



Land Adjacent to H-pack, Davy Way, Llay, Wrexham, LL12 0PG

Ecological Impact Assessment

Prepared For: H-Pack Packaging UK Ltd

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The conclusions and recommendations contained in this document are based upon information gathered by TEP and provided by third parties. Information provided by third parties and referred to herein has not been independently verified by TEP, unless otherwise expressly stated in the document.

Nothing in this report constitutes legal opinion. If legal opinion is required, the advice of a qualified legal professional should be secured.

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Executive Summary

Site Details	The site is located to the north of Davy Way, Llay, Wrexham. Central grid reference SJ 32294 56794. The site application boundary measures 3.54ha. The site is currently comprised of hard standing, modified neutral grassland, broadleaved woodland, dense scattered scrub, introduced scrub, a dry ditch and amenity buildings.
Proposals	Erection of 1no B8 storage and distribution building and associated access and external works at Land adjacent to H-Pack, Davy Way, Llay.
Designated wildlife sites	■ No designated wildlife sites will be directly impacted by the proposals.
Important Ecological Features present within or adjacent to the site	■ There are no notable habitats on, adjacent to or connected with the site.
Recommendations	The following recommendations are made to ensure that delivery of the project remains compliant with relevant legislation and policy: ■ A Root Protection Zone (RPZ) should be implemented around retained trees in accordance with BS5837:2012 if development is likely to affect any trees, their roots and overhanging canopies. ■ Replacement native tree planting is recommended to replace those lost from the development. ■ A Construction and Environmental Management Plan (CEMP) is required to ensure no impacts to the woodland on site from run off, dust, and spillages. ■ A GCN mitigation licence from NRW will be required for the development due to the risk of disturbance, injury, and killing of GCN within the terrestrial habitat present on site. ■ Self-clearing/one-way amphibian fencing will be required prior to development. ■ Vegetation and potential hibernacula clearance will be undertaken under a Precautionary Working Method Statement (PWMS). ■ A 1ft deep 4m long scrape will be installed near to the northern boundary where the existing grassland is present and hibernacula will be created and retained post development. ■ Works must take place within 12 months of the original badger survey (by 25/07/23). ■ Any removal of low potential trees or pruning/lopping of their branches will require to be undertaken under a Precautionary Working Method Statement (PWMS). ■ A sensitive lighting plan will be required. ■ A Precautionary Working Method Statement (PWMS) will be required for building demolition and vegetation clearance to protect nesting birds, mammals and reptiles. ■ Vegetation clearance works should be completed outside of the bird nesting period (typically taken to be March to August inclusive).
Conclusions	No ecological impact arising from the proposals is likely to be significant at more than the site level. All impacts are anticipated to temporary and reversible in the short term. With implementation of the recommended precautionary working methods, habitat restoration and compensatory features, no residual significant ecological effects are expected to impact upon statutory or non-statutory wildlife sites, notable habitats or protected or notable species.

This Executive Summary is not a substitute for the full report. Refer to the full text of this report for further detail.

1.0 Introduction

- 1.1 The Environment Partnership (TEP) was commissioned by H Pack Packaging Ltd in June 2022 to undertake an Ecological Impact Assessment (EclA) to support of a planning application for the erection of 1no B8 storage and distribution building and associated access and external works at Land adjacent to H-Pack, Davy Way, Llay (hereafter referred to as 'the site').
- 1.2 An Ecological Desk Study has been produced to support this EclA, reported under separate cover (TEP Ref: 9529.001). This EclA report should read in conjunction with the Desk Study.
- 1.3 This EclA report includes details of the methods employed and any limitations of the surveys undertaken. Results are provided with supporting maps, together with an evaluation of the ecological features within the site, an assessment of the potential impacts associated with the development proposals and requirements for mitigation. The assessment has been undertaken with due consideration for current best practice guidelines (CIEEM 2017a¹, 2018²).

Site Location

- 1.4 The site is located north of Davy Way and east of Rackery Lane in Llay, Wrexham. The location of the site is depicted by the red line shown in Figure 1. The approximate central grid reference of the site is SJ 32294 56794.
- 1.5 The site is immediately bounded by Rackery Lane (B5373) to the west and Davy Way to the south. An industrial estate lies to the south and arable land and sheep pasture lies to the north and wider surroundings.
- 1.6 The wider area is predominantly rural, comprising arable and grazing farmland with a network of hedgerows, deciduous woodland, ponds, and scrub. The river Alyn lies 1km to the west and the village of Llay lies 1.3km southeast with the town of Wrexham 6km to the south.

¹ CIEEM (2017a) Guidelines for Ecological Report Writing, 2nd Edition. Chartered Institute of Ecology & Environmental Management

² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester

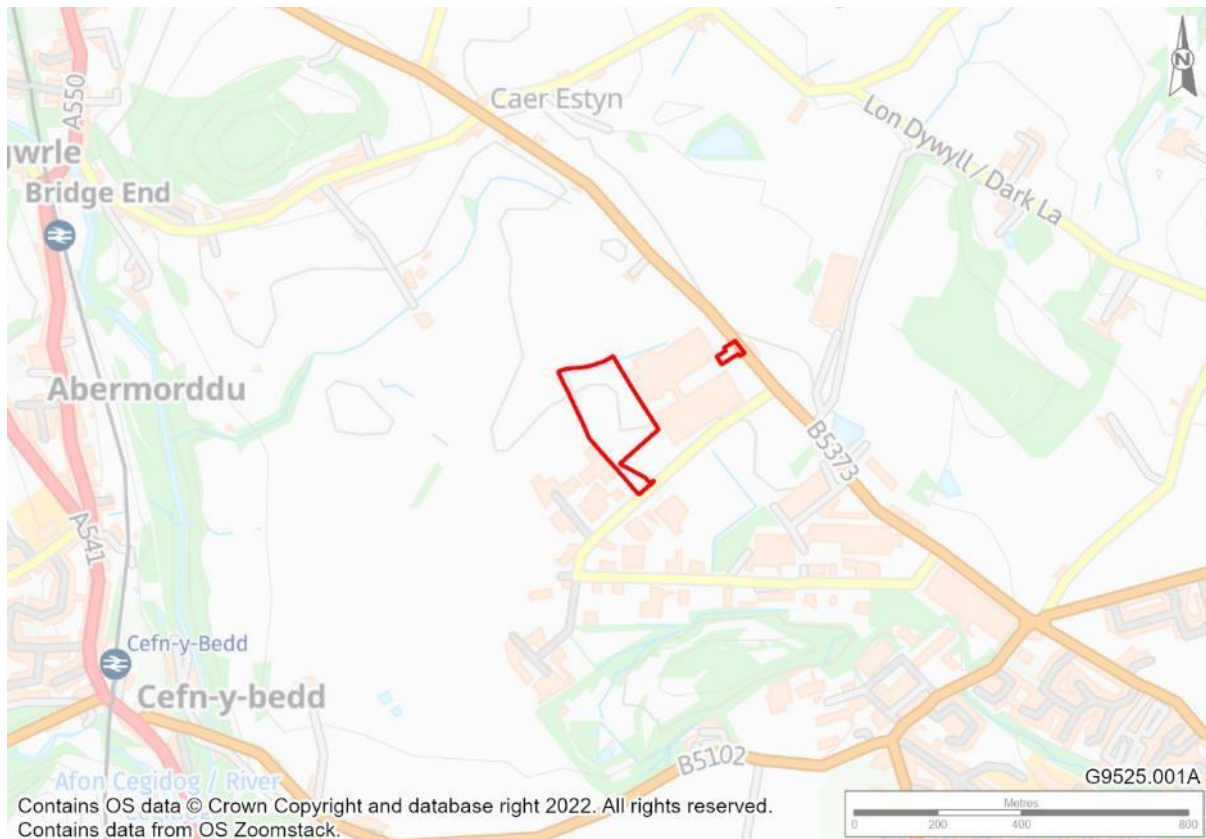


Figure 1: Site location

Proposals

- 1.7 The proposals are for the erection of 1no B8 storage and distribution building and associated access and external works at land adjacent to H-Pack, Davy Way, Llay, Wrexham. Central grid reference SJ 32294 56794.

Planning Context

- 1.8 Relevant information regarding local planning policy is provided in the Ecological Desk Study (TEP Ref 9529.001).
- 1.9 The following policies within the Wrexham Local Development Plan are of relevance to ecology and biodiversity:
- 17 - Trees and Development; and
 - 32 - Biodiversity and Development.

Scope

- 1.10 This ecological assessment considers potential ecological effects upon any notable habitats or species which may be present or adjacent to the site.

- 1.11 This report provides baseline information on the habitats and protected species present on site, gathered during a desktop study and extended phase 1 habitat survey undertaken in July 2022.
- 1.12 This report presents the findings of the EcIA, the objectives of which are to:
- Detail the methods and results of the aforementioned surveys;
 - Identify features of ecological value within the application site such as legally protected species or habitats of importance to biodiversity;
 - Identify any non-native invasive species on site and provide advice regarding removal or management;
 - Advise on avoidance or mitigation requirements that may be needed prior to development commencing; and
 - Provide outline recommendations for biodiversity enhancement within site proposals in accordance with the National Planning Policy Framework (NPPF).

2.0 Methods

Desk Study

- 2.1 In line with current best practice (CIEEM, 2016³, 2017b⁴), information regarding designated sites, notable habitats and existing protected and notable species records of the past decade, within a 2km minimum radius of the site was collated and reviewed to inform this ecological assessment. Further detail regarding ecological zones of influence (EZOI) applied for different ecological features and the sources of information included are presented in the Ecological Desk Study (TEP Ref 9529.001).
- 2.2 In brief, key data sources included Natural Resources Wales (NRW), Environment Agency; Wrexham County Borough Council, Wrexham Local Plan, and other relevant planning documentation such as the Wrexham Local Development Plan (LPD2), North Wales Environmental Information Service (Cofnod) and Wrexham Borough Council Biodiversity Action Plan (LBAP) and a review of relevant (within the past ten years) species records.
- 2.3 Statutory designated wildlife sites were searched for as follows (EZOI applied for each is indicated in brackets):
- Ramsar sites (10km);
 - National Sites Network (10km), includes Special Areas of Conservation (SAC) and Special Protection Areas (SPA);
 - Site of Special Scientific Interest (SSSI) (5km);
 - National Nature Reserve (NNR) (5km); and
 - Marine Nature Reserve (MNR) (5km);
 - Local Nature Reserves (LNR) (2km).
- 2.4 Non-statutory designated wildlife sites were searched for within 2km of the site and, within Wrexham, these may include:
- Local Wildlife Sites (LWS)
- 2.5 Regionally Important Geological Sites (RIGS) are also identified in the search results provided by North Wales Environmental Information Service, but assessment of RIGS and other geological features do not fall within the scope of this EclA and are not discussed further.
- 2.6 Notable habitats were searched for within 2km of the site. Notable habitats may include those listed under any of the following:
- Ancient woodland;
 - Main rivers;

³ CIEEM (2016) Guidelines for Accessing and Using Biodiversity Data. Chartered Institute of Ecology & Environmental Management

⁴ CIEEM (2017b) Guidelines for Preliminary Ecological Appraisal, 2nd Edition. Chartered Institute of Ecology & Environmental Management

- Habitats of principal importance under Section 7 of the Environment (Wales) Act 2016 (S7); and
- Local Biodiversity Action Plan Habitats (LBAP).

2.7 Pre-existing records for notable species were reviewed from the combined data sources, where found from within approximately 2km of the site. Notable species include those listed under any of the following:

- Protected animal species under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (EPS);
- Protected bird species under Schedule 1 of the Wildlife and Countryside Act 1981, as amended (WCA1);
- Protected animal species under Schedule 5 of the Wildlife and Countryside Act 1981, as amended (WCA5);
- Protected plant species under Schedule 8 of the Wildlife and Countryside Act 1981, as amended (WCA8);
- Invasive non-native plant species under Schedule 9 of the Wildlife and Countryside Act 1981, as amended (WCA9);
- Invasive non-native species under the Invasive Alien Species (Enforcement and Permitting) Order 2019 (IAS);
- Species of principal importance under Section 7 of the Environment (Wales) Act 2016 (S7);
- Protection of Badgers Act 1992 (PBA);
- Red and Amber listed Birds of Conservation Concern (BRd/BAm); and
- Wrexham Borough Council Biodiversity Action Plan Species (LBAP).

Limitations

2.8 Species records can provide a useful indication of the species present within the search area, although the absence of a given species from the dataset cannot be taken to represent actual absence.

Habitats and Flora

Habitat Survey

2.9 An extended Phase 1 habitat survey was completed by consultant ecologist Alex Fitzroy. The survey was completed in July 2022. The survey was carried out in accordance with the Phase 1 habitat assessment methods (JNCC, 2010⁵) and Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017b⁴). The method records the habitat present, within the survey route, based on the JNCC descriptions. Plant species were identified in accordance with the New Flora of the British Isles (Stace, 2019⁶) and recorded as target notes using the DAFOR⁷ scale, where relevant.

⁵ JNCC (2010) Handbook for Phase 1 Habitat Survey – a technique for environmental audit

⁶ Clive Stace (2019) New Flora of the British Isles

⁷ DAFOR = Dominant, Abundant, Frequent, Occasional & Rare

- 2.10 Habitats are displayed with the site boundary on Drawing G9529.010.

Limitations

- 2.11 Any ecological survey represents a snapshot of ecological conditions at the time of survey; ecological conditions may change over time. Efforts to identify dominant plant species for the purposes of characterising broad habitat types do not constitute a detailed botanical survey.
- 2.12 The survey was undertaken during the optimal window for Phase 1 surveys.

Fauna

- 2.13 Ordnance Survey maps and aerials were reviewed to identify potentially suitable habitats offsite within influence (e.g., dispersal distances for mobile species) of the site. The Ecological Desk Study identified any pre-existing records for protected and notable species within at least 2km of the site.
- 2.14 The habitat survey included an extended assessment of the habitats present for their potential to support notable or protected wildlife species. Any signs indicating the presence of these species were recorded.

Bats

- 2.15 A Ground Level Tree Assessment (GLTA) of trees to be impacted within and immediately adjacent to the site was also carried out to determine their suitability to provide bat roost habitat. The GLTA was completed by TEP Principal Ecologist Lee Greenhough.
- 2.16 The GLTA involved the surveyor using close focussing binoculars to search from the ground for any Potential Roost Features (PRFs), which may be used by bats. Most tree roosts are created by one or a combination of the following:
- Old woodpecker holes;
 - Splits in trunk, bough or large branches;
 - Rot holes in trunk, bough or large branches;
 - Holes formed by two boughs or branches growing in contact;
 - Loose or lifting bark; and
 - Underneath a covering of dense latticed creeper, usually ivy *Hedera helix*.
- 2.17 During the GLTA, physical evidence of use by bats was also searched for, including:
- Live or dead bats;
 - Bat droppings;
 - Feeding remains (e.g. stripped moth or butterfly wings);
 - Urine staining; and
 - Fur oil staining.

- 2.18 Following the GLTA, the trees within the site were categorised in accordance with the criteria for roost habitat assessments identified in the Bat Conservation Trust (BCT) 2016 Good Practice Guidelines (Collins)⁸. Bat roost habitat suitability categorisation details are described in Table 1. Roost habitat suitability categorisation takes into consideration parameters such as location, habitat connectivity, materials, condition and aspect of structures and trees.

