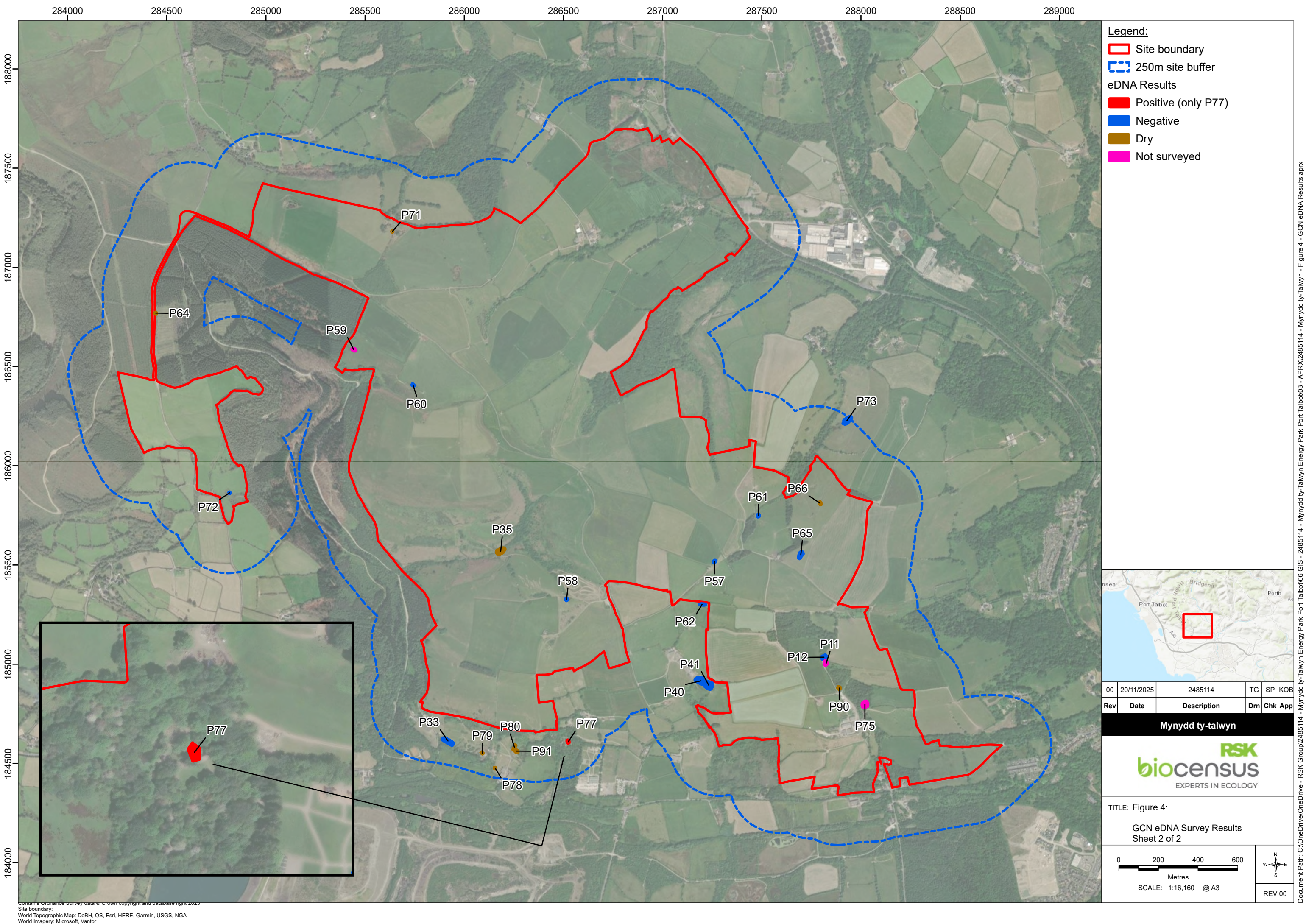
TITLE: Figure 4:
GCN eDNA Survey Results
Sheet 1 of 2

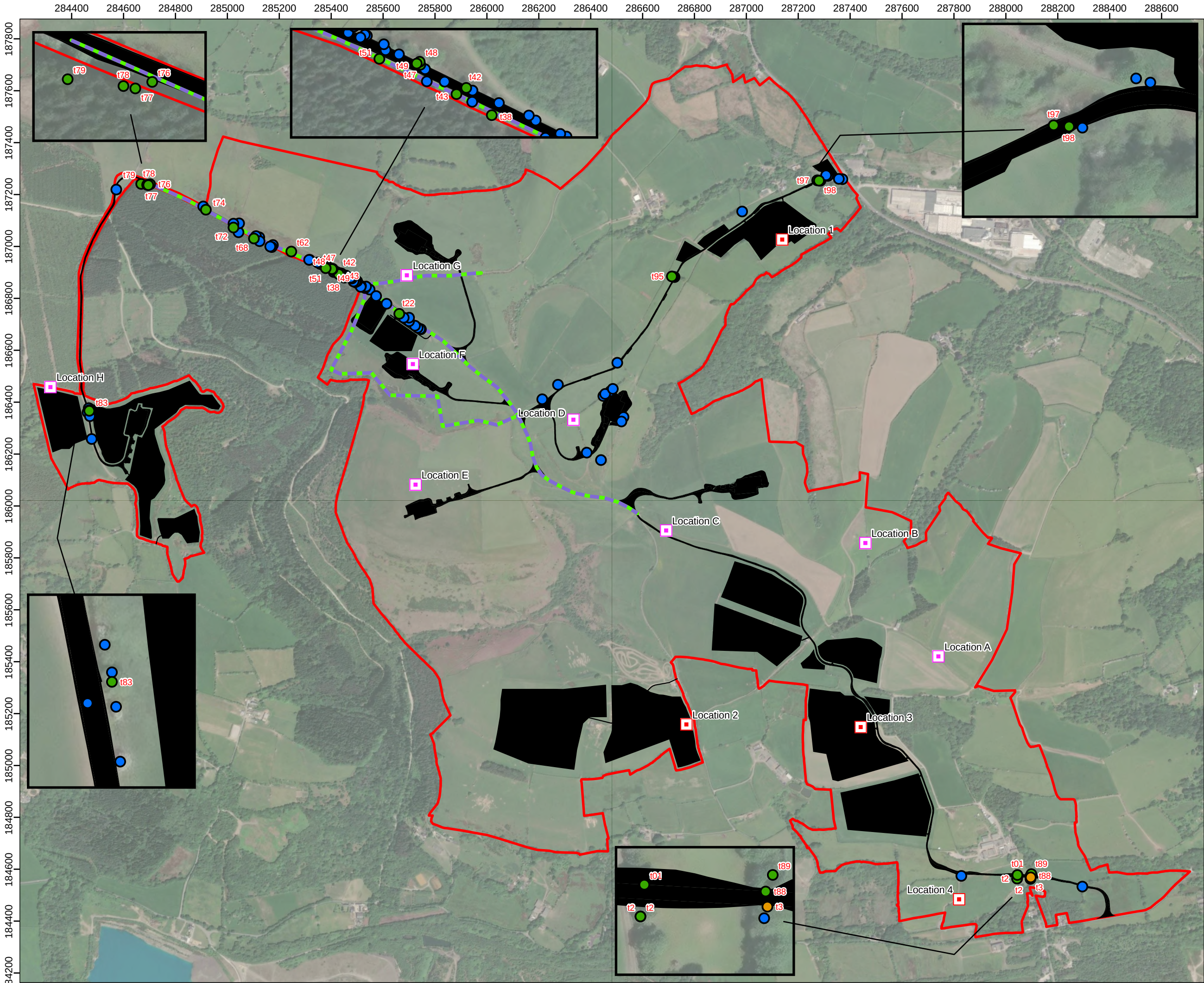
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Metres