Table 1: Bat Roosting Habitat Categories

Roost Category	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. 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 or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree 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 - the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed)
High	A structure or tree 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 time due to their size, shelter, protection, conditions and surrounding habitat

Great Crested Newts (GCN)

- 2.19 Habitats onsite were assessed as part of the extended phase 1 habitat survey. Ponds within 500m of the site were surveyed separately (see below).

⁸ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines. (3rd edn). The Bat Conservation Trust, London.

Environmental DNA (eDNA) Survey

- 2.20 A search of Ordnance Survey mapping was undertaken to identify ponds within a 500m radius of the site. Ponds that were separated from the site by significant barriers, such as major road, were excluded from the search. Four ponds with no significant barriers between the site were identified within this radius, none of which were present on site.
- 2.21 eDNA testing of two of the four ponds were undertaken in June 2022. The remaining two ponds were dry at the time of survey.
- 2.22 Sample kits and analysis was provided by ADAS. Both parties followed the relevant survey guidelines. In summary the sampling protocol is as follows:
- 20 samples were taken from around the entire perimeter of the waterbody.
 - The surveyor stayed out of the water while taking the samples (extension poles were used in situations where open/sufficiently deep water was at a distance from the dry banks.
 - Survey locations were distributed around the pond perimeter, but micro-siting was used to select locations most likely to be used by GCN.
 - At each sample location the water column was stirred prior to taking the sample but care was taken to avoid disturbing the sediment on the base of the pond.
 - Once all 20 samples were taken, 15ml of the total sample were pipetted into each of the 6 sampling tubes, whilst ensuring that the water in the sample bag was mixed before taking each 15ml sample and that only one sample tube was opened at any one time.
 - At all times, the surveyor ensured that the risk of contaminating the sampling equipment was minimised by avoiding the placement of the ladle or pipette on the ground or on any otherwise potentially contaminated surfaces and by changing gloves between the initial sampling stage and the pipetting stages of the method.

Limitations

- 2.23 Ecological surveys have been carried out over the period June to August 2022. All surveys were completed within appropriate seasons over appropriate periods in accordance with industry standards for the specific survey. Nevertheless, the surveys will only identify habitats present at the site at the time of surveys. Additionally, the species investigated are mobile and will move into and out of areas over time. For these reasons a precautionary approach has been taken in the prediction of impacts.

Ecological Assessment Process

- 2.24 This EcIA follows the published guidelines (CIEEM, 2018²) and accepted best practice approach (BS42020:2013⁹) of the mitigation hierarchy whereby impacts are first avoided or, where this is not possible, reduced or mitigated or, as a last resort, compensated.

⁹ British Standards Institution (2013) BS 42020:2013: Biodiversity — Code of practice for planning and development. BSI Standards Limited, London

- 2.25 In summary, the following procedure was undertaken during this EclA:
- Describe the baseline and identify important ecological features;
 - Describe important ecological features and identify those which may potentially be affected by the proposed development;
 - Identify potential impacts upon important ecological features and characterise the effect of such impacts (in respect of biophysical changes and taking account of relevant aspects of ecosystem structure or function);
 - Incorporate measures to avoid or reduce these effects;
 - Determine whether residual ecological effects are considered significant after avoidance or mitigation;
 - Identify appropriate compensation measures to offset significant residual effects; and
 - Identify opportunities for ecological enhancement.
- 2.26 Important ecological features are identified and valued, ecological impacts are characterised and assessed, and recommendations for appropriate mitigation, compensation and enhancement are made, in accordance with CIEEM guidance².
- 2.27 BS42020:2013 defines a significant effect as one *“which is important, notable, or of consequence, having regard to its context”*. CIEEM describes significance as *“a concept related to the weight that should be attached to effects when decisions are made”*. CIEEM defines an ecological effect as significant if it is *“sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project”*.
- 2.28 BS42020:2013 sets out a practical approach to determining the significance of an ecological effect, applicable at all levels of decision making in legal and policy terms, as follows:
- will the effect on biodiversity influence the balance of planning considerations and therefore the decision as to whether planning permission is likely to be refused or granted; and
 - if planning permission is granted, is the effect important enough to warrant the use of planning conditions and/or obligations to guarantee proposed measures or to impose restrictions, or to seek further requirements (e.g. for mitigation, compensation, enhancement, monitoring or site management).
- 2.29 Significance is therefore assessed on a case-specific basis according to the importance of the ecological feature (site, habitat or species) within the conservation hierarchy, and the effect upon it.

Assumptions

- 2.30 Information provided by third parties, including publicly available information, is assumed to be correct at the time of publication.

3.0 Results

Planning Context

3.1 The NPPF at *Chapter 11: Conserving and Enhancing the Natural Environment* requires that development delivers net gains in biodiversity in addition to minimising the impacts on biodiversity. The chapter highlights the need to protect and enhance valued landscapes, geological conservation interests and soils, as well as recognising the wider benefits of ecosystems.

3.2 The Wrexham Unitary Development Plan was adopted by Wrexham Council in February 2005. Relevant extracts of local planning policy are provided in the Ecological Desk Study (TEP Ref 9529.001). Wrexham Local Development Plan 2 (LDP2) is currently being prepared and will eventually replace the Unitary Development Plan. Progress of the LDP2 can be viewed at the link below:

<https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-local-development-plan-2-ldp2-2013-2028>

3.3 The following policies relate to biodiversity and nature;

- Policy 17 - Trees and Development; and
- Policy 32 - Biodiversity and Development.

Designated Sites

Statutory Wildlife Sites

3.4 Full details regarding designated sites are provided within the Ecological Desk Study (TEP Ref 9529.001).

3.5 There are five statutory designated sites of international importance within 10km of the site, seven of national importance within 5km and one of regional or local importance within 2km. These are:

- Midland Meres & Mosses Phase 2 Ramsar, situated approx. 4.2km southeast of the site. Designated for a diverse range of habitats from open water to raised bog and supports a variety of rare species of wetland plants.
- Deeside and Buckley Newt Sites SAC, situated approx. 7.3km northwest of site. This site provides breeding habitat for one of the largest populations of great crested newt *Triturus cristatus* in Great Britain. The site also supports considerable numbers of all the widespread amphibian species.
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC, situated approx. 7.4km east of site. The site is designated as it is a water course of plain to mountain levels with *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation, and it supports important populations of Atlantic salmon *Salmo salar*.
- Berwyn and South Clwyd Mountains / Berwyn a Mynyddoedd De Clwyd SAC, situated approx. 7.7km southwest of site. This site is designated for its habitats. It contains one

of the largest stands of upland European dry heath and supports the most extensive tract of near-natural blanket bog in Wales.

- Johnstown Newt Sites SAC, situated approx. 9.5km south of site. This site is designated for its population of great crested newts *Triturus cristatus*, which is one of the largest known in Great Britain. Good populations of the widespread amphibian species are also present.
- Llay Bog SSSI, situated approx. 1.2km south of site. The site is a small peat bog in an ice hollow in the glacial drift deposits and is designated for its botanical interest.
- Chwarel Singret SSSI, situated approx. 2.1km southeast of site. The site is of interest for an exposure through a sequence of deposits that has a major bearing on interpretations of the Quaternary history of north-east Wales.
- Marford Quarry SSSI, situated approx. 3.4km east of site. This disused sand and gravel working is designated for its entomological interest.
- Vicarage Moss SSSI, situated approx. 4.1km southeast of site. The site is one of the best-developed examples of a kettle hole complex in Wales comprising one very large and several smaller subsidiary kettle holes.
- Fossil Forest / Coedwig Ffossil Brymbo SSSI, situated approx. 4.2km southwest of site. The site is of interest for exposures that contain an internationally important plant fossil assemblage.
- Coed Talon Marsh SSSI, situated approx. 4.7km west of site. The site is the largest and one of the best examples of the "southern mesotrophic mire" wetland in Clwyd and is designated for its botanical interest.
- Gatewen Marsh SSSI, situated approx. 4.9km south of site. The site is one of only three significant examples of "southern mesotrophic mire" wetland in Clwyd.
- Alyn Waters LNR, situated approx. 1.3km south of site. A series of woods along the River Alyn and some regenerating neutral grassland.

- 3.6 SSSI Impact Risk Zones (IRZ) highlight the potential for effects on a SSSI if certain types of development are planned within a specified radius of it. The site does not fall within an SSSI Impact Risk Zone (IRZ).

Non-Statutory Wildlife Sites

- 3.7 There are thirteen non-statutory wildlife sites identified within 2km of the site.
- 3.8 Details are presented in the Ecological Desk Study. Of most relevance are the following:
- Bryn-y-Gaer LWS, situated approx. 900m northwest of site. Broad-leaved woodland with a disused silica quarry to the east. The quarry has a diverse flora colonising the disturbed ground;
 - Alywn Waters LWS, situated approx. 1.0km west of site. A series of woods along the River Alyn and some regenerating neutral grassland.
 - Llay Valley & Nant Y Gaer LWS, situated approx. 1.0km southeast of site. Semi-natural woodland along two joining valleys.

- 3.9 Other non-statutory wildlife sites identified by the Ecological Desk Study (TEP Ref 9529.001) are located at least 1.1km from the proposed works and have no impact pathways relevant to the site or the proposed nature of the works. Given this and the small scale and nature of the proposals and distances concerned, no significant effect would be anticipated to arise upon these other non-statutory wildlife sites (LWS) are therefore scoped out from further assessment.

Habitats and Flora

Pre-existing Data

- 3.10 The Desk Study identified no notable habitats on, adjacent to or connected with the site.
- 3.11 Records of the following Protected and notable species flora were returned within 2km of the site:
- Native Bluebell, *Hyacinthoides non-scripta* - WCA8
 - Marsh fragrant-orchid, *Gymnadenia densiflora* - S7
 - Maidenhair spleenwort, *Asplenium trichomanes* – S7
- 3.12 Records of the following Non-native invasive species flora were returned within 2km of the site:
- Canadian waterweed, *Elodea canadensis* – WCA9
 - Japanese rose, *Rosa rugosa* – WCA9
 - Nuttall's waterweed, *Elodea nuttallii* – WCA9
 - Parrot's feather, *Myriophyllum aquaticum* – WCA9
 - Himalayan balsam, *Impatiens glandulifera* – WCA9
 - Montbretia, *Crocasmia x crocosmiiflora* – WCA9
 - Variegated yellow archangel, *Lamium galeobdolon subsp. Argentatum* – WCA9
 - Japanese knotweed, *Fallopia japonica* – WCA9
 - Common rhododendron, *Rhododendron ponticum* – WCA9
 - Himalayan cotoneaster, *Cotoneaster simonsii* – WCA9
 - Wall cotoneaster, *Cotoneaster horizontalis* – WCA9
- 3.13 Habitats of ecological value present in and around the site are described below and illustrated in Drawing G9529.008. Target notes (TN) are provided in Appendix B.

Modified neutral grassland

- 3.14 The main habitat type present on site is modified neutral grassland. A large area is present within the central portion of the site (TN2, Figure 3), along with strips along the access road verges along the western site boundary and adjacent to the site entrance (TN1, Figure 2), and to the north of the parking/storage area (TN6, Figure 4). Most of this habitat was mown to a very short sward height at the time of survey

making species identification difficult. The typical species assemblage included abundant Yorkshire fog *Holcus lanatus*, frequent perennial ryegrass *Lolium perenne*, red fescue *Festuca rubra*, creeping buttercup *Ranunculus repens*, with occasional yarrow *Achillea millefolium*, white clover *Trifolium repens*, cock's foot *Dactylis glomerata*, ribwort plantain *Plantago lanceolata*, selfheal *Prunella vulgaris*, dandelion *Taraxacum officinale* agg., lesser trefoil *Trifolium dubium*, creeping thistle *Cirsium arvense* and wild carrot *Daucus carota*. Rarely recorded were common cat's ear *Hypochaeris radicata*, bird's foot trefoil *Lotus corniculatus*, St. John's Wort *Hypericum* sp., soft rush *Juncus effusus*, vetch, and creeping cinquefoil *Potentilla reptans*.



Figure 2: TN1 Main entrance. Comprised of hard-standing access road with short-mown modified grassland and associated shrubs and scrub.



Figure 3: TN2 central portion of site comprised of large area of short-mown modified grassland

- 3.15 The northern extent of this habitat (TN6, Figures 4 and 6) is much more rank in nature with a taller sward height and interspersed tall ruderal vegetation which transitions into the scrub along the northern boundary and offers more cover than the short-mown areas on site. Cock's-foot is more abundant here with frequent false oat-grass *Arrhenatherum elatius*, red fescue, and creeping thistle. Additional species recorded here include occasional hogweed *Heracleum sphondylium*, rosebay willowherb

Chamaenerion angustifolium, knapweed *Centaurea nigra*, common ragwort *Jacobaea vulgaris*, annual meadow-grass *Poa annua*, broad-leaved dock *Rumex obtusifolius*, nettle *Urtica dioica*, along with rarely occurring hedge bedstraw *Galium album*, meadow cranesbill *Geranium pratense*, lady's-mantle *Alchemilla vulgaris* agg., buddleia *Buddleja davidii*, and prickly sow-thistle *Sonchus asper*.



Figure 4: Modified grassland and dense scrub habitat at the northern edge of the site

Semi-natural broad-leaved woodland

- 3.16 Broadleaved woodland bounds the western and northern site boundaries (TN3 (Figure 5)). Large mature oak *Quercus robur* trees are predominant along the outer extent, some of which contain features with bat roost potential. Many of the trees are covered in dense ivy *Hedera helix*. Other species included frequent ash *Fraxinus excelsior*, occasional sycamore *Acer pseudoplatanus*, goat willow *Salix caprea*, with rarely occurring silver birch *Betula pendula*, and Swedish whitebeam *Sorbus intermedia*. The understory is comprised of dense and scattered scrub, with abundant hawthorn *Crataegus monogyna*, frequent Blackthorn *Prunus spinosa* and bramble *Rubus fruticosus* agg., occasional holly *Ilex aquifolium*, honeysuckle *Lonicera periclymenum*, and rarely occurring hornbeam *Carpinus betulus*. The ground flora was comprised of frequent false brome *Brachypodium sylvaticum*, ivy, occasional ground-elder *Aegopodium podagraria*, wood avens *Geum urbanum*, black bryony *Tamus communis*, bracken *Pteridium auilinum*, wood dock *Rumex sanguineus*, with rarely occurring wood millet *Milium effusum*, raspberry *Rubus idaeus*, and red campion *Silene dioica*.
- 3.17 The woodland area tapers down to become a line of trees along to the north of the existing warehouses, continuing east to meet with the line of trees along Rackery Lane. As such, this feature provides good connectivity across the site.



Figure 5: Broadleaved woodland bounding the western and northern site boundaries

Buildings

- 3.18 TN4 is comprised of a garage building covered with ivy and encroaching scrub to one side. Metal storage containers are also present on hardstanding. The buildings offer negligible potential for roosting bats. There are some piles of material and rubble adjacent to this which could offer potential hibernacula for amphibians. Areas surrounding the buildings are described in TN5 and TN6.
- 3.19 A small electric utility building is located near the site entrance within a fenced off compound. The structure was well sealed and contained negligible potential for protected species.

Introduced shrub and scrub associated with utilities compound

The southern extent of the site is comprised of the site entrance, grass verges, and a small electric utility building and compound which is fenced off, with associated introduced shrubs, modified grassland, and scrub (adjacent to TN1). The introduced/non-native species were comprised of *Cotoneaster* sp. (not a Schedule 9 species). The native planting around this compound included frequent dogwood *Cornus sanguinea*, occasional rose *Rosa* sp., bramble *Rubus fruticosus* agg., and gorse *Ulex europeaus*.

Dense continuous and scattered scrub

- 3.20 A south facing area of dense continuous is present along the northern edge of the grassland (TN5, Figure 6), which transitions into the woodland along the edge of the site beyond the ditch. This area provides good cover and foraging opportunities. Species recorded include abundant blackthorn, hawthorn, frequent bramble, ash, with occasional gorse and raspberry.
- 3.21 Scattered scrub in the form of willow *Salix* Sp., and young oak, and sycamore are also present scattered within the grassland area.



Figure 6: Area of taller grassland with abundant tall ruderal vegetation

Dry ditch

- 3.22 A ditch which was dry at the time of survey separates the dense scrub and woodland habitats. This feature runs along the northern periphery of the site, curving around and continuing down along the western site boundary to approximately halfway prior to diverting off site to the adjacent land to the west.

Amenity grassland and scattered trees

- 3.23 The area proposed for a new access road is comprised of amenity grassland, and standard scattered trees. The scattered trees part of the existing soft landscaping within the site compound are comprised of a mix of birch *Betula sp.*, and sycamore *Acer pseudoplatanus*. A chain link fence bounds the site, beyond the fence located between the road is an area of scrub comprising bramble *Rubus fruticosus*, nettle *Urtica dioica*, and ivy *Hedera*.
- 3.24 The linear stand of trees along Rackery lane are comprised of mature oak trees *Quercus sp.* Oak one is covered with ivy; with a few scars this has low potential for bats. Oak two is densely covered with ivy and has dead branches but again has low potential for bats.

Habitat Connectivity

- 3.25 The broad-leaved woodland and scrub habitats along the north and west boundaries of the site provide good connectivity to the linear rows of trees, hedgerows, arable fields, and ponds within the wider area. A dry ditch also provides good commuting opportunity along the site periphery.

Notable flora

- 3.26 No protected or non-native invasive species were recorded within the site at the time of survey. However, the survey was undertaken outside the optimal period for surveying woodland ground flora, therefore species such as bluebell *Hyacinthoides non-scripta* (WCA8) may have been missed at this time of year.

Notable habitats

- 3.27 There are no notable habitats located within or immediately adjacent to the site.

Fauna

Amphibians

- 3.28 Numerous Great crested newt (GCN) *Triturus cristatus* (EPS, WCA5, S7, LBAP) records were returned within 2km of the site. The closest of these were 280m northeast of the site.
- 3.29 Common toad *Bufo bufo* (S7) records were returned for within 2km of the site. The closest of these were 560m south of the site
- 3.30 A ditch is present at the north of the site situated within the woodland; however, this was dry at the time of survey. The closest ponds are 170m northeast and 200m northwest of site.
- 3.31 Pond 1 (figure 7) is located in the centre of the field directly to the north of the existing H-Pack warehouse. It is immediately surrounded by rank grassland, scrub, and trees.



Figure 7: Pond P1

- 3.32 Pond 2 (figure 8) is located 200m to the north of the site bounded by a hedgerow and trees and surrounded by scrub. The pond is fully shaded and contains high levels of silt.



Figure 8: Pond P2

eDNA survey

- 3.33 The results of the eDNA surveys are presented in Table 5 below.

Table 2 eDNA survey results

Pond Ref	Survey Date	Sample Kit ID	Surveyor	Score	GCN Present? (Y/N)
1	20/06/22	4225	AC	09/12	Y
2	20/06/22	4226	AC	0/12	N

- 3.34 The eDNA results for Pond 1 (Figure 7) were positive, meaning GCN are present within the pond. The full results are included within Appendix C. A pond map with GCN eDNA results is shown in drawing G9529.002.
- 3.35 Pond 2 results returned negative; meaning GCN are absent from the pond.
- 3.36 Ponds 3 and 4 were dry at the time of the eDNA survey so have been excluded.

Badger

3.37

Bats

- 3.39 Several records of bats were returned within 2km of the site. These were all located over 1km away from the site. Species included brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, myotis bat *Myotis* sp., noctule *Nyctalus noctula*, and soprano pipistrelle *Pipistrellus pygmaeus*. Several records of unidentified bats were also returned.

Ground Based Tree Assessment (GBTA)

- 3.40 Two oak trees were recorded as having low bat roosting potential within the line of trees present within the red line boundary along Rackery Lane. Oak one is a mature oak which has moderate coverage of ivy and a few scars present to the trunk but is considered to have low potential for bats. Oak two is a mature oak and is densely covered with ivy with a few dead branches present but is also considered to have low bat potential.
- 3.41 Several of the large mature oak trees within the woodland habitat on site have moderate and high bat potential. However, it is understood this habitat is being retained.

Brown Hare

- 3.42 Several records of brown hare *Lepus europaeus* (S7) were recorded within 2km of the site, the nearest being approximately 1.38km from the site.
- 3.43 The site itself does not offer suitable brown hare habitat, being predominantly short mown grassland and thus lacking in the type of cover preferred by this species.

Hedgehog

- 3.44 Numerous records of hedgehog *Erinaceus europaeus* (S7) were located within 2km of the site, and due to the surrounding wider landscape, it is highly likely that hedgehog are active in the area.
- 3.45 The rank grassland, scrub, and woodland habitats along the northern and western site boundaries offer potential foraging, commuting, and hibernation habitat for this species.

Reptiles

- 3.46 Several records of common lizard *Zootoca vivipara* and grass snake *Natrix Helvetica* were recorded within 2km of the site. The nearest record of grass snake was in June 2017, situated at the Police HQ, 188m from the southern site boundary. This is separated by Davy Way.
- 3.47 The nearest record of common lizard was in May 2021, on Prospect Estate situated approximately 440m to the southeast of the site and bordered by Davy Way to the north and Rackery Lane to the east.

4.0 Assessment of Potential Impacts

- 4.1 This section assesses the potential impacts on ecological features associated with the proposed development.

Wildlife Sites

- 4.2 Due to the distance between the site and any designated sites, impacts from the proposals are assessed as highly unlikely.

Habitats and Flora

Notable Habitats

- 4.3 Due to the distance between the site and any notable (S7) habitats, impacts from the proposals are assessed as highly unlikely.

Other Habitats

Trees

- 4.4 Several trees will be felled as part of the proposed access road off Rackery Lane. There is also the potential for damage to retained trees to occur in the absence of mitigation.

Fauna

Amphibians

- 4.5 Due to the positive eDNA result for pond 1 and good core terrestrial habitat in the form of woodland, scrub, ditch, and tall ruderal/rank grassland being present along the western, northern, and eastern site boundaries there are implications for the proposed development with regard to GCN. This includes the high risk of direct impacts to GCN disturbance, injury, killing, and habitat fragmentation in the absence of mitigation and compensation.
- 4.6 No ponds were present within the site boundaries, therefore, there will be no direct impacts to GCN breeding habitat.
- 4.7 There is an opportunity for habitat compensation and enhancements to be included around the periphery of the site post-development to aid these species.

Badger

- 4.8 There are no current implications of the development with regard to badger, although suitable sett building habitat does exist on site within the woodland.

Bats

- 4.9 There is a low potential for bat roosts to be present within the oak trees along Rackery Lane where the new access road is proposed. Without adequate mitigation, there is a low risk of disturbance, injury, and killing of bats.
- 4.10 There are several trees with moderate and high bat potential within the area of woodland along the northern and north-eastern periphery of the site. Given that this habitat will be retained in full, no direct impacts to bats are anticipated within this area.
- 4.11 There is potential for habitat fragmentation to occur if additional lighting is proposed, particularly along the northern and western boundary of the site due to the suitable foraging and commuting habitat which exists.

Birds

- 4.12 The scrub and trees on site have the potential to support nesting birds. There is a risk of damage or destroying a nest if tree felling or lopping or vegetation clearance is carried out in the nesting period (generally considered to be between March to August inclusive, although geographical position of the site will influence this period and some species nest also commonly nest outside this period).

Hedgehog

- 4.13 There is potential for injury and killing of hedgehog during preliminary vegetation clearance works along the northern and western periphery of the site, where hedgehogs may take shelter within the taller vegetation.

Reptiles

- 4.14 Due to records of grass snake adjacent to the site and of common lizard within 500m, there is the potential for injury and killing of reptiles during preliminary vegetation clearance works, particularly along the edge habitats along the northern boundary of the site, which is comprised of south-facing rank grassland with tall ruderal vegetation and scrub habitat with piles of material and rubble associated with the building which could provide adequate cover, hunting and basking opportunities.

5.0 Recommendations

- 5.1 This section describes appropriate and proportionate measures for impact avoidance, mitigation and enhancement required or recommended to address the potential ecological effects described in Section 4.0.

Habitats and Flora

- 5.2 A Root Protection Zone (RPZ) should be implemented around retained trees in accordance with BS5837:2012 if development is likely to affect the trees, their roots, and overhanging canopies.
- 5.3 Replacement native tree planting is recommended to replace those lost from the proposed access road.
- 5.4 Standard pollution prevention and dust control measures should be set out in a Construction Environmental Management Plan (CEMP) and implemented during site clearance and construction works. The CEMP will identify measures to ensure the potential for indirect impacts on retained habitats within and adjacent to the site.
- 5.5 It is recommended that an ecological precautionary working method statement (PWMS) for the protection of habitats and species is drafted to inform ecological input into the contractors CEMP. The PWMS will also identify any further measures to ensure that impacts on nearby designated sites or priority habitats are reduced to a reasonable minimum such that the qualifying features of such designations are not negatively affected by the proposed development.

Fauna

Amphibians

- 5.6 GCN and their habitats are fully protected under the Habitats Regulations and the Wildlife & Countryside Act 1981 (as amended).
- 5.7 Consultation with Natural Resources Wales (NRW) regarding the site proposals and proposed mitigation and compensation for GCN has taken place.
- 5.8 A GCN mitigation licence from NRW will be required for the development due to the risk of disturbance, injury, and killing of GCN within the terrestrial habitat present on site. The licence and method statement will follow at a later date separately to this report. However, an outline of the proposed mitigation and compensation is set out below which has been agreed upon following consultation with NRW.
- 5.9 Self-clearing/one-way temporary amphibian fencing (TAF) will be required to be installed along the northern and western boundary of the site, along the edge of the grassland habitat and around the working area of the proposed new access from Rackery Lane. The TAF will remain in place for the duration of the development and will be regularly maintained.

- 5.10 All proposed vegetation and potential hibernacula clearance will be undertaken under a Precautionary Working Method Statement (PWMS) under supervision of a GCN licenced ecologist. This will also mitigate for other protected species, including reptiles.
- 5.11 To compensate for the proposals and to enhance the site for amphibians, a 1ft deep 4m long scrape will be installed near to the northern boundary where the existing grassland is present. This will naturally fill with rainwater to provide additional habitat on site. Hibernacula will be created adjacent to this as compensation for the loss of terrestrial habitat. This should utilise brash and log piles from vegetation/tree clearance elsewhere on site. The rank grassland, scrub, ditch and woodland habitat will be retained post development.

Badger

- 5.12 Badgers are protected under the Protection of Badgers Act 1992 from killing, injury and certain acts of cruelty. Their setts are also protected from damage, obstruction or destruction.
- 5.13 If works do not take place within 12 months of the original survey (by 25th July 2023) an updated badger walkover survey will be required to ensure not setts have been created within 30m of the proposed works.

Bats

- 5.14 All British bats are European protected species, afforded full protection under the Habitats Regulations and the Wildlife & Countryside Act 1981 (as amended). Bats are protected from killing or injury, and from disturbance at the place of rest. Bat roosts are also protected from obstruction, damage or destruction (whether or not a bat is in occupation at the time).
- 5.15 Any removal of low potential trees or pruning/lopping of their branches will require to be undertaken under a Precautionary Working Method Statement (PWMS). The PWMS will set out the working methods that will need to be adhered to throughout the tree works to avoid impacts on roosting bats. The method statement will include the need for trees to be soft felled under the supervision of a bat licenced ecologist. If a roosting bat is encountered during the works, works must stop and a licence from NRW must be obtained. All wood must be retained for habitat creation elsewhere on site, including the proposed amphibian hibernacula.
- 5.16 A sensitive lighting plan will be required to ensure impacts to potential foraging, commuting, and roosting habitat within the woodland along the northern and western boundary are minimised.

Birds

- 5.17 Native nesting birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981 (as amended) from damage and destruction, from the time of nest construction to fledging of the young.

- 5.18 Vegetation clearance works should be completed outside of the nesting period (typically taken to be March to August inclusive). Where avoidance of the nesting period is not practicable, a nesting bird check must be carried out by an ecologist no more than 24 hours prior to the works, to confirm that no active nests are present. In the event that an active nest is identified, works within the surrounding area must halt until the chicks have fledged. The required radius of the exclusion area will depend on the species found nesting and the context of the nesting location.

Hedgehog, other mammals, and reptiles

- 5.19 Precautionary methods included within the PWMS to protect both mammals and reptiles should include:
- Staged vegetation clearance measures and checking of potential refugia and tall vegetation will ensure no harm to hedgehog or other mammals and reptiles if present during site clearance works
 - Vegetation clearance if required should take place starting from the southern point of the site and moving north, to encourage any species utilising the site to move towards the safety of adjacent habitats to the north.
 - If any vulnerable animals are encountered, then clearance works must cease, and the advice of an ecologist be sought.
 - Any holes, drains or trenches dug into the ground must be covered or have ramps placed within to allow trapped animals to escape. All pipework must be capped overnight to prevent small mammals entering and becoming trapped. All mesh, wiring, and other materials that could risk entanglement must be stored off the ground.

Appendix A

Ecological Desk Study



THE
ENVIRONMENT
PARTNERSHIP



LAND ADJACENT TO H-PACK LLAY, WREXHAM ECOLOGY DESK STUDY

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1.0 Introduction

- 1.1 The Environment Partnership (TEP) were commissioned, by H Pack Packaging Ltd in July 2022, to complete an ecology desk-based assessment of land adjacent to H-pack, Davy Way, Llay, Wrexham, LL12 0PG (hereafter referred to as 'the site'). This assessment is required to inform and support a Full Planning Application for the erection of 1no B8 storage and distribution building and associated access and external works.
- 1.2 The central grid reference of the site is SJ 32294 56794 and the location of the site is shown in Figure 1 below.