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REV 00



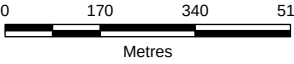


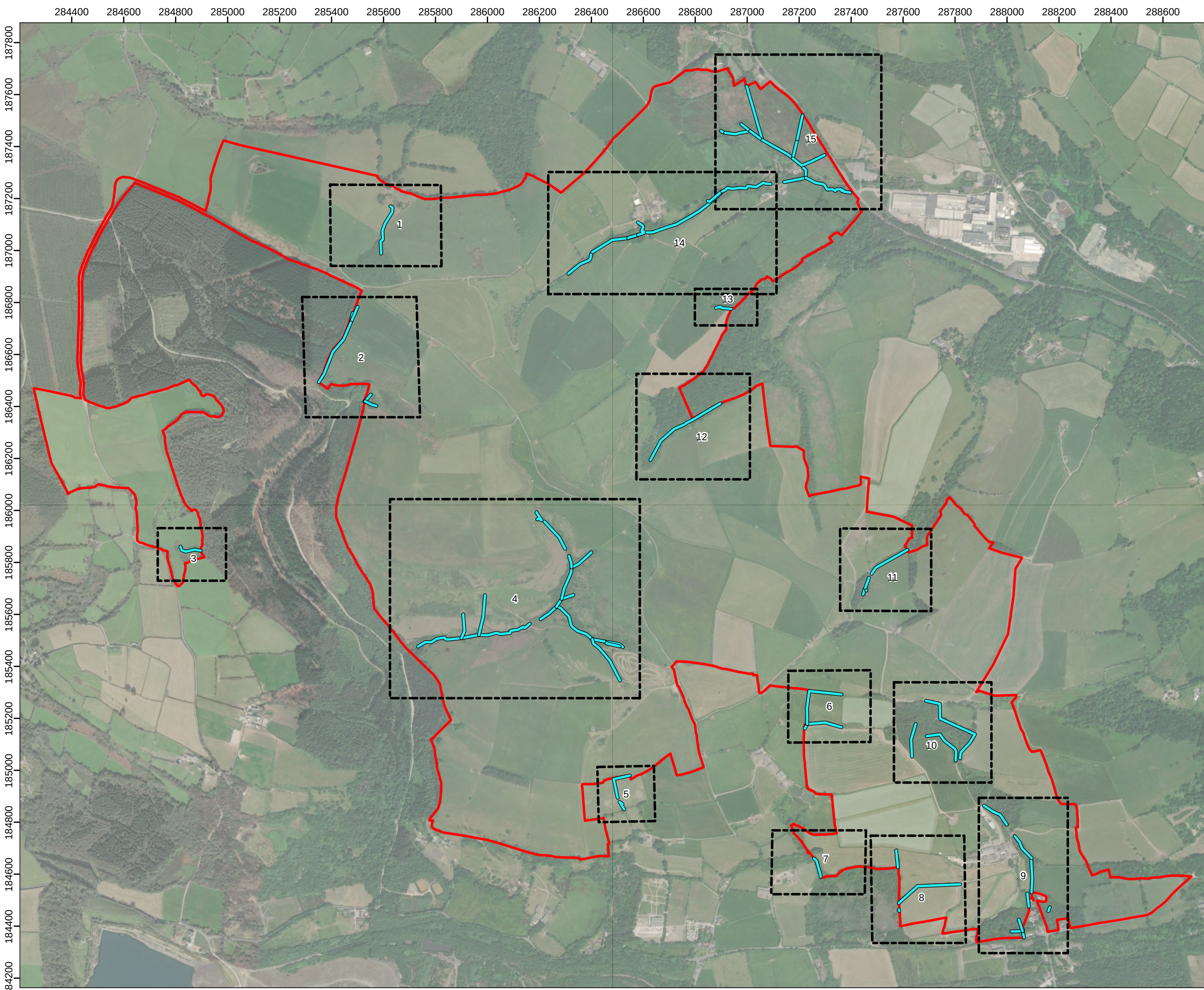
Legend:

- Site boundary
- Proposed Infrastructure
- Transect route
- Bat Statics - Solar
- Bat Statics - Turbines

Overall Tree Suitability

- PRF-M
- PRF-I
- Non

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Rev	Date	Description	Drn	Chk	App
Mynydd ty-talwyn					
					
TITLE: Figure 5: Bat Static Locations and GLTA Results					
 SCALE: 1:13,500 @ A3			 REV 00		



Legend:

- Site boundary
- Watercourses

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Rev	Date	Description	Drm	Chk	App

Mynydd Ty-talwyn

RSK
biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 6:
Otter and Water Vole Waterbodies

0 170 340 510
Metres
SCALE: 1:13,500 @ A3

REV 00

ANNEX A – Noteworthy species records

Species that are protected by law under Schedules 2 and 5 of The Conservation of Habitats and Species Regulations 2017, Schedules 2, 5 and 8 of The Wildlife and Countryside Act 1981 or The Protection of Badgers Act 1992 and have been recorded in the search area are listed in **Table 38** (excluding species protected only against collection for sale). These species records were obtained from the South East Wales Biological Record Centre. The Latin and common names for species are given, along with the year of the most recent record and their level of designation. Any species that is recorded within 100 m of the Site boundary is also highlighted.

Table 39 displays all noteworthy species that were returned within the search area. A glossary defining abbreviations used in the table is given in **Table 40, Annex B**. If a species is not included in the tables below it does not necessarily mean the species is absent from the search area, but rather that data-holding organizations do not have records of it in these locations.

Table 38 Protected species records within 2 km of the Site Boundary

Latin Name	Common Name	Designation	Most Recent	Any Records in
Amphibians				
<i>Triturus cristatus</i>	Great Crested Newt	EPS(Sch2), WCA5, S7	2022	
Birds				
<i>Tyto alba</i>	Barn Owl	WCA1.1	2021	
<i>Botaurus stellaris</i>	Bittern	WCA1.1, S7, Red, GB RDB(VU)	2014	
<i>Phoenicurus ochruros</i>	Black Redstart	WCA1.1, Amber, GB RDB(EN)	2021	
<i>Limosa limosa</i>	Black-tailed Godwit	WCA1.1, Amber, GB RDB(EN)	2019	
<i>Fringilla montifringilla</i>	Brambling	WCA1.1	2021	
<i>Cettia cetti</i>	Cetti's Warbler	WCA1.1	2016	
<i>Melanitta nigra</i>	Common Scoter	WCA1.1, S7, Amber, GB RDB(CR)	2021	
<i>Loxia curvirostra</i>	Crossbill	WCA1.1	2022	
<i>Turdus pilaris</i>	Fieldfare	WCA1.1, Amber, GB RDB(CR)	2021	
<i>Regulus ignicapilla</i>	Firecrest	WCA1.1, Amber	2015	

Latin Name	Common Name	Designation	Most Recent	Any Records in
<i>Spatula querquedula</i>	Garganey	WCA1.1, Amber, GB RDB(CR)	2015	
<i>Aquila chrysaetos</i>	Golden Eagle	WCA1.1	2008	
<i>Bucephala clangula</i>	Goldeneye	WCA1.2, Amber, GB RDB(VU)	2023	
<i>Accipiter gentilis</i>	Goshawk	WCA1.1, Amber	2022	
<i>Tringa ochropus</i>	Green Sandpiper	WCA1.1, Amber, GB RDB(EN)	2016	
<i>Tringa nebularia</i>	Greenshank	WCA1.1	2016	
<i>Circus cyaneus</i>	Hen Harrier	WCA1.1, S7, Red, GB RDB(VU)	2019	
<i>Falco subbuteo</i>	Hobby	WCA1.1	2021	
<i>Upupa epops</i>	Hoopoe	WCA1.1, Amber	2005	
<i>Alcedo atthis</i>	Kingfisher	WCA1.1	2021	
<i>Charadrius dubius</i>	Little Ringed Plover	WCA1.1	2022	
<i>Circus aeruginosus</i>	Marsh Harrier	WCA1.1, Amber	2022	
<i>Falco columbarius</i>	Merlin	WCA1.1, Red, GB RDB(EN)	2022	
<i>Pandion haliaetus</i>	Osprey	WCA1.1, Amber	2017	
<i>Falco peregrinus</i>	Peregrine	WCA1.1	2022	
<i>Anas acuta</i>	Pintail	WCA1.2, Amber, GB RDB(CR)	2021	
<i>Coturnix coturnix</i>	Quail	WCA1.1, Amber	2016	
<i>Milvus milvus</i>	Red Kite	WCA1.1	2022	X
<i>Turdus iliacus</i>	Redwing	WCA1.1, GB RDB(CR)	2022	
<i>Aythya marila</i>	Scaup	WCA1.1, Amber, GB RDB(EN)	2008	
<i>Numenius phaeopus</i>	Whimbrel	WCA1.1, Amber, GB RDB(CR)	2021	
<i>Cygnus cygnus</i>	Whooper Swan	WCA1.1, GB RDB(EN)	2016	
<i>Tringa glareola</i>	Wood Sandpiper	WCA1.1, Amber, GB RDB(EN)	1991	
<i>Jynx torquilla</i>	Wryneck	WCA1.1, Amber	2016	
Invertebrate				
<i>Euphydryas aurinia</i>	Marsh Fritillary	WCA5, S7, GB RDB(VU)	2004	
Mammals				
<i>Chiroptera</i>	Bat	EPS(Sch2)	2016	
<i>Plecotus auritus</i>	Brown Long-eared Bat	EPS(Sch2), WCA5, S7	2015	

Latin Name	Common Name	Designation	Most Recent	Any Records in
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	EPS(Sch2), WCA5, S7	2018	
<i>Myotis daubentonii</i>	Daubenton's Bat	EPS(Sch2), WCA5	2020	
<i>Meles meles</i>	Eurasian Badger	BA	2019	
<i>Lutra lutra</i>	Eurasian Otter	EPS(Sch2), WCA5, S7	2021	
<i>Arvicola amphibius</i>	European Water Vole	WCA5, S7, GB RDB(EN)	2014	
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	EPS(Sch2), WCA5, S7	2016	
<i>Muscardinus avellanarius</i>	Hazel Dormouse	EPS(Sch2), WCA5, S7, GB RDB(VU)	2022	
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	EPS(Sch2), WCA5, S7	2019	
<i>Plecotus</i>	Long-eared Bat species	EPS(Sch2), WCA5	2012	
<i>Myotis</i>	Myotis Bat species	EPS(Sch2), WCA5	2020	
<i>Myotis nattereri</i>	Natterer's Bat	EPS(Sch2), WCA5	2015	
<i>Nyctalus noctula</i>	Noctule Bat	EPS(Sch2), WCA5, S7	2018	
<i>Martes martes</i>	Pine Marten	WCA5, S7	1997	
<i>Pipistrellus</i>	Pipistrelle Bat species	EPS(Sch2), WCA5, S7	2017	
<i>Eptesicus serotinus</i>	Serotine	EPS(Sch2), WCA5, GB RDB(VU)	2016	
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	EPS(Sch2), WCA5, S7	2020	
<i>Myotis mystacinus</i>	Whiskered Bat	EPS(Sch2), WCA5	2015	
Plants				
<i>Veronica spicata</i>	Spiked Speedwell	WCA8	1996	
<i>Scorzonera humilis</i>	Viper's-grass	WCA8, GB RDB(VU), NR	2014	
Reptiles				
<i>Vipera berus</i>	Adder	WCA5, S7	2022	
<i>Zootoca vivipara</i>	Common Lizard	WCA5, S7	2021	
<i>Natrix helvetica</i>	Grass Snake	WCA5, S7	2022	
<i>Anguis fragilis</i>	Slow-worm	WCA5, S7	2022	

Table 39 Noteworthy species records within 2 km of the Site Boundary

Latin Name	Common Name	Designation
Amphibians		
<i>Rana temporaria</i>	Common Frog	WCA5
<i>Bufo bufo</i>	Common Toad	WCA5, S7
<i>Lissotriton helveticus</i>	Palmate Newt	WCA5
<i>Lissotriton vulgaris</i>	Smooth Newt	WCA5
Birds		
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	S7, Red, GB RDB(VU)
<i>Pyrrhula pyrrhula</i>	Bullfinch	S7, Amber
<i>Larus canus</i>	Common Gull	Amber
<i>Actitis hypoleucos</i>	Common Sandpiper	Amber, GB RDB(VU)
<i>Fulica atra</i>	Coot	Amber
<i>Cuculus canorus</i>	Cuckoo	S7, Red, GB RDB(VU)
<i>Numenius arquata</i>	Curlew	S7, Red, GB RDB(EN)
<i>Calidris alpina</i>	Dunlin	Red, GB RDB(EN)
<i>Prunella modularis</i>	Dunnock	S7, Amber
<i>Sylvia borin</i>	Garden Warbler	Amber
<i>Larus hyperboreus</i>	Glaucous Gull	Amber, GB RDB(VU)
<i>Regulus regulus</i>	Goldcrest	Red
<i>Pluvialis apricaria</i>	Golden Plover	S7, Red
<i>Locustella naevia</i>	Grasshopper Warbler	S7, Red
<i>Larus marinus</i>	Great Black-backed Gull	Amber, GB RDB(EN)
<i>Podiceps cristatus</i>	Great Crested Grebe	GB RDB(VU)
<i>Picus viridis</i>	Green Woodpecker	Amber
<i>Chloris chloris</i>	Greenfinch	Red, GB RDB(EN)
<i>Ardea cinerea</i>	Grey Heron	Amber
<i>Perdix perdix</i>	Grey Partridge	S7, Red, GB RDB(VU)
<i>Pluvialis squatarola</i>	Grey Plover	Red, GB RDB(VU)
<i>Motacilla cinerea</i>	Grey Wagtail	Amber
<i>Coccothraustes coccothraustes</i>	Hawfinch	S7, Amber, GB RDB(EN)
<i>Larus argentatus</i>	Herring Gull	S7, Red, GB RDB(EN)
<i>Corvus cornix</i>	Hooded Crow	Amber
<i>Delichon urbicum</i>	House Martin	Amber, GB RDB(VU)
<i>Passer domesticus</i>	House Sparrow	S7, Amber
<i>Larus glaucoides</i>	Iceland Gull	Amber, GB RDB(VU)
<i>Limnospiza minima</i>	Jack Snipe	Amber
<i>Falco tinnunculus</i>	Kestrel	S7, Red, GB RDB(VU)
<i>Calidris canutus</i>	Knot	Amber
<i>Vanellus vanellus</i>	Lapwing	S7, Red, GB RDB(EN)