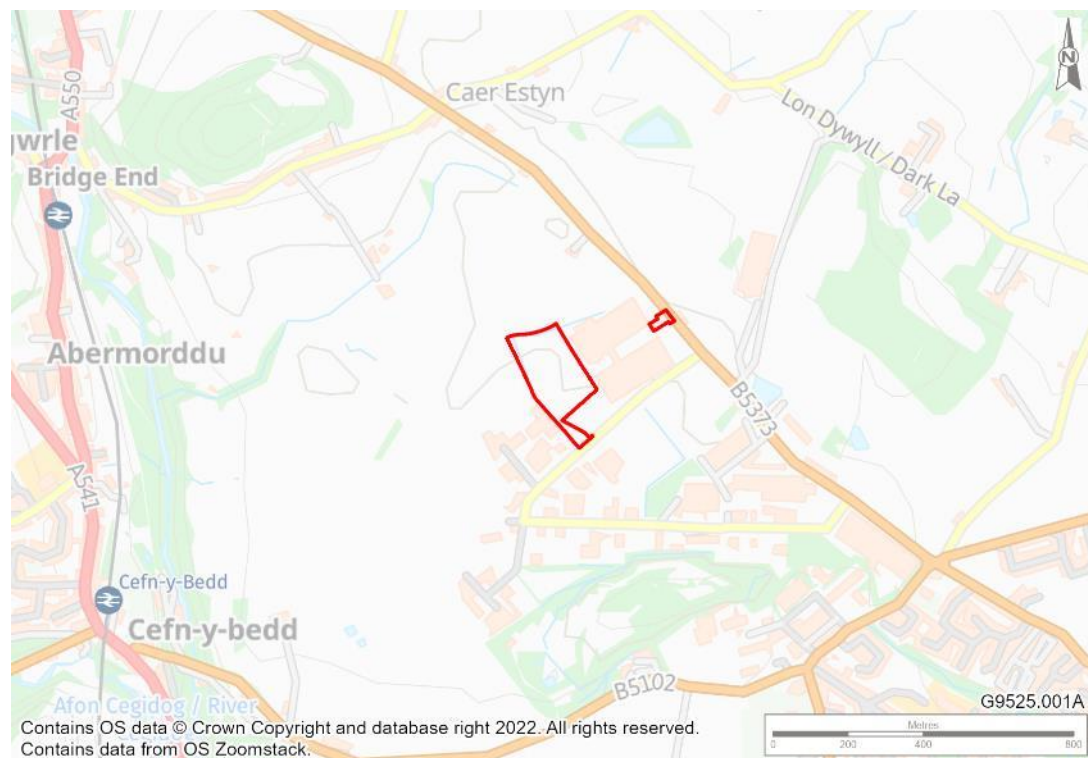


Figure 1: Site Location Plan

2.0 Method

- 2.1 Information regarding historic species records and protected sites was requested/gathered from the sources listed in Table 1. This collated data gives a useful indication of the distribution and abundance of ecological receptors at a given locale. An absence of records does not indicate the absence of protected species from the search area.

Table 1: Sources of Ecological Information

Source of Information	Nature of Information
Natural Resources Wales (NRW)	Statutory designated wildlife sites of international importance within 10km Statutory designated wildlife sites of national importance within 5km Statutory designated wildlife sites of local importance within 2km
LANDMAP	Notable habitats within and adjacent to the site
North Wales Environmental Information Service (COFNOD)	Protected species records within 2km Non-statutory designated wildlife sites of local importance within 2km
Wrexham County Borough Council	Land allocations and relevant policies
ArcMap10	Ordnance & Aerial survey mapping

- 2.2 Statutory designated wildlife sites of international importance may include:
- Ramsar sites;
 - Special Areas of Conservation (SAC); and
 - Special Protection Areas (SPA).
- 2.3 Statutory designated wildlife sites of national importance may include:
- Site of Special Scientific Interest (SSSI);
 - National Nature Reserve (NNR);
 - Marine Nature Reserve (MNR); and
 - Area of Outstanding National Beauty (AONB).
- 2.4 Statutory designated wildlife sites of local importance refers to Local Nature Reserves (LNR).
- 2.5 Non-statutory designated wildlife sites of local importance may include:
- Local Wildlife Site (LWS);
 - Site of Biological Importance (SBI); and

- Biological Heritage Site (BHS).

2.6 Habitats of value may include those listed under any of the following:

- Ancient woodland;
- Main rivers¹;
- Habitats of principal importance under Section 7 of the Environment (Wales) Act 2016 (S7); and
- Local Biodiversity Action Plan Habitats (LBAP).

2.7 Protected species records may include those listed under any of the following:

- European Protected Species (EPS);
- Protected bird species under Schedule 1 of the Wildlife and Countryside Act 1981, as amended (WCA1);
- Protected animal species under Schedule 5 of the Wildlife and Countryside Act 1981, as amended (WCA5);
- Protected plant species under Schedule 8 of the Wildlife and Countryside Act 1981, as amended (WCA8);
- Invasive non-native plant species under Schedule 9 of the Wildlife and Countryside Act 1981, as amended (WCA9);
- Invasive Alien Species (Enforcement and Permitting) Order 2019 (IAS);
- Protection of Badgers Act 1992 (PBA);
- Species of principal importance under Section 7 of the Environment (Wales) Act 2016 (S7);
- Red and Amber listed Birds of Conservation Concern (BRd/BAm); and
- Local Biodiversity Action Plan Species (LBAP).

¹ Main rivers are statutory watercourses designated by Natural Resources Wales (in Wales). 'Main rivers' are usually larger streams and rivers, but some of them are small watercourses of significance. Works within 8m of main rivers are generally prohibited or require permission as there could be flood risk implications.

3.0 Legislation and Planning Policy

- 3.1 This section details legislation and planning policy which may have relevance to the site. Only legislation and policy relevant to biodiversity are included.

Relevant Legislation

International Conventions

- 3.2 The UK is a Contracting Party to numerous environmental conventions, the commonest form of international agreements to encourage a coordinated response to managing the environment. Key environmental conventions ratified in the UK include:
- The Convention on Wetlands of International Importance especially as Waterfowl Habitat ('Ramsar Convention'² or 'Wetlands Convention') - provides the only international mechanism for protecting sites of global importance;
 - The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention³) - imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species;
 - The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention⁴ or CMS) - provides strict protection for endangered migratory species. The UK has currently ratified four legally binding Agreements under the convention relating to bats (EUROBATS), African-Eurasian migratory birds (AEWA), small cetaceans in the Baltic, Irish and North Seas (ASCOBANS) and albatrosses and petrels (ACAP) in addition to five Memorandum of Understanding (MoU) and is non-party range state to a further Agreement and a further MoU;
 - The Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO World Heritage Convention) - seeks to protect both cultural and natural heritage;
 - The Convention on Biological Diversity (Biodiversity Convention⁵ or CBD) - provides a legal framework for biodiversity conservation. Within the UK, delivery of the CBD and the Strategic Plan for Biodiversity 2011-2020⁶ is guided by the UK Post-2010 Biodiversity Framework⁷.
- 3.3 The legal obligations of the multiple Conventions to which the UK is a Contracting Party are enacted through a suite of national environmental legislation. The most relevant are described in the following paragraphs.

² Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramsar, 2.2.1971
<https://www.ramsar.org/>

³ Convention on the Conservation of European Wildlife and Natural Habitats. Bern, 1979 <https://www.coe.int/>

⁴ Convention on the Conservation of Migratory Species of Wild Animals, Bonn, June 1979 <https://www.cms.int/>

⁵ Convention on Biological Diversity, Rio de Janeiro, June 1992 <https://www.cbd.int/>

⁶ In October 2010, at the 10th Conference of the Parties to the CBD in Nagoya, Japan, the Parties adopted a new 'Strategic Plan for Biodiversity 2011–2020' along with its 20 'Aichi targets'. <https://www.cbd.int/sp/>

⁷ The framework is overseen by the Environment Departments of the four UK governments working through the Four Countries' Biodiversity Group. It demonstrates how the UK, through each of the four countries, contributes to achieving the 'Aichi targets', and identifies the activities required to complement the individual country biodiversity strategies <https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/>

Conservation of Habitats and Species Regulations

- 3.4 The Conservation of Habitats and Species Regulations 2017⁸ (2017 Regulations) transposed the land and marine aspects of the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Wild Birds Directive (Directive 2009/147/EC) (known as the Nature Directives) into domestic law.
- 3.5 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019⁹ (2019 Regulations) amends the 2017 Regulations to make them operable following the withdrawal of the United Kingdom from the European Union (EU). Most of the changes involve transferral of functions from European Commission to the appropriate authorities in England and Wales, also extending to Scotland and Northern Ireland and applies to Scotland and Northern Ireland (including the adjacent territorial sea to a limited degree), as regards reserved and excepted matters respectively. It also amends Section 27 of the Wildlife and Countryside Act 1981 to maintain existing protections and enforcement for species of wild birds.
- 3.6 All other processes or terms in the 2017 Regulations remain unchanged and existing guidance and obligations (of a competent authority) remain relevant.

National Site Network

- 3.7 Under the 2019 Regulations, Special Areas of Conservation (SAC) and Special Protection Areas (SPA) in the UK no longer form part of the EU's 'Natura 2000' ecological network, but instead (along with new SACs and SPAs designated under the 2019 Regulations) form the new National Site Network (NSN). Ramsar sites² do not form part of the NSN, but remain protected in the same way as SACs and SPAs.
- 3.8 Proposals which may significantly affect a site belonging to the NSN and which are not connected with or necessary to the management of that site require (by Regulations 63 and 64 of the 2017 Regulations, as amended by Regulations 24 and 25 of the 2019 Regulations, respectively) competent authorities to undertake an Appropriate Assessment of the implications of the plan or project in view of that site's conservation objectives. This process is commonly referred to as a 'Habitats Regulations Assessment' (HRA). The assessment must take into account the potential effects both of the plan/project itself and in combination with other plans or projects. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest (IROPI) and if the necessary compensatory measures can be secured.

Protected Species

- 3.9 Certain animals and their breeding sites or resting places are protected under Regulation 43 of the 2017 Regulations, which makes it illegal to:
- Deliberately capture, injure or kill any such animal or to deliberately take or destroy the eggs of such an animal;

⁸ Conservation of Habitats and Species Regulations 2017 (SI 2017/1012)
<https://www.legislation.gov.uk/uksi/2017/1012/>

⁹ Conservation of Habitats and Species Regulations 2019 (SI 2019/579)
<https://www.legislation.gov.uk/uksi/2019/579/>

- Deliberately disturb such an animal; and
 - Damage or destroy a breeding site or resting place of such an animal.
- 3.10 Disturbance is defined in the 2017 Regulations as an activity which is likely to impair a species' ability to survive, to breed or reproduce, to rear or nurture young or, in the case of animals hibernating or migratory species, to hibernate, migrate or which may affect significantly the local distribution or abundance; of the species.
- 3.11 A bat's resting place is known as a roost site. Because bats tend to be faithful to roost sites but their biology is such that different roost site characteristics are preferred at different times of the year by different species for different functions, a bat roost is considered to be afforded protection even when it is not occupied.
- 3.12 Certain plant species are protected under Regulation 47 of the 2017 Regulations against deliberate picking, collecting, cutting, uprooting or destruction. It is also an offence to be in possession or control and to transport any live or dead plant or part of a plant of such a species which has been taken in the wild.
- 3.13 The 2017 Regulations (Regulation 55) enables a relevant licensing body to grant a licence for certain activities that may affect animal or plant species protected by the above provisions. The purpose must conform to one of those listed under Regulation 55(2). For most development related activities, the purpose normally relates to Regulation 55(2)(e) 'preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequence of primary importance for the environment' – commonly known as the IROPI test. Regulation 55(9) introduces two further tests that the licensing body must consider:
- There is no satisfactory alternative; and
 - The favourable conservation status of the species concerned will be maintained and/or enhanced.
- 3.14 Under Regulation 9(1) of the 2017 Regulations (as amended), competent authorities "must exercise their functions which are relevant to nature conservation... so as to secure compliance with the requirements of the Directives". Regulation 9(3) requires a competent authority, in exercising any of its function, to "have regard to the requirements of the Directives so far as they be affected by the exercise of those functions." Local planning authorities must therefore consider the above three 'tests' when determining if planning permission should be granted for developments likely to cause an offence under the Regulations.

Wildlife and Countryside Act 1981

- 3.15 The Wildlife and Countryside Act 1981 (as amended)¹⁰ (WCA) is a major legal instrument for wildlife protection in the UK. In respect of habitats and flora, the WCA protects important habitats and/or species as Sites of Special Scientific Interest (SSSI). The designation of UK Ramsar sites² has usually been underpinned through prior notification of these areas as SSSI and accordingly they receive statutory protection under the WCA.

¹⁰ Wildlife and Countryside Act 1981 c. 69 <https://www.legislation.gov.uk/ukpga/1981/69/>

- 3.16 The obligations of the Bern Convention³ (the protection of wild plant and animal species and their natural habitats) are transposed into law for England and Wales¹¹ by the WCA. The legal requirement for the protection of migratory species listed by the Bonn Convention⁴ is also provided by the WCA.
- 3.17 All wild birds (as defined by the WCA and with exception to species listed in Schedule 2) are protected under the WCA, which makes it illegal to:
- Intentionally kill, injure or take any wild bird;
 - Take, damage or destroy the nest (whilst being built or in use) of any wild bird; or
 - Take or destroy the eggs of any wild bird.
- 3.18 Special penalties are available for offences related to birds listed in Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young. The Secretary of State may also designate Areas of Special Protection (subject to exceptions) to provide further protection to birds. The WCA also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.
- 3.19 Certain animal species (listed under Schedule 5) of the WCA receive protection which makes it illegal (with certain exceptions) to:
- Intentionally kill, injure or take any such animal;
 - Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal;
 - Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.
- 3.20 Plant species listed under Schedule 8 of the WCA are protected from unauthorised intentional picking, uprooting and destruction. It is an offence to plant or otherwise cause to grow in the wild any plant that is included in Schedule 9.

Countryside and Rights of Way Act 2000

- 3.21 Part III of the Countryside and Rights of Way Act 2000¹² (CROW) deals specifically with wildlife protection and nature conservation. It requires that Government Departments have regard for the conservation of biodiversity, in accordance with the CBD. In addition, it requires that The Secretary of State publishes a list of living organisms and habitat types that are considered to be of principal importance in conserving biodiversity.
- 3.22 CROW also amends the WCA, expanding the terms of offences to include reckless activity. It increases the legal protection of threatened species, by also making it an offence to “recklessly” obstruct access to a sheltering place used by an animal listed in Schedule 5 of the WCA or “recklessly” disturb an animal occupying such a structure or place.

¹¹ In Scotland by the Nature Conservation (Scotland) Act 2004 (as amended) and in Northern Ireland by Wildlife (Northern Ireland) Order 1985 and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985.

¹² Countryside and Rights of Way Act 2000 c. 37 <https://www.legislation.gov.uk/ukpga/2000/37/>

Environment (Wales) Act 2016

- 3.23 Section 6 of the Environment (Wales) Act places a duty on public authorities to ‘seek to maintain and enhance biodiversity’ so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to ‘promote the resilience of ecosystems’.
- 3.24 Section 7 of the Environment Act requires The Welsh Ministers to publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales. This is known as the S7 list.

Hedgerow Regulations 1997

- 3.25 Important hedgerows are protected from removal by the Hedgerows Regulations¹³ (as amended). Regulation 3 defines the hedgerows to which the Regulations apply. Regulation 4 sets out the criteria for identifying “important hedgerows” including ecological, landscape or historical/cultural reasons. Under the Hedgerow Regulations it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. Works to “important hedgerows” are exempt under the Hedgerow Regulations if planning consent is granted which allows their removal.
- 3.26 The identification of important hedgerows also provides an additional means to value hedgerows aside from their botanical value (e.g. species richness) as the assessment of importance also includes characteristics relating to maturity and structure (e.g. associated features, connectivity, integrity) which will affect the functional value of the hedgerow.

Protection of Badgers Act 1992

- 3.27 Badgers and their setts receive statutory protection under the Protection of Badgers Act 1992 (PBA)¹⁴. This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett.
- 3.28 Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as “any structure or place, which displays signs indicating current use by a badger.”

Relevant Policy

Planning Policy Wales 2021

- 3.29 Planning Policy Wales (Edition 11, February 2021) delivers land use planning policy for Wales and provides a framework for the effective preparation of local planning authorities’ development plans. This is supplemented by 21 topic based Technical Advice Notes (TANs). Technical Advice Note 5- Nature Conservation and Planning is a key TAN in relation to nature conservation and biodiversity.

¹³ The Hedgerow Regulations 1997 (SI 1997/1167) <https://www.legislation.gov.uk/ukSI/1997/1160/>

¹⁴ Protection of Badgers Act 1992 c. 51 <https://www.legislation.gov.uk/ukpga/1992/51/>

3.30 TAN 5 states that the town and country planning system in Wales should:

- work to achieve nature conservation objectives through a partnership between local planning authorities, NRW, the Environment Agency Wales, voluntary organisations, developers, landowners and other key stakeholders;
- integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time;
- ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions;
- look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally;
- help to ensure that development does not damage, or restrict access to, or the study of, geological sites and features or impede the evolution of natural processes and systems especially on rivers and the coast;
- forge and strengthen links between the town and country planning system and biodiversity action planning particularly through policies in local development plans and the preparation of supplementary planning guidance that adds value to Local Biodiversity Action Plans (LBAPs) by highlighting the ways in which the planning system can help to deliver the objectives of LBAPs in practical ways; and
- plan to accommodate and reduce the effects of climate change by encouraging development that will reduce damaging emissions and energy consumption and that help habitats and species to respond to climate change.

Local Planning Policy

Natural Resources Wales Area Statements

- 3.31 Natural Resources Wales have developed seven Area Statements covering different areas of Wales. These statements are seen as a collaborative response to the Natural Resources Policy, published by the Welsh Government in 2017.
- 3.32 The Area Statement for North East Wales can be viewed by following the link: <https://naturalresources.wales/about-us/area-statements/?lang=en>
- 3.33 The following sections of the Area Statement relate to biodiversity and nature conservation:
- Develop and improve urban/rural green infrastructure;
 - Increasing woodland cover for social, environmental and economic benefits; and
 - Promoting the resilience of ecosystems in maintaining and enhancing biodiversity.

Wrexham Unitary Development Plan 1996 - 2011 (adopted February 2005)

- 3.34 The Wrexham Unitary Development Plan outlines the Council's broad intention for development in the area and provides a framework for the more specific policies and proposals. It is chiefly concerned with a vision of how the area should develop for the benefit of local people, developers and visitors alike. The specific policies provide detailed guidance for the development and other use of land.
- 3.35 The interactive policies map for the Local Plan Core Strategy can be viewed by following the link: <https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-unitary-development-plan>
- 3.36 Neither the site nor adjacent land is allocated for biodiversity purposes.
- 3.37 The Core Strategy document can be viewed by following the link: <https://www.wrexham.gov.uk/sites/default/files/2020-05/udp-statement.pdf>
- 3.38 The following policies relate to biodiversity and nature conservation:
- Policy PS11 - Biodiversity;
 - Policy GDP1 - Development Objectives;
 - Policy EC2 - Agricultural Land;
 - Policy EC4 - Hedgerows, Trees and Woodland;
 - Policy EC6 - Biodiversity Conservation;

Wrexham Local Development Plan 2 (LDP2) 2013 to 2028

- 3.39 The Wrexham Local Development Plan 2 (LDP2) will be a long-term land use and development strategy that will focus on achieving sustainable development.
- 3.40 This plan is currently being prepared and will eventually replace the Unitary Development Plan.
- 3.41 The progress of the LDP2 can be viewed at the following link: [Wrexham Local Development Plan 2 \(LDP2\) 2013 to 2028 | Wrexham County Borough Council](#)

Local Planning Guidance Notes

- 3.42 The Wrexham Borough Council Local Planning Guidance Notes can be viewed at the following link: <https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/local-planning-guidance-notes>
- 3.43 The following guidance notes relate to biodiversity and nature conservation:
- 17 - Trees and Development
 - 32 - Biodiversity and Development

Local Biodiversity Action Plans (LBAP)

- 3.44 The LBAP document for Wrexham can be viewed by following the link: <https://webarchive.nationalarchives.gov.uk/20110303154000/http://www.ukbap.org.uk/lbap.aspx?id=499#6>
- 3.45 The following habitats are identified within LBAPs by Wrexham Borough Council:

- Derelict and Industrial Land
- Garden
- Linear aquatic habitats (rivers, streams, canals)
- Ponds
- Upland Moorland
- Woodland
- Lowland raised bog
- Lowland wood-pasture and parkland
- Wet Woodland

3.46 The following species are identified within LBAPs by Wrexham Borough Council:

- Great crested newt (*Triturus cristatus*)
- Barn owl (*Tyto alba*)
- Song thrush (*Turdus philomelos*)
- Badger (*Meles meles*)
- Otter (*Lutra lutra*)
- Lesser horseshoe bat (*Rhinolophus hipposideros*)
- Black poplar (*Populus nigra*)

4.0 Site Designations

Statutory Designated Wildlife Sites of International Importance

- 4.1 There are five internationally designated wildlife sites within 10km of the site (Figure 2). These are detailed in Table 2 below. Citations are included in Appendix A.

Table 2: Details of Internationally Designated Wildlife Sites within 10km of the Site

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Reason for Site Designation
Midland Meres & Mosses Phase 2	Ramsar	Approximately 4.2km southeast, beyond the A483 and the River Alyn	The site comprises a diverse range of habitats from open water to raised bog and supports a variety of rare species of wetland plants (including cowbane <i>Cicuta virosa</i> and elongated sedge <i>Carex elongata</i>), bryophytes (including <i>Dicranum affine</i> and <i>Sphagnum pulchrum</i>) and invertebrates (including the moth <i>Glyphipteryx lathamella</i> , the caddisfly <i>Hagenella clathrata</i> and the sawfly <i>Trichiosoma vitellinae</i>).
Deeside and Buckley Newt Sites	SAC	Approximately 7.3km northwest, beyond the A550, the A5118 and the A549	This site provides breeding habitat for one of the largest populations of great crested newt <i>Triturus cristatus</i> in Great Britain. The site also supports considerable numbers of all the widespread amphibian species.

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Reason for Site Designation
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid	SAC	Approximately 7.4km east, beyond the A483 and the River Alyn	The site is designated as it is a water course of plain to montain levels with <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, and it supports important populations of Atlantic salmon <i>Salmo salar</i> and floating water-plantain <i>Luronium natans</i> . Sea lamprey <i>Petromyzon marinus</i> , brook lamprey <i>Lampetra planeri</i> , river lamprey <i>Lampetra fluviatilis</i> , Bullhead <i>Cottus gobio</i> and Otter <i>Lutra lutra</i> are also present.
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	SAC	Approximately 7.7km southwest, beyond the A541, the River Cegidog and the River Alyn	This site is designated for its habitats. It contains one of the largest stands of upland European dry heath and supports the most extensive tract of near-natural blanket bog in Wales. Other areas of calcareous habitat are also present.
Johnstown Newt Sites	SAC	Approximately 9.5km south, beyond the A483, the A5152, the River Cegidog, the River Gwenfro and the River Alyn	This site is designated for its population of great crested newts <i>Triturus cristatus</i> , which is one of the largest known in Great Britain. Good populations of the widespread amphibian species are also present.



Figure 2: Internationally Designated Wildlife Sites within 10km of the Site

Statutory Designated Wildlife Sites of National Importance

- 4.2 There are seven nationally designated wildlife sites within 5km of the site (Figure 3). These are detailed in Table 3 below. Citations are included in Appendix B.

Table 3: Details of Nationally Designated Wildlife Sites within 5km of the Site

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Reason for Site Designation
Llay Bog	SSSI	Approximately 1.2km south	The site is a small peat bog in an ice hollow in the glacial drift deposits and is designated for its botanical interest.
Chwarel Singret	SSSI	Approximately 2.1km southeast	The site is of interest for an exposure through a sequence of deposits that has a major bearing on interpretations of the Quaternary history of north-east Wales.
Marford Quarry	SSSI	Approximately 3.4km east, beyond the A483 and the River Alyn	This disused sand and gravel working is designated for its entomological interest.
Vicarage Moss	SSSI	Approximately 4.1km southeast, beyond the A483	The site is s one of the best-developed examples of a kettle hole complex in Wales comprising one very large and several smaller subsidiary kettle holes. It is the largest example of a basin mire in Clwyd and the vegetation is distinctly zoned, and is therefore of geomorphological and botanical interest.
Coedwig Ffossil Brymbo Fossil Forest	SSSI	Approximately 4.2km southwest, beyond the A541 and the River Alyn	The site is of interest for exposures that contain an internationally important plant fossil assemblage.

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Reason for Site Designation
Coed Talon Marsh	SSSI	Approximately 4.7km west, beyond the A541 and the River Alyn	The site is the largest and one of the best examples of the "southern mesotrophic mire" wetland in Clwyd and is designated for its botanical interest.
Gatewen Marsh	SSSI	Approximately 4.9km south, beyond the River Alyn	The site is one of only three significant examples of "southern mesotrophic mire" wetland in Clwyd.

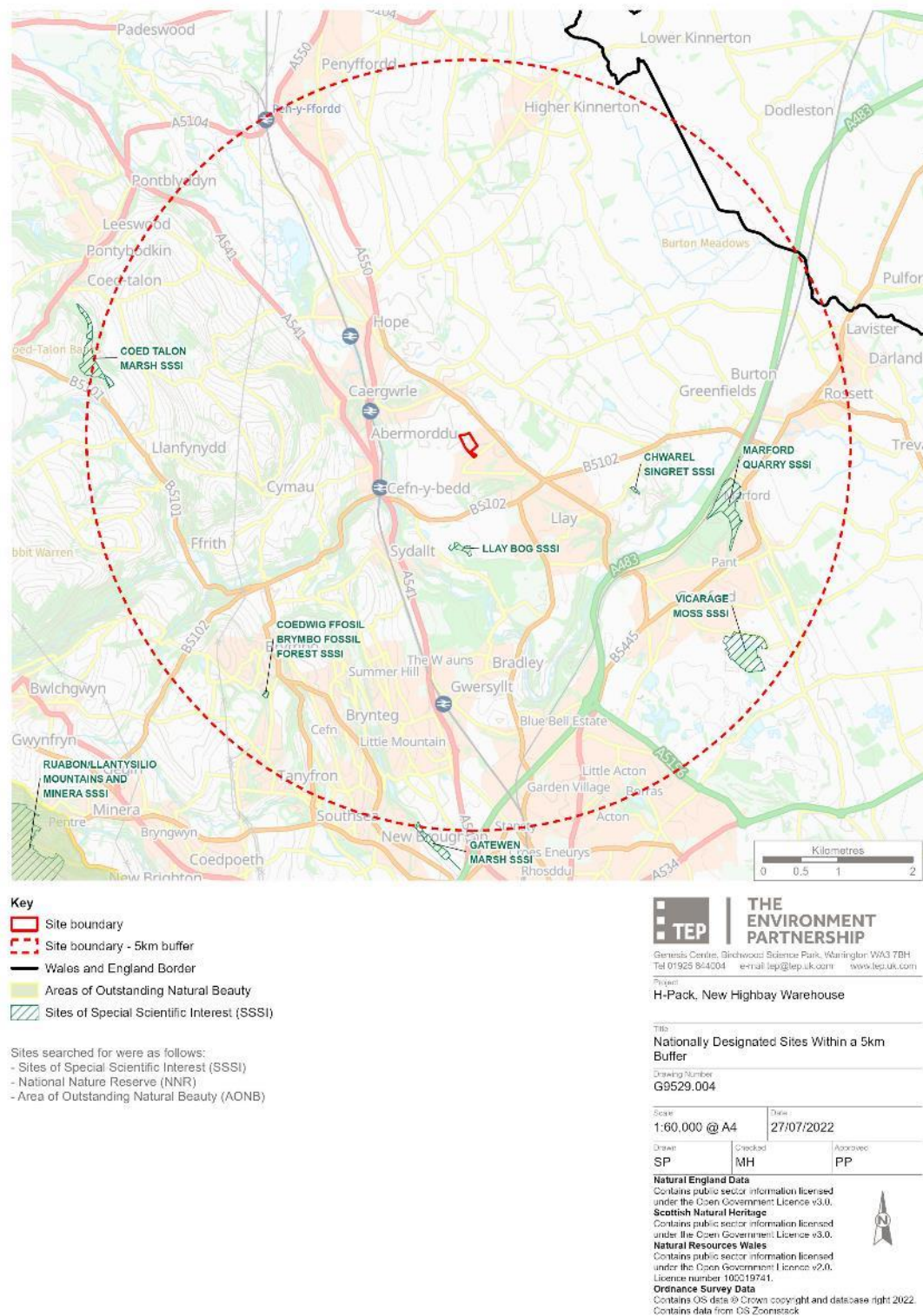


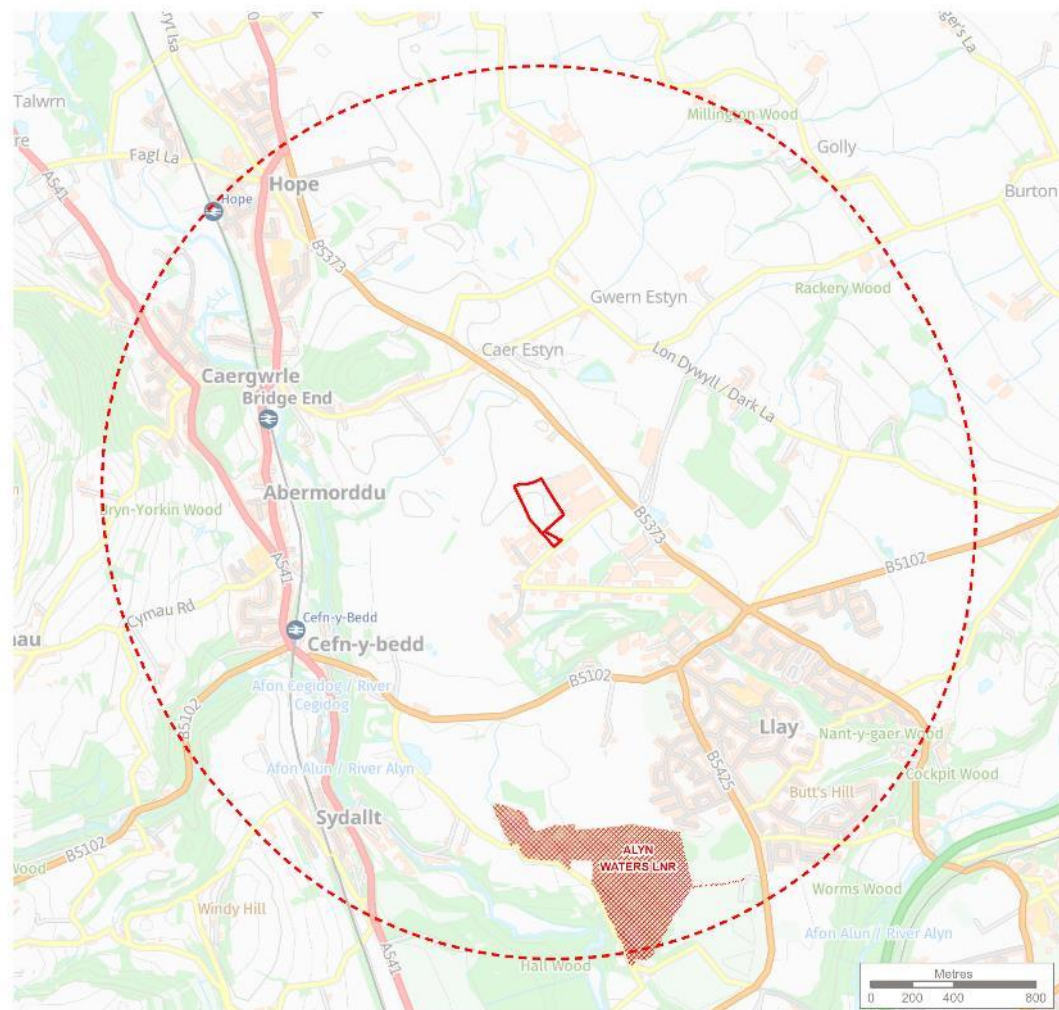
Figure 3: Nationally Designated Wildlife Sites within 5km of the Site

Statutory Designated Wildlife Sites of Local Importance

- 4.3 There is one statutory locally designated wildlife site within 2km of the site (Figure 4). This site is detailed in Table 4 below.