Latin Name	Common Name	Designation
<i>Larus fuscus</i>	Lesser Black-backed Gull	Red
<i>Acanthis cabaret</i>	Lesser Redpoll	S7, Amber
<i>Dryobates minor</i>	Lesser Spotted Woodpecker	S7, Red, GB RDB(EN)
<i>Linaria cannabina</i>	Linnet	S7, Red
<i>Asio otus</i>	Long-eared Owl	Amber
<i>Poecile palustris</i>	Marsh Tit	S7, Red, GB RDB(VU)
<i>Anthus pratensis</i>	Meadow Pipit	Red
<i>Turdus viscivorus</i>	Mistle Thrush	Amber, GB RDB(VU)
<i>Caprimulgus europaeus</i>	Nightjar	S7
<i>Haematopus ostralegus</i>	Oystercatcher	Amber
<i>Ficedula hypoleuca</i>	Pied Flycatcher	S7, Amber, GB RDB(VU)
<i>Aythya ferina</i>	Pochard	Red, GB RDB(EN)
<i>Tringa totanus</i>	Redshank	Red, GB RDB(VU)
<i>Emberiza schoeniclus</i>	Reed Bunting	S7
<i>Turdus torquatus</i>	Ring Ouzel	S7, Red, GB RDB(VU)
<i>Charadrius hiaticula</i>	Ringed Plover	S7, Red, GB RDB(VU)
<i>Thalasseus sandvicensis</i>	Sandwich Tern	Amber
<i>Asio flammeus</i>	Short-eared Owl	Amber, GB RDB(EN)
<i>Spatula clypeata</i>	Shoveler	Amber
<i>Alauda arvensis</i>	Skylark	S7, Amber
<i>Gallinago gallinago</i>	Snipe	Amber
<i>Turdus philomelos</i>	Song Thrush	S7
<i>Muscicapa striata</i>	Spotted Flycatcher	S7, Red
<i>Sturnus vulgaris</i>	Starling	Red, GB RDB(VU)
<i>Apus apus</i>	Swift	Red, GB RDB(EN)
<i>Anas crecca</i>	Teal	Amber
<i>Anthus trivialis</i>	Tree Pipit	S7, Red
<i>Passer montanus</i>	Tree Sparrow	S7, Red, GB RDB(VU)
<i>Oenanthe oenanthe</i>	Wheatear	Amber
<i>Saxicola rubetra</i>	Whinchat	Red
<i>Curruca communis</i>	Whitethroat	Red
<i>Mareca penelope</i>	Wigeon	Amber
<i>Poecile montanus</i>	Willow Tit	S7, Red, GB RDB(EN)
<i>Phylloscopus trochilus</i>	Willow Warbler	Red
<i>Phylloscopus sibilatrix</i>	Wood Warbler	S7, Red, GB RDB(VU)
<i>Scolopax rusticola</i>	Woodcock	Red, GB RDB(VU)
<i>Motacilla flava</i>	Yellow Wagtail	S7, Red
<i>Emberiza citrinella</i>	Yellowhammer	S7, Red
Invertebrates		
<i>Stathmopoda pedella</i>	Alder Signal	Notable:B
<i>Stilbia anomala</i>	Anomalous	S7
<i>Ennomos quercinaria</i>	August Thorn	S7

Latin Name	Common Name	Designation
<i>Eugnorisma glareosa</i>	Autumnal Rustic	S7
<i>Agrochola lychnidis</i>	Beaded Chestnut	S7
<i>Meloe proscarabaeus</i>	Black Oil-beetle	S7
<i>Timandra comae</i>	Blood-vein	S7
<i>Argolamprotes micella</i>	Bright Neb	Notable
<i>Lycia hirtaria</i>	Brindled Beauty	S7
<i>Gymnetron veronicae</i>	Brooklime Gall Weevil	Notable:B
<i>Ceramica pisi</i>	Broom Moth	S7
<i>Bombus humilis</i>	Brown-Banded Carder Bee	S7
<i>Spilosoma lutea</i>	Buff Ermine	S7
<i>Calamotropha paludella</i>	Bulrush Veneer	Notable:B
<i>Atethmia centrigo</i>	Centre-barred Sallow	S7
<i>Tyria jacobaeae</i>	Cinnabar	S7
<i>Mniotype adusta</i>	Dark Brocade	S7
<i>Xanthorhoe ferrugata</i>	Dark-barred Twin-spot Carpet	S7
<i>Deleaster dichrous</i>	Deleaster dichrous	Notable:B
<i>Erynnis tages</i>	Dingy Skipper	S7, GB RDB(VU)
<i>Melanchra persicariae</i>	Dot Moth	S7
<i>Graphiphora augur</i>	Double Dart	S7
<i>Apamea remissa</i>	Dusky Brocade	S7
<i>Ennomos fuscantaria</i>	Dusky Thorn	S7
<i>Cirrhia gilvago</i>	Dusky-lemon Sallow	S7
<i>Epirrhone galiata</i>	Galium Carpet	S7
<i>Euxoa nigricans</i>	Garden Dart	S7
<i>Arctia caja</i>	Garden Tiger	S7
<i>Hepialus humuli</i>	Ghost Moth	S7
<i>Perizoma albulata</i>	Grass Rivulet	S7
<i>Perizoma albulata albulata</i>	Grass Rivulet	S7
<i>Hipparchia semele</i>	Grayling	S7, GB RDB(VU)
<i>Allophyas oxyacanthae</i>	Green-brindled Crescent	S7
<i>Acronicta psi</i>	Grey Dagger	S7
<i>Pyrgus malvae</i>	Grizzled Skipper	S7, GB RDB(VU)
<i>Gymnetron villosulum</i>	Gymnetron villosulum	Notable:B
<i>Tholera cespitis</i>	Hedge Rustic	S7
<i>Acronicta rumicis</i>	Knot Grass	S7
<i>Malacosoma neustria</i>	Lackey	S7
<i>Rhizedra lutosa</i>	Large Wainscot	S7
<i>Chiasmia clathrata</i>	Latticed Heath	S7
<i>Forficula lesnei</i>	Lesne's Earwig	NS
<i>Lophosia fasciata</i>	Lophosia fasciata	Notable
<i>Brachylomia viminalis</i>	Minor Shoulder-knot	S7
<i>Bombus muscorum</i>	Moss Carder Bee	S7

Latin Name	Common Name	Designation
<i>Caradrina morpheus</i>	Mottled Rustic	S7
<i>Amphipyra tragopoginis</i>	Mouse Moth	S7
<i>Xestia castanea</i>	Neglected Rustic	S7
<i>Watsonalla binaria</i>	Oak Hook-tip	S7
<i>Orthonama vittata</i>	Oblique Carpet	S7
<i>Dioctria oelandica</i>	Orange-legged Robberfly	NS, Notable
<i>Eudonia delunella</i>	Pied Grey	Notable:B
<i>Orthosia gracilis</i>	Powdered Quaker	S7
<i>Melanthia procellata</i>	Pretty Chalk Carpet	S7
<i>Ptinus sexpunctatus</i>	Ptinus sexpunctatus	Notable:B
<i>Litoligia literosa</i>	Rosy Minor	S7
<i>Hydraecia micacea</i>	Rosy Rustic	S7
<i>Hoplodrina blanda</i>	Rustic	S7
<i>Cirrhia icteritia</i>	Sallow	S7
<i>Crambus pratella</i>	Scarce Grass-veneer	Notable:B
<i>Ennomos erosaria</i>	September Thorn	S7
<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	S7
<i>Leucania comma</i>	Shoulder-striped Wainscot	S7
<i>Bombus sylvarum</i>	Shrill Carder Bee	S7, Notable:B
<i>Cupido minimus</i>	Small Blue	WCA5, S7
<i>Hemistola chrysoprasaria</i>	Small Emerald	S7
<i>Coenonympha pamphilus</i>	Small Heath	S7
<i>Boloria selene</i>	Small Pearl-bordered Fritillary	S7
<i>Ecliptopera silaceata</i>	Small Phoenix	S7
<i>Diarsia rubi</i>	Small Square-spot	S7
<i>Suillia vaginata</i>	Suillia vaginata	Notable
<i>Tipula yerburyi</i>	Tipula yerburyi	Notable
<i>Meloe violaceus</i>	Violet Oil-beetle	S7, Notable:B
<i>Macaria wauaria</i>	V-moth	S7
<i>Lasiommata megera</i>	Wall	S7
<i>Spilosoma lubricipeda</i>	White Ermine	S7
<i>Xylota xanthocnema</i>	Xylota xanthocnema	NS, Notable
<i>Lithobius (Lithobius) pilicornis</i>	Lithobius (Lithobius) pilicornis	NS
Mammals		
<i>Lepus europaeus</i>	Brown Hare	S7
<i>Micromys minutus</i>	Harvest Mouse	S7
<i>Mustela putorius</i>	Polecat	S7
<i>Erinaceus europaeus</i>	West European Hedgehog	S7, GB RDB(VU)

Latin Name	Common Name	Designation
Plants		
<i>Hyacinthoides non-scripta</i>	Bluebell	WCA8
<i>Allium schoenoprasum</i>	Chives	NS
<i>Pinguicula vulgaris</i>	Common Butterwort	GB RDB(VU)
<i>Euphrasia micrantha</i>	Common Slender Eyebright	GB RDB(EN)
<i>Fritillaria meleagris</i>	Fritillary	NS
<i>Lotus subbiflorus</i>	Hairy Bird's-foot-trefoil	NS
<i>Hornungia petraea</i>	Hutchinsia	NS
<i>Sagina nodosa</i>	Knotted Pearlwort	GB RDB(VU)
<i>Thelypteris palustris</i>	Marsh Fern	NS
<i>Rorippa islandica</i>	Northern Yellow-cress	NS
<i>Hippophae rhamnoides</i>	Sea-buckthorn	NS
<i>Hypochaeris glabra</i>	Smooth Cat's-ear	GB RDB(VU)
<i>Carex montana</i>	Soft-leaved Sedge	NS
<i>Meconopsis cambrica</i>	Welsh Poppy	NS
<i>Brassica oleracea</i>	Wild Cabbage	NS
<i>Iberis amara</i>	Wild Candytuft	GB RDB(VU), NS

ANNEX B – ABBREVIATIONS

Table 40 displays abbreviations of protected species legislation.