Table 4: Details of Statutory Locally Designated Wildlife Sites within 2km of the Site

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Site Description
Alyn Waters	LNR	Approximately 1.3km south	A series of woods along the River Alyn and some regenerating neutral grassland.



Key
 Site boundary
 Site boundary - 2km buffer
 Local Nature Reserve (LNR)

Sites searched for were as follows:
 - Local Nature Reserves

THE ENVIRONMENT PARTNERSHIP
 Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
 Tel 01925 844204 e-mail: tep@tep.uk.com www.tep.uk.com
 Project:
 H-Pack, New Highbay Warehouse

Statutory Locally Designated Sites Within a 2km Buffer
 Drawing Number:
 G9529.005

Scale: 1:25,000 @ A4	Date: 27/07/2022
Drawn: SP	Checked: MH
Approved: PP	

Natural England Data
 Contains public sector information licensed under the Open Government Licence v3.0.
Scottish Natural Heritage
 Contains public sector information licensed under the Open Government Licence v3.0.
Natural Resources Wales
 Contains public sector information licensed under the Open Government Licence v2.0.
 Licence number: 100519741.
Ordnance Survey Data
 Contains OS data © Crown copyright and database right 2022.
 Contains data from OS Zoomstack.



Figure 4: Statutory Locally Designated Wildlife Sites within/2km of the Site

Non-statutory Designated Wildlife Sites of Local Importance

- 4.4 There are 13 non-statutory locally designated wildlife sites within 2km of the site (Figure 5). These are detailed in Table 5 below.

Table 5: Details of Non-statutory Locally Designated Wildlife Sites within 2km of the Site

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Site Description
Bryn-y-Gaer	LWS	Approximately 900m northwest	Broad-leaved woodland with a disused silica quarry to the east. The quarry has a diverse flora colonising the disturbed ground.
Alywn Waters	LWS	Approximately 1.0km west	A series of woods along the River Alyn and some regenerating neutral grassland.
Nant Y Gaer & Llay Valley	LWS	Approximately 1.0km southeast	Semi-natural woodland along two joining valleys.
Rhydun Hall Grassland	LWS	Approximately 1.1km west, beyond the River Alyn	Grassland on the slope down to the River Alyn. The lower slopes in the northern half are damp and semi-improved, whereas the southern half is more improved.
Blast Road Pond	LWS	Approximately 1.3km southwest	An old gravel pit which is now a fishing lake. There is little marginal vegetation present but there is still a large population of mare's tail within the pond. On the west side is a very steep unimproved grassland slope and to the south extends a small area of semi-improved grassland.
Caergwrle Castle	LWS	Approximately 1.4km northwest, beyond the A550 and the River Alyn	Semi-natural broad-leaved woodland on the steep slopes surrounding the ruins of Caergwrle Castle.

Name of Designation	Type of Designation	Location of Designation in Relation to Site	Site Description
Silverdale Meadow	LWS	Approximately 1.5km north	Small pasture of unimproved neutral grassland on a steep bank with an area of marshy grassland at the foot of the slope.
Hope Mountain & Ffrwdd Wood	LWS	Approximately 1.5km southwest, beyond the A541 and the River Alyn	A site featuring broad-leaved woodland, scrub, bracken, neutral, acid and calcareous grassland, marshy grassland and swamp.
Sydallt Wood	LWS	Approximately 1.5km southwest, beyond the A541, the River Alyn and the River Cegidog	A woodland on the banks of the River Cegidog. To the south-east of the wood are some semi-improved neutral grassland slopes which have a fair diversity and grass/herb mix.
Caeau Abermonddu	LWS	Approximately 1.5km beyond the A550, A541 and the River Alyn	Elongated, narrow site along a hillside with semi-improved acid grassland, marshy grassland, wet woodland and semi-improved neutral grassland.
Rackery Wood	LWS	Approximately 1.5km northeast	Oak/ash woodland with much planted beech and some alder woodland along the stream. To the east is a very small area of marshy semi-improved grassland.
Caeau Farm Wood	LWS	Approximately 1.6km northwest	Broad-leaved woodland on a mound. The canopy comprises oak, sycamore and birch, and on the east side, where it is wet, alder and poplars are frequent.
Burton Tower Lake	LWS	Approximately 1.7km east	Fishing lake which is of ornithological importance.

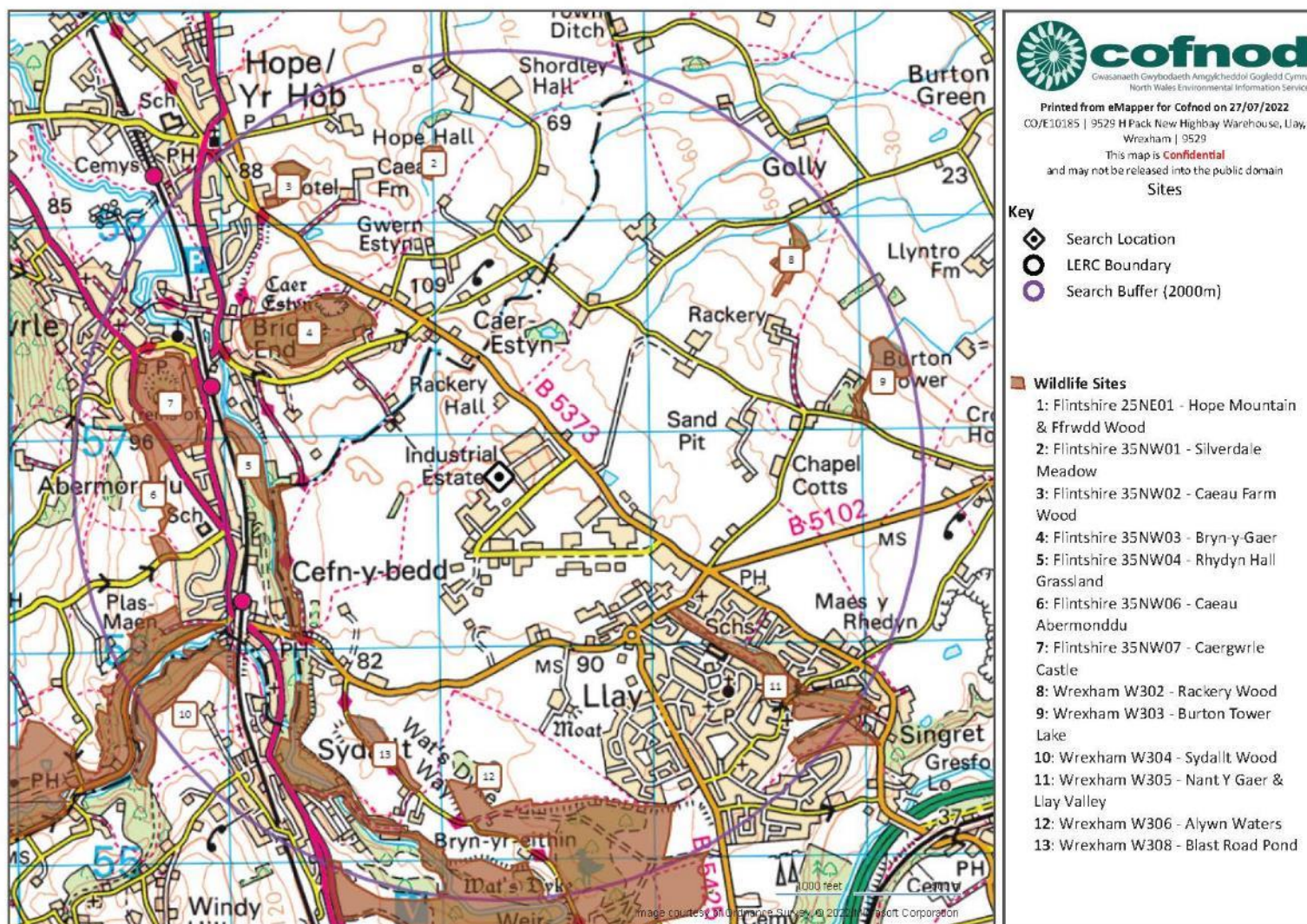


Figure 5: Non-statutory Locally Designated Wildlife Sites within 2km of the Site

5.0 Habitats

5.1 There are no notable habitats within or adjacent to the site (Figure 6).

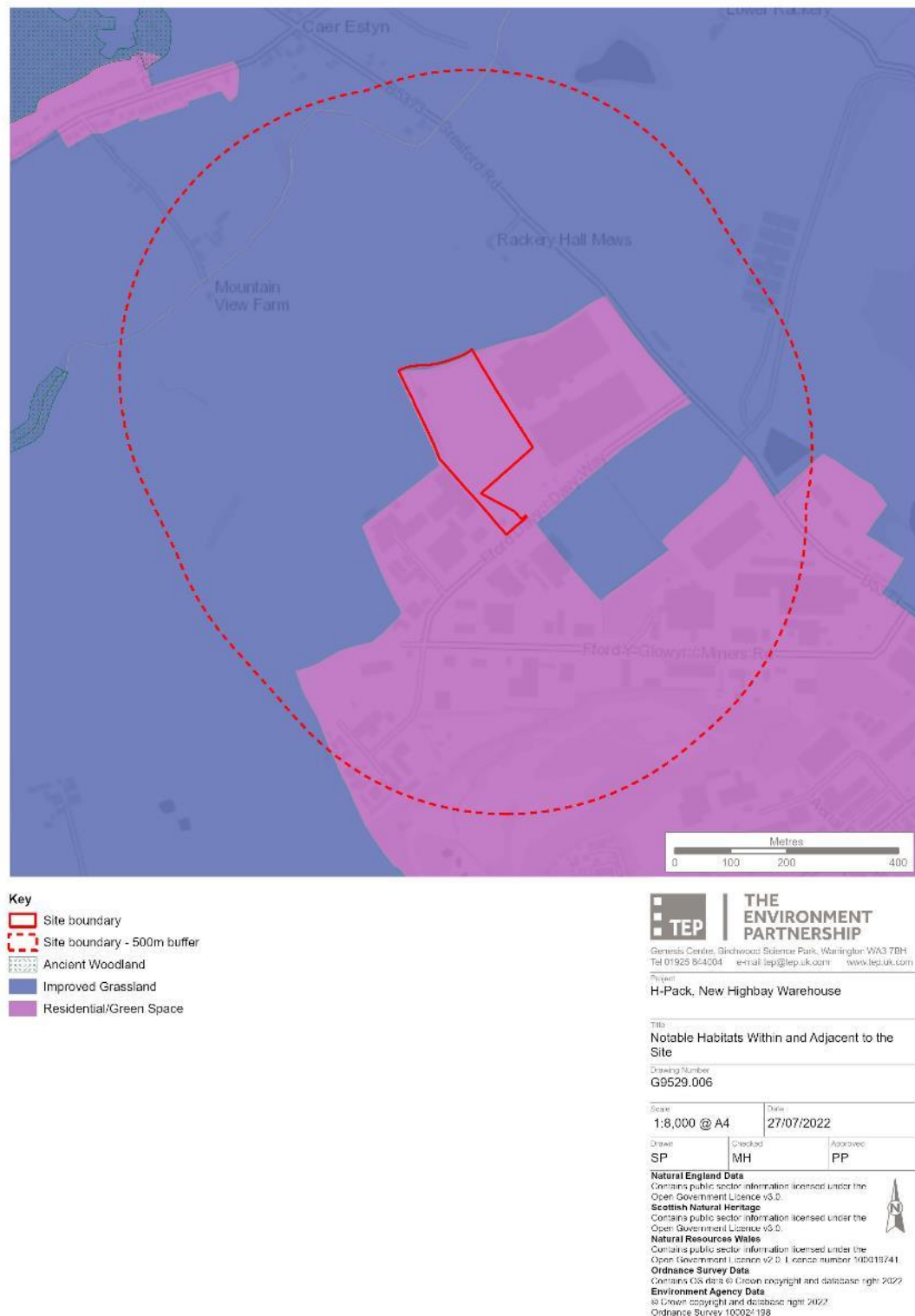


Figure 6: Notable Habitats within and adjacent to the Site

6.0 Species

- 6.1 1814 species records were returned from Cofnod for within 2km of the site. These are shown in Table 6 and Figure 7.
- 6.2 A review of Magic Maps did not return any pond survey data for great crested newts between 2017 and 2019 within 2km of the site.

Table 6: Notable Species Records within 2km of the Site

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
<i>Amphibians</i>			
Great crested newt <i>Triturus cristatus</i>	EPS, WCA5, S7, LBAP	20	Approximately 280m northeast
Common toad <i>Bufo bufo</i>	S7	6	Approximately 560m south
<i>Birds</i>			
Curlew <i>Numenius arquata</i>	S7, BRd	3	Approximately 300m southeast
Greenfinch <i>Chloris chloris</i>	BRd	17	Approximately 300m southeast
Herring gull <i>Larus argentatus</i>	S7, BRd	8	Approximately 300m southeast
Lapwing <i>Vanellus vanellus</i>	S7, BRd	22	Approximately 300m southeast
Skylark <i>Alauda arvensis</i>	S7, BRd	9	Approximately 300m southeast
Song thrush <i>Turdus philomelos</i>	S7, BAm	18	Approximately 300m southeast
Whitethroat <i>Curruca communis</i>	BAm	8	Approximately 300m southeast

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Willow warbler <i>Phylloscopus trochilus</i>	BAm	14	Approximately 300m southeast
Woodpigeon <i>Columba palumbus</i>	BAm	22	Approximately 300m southeast
Dunnock <i>Prunella modularis</i>	S7, BAm	24	Approximately 370m southwest
Kestrel <i>Falco tinnunculus</i>	S7, BAm	11	Approximately 370m southwest
Wren <i>Troglodytes troglodytes</i>	BAm	19	Approximately 370m southwest
House sparrow <i>Passer domesticus</i>	S7, BRd	21	Approximately 730m northwest
Starling <i>Sturnus vulgaris</i>	S7, BRd	17	Approximately 730m northwest
Stock dove <i>Columba oenas</i>	BAm	8	Approximately 730m northwest
Swift <i>Apus apus</i>	BRd	16	Approximately 730m northwest
Red kite <i>Milvus milvus</i>	WCA1	6	Approximately 750m north
Hobby <i>Falco subbuteo</i>	WCA1	5	Approximately 1.05km west, beyond the River Alyn
Mistle thrush <i>Turdus viscivorus</i>	BRd	13	Approximately 1.05km west, beyond the River Alyn
Moorhen <i>Gallinula chloropus</i>	BAm	10	Approximately 1.05km west, beyond the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Wood warbler <i>Phylloscopus sibilatrix</i>	S7, BRd	1	Approximately 1.05km west, beyond the River Alyn
Barnacle goose <i>Branta leucopsis</i>	BAm	6	Approximately 1.06km southwest
Little ringed plover <i>Charadrius dubius</i>	WCA1	5	Approximately 1.23km southwest
Oystercatcher <i>Haematopus ostralegus</i>	BAm	5	Approximately 1.23km southwest
Black-headed gull <i>Chroicocephalus ridibundus</i>	S7, BAm	6	Approximately 1.25km southeast
Egyptian goose <i>Alopochen aegyptiaca</i>	IAS	1	Approximately 1.25km southeast
Lesser black-backed gull <i>Larus fuscus</i>	BAm	9	Approximately 1.25km southeast
Rook <i>Corvus frugilegus</i>	BAm	11	Approximately 1.25km southeast
Tree sparrow <i>Passer montanus</i>	S7, BRd	3	Approximately 1.25km southeast
Common sandpiper <i>Actitis hypoleucos</i>	BAm	4	Approximately 1.27km southwest
Greylag goose <i>Anser anser</i>	WCA1, BAm	10	Approximately 1.27km southwest
Slavonian grebe <i>Podiceps auritus</i>	WCA1, BRd	4	Approximately 1.27km southwest

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Bullfinch <i>Pyrrhula pyrrhula</i>	S7, BAm	19	Approximately 1.32km south
Dipper <i>Cinclus cinclus</i>	BAm	9	Approximately 1.32km south
House martin <i>Delichon urbicum</i>	BRd	11	Approximately 1.32km south
Linnet <i>Linaria cannabina</i>	S7, BRd	6	Approximately 1.32km south
Peregrine <i>Falco peregrinus</i>	WCA1	3	Approximately 1.32km south
Redwing <i>Turdus iliacus</i>	WCA1, BAm	9	Approximately 1.32km south
Sparrowhawk <i>Accipiter nisus</i>	BAm	11	Approximately 1.32km south
Barn owl <i>Tyto alba</i>	WCA1	4	Approximately 1.36km south
Grey partridge <i>Perdix perdix</i>	S7, BRd	1	Approximately 1.36km south
Woodcock <i>Scolopax rusticola</i>	BRd	5	Approximately 1.36km south
Brambling <i>Fringilla montifringilla</i>	WCA1	2	Approximately 1.40km east
Black-tailed godwit <i>Limosa limosa</i>	WCA1, BRd	1	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Common gull <i>Larus canus</i>	BAm	2	Approximately 1.52km southwest, beyond the A541 and the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Dunlin <i>Calidris alpina</i>	BRd	2	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Fieldfare <i>Turdus pilaris</i>	WCA1, BRd	5	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Gadwall <i>Mareca strepera</i>	BAm	1	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Grey wagtail <i>Motacilla cinerea</i>	BAm	7	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Mallard <i>Anas platyrhynchos</i>	BAm	10	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Meadow pipit <i>Anthus pratensis</i>	BAm	6	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Merlin <i>Falco columbarius</i>	WCA1, BRd	2	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Pink-footed goose <i>Anser brachyrhynchus</i>	BAm	3	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Pintail <i>Anas acuta</i>	WCA1, BAm	1	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Reed bunting <i>Emberiza schoeniclus</i>	S7, BAm	3	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Shelduck <i>Tadorna tadorna</i>	BAm	3	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Shoveler <i>Spatula clypeata</i>	BAm	3	Approximately 1.52km southwest, beyond the A541 and the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Teal <i>Anas crecca</i>	BAm	4	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Tree pipit <i>Anthus trivialis</i>	S7, BRd	1	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Wigeon <i>Mareca penelope</i>	BAm	3	Approximately 1.52km southwest, beyond the A541 and the River Alyn
Marsh tit <i>Poecile palustris</i>	S7, BRd	2	Approximately 1.81km southwest, beyond the A541 and the River Alyn
Common tern <i>Sterna hirundo</i>	BAm	1	Approximately 1.87km northwest
Crane <i>Grus grus</i>	BAm	1	Approximately 1.87km northwest
Goldeneye <i>Bucephala clangula</i>	WCA1, BRd	2	Approximately 1.87km northwest
Green sandpiper <i>Tringa ochropus</i>	WCA1, BAm	4	Approximately 1.87km northwest
Kingfisher <i>Alcedo atthis</i>	WCA1	5	Approximately 1.87km northwest
Pochard <i>Aythya ferina</i>	BRd	2	Approximately 1.87km northwest
Snipe <i>Gallinago gallinago</i>	BAm	4	Approximately 1.87km northwest
Wheatear <i>Oenanthe oenanthe</i>	BAm	3	Approximately 1.87km northwest
Cuckoo <i>Cuculus canorus</i>	S7, BRd	4	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Golden plover <i>Pluvialis apricaria</i>	S7	1	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
Lesser redpoll <i>Acanthis cabaret</i>	S7, BRd	4	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
Spotted flycatcher <i>Muscicapa striata</i>	S7, BRd	3	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
<i>Fish</i>			
Brown/sea trout <i>Salmo trutta</i>	S7	2	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Atlantic salmon <i>Salmo salar</i>	S7	1	Approximately 1.97km south, in the River Alyn
<i>Invertebrates</i>			
Cinnabar <i>Tyria jacobaeae</i>	S7	5	Approximately 300m southeast
Dingy skipper <i>Erynnis tages</i>	S7	3	Approximately 300m southeast
Shaded broad-bar <i>Scotopteryx chenopodiata</i>	S7	2	Approximately 300m southeast
Small heath <i>Coenonympha pamphilus</i>	S7	2	Approximately 300m southeast
Wall <i>Lasiommata megera</i>	S7	1	Approximately 610m south

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Shoulder-striped wainscot <i>Leucania comma</i>	S7	1	Approximately 1.48km south
White-letter hairstreak <i>Satyrrium w-album</i>	S7	4	Approximately 1.66km northwest
Beaded chestnut <i>Agrochola lychnidis</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Blood-vein <i>Timandra comae</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Brindled beauty <i>Lycia hirtaria</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Buff ermine <i>Spilosoma lutea</i>	S7	2	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Centre-barred sallow <i>Atethmia centrargo</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Dusky thorn <i>Ennomos fuscantaria</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Figure of eight <i>Diloba caeruleocephala</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Ghost moth <i>Hepialus humuli</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Grass rivulet <i>Perizoma albulata</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Green-brindled crescent <i>Allophyes oxyacanthae</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Knot grass <i>Acronicta rumicis</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Mottled rustic <i>Caradrina morpheus</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Mouse moth <i>Amphipyra tragopoginis</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Oak hook-tip <i>Watsonalla binaria</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Powdered quaker <i>Orthosia gracilis</i>	S7	2	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Rosy rustic <i>Hydraecia micacea</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Sallow <i>Cirrhia icteritia</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
September thorn <i>Ennomos erosaria</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Small phoenix <i>Ecliptopera silaceata</i>	S7	2	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Small square-spot <i>Diarsia rubi</i>	S7	2	Approximately 1.80km northwest, beyond the A550, in the River Alyn

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
White ermine <i>Spilosoma lubricipeda</i>	S7	1	Approximately 1.80km northwest, beyond the A550, in the River Alyn
Mammals			
Hedgehog <i>Erinaceus europaeus</i>	S7	20	Approximately 250m south
Brown long-eared bat <i>Plecotus auritus</i>	EPS, WCA5, S7	1	Approximately 1.32km south
Common pipistrelle <i>Pipistrellus pipistrellus</i>	EPS, WCA5, S7	1	Approximately 1.32km south
Myotis bat <i>Myotis sp.</i>	EPS, WCA5	1	Approximately 1.32km south
Pipistrelle bat <i>Pipistrellus sp.</i>	EPS, WCA5	2	Approximately 1.32km south
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	EPS, WCA5, S7	1	Approximately 1.32km south
Unidentified bat	EPS, WCA5	2	Approximately 1.36km south
Noctule <i>Nyctalus noctula</i>	EPS, WCA5, S7	1	Approximately 1.36km south
Brown hare <i>Lepus europaeus</i>	S7	5	Approximately 1.38km northeast
Otter <i>Lutra lutra</i>	EPS, WCA5, S7, LBAP	10	Approximately 1.45km southwest, beyond the A541, the River Alyn and the River Cegidog
Badger <i>Meles meles</i>	PBA, LBAP	50	Within 2.0km

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
<i>Plants</i>			
Canadian waterweed <i>Elodea canadensis</i>	WCA9	2	Approximately 370m southwest
Japanese rose <i>Rosa rugosa</i>	WCA9	1	Approximately 370m southwest
Nuttall's waterweed <i>Elodea nuttallii</i>	WCA9, IAS	1	Approximately 370m southwest
Parrot's-feather <i>Myriophyllum aquaticum</i>	WCA9, IAS	1	Approximately 370m southwest
Bluebell <i>Hyacinthoides non-scripta</i>	WCA8	20	Approximately 730m northwest
Himalayan balsam <i>Impatiens glandulifera</i>	WCA9, IAS	6	Approximately 1.15km west, beyond the River Alyn
Montbretia <i>Crocasmia x crocosmiiflora</i>	WCA9	3	Approximately 1.15km west, beyond the River Alyn
Variegated yellow archangel <i>Lamium galeobdolon subsp. argentatum</i>	WCA9	5	Approximately 1.15km west, beyond the River Alyn
Marsh fragrant-orchid <i>Gymnadenia densiflora</i>	S7	1	Approximately 1.32km south
Japanese knotweed <i>Fallopia japonica</i>	WCA9	2	Approximately 1.52km southwest, beyond the A541 and the River Alyn
<i>Rhododendron ponticum</i>	WCA9	4	Approximately 1.71km north

Name of Species	Legislation	Number of Records Returned	Closest Record to Site
Himalayan cotoneaster <i>Cotoneaster simonsii</i>	WCA9	1	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
Maidenhair spleenwort <i>Asplenium trichomanes</i>	S7	2	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
Wall cotoneaster <i>Cotoneaster horizontalis</i>	WCA9	1	Approximately 1.92km west, beyond the A550, the A541 and the River Alyn
<i>Reptiles</i>			
Grass snake <i>Natrix helvetica</i>	WCA5, S7	13	Adjacent to northern site boundary
Common lizard <i>Zootoca vivipara</i>	WCA5, S7	3	Approximately 440m east

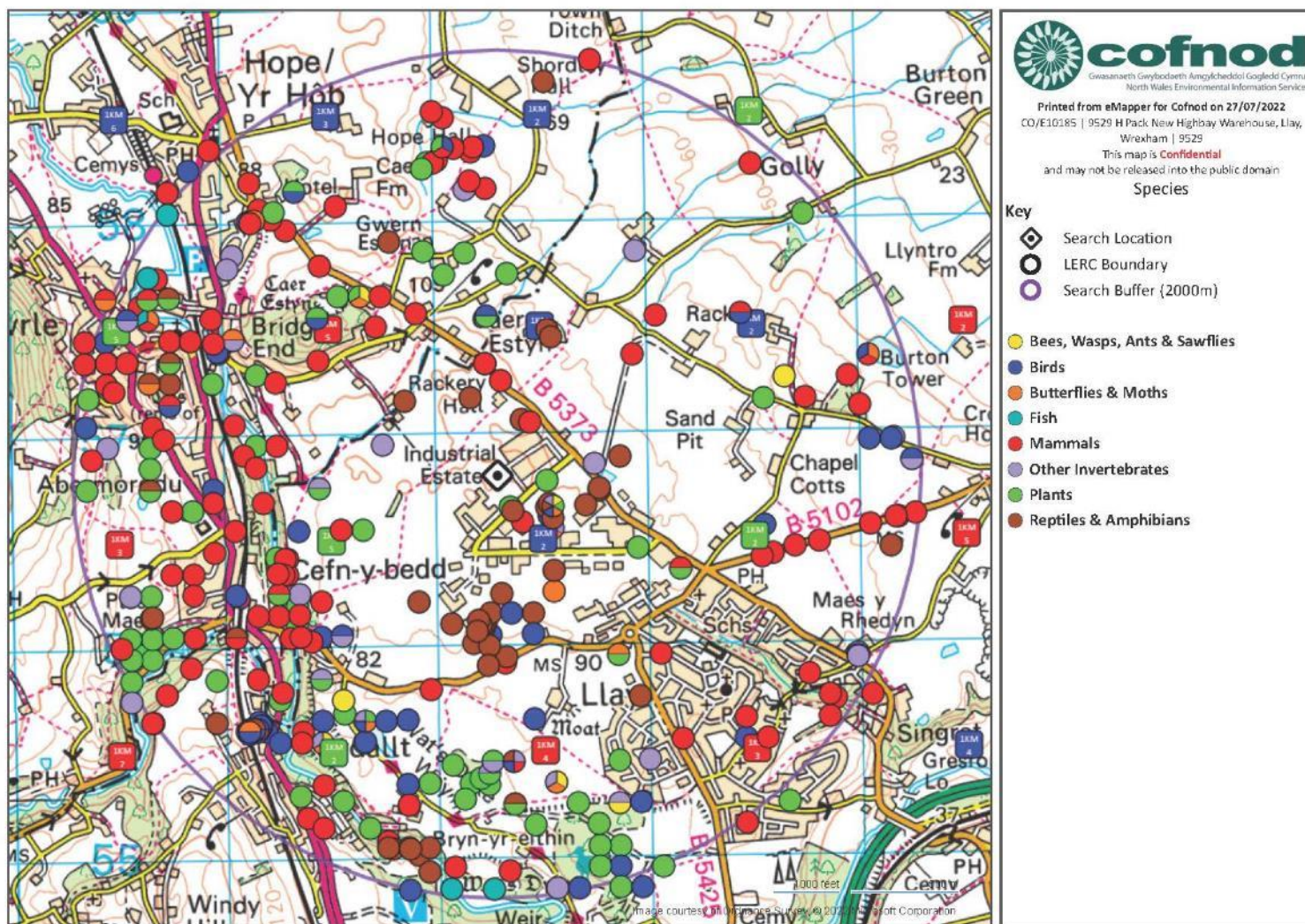


Figure 7: Notable Species Records within 2km of the Site



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Appendix B

Target Notes

Target Notes Report

Extended phase 1 survey 25th July 2022.