Table 40 Glossary of abbreviations used in this report

Code	Full Title	Explanation
Amber	Amber list	Amber listed species have a population status in the UK of medium conservation concern.
BA	Protection of Badger Act	Legislation making it an offence to kill, injure or take a badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority.
EPS (Sch 2)	European protected species (Schedule 2)	European protected species of animals, listed on Schedule 2 of The Conservation of Habitats and Species Regulations 2017.
GB RDB	Red data book species	Species identified in one of the UK Red Data 2001.
GB RDB(CR)	Critically endangered	An IUCN Red List designation for species at an extremely high risk of extinction.
GB RDB(EN)	Endangered	An IUCN Red List designation for species at a very high risk of extinction.
GB RDB(VU)	Vulnerable	An IUCN Red List designation for species at high risk of extinction.
HDir	EU Habitat Directive Species	The Habitats Directive contributes to ensuring biodiversity in the European Union by conserving natural habitats and wild fauna and flora species.
IUCN	International Union for Conservation of Nature and Natural Resources	A worldwide partnership and conservation network to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
Notable	Scarce and threatened invertebrates	Invertebrate species which are estimated to occur within the range of 16 to 100 10km squares but subdivision into Notable A and Notable B categories is not possible as there is insufficient information available).
Notable: B	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties.
NR	Nationally rare	Species in 15 or fewer hectads in Great Britain.
NS	National scarce	Species in 16-100 hectads in Great Britain.
Red	Red list	Red listed species have a population status in the UK with high conservation concern.
RD2 (UK)	UK Red Data Book listing not based on IUCN guidelines	A document that is established for documenting rare and endangered species of animals, plants, and fungi that exist within the territory of the state or country.

Code	Full Title	Explanation
S7	Species of principal importance	Species of Principal Importance in Wales under The Environment (Wales) Act 2016
WCA1	Schedule 1 of The Wildlife and Countryside Act 1981 (as amended)	This Schedule lists birds protected by special penalties at all times, but virtually all wild birds have some protection in law. Acts which are prohibited for all wild birds (except derogated 'pest' species) include intentional killing, injuring or taking; taking, damaging or destroying nests in use or being built; taking or destroying eggs; possessing or having control of (with certain exceptions but including live for dead birds, parts or derivative); setting or permitting certain traps, weapons, decoys or poisons. Selling, offering or exposing for sale, possessing or transporting for sale any live wild bird, egg or part of an egg or advertising any of these for sale, or dead wild bird including parts or derivatives are also prohibited. Many birds must be formally registered and ringed if kept in captivity. Schedule I WCA birds are additionally protected from intentional or reckless disturbance while building a nest, or when such a bird is in, on or near a nest containing eggs or young, or intentional or reckless disturbance of dependent young.
WCA5	Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	Schedule 5 animals are protected from intentional killing, injuring or taking; possessing (including parts or derivatives); intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; selling, offering or exposing for sale, possessing or transporting for the purpose of sale (alive or dead, including parts or derivatives). Protection of some species is limited to certain Sections of the Act (e.g. S9(1), S9(4a), S9(4b), S9(5)).
WCA8	Schedule 8 of The Wildlife and Countryside Act 1981 (as amended)	Plants and fungi protected from intentional picking, uprooting, destroying, trading (including parts or derivatives), etc.
WCA9	Schedule 9 of The Wildlife and Countryside Act 1981 (as amended)	Schedule 9 lists non-native species that are already established in the wild and whose further release or establishment is regulated to protect native biodiversity and habitats. It is an offence under section 14 of the Act to release or plant any species listed in Schedule 9.

ANNEX C – TARGET NOTES

Target note number	Description
1	Japanese Knotweed
2	Skylark sighting
3	Common lizard sighting
4	Brown hare sighting
5	Exposed bank/earth could be suitable for solitary bees/ hymenoptera species
6	Pile of silage – could provide suitable basking/ resting opportunities for reptiles
7	Stone wall in disrepair –suitable basking/ resting opportunities for reptiles
8	Sighting of 6 green woodpecker
9	Farmer informed surveyor that there were lapwing chicks within the field
10	Badger footprint
11	Large entrance but appears to have been dug under a paving slab approx. 20cm wide full of leaf litter
12	Log piles –suitable basking/ resting opportunities for reptiles
13	Montbretia
14	Small amount of Devil's-bit Scabious present within field.

ANNEX D – SITE PHOTOGRAPHS

Plate Number	
1 – Example of improved grassland present within the Site	
2 – steep valley within the west of the Site	

3 – view north of the Site showing improved woodland, large area of bracken and woodland



4 – fenced pond located within the west of the Site



5 –
woodland
located in
the east
of the Site



6 –
conifer
plantation
adjacent
to
improved
grassland



7 – view of improved grassland along proposed northern access route



8 – defunct hedgerow between improved grassland



9 –
lowland
dry acid
grassland
within
valley



ANNEX E: GREAT CRESTED NEWTS – FULL SURVEY RESULTS

Table 41 Waterbody Descriptions and HSI Results

Pond Number	Description	HSI Score	Suitability
Within Red Line Boundary			
11	Small pond completely surrounded by scrub (Willow and Bramble, no access. Aquatic vegetation within mainly hemlock water drop wort.	0.52	Below Average
12	Retained pooling of water formed between two streams of water into and out of the pond. Surrounded by scrub, mainly willow to the north bank and metal fencing to the south bank. Small amount of aquatic vegetation within comprising of bullrush, hemlock water drop wort, floating sweet grass.	0.40	Poor
35	Large pond located with grassland. Stream running through with small areas of pooling water. Pond is choked with rushes, bullrush, floating sweet grass, water crowfoot and willow encroaching from woodland.	0.81	Excellent
57	Large pond surrounded by bramble and metal fencing. Minimal aquatic vegetation within. Himalayan balsam present.	0.57	Below Average
58	Large pond within grassland. Aquatic vegetation within, including but not limited to floating sweet grass and pond weed. Sheep present in field, poached ground.	0.62	Average
59	Large pond in grassland surrounded by metal fencing. Aquatic vegetation within. Canada geese pair nesting on pond.	0.44	Poor
60	Large pond within grassland surrounded by scrub. Good egg laying plants such as <i>Potamogeton</i> sp, Himalayas balsam present. Burrows throughout the west bank.	0.39	Poor

Pond Number	Description	HSI Score	Suitability
61	Small pond within grassland. Sheep present, poached ground. Lots of aquatic vegetation floating sweet grass, brooklime, duckweed. Inlet and outlet of water, but large areas of still water.	0.49	Poor
64	Dry pond.	0.34	Poor
65	Large pond, shallow around the edges. Aquatic vegetation within; bullrush, saltwort, floating sweet grass, fools water parsley.	0.62	Average
66	Shallow pond, lots of aquatic vegetation such as floating sweet grass and crowfoot. Outflow into pond but still areas present.	0.46	Poor
71	Small shallow pond within a grassland surrounded by rush and gorse. Aquatic vegetation within comprising of floating sweet grass, water crowfoot. Inflow and outflow of water, areas of still water where tadpoles congregated.	0.42	Poor
72a	Small pond surrounded by dense bramble scrub and metal fencing meaning its inaccessible. Aquatic vegetation within.	0.57	Below Average
72b	Large pond within grassland. Lots of aquatic vegetation within such as floating sweet grass, pondweed sp. Water crowfoot, starwort sp. and soft rush. Sheep present within field, poached ground.	0.73	Good
75	Streaming outflow of water, very small area of pooling still water adjacent. Very little aquatic vegetation present. Himalayan balsam and Japanese Knotweed present.	0.43	Poor
90	Dry Pond. Some aquatic vegetation suggesting recently pooled water; opposite leaved golden saxifrage, Hemlock water drop wort.	0.41	Poor
250m of the Red Line Boundary			
5	No access	n/a	n/a
6	No access	n/a	n/a
7	No access	n/a	n/a

Pond Number	Description	HSI Score	Suitability
8	No access	n/a	n/a
9	No access	n/a	n/a
10	No access	n/a	n/a
33	Large pond in grassland. Minimal aquatic vegetation. Woodland on embankment to south. Sheep present in field, poached ground.	0.52	Below Average
40	Man made angling pond within grassland. Concrete lined with fish present. Scrub present along embankment on the north side. No emergent vegetation.	0.33	Poor
41	Man made angling pond within grassland. Concrete lined with fish present. No emergent vegetation.	0.33	Poor
62	Large pond in grassland surrounded by metal fencing. Aquatic vegetation within, predominately rush and grasses. Gorse, willow and hawthorn around pond edge. Himalayan Balsam present.	0.58	Below Average
63	Not a pond, dry. Two vehicle tracks that do hold water (but dry during survey).	n/a	n/a
67	Not a pond, flowing water.	n/a	n/a
73a	Large shallow pond within grassland. Minimal aquatic vegetation, of which none are considered large enough for GCN egg laying; Floating sweet grass and starwort. Lots of the water is choked by rushes and filamentous algae. mallards seen on pond. pond dried up slightly as separated by wet ground. 40% choked with soft rush. filamentous algae in pond.	0.55	Below Average
73b	No access due to high fence. Stream with pooling still water. Within wet woodland, with lots of soft rush.	n/a	n/a
74	No access	n/a	n/a
77	Large pond within an enclosed grazing area for chickens. Some aquatic vegetation within. Surrounded by metal fencing and trees. Himalayan balsam present. Male mallard scared off pond.	0.37	Poor

Pond Number	Description	HSI Score	Suitability
78	Dry pond.	0.48	Poor
79	Dry pond with man-made inlet pipe. Japanese knotweed present. Waste metal dumped within.	0.43	Poor
80	Dry channel draining into adjacent dry pond.	0.44	Poor
81	Not a pond. Area of soft rush with no obvious signs of pooling.	n/a	n/a
83	Not a pond, flowing water.	n/a	n/a
84	No access	n/a	n/a
86	No access	n/a	n/a
91	Dry pond with dry channel feeding into it and out. Chocked with flag iris, willow and rush. Sheep present in field, poached ground.	0.63	Average

Table 42 GCN Population Estimate Survey Results

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
11	Torch	No access due to bramble and heavily vegetated					
12	Torch	No records	No records	No records	3 female palmate newts	n/a	n/a
	Bottle trapping	4 female palmate newts (2 gravid)	No records	No records	No records	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
33	Torch	No records	2 unknown female newts	No records	No records	n/a	n/a

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
			(palmate or smooth)				
	Bottle trapping	8 male palmate newts 1 female palmate newt Frog spawn	2 male palmate newts	No records	Too shallow	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
35	Torch	2 male palmate newts 7 unknown palmate newts 1 unknown juvenile newt (smooth or palmate)	39 female palmate newts 6 juvenile palmate newts	4 male palmate newts 4 female palmate newts 22 unknown palmate newts	3 male palmate newts 9 female palmate newts	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
57	Torch	2 unknown palmate newts	No records	No records	No records	n/a	n/a
	Bottle trapping	1 female palmate newt 1 juvenile newt	1 male palmate newt 1 female palmate newt	1 female palmate newt 2 dragon fly larvae	1 newt eft.	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
58	Torch	1 female palmate newt	6 female palmate newts	4 male palmate newts	4 female palmate newts	n/a	n/a

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
		3 unknown palmate newts	1 male palmate newt 2 unknown newts (palmate or smooth)	8 palmate newts 3 unknown palmate newts			
	Bottle trapping	3 male palmate newts 6 female palmate newts (3 gravid) 1 juvenile palmate newt	4 male palmate newts 8 female palmate newts	7 male palmate newts 10 female palmate newts	1 juvenile palmate newt	n/a	n/a
	Egg search	Palmate newt eggs	No records	No records	No records	n/a	n/a
59	Torch	Geese nesting	Geese nesting	3 male palmate newts (In trap) 30 female palmate newt 1 juvenile palmate newt (in trap)	2 palmate newts	n/a	n/a
	Bottle trapping			10 male palmate newts 10 female palmate newts 1 juvenile palmate newt	5 male palmate newts 4 female palmate newts 17 newt efts.	n/a	n/a
	Egg search			No records	No records	n/a	n/a

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
60	Torch	No records	1 male palmate newt 2 female palmate newts	2 male palmate newts 12 female palmate newts	No records	n/a	n/a
	Bottle trapping	3 male palmate newts 2 female palmate newts	1 male palmate newt 4 female palmate newts 1 juvenile palmate newt	No records	4 newt efts	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
61	Torch	1 female palmate newt 4 unknown palmate newts	No records	1 common frog	No records	n/a	n/a
	Bottle trapping	4 male palmate newts 6 female newts	No records	1 male palmate newt	No records	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
65	Torch	2 male palmate newts 4 female palmate newts (3 gravid) 6 unknown palmate newts	2 unknown female newts (smooth or palmate) 2 unknown juvenile newts (smooth or palmate)	1 male palmate newt 1 female palmate newt 4 unknown newts (smooth or palmate)	3 female palmate newts	n/a	n/a

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
			1 female palmate newt				
	Bottle trapping	15 male palmate newts 34 female palmate newts (32 gravid) 1 juvenile palmate newt	4 male palmate newts 6 female palmate newts	8 male palmate newts 9 female palmate newts 1 juvenile palmate newt 1 common frog	2 male palmate newts 1 female palmate newt	n/a	n/a
	Egg search	No records	No records	No records	No records	n/a	n/a
66	Egg search	Too shallow and highly vegetated					
71	Torching	No records	Dry				
	Egg search	No records					
72a	Torching	Limited access and highly vegetated					
72b	Torching	5 unknown palmate newts 4 female palmate newts Common frog	5 male palmate newts 4 female palmate newts 3 unknown newts (smooth or palmate)	2 female palmate newts	No records	n/a	n/a
	Bottle trapping	14 male palmate newts	10 male palmate newts	5 male palmate newts	No records	n/a	n/a

Waterbody Number	Methods	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
		8 female palmate newts (5 gravid)	8 female palmate newts	4 female palmate newts			
	Egg search	No records	No records	No records	No records	n/a	n/a
77	No access						

ANNEX F: WATER VOLE AND OTTER – FULL SURVEY RESULTS

Table 43 Watercourse Descriptions with Otter and Water Vole Survey Results

Watercourse	Description	Otter survey result	Water vole survey results
1	Watercourse to west. A shallow stony stream with high inaccessible banks, heavily shaded in this area, fallen trees present around area. Further in eastern section watercourse was a stream that was smaller and predominantly dry during time of survey with a steep gradient channel. Banks were eroded by sheep grazing, mature trees and hedgerow border majority resulting in heavy shading.	Western area of watercourse showed some suitability for otters but no evidence or holts were identified during survey. Eastern area of stream showed limited suitability for otter with no potential holts or couches observed. Fallen trees were present in both areas but no cavity were found by exposed roots. Commuting otter cannot be ruled out of area but it was deemed unlikely that they are regularly present.	The watercourses were deemed unsuitable for water vole due to the low water levels during surveys and the watercourse is heavily shaded and there is a lack of aquatic and marginal vegetation. Banks steep in places but no evidence of burrowing present. No other evidence of water vole present.
2	Watercourse to east. A stream with moderate flow with silt and stoney substrate at the bottom of a valley. The majority of the stream was shallow (<10 cm) and varied from being a single channel (0.5 m wide) to smaller intersecting channels (0.25 m). Bramble, gorse and Himalayan balsam intermittently choked parts of the watercourse. Soft rush dominated sections of the watercourse, becoming more flush like in structure.	No locations were recorded which could provide suitable holts for otter. The vegetation either side of the watercourse may provide suitable couches for otter but no evidence was recorded to suggest that otters had used these areas recently. The watercourse itself is unlikely to provide suitable foraging habitat for otter. However, it is connected to higher value habitat in the surrounding area in the form of the	The western section of the watercourse is unsuitable for water vole as it heavily shaded from the surrounding woodland, with no marginal or aquatic vegetation present and no banks to provide burrowing habitat. Where the watercourse becomes choked with scrubby vegetation further upstream it provides suboptimal habitat for water

Watercourse	Description	Otter survey result	Water vole survey results
		larger watercourse at Crag Yr Aber Woods. No other evidence of otter was recorded; however access was not possible due to dense vegetation.	vole. The flush-like sections also provided poor habitat for water vole due to the very shallow water and lack of bank structure. No evidence of water voles were recorded around the watercourse; however access was not possible due to dense vegetation.
3	Watercourse was found to be within a small marshy area completely isolated from other aquatic habitats on Site. No significant areas of standing or flowing water were identified.	The watercourse was largely unsuitable for otter. No significant standing or flowing water were present. The watercourse was isolated from other aquatic habitats on Site. No evidence of otter was recorded.	The watercourse was largely unsuitable for water vole. No significant standing or flowing water were present. The watercourse was isolated from other aquatic habitats on Site. No evidence of water vole was recorded.
4	A stream with moderate flow running through a valley, with several tributaries. Where visible the water course range between 0.5 – 1 m wide and on average ≤ 0.5 m in depth. Banks ranged from 0.3 m – 1 m and varied on angle from steep (90°) to non-existent. Where visible the watercourse has a rocky substrate. The watercourse also appeared to be polluted potentially by iron oxide as it was orange throughout. A pooling area had formed towards the centre of the watercourse (P29), containing soft rush, water crows-foot, Typha amongst	Exposed tree roots were recorded in the east of the watercourse (P26). Whilst these areas provide suitable couches, they could not be thoroughly searched due to access constraints, therefore it is possible these may extend further into the banks and could provide suitable holt habitat. A push through under the fence was also noted in this area. An unconfirmed spraint was also recorded in the eastern section	Poor suitability for water vole as the stream is heavily shaded from the surrounding woodland. The banks are either non-existent or choked with scrubby vegetation. There is also a lack of emergent and aquatic vegetation to provide foraging habitat for water vole. The only exception to this is within the pooled areas however these areas have

Watercourse	Description	Otter survey result	Water vole survey results
	other aquatic vegetation; tadpoles and toads were also noted. This area was relatively shallow (<20 cm) and had very little bank. The majority of the watercourse is located within dense woodland and scrub with boggy ground, preventing access to the northern most section and southern section (P31). In places the water channel was inundated with rushes and became marshier (P27); this was particularly true of the tributaries to the southern section of the watercourse. The southern most section of the watercourse was partially accessible (P32, P33). The watercourse was connected to a larger watercourse in Crag Yr Aber Woods via a culvert. A pond within a sheep grazed field was also present to the east of the watercourse bordering the dirt track. Water was present within the pond (~30 cm) however the substrate and banks had been heavily poached by sheep. Soft rush was present around some of the periphery. Grass and water-crows foot was present within the pond.	however access prevented closer examination and what was visible could not conclusively be determined as otter. As previously stated, access was not possible for the majority of the watercourse. However, the watercourse is connected to a larger watercourse in Crag Yr Aber Woods via a culvert. Therefore, it is possible otters may travel between the two watercourses. No other evidence of otter was recorded but again it was not possible to thoroughly check the entire watercourse. The pond was not suitable for otter. No potential holts or layups were recorded. The pond was devoid aquatic fauna. No other field signs of otter was recorded.	little or no bank to provide burrowing habitat. No evidence of water voles were recorded around the watercourse; however, access was not possible due to dense vegetation and steep sided banks. The pond is not suitable for water vole. The banks present are heavily poached from sheep and were not suitable for water vole. No other field signs of water vole were recorded.
5	A dry ditch along the base of a hedgerow which may hold water temporarily after heavy rain (P23). Grass and Common Nettle had colonised the depression of where the ditch would be.	The watercourse was not suitable for otter. It is also isolated from other watercourses within the surrounding landscape.	This watercourse is unsuitable for water vole as it was dry at the time of survey.
6	Very shallow stream which has formed from a flush at the top of the hill in the north before	The watercourse has limited suitability for otter. The stream itself	Poor suitability for water vole as the stream is heavily

Watercourse	Description	Otter survey result	Water vole survey results
	descending downhill in the south. The stream was heavily choked with vegetation from the adjacent hedgerows preventing access to the majority of the stream with the following dominant species bramble, holly, bracken and Himalayan balsam (P1). Vegetation became slightly less dense in the south but the channel was still heavily shaded from overhanging trees. Where visible the channel was narrow ~40 cm and very shallow ~5cm with a rocky bed. The banks appeared to be very steep (1.5 m) particularly to the south of the water course becoming more gorge-like, however again it was not possible to view the entirety of the banks. A water trough and pipes are present towards the centre of the watercourse, indicating some modification (P2). A pond approx. 122 m² that has a dense cover of typha, rushes and other aquatic bistort (P4) was present to the north of the watercourse. The banks (0.5 m) were primarily covered by long grass (including Yorkshire-fog and cock's-foot), bramble, common nettle, Himalayan balsam and young willow trees. The vegetation around the banks were dense and access was only possible along the northern bank. It was not possible to fully determine the depth of the pond but potentially ~30 cm. Froglets were observed within the pond.	is unlikely to provide a foraging resource as it very shallow (<5 cm) and unlikely to support fish species. As the watercourse was heavily choked with vegetation it was not possible to thoroughly inspect for holts or couches. However, in the south exposed tree roots in the bank in the created a potentially couch (P3). It remains possible that other potential holts or couches may be present elsewhere in the inaccessible areas along the watercourse. No evidence of otter was recorded but again it was not possible to thoroughly check the entire watercourse. The pond was considered largely unsuitable for otter. No potential holts were recorded along the banks however it was not possible to thoroughly inspect these. The dense vegetation may provide potential couches for otter however again it was not possible to thoroughly inspect these areas and were access was possible no evidence of otter was recorded. Froglets were recorded within the pond which could potentially provide a feeding	choked with scrubby vegetation and where water is present it is very shallow (<5 cm). The watercourse is heavily shaded and there is a lack of aquatic and marginal vegetation. Banks appeared to be steep in places, but dense scrubby vegetation prevented through inspection. No evidence of water vole was recorded but again it was not possible to thoroughly check the entire watercourse.

Watercourse	Description	Otter survey result	Water vole survey results
	A dry stream within a hedgerow (P6) was present to the east. The stream had high banks, 90° (1-1.5 m) in places, and comprised bare earth, Common Ivy and Bracken (P7 and P8).	resource for otter. No other evidence of otter was recorded but again it was	
7	Two large ponds, 1097 m² and 980 m², stocked with fish. Shallow steep banks (<0.5 m) at 90° angle, primarily covered with rush, bramble and willow, no other marginal vegetation. Depth unconfirmed but likely to be deeper than 2 m. Very turbid water, between 4 and 5 on scale. No aquatic vegetation recorded within the watercourse. Watercourse travelling south from large ponds was a stream within a wooded valley, ~50 cm wide, 10-20 cm deep. The stream had a moderate flow, with stoney substrate. The watercourse also appeared to be polluted potentially by iron oxide as it was orange throughout (P11). Discarded rubbish was also recorded along the banks intermittently. The banks were approx. 3 m between 40 – 90° and were primarily covered in ferns, nettle, bramble and Himalayan balsam associated with the woodland (P12). Approximately 50% of the watercourse was surveyed before vegetation became too dense in the south to continue.	Anecdotal evidence from the farmer confirmed that an otter was observed foraging within the ponds some years ago. No holts or couches were recorded around the ponds. No other evidence of otter was recorded but again it was not possible to thoroughly check the entire watercourse. The watercourse running south showed moderate suitability for otter. Whilst the water course itself is partly polluted and of poor quality it is connected to high value habitat to the north in the form of the fish-stocked ponds. However, were otter present evidence would be obvious in form of discarded fish carcasses and spraints but no evidence was present.	The watercourse may have moderate suitability for water vole. The banks provide suitable burrowing and foraging habitat. No evidence of water voles were recorded around the watercourse; however, access was not possible due to dense vegetation and steep sided banks. The watercourse running south showed poor suitability for water vole as the stream is heavily shaded from the surrounding woodland. The banks are very rocky and would provide poor burrowing habitat for water vole. There is also a lack of emergent and aquatic vegetation to provide foraging habitat for water vole. A small number of droppings were recorded; however, these were consistent with rat rather than water vole.

Watercourse	Description	Otter survey result	Water vole survey results
8	Dry woodland streams with damp ground present but no running water only damp mud. The stream had little to no banks. Access was limited due to dense scrub.	Streams were dry so do not provide any foraging opportunities for otter. No evidence was present within areas that were able to be surveyed.	This watercourse is unsuitable for water vole as it was dry at the time of survey and choked with scrubby vegetation.
9	Smaller watercourse but more water present than other sites ~15cm. Heavy shading present from woodland around stream resulting in lack of bankside vegetation. Boulders and other appropriate spraint sites present along stream. Banks present throughout much of watercourse surveyed.	Site was deemed moderately suitable for commuting and foraging otter. However, despite obvious locations for sprainting being present such as boulder and an old weir wing wall no signs of otter were found and as such were considered likely to be absent.	Habitat was largely unsuitable for water vole due to shallow water and heavy shading preventing growth of suitable forage plants.
10	A small woodland stream with moderate flow which has created pools in certain sections (P17). Where accessible the watercourse was shallow (<10 cm) with a substrate consisting of stones and rocks. Where visible the water quality appeared good but no aquatic life was noted. Banks varied from little to no bank present to deeper gorges (~90°) in the north, generally banks increased in gradient in the north and central section of the watercourse. Where the bank was visible ferns, Himalayan balsam and Common Nettle dominated the sides. Bramble and dense vegetation choked the stream in the north and central sections (P19 and 21). Pools had formed in the south and in the northern woodland block (P16 and P20). These pools had little to shallow banks	Exposed tree roots were recorded, this did not extend into a cavity but may provide suitable area for a couch (P18). Other potential holts and couches may be present however due to the dense vegetation it was not possible to thoroughly inspect the majority of banks. The water course was reasonably shallow and is likely to provide minimal foraging opportunities for otter. No other evidence of otter was recorded but again it was not possible to thoroughly check the entire watercourse.	Poor suitability for water vole as the stream is heavily shaded from the surrounding woodland. The banks are either non-existent or choked with scrubby vegetation. There is also a lack of emergent and aquatic vegetation to provide foraging habitat for water vole. The only exception to this is within the pooled areas however these areas have little or no bank to provide burrowing habitat. No evidence of water voles were recorded around the watercourse; however, it was

Watercourse	Description	Otter survey result	Water vole survey results
	present, some aquatic vegetation such as Typha was present but with some large bare patches where the stoney substrate was visible.		not possible to thoroughly check the entire watercourse.
11	Small watercourse with very shallow water throughout. Located in steep sided valley with thorny impenetrable understory. Area in conifer plantation steep sided with a lack of cover and vegetation. Watercourse drier in areas within conifer plantation. Heavy shading resulting in lack and emergent vegetation.	Unlikely to be fish prey present due to size of watercourse. Multiple potential sprainting sites seen but no spraint or other signs observed during surveys. Deemed to be generally unsuitable for otter.	Heavy shading prevents growth of forage plants for water vole so habitat is largely unsuitable. No signs were observed for water vole.
12	Small watercourse with little water, alternating between wide and rocky and shallow and deep. Pools with a max depth of 40cm. Heavily shaded by surrounding woodland. Majority of watercourse walked.	Unlikely to be fish prey present due to size of watercourse. No evidence of otter activity observed. Potential but unlikely habitat present for maternity holt.	Heavy shading prevents growth of forage plants for water vole so habitat is largely unsuitable. No signs were observed for water vole.
13	Small watercourse that was predominantly dry when observed runs into woodland to the east. Heavily shaded by surrounding trees preventing growth of significant bankside vegetation.	Due to watercourse being predominantly dry there is little potential for foraging otter. No evidence of otter activity was observed although access to whole watercourse water not possible due to dense vegetation.	Heavy shading prevents growth of forage plants for water vole so habitat is largely unsuitable. No signs were observed for water vole.
14 & 15	Smaller tributaries consisted of shallow watercourses holding a permanent flow of water with heavy shading throughout. Main channel stream also holding permanent flow of water, likely fish population, potential small trout seen. several areas with bank over hang, with some	Potential habitat for otter in main channel, albeit poor due to presence of fish and connection of watercourse to wider landscape. However, despite finding multiple prime sites for sprainting (e.g.	Both main channel and small tributaries unsuitable for water vole due to shading on banks. The adjacent wet meadow habitat offered some potential for water vole foraging but the

Watercourse	Description	Otter survey result	Water vole survey results
	extending deeper in to the bank. numerous sand and shingle islands and beaches, stream holding permanent flow of water, likely fish population, potential small trout seen. several areas with bank over hang, with some extending deeper in to the bank. numerous sand and shingle islands and beaches, no field signs of otter or water vole observed. water course ends in culvert over road.	conspicuous boulders or fallen trees in channel) no spraints or other field signs were observed. Smaller tributaries largely unsuitable for otter with no evidence observed.	absence of significant water (e.g. to escape from predators) makes it generally unsuitable.

Table 44 Water Vole and Otter Survey Photographs

	
P1: Representative of dense scrub preventing access along watercourse 1.	P2: Watercourse 1 and pipes in channel.
	
P3: Overhang created in bank from tree roots, creating a potential otter couch	P4: Watercourse 2 – a heavily vegetated pond.
	
P5: Feeding remains of small mammal (not water vole) observed at watercourse 2.	P6: Hedgerow obscuring watercourse 3.



P7: Obscured view of dry stream at watercourse 3.



P8: Dry bed of watercourse 3 with exposed sandy banks.



P9: Fish stocked lake 1 of 2 at watercourse 4.1.



P10: Fish stocked lake 2 of 2 at watercourse 4.1.



P11: Example of polluted water as seen in watercourse 4.2.



P12: Example of banks recorded along watercourse 4.2.



P13: Watercourse 5 – dry stream within a woodland.



P14: Visible section of watercourse 6, very shallow with no bank.



P15: Overgrown hedge preventing access to watercourse 6.



P16: Pooling area in the south of watercourse 7.



P17: Example of water channel at watercourse 7.



P18: Exposed tree roots which lead to a shallow cavity at watercourse 7.



P19: Choked vegetation preventing access towards the central section of watercourse 7.



P20: Pooling area in the north of watercourse 7.



P21: Choked vegetation preventing access in the northern section of watercourse 7.



P22: Watercourse 8.



P23: Watercourse 9.



P24: Eastern section of watercourse 10.



P25: Unconfirmed spraint.



P26: One of several areas of exposed tree roots seen in the eastern section of watercourse 10.



P27: Northern section of watercourse 10.



P28: Marshy area of watercourse 10.



P29: Pooling area of watercourse 10.



P30: Continuation of the stream south of watercourse 10.

	
P31: Dense vegetation preventing access to the majority of watercourse 10.	P32: Southernmost section of watercourse 10.
	
P33: Southernmost section of watercourse 10 with culvert linking into larger watercourse within forest	P34: Western end of watercourse 11 within woodland edge.
	
P35: Watercourse 11.	



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