TN1

Southern portion of site which includes the main entrance. Comprised of hard-standing access road with short-mown modified grassland verge. Far southern corner of the site includes small electric utility compound fenced off with building and associated soft landscaping, including short-mown modified grassland, introduced shrubs, and scrub.

<i>Cornus sanguinea</i>	Dogwood	F
<i>Lolium perenne</i>	Perennial Ryegrass	F
<i>Achillea millefolium</i>	Yarrow	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Daucus carota</i>	Wild Carrot	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Prunella vulgaris</i>	Selfheal	O
<i>Rosa sp.</i>	Rose species	O
<i>Rubus fruticosus agg.</i>	Bramble	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Taraxacum officinale agg.</i>	Dandelion	O
<i>Trifolium dubium</i>	Lesser Trefoil	O
<i>Trifolium repens</i>	White Clover	O
<i>Ulex europaeus</i>	Gorse	O
<i>Hypochaeris radicata</i>	Common Cat's-ear	R
<i>Lapsana communis</i>	Nipplewort	R
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	R
<i>Potentilla reptans</i>	Creeping Cinquefoil	R

TN2

Central portion of site comprised of large area of short-mown modified grassland with typically low diversity, although some areas more species rich. Includes grassland road verge along western boundary. Grass species difficult to identify due to short sward height at the time of survey having recently been

<i>Holcus lanatus</i>	Yorkshire-fog	A
<i>Festuca rubra</i>	Red Fescue	F
<i>Lolium perenne</i>	Perennial Ryegrass	F
<i>Ranunculus repens</i>	Creeping Buttercup	F
<i>Arrhenatherum elatius</i>	False Oat-grass	O
<i>Centaurea nigra</i>	Knapweed	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Hypochaeris radicata</i>	Common Cat's-ear	O
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Potentilla reptans</i>	Creeping Cinquefoil	O
<i>Prunella vulgaris</i>	Selfheal	O
<i>Taraxacum officinale agg.</i>	Dandelion	O
<i>Trifolium dubium</i>	Lesser Trefoil	O
<i>Trifolium pratense</i>	Red Clover	O
<i>Trifolium repens</i>	White Clover	O
<i>Urtica dioica</i>	Nettle	O
<i>Epilobium hirsutum</i>	Great Willowherb	R
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Hypericum sp.</i>	St John's-wort	R
<i>Jacobaea vulgaris</i>	Common Ragwort	R
<i>Juncus effusus</i>	Soft Rush	R
<i>Vicia sp.</i>	Vetch species	R

KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

TN3

Linear stand of broadleaved woodland bounding the western and northern site boundaries. Large mature oak trees present at the outer extent with bat roost potential. Some fallen deadwood present. Trees with dense ivy covering in places. Understory comprised of dense and scattered scrub, with hawthorn abundant but mixed species present. Ground cover comprised of low growing bramble and rose, mixed with other species. Ditch which runs parallel to woodland separating habitat from the site dry at the time of survey. Transitions into dense scrub habitat beyond the ditch to the south and east.

<i>Crataegus monogyna</i>	Hawthorn	A
<i>Brachypodium sylvaticum</i>	False Brome	F
<i>Fraxinus excelsior</i>	Ash	F
<i>Hedera helix</i>	Ivy	F
<i>Prunus spinosa</i>	Blackthorn	F
<i>Quercus robur</i>	English Oak	F
<i>Rubus fruticosus agg.</i>	Bramble	F
<i>Acer pseudoplatanus</i>	Sycamore	O
<i>Aegopodium podagraria</i>	Ground-elder	O
<i>Calystegia sepium</i>	Hedge Bindweed	O
<i>Epilobium montanum</i>	Broad-leaved Willowherb	O
<i>Geum urbanum</i>	Wood Avens	O
<i>Ilex aquifolium</i>	Holly	O
<i>Lonicera periclymenum</i>	Honeysuckle	O
<i>Pteridium aquilinum</i>	Bracken	O
<i>Rosa canina agg.</i>	Dog Rose	O
<i>Rumex sanguineus</i>	Wood Dock	O
<i>Salix caprea</i>	Goat Willow	O
<i>Salix species</i>	Willow species	O
<i>Tamus communis</i>	Black Bryony	O
<i>Urtica dioica</i>	Nettle	O
<i>Betula pendula</i>	Silver Birch	R
<i>Carpinus betulus</i>	Hornbeam	R
<i>Epilobium hirsutum</i>	Great Willowherb	R
<i>Milium effusum</i>	Wood Millet	R
<i>Rubus idaeus</i>	Raspberry	R
<i>Silene dioica</i>	Red Campion	R
<i>Sorbus intermedia</i>	Swedish Whitebeam	R

TN4

Area of site comprised of garage building, covered on its western elevation by ivy and encroaching scrub. Negligible potential for bat roosts. Metal storage containers also present on hardstanding. Rubble piles and other debris and materials, and brash piles present which offer potential amphibian hibernacula. Area to rear/north and east of building comprised of modified grassland with tall ruderal described in more detail in TN6, and scrub habitat described in more detail in TN5.

TN5

Area of modified grassland and dense scrub habitat at the northern edge of the site, beyond which lies the woodland and drainage ditch (TN3). Scrub species listed; modified grassland species list similar to that of TN2.

<i>Rubus fruticosus agg.</i>	Bramble	A
<i>Crataegus monogyna</i>	Hawthorn	F
<i>Fraxinus excelsior</i>	Ash	F
<i>Prunus spinosa</i>	Blackthorn	O
<i>Quercus robur</i>	English Oak	O
<i>Salix species</i>	Willow species	O
<i>Ulex europaeus</i>	Gorse	O
<i>Acer pseudoplatanus</i>	Sycamore	R
<i>Rubus idaeus</i>	Raspberry	R

TN6

Area of taller grassland with abundant tall ruderal vegetation, offering potential cover. Forms transitional habitat between the short-mown grassland to the south and the dense scrub and woodland to the north. Scattered scrub also present.

<i>Dactylis glomerata</i>	Cock's-foot	A
<i>Arrhenatherum elatius</i>	False Oat-grass	F
<i>Cirsium arvense</i>	Creeping Thistle	F
<i>Festuca rubra</i>	Red Fescue	F
<i>Achillea millefolium</i>	Yarrow	O
<i>Centaurea nigra</i>	Knapweed	O
<i>Chamaenerion angustifolium</i>	Rosebay Willowherb	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Hippuris vulgaris</i>	Mare's-tail	O
<i>Jacobaea vulgaris</i>	Common Ragwort	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Poa annua</i>	Annual Meadow-grass	O
<i>Potentilla reptans</i>	Creeping Cinquefoil	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Salix species</i>	Willow species	O
<i>Urtica dioica</i>	Nettle	O
<i>Alchemilla vulgaris</i> agg.	Lady's-mantle	R
<i>Buddleja davidii</i>	Buddleia	R
<i>Galium album</i>	Hedge Bedstraw	R
<i>Geranium pratense</i>	Meadow Cranesbill	R
<i>Sonchus asper</i>	Prickly Sow-thistle	R

Appendix C

Environmental DNA (eDNA) GCN results

Client: Danielle Langton,
The Environment Partnership



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk
www.adas.uk

Sample ID: ADAS-4225 Condition on Receipt: Good Volume: Passed
Client Identifier: Pond 1 – Llay, Wrexham Description: pond water samples in preservative
Date of Receipt: 23/06/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	27/06/2022
Degradation Control [§]	Within Limits	Real Time PCR	27/06/2022
Great Crested Newt*	9 of 12 (GCN positive)	Real Time PCR	27/06/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	28/06/2022	Date of issue:	28/06/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Client: Danielle Langton,
The Environment Partnership



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
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www.adas.uk

Sample ID: ADAS-4226 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: Pond 2 – Llay, Wrexham Description: pond water samples in preservative
Date of Receipt: 23/06/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	27/06/2022
Degradation Control [§]	Within Limits	Real Time PCR	27/06/2022
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	27/06/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	28/06/2022	Date of issue:	28/06/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

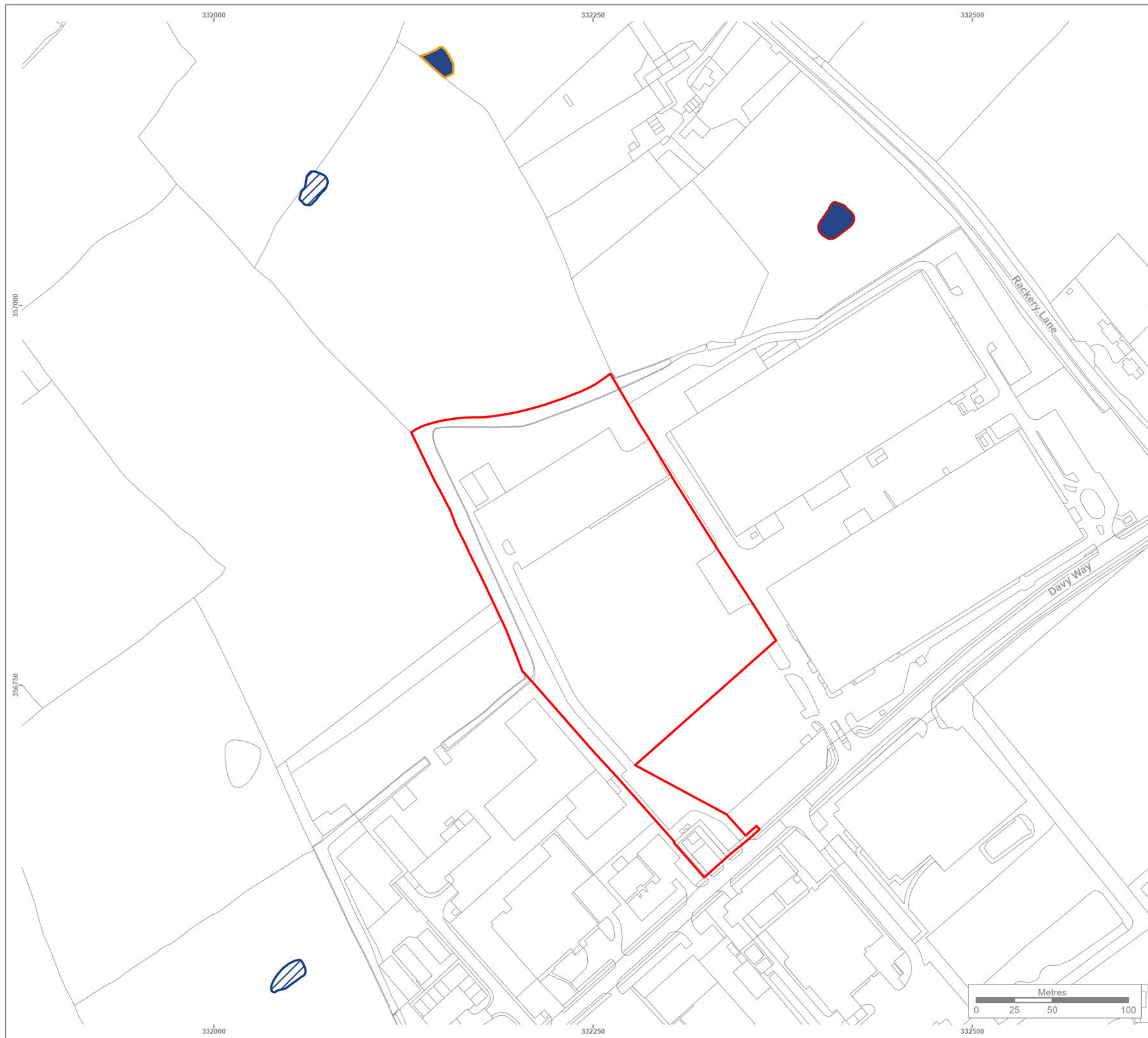
On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

Drawings

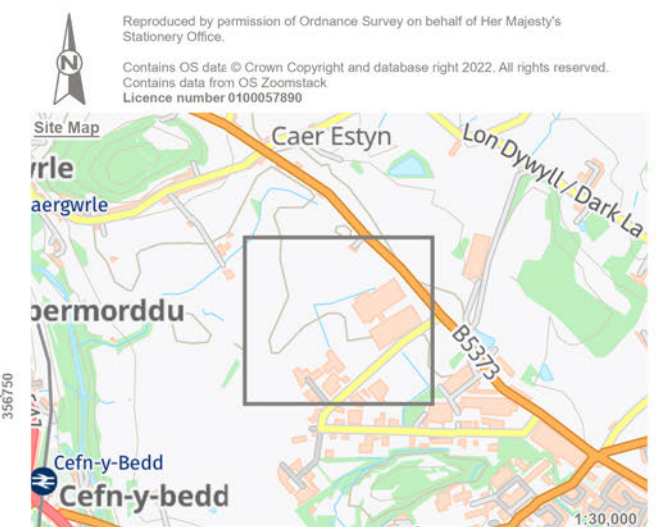
G9529.002 GCN Survey Results
G9529.010 Phase 1 Habitat Map



KEY

-  Site boundary
- Great Crested Newt Results**
-  Positive for Great Crested Newts
-  Negative for Great Crested Newts
-  Dry pond

Note:
The locations of habitats and habitat features are indicative.



Rev	Description	Drawn	Approved	Date

TEP | **THE ENVIRONMENT PARTNERSHIP**

Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
H-Pack, New Highbay Warehouse

Title
Great Crested Newt survey results

Drawing Number
G9529.002

Drawn	Checked	Approved	Scale	Date
JK	CB	PB	1:2,500 @ A3	20/07/2022

Page 2

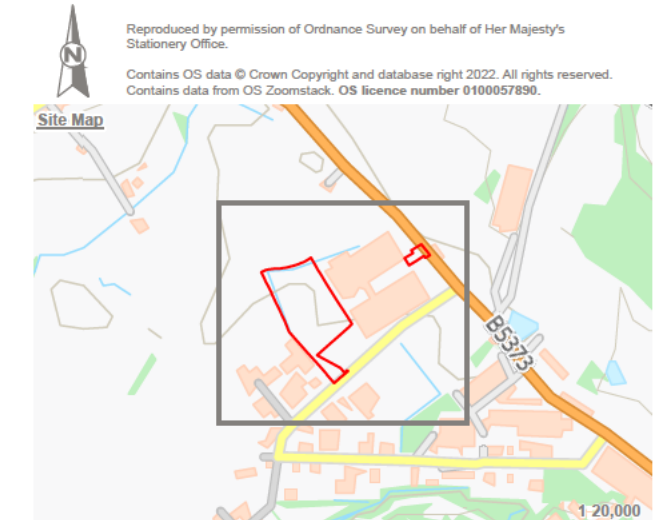
Page 3

KEY

- Site boundary
- Dry ditch
- Semi-natural broad-leaved woodland
- Dense/continuous scrub
- Modified neutral grassland
- Amenity grassland
- Introduced shrub
- Building
- Hardstanding

Note:

The locations of habitats and habitat features are indicative.



Rev	Description	Drawn	Approved	Date



Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www tep uk.com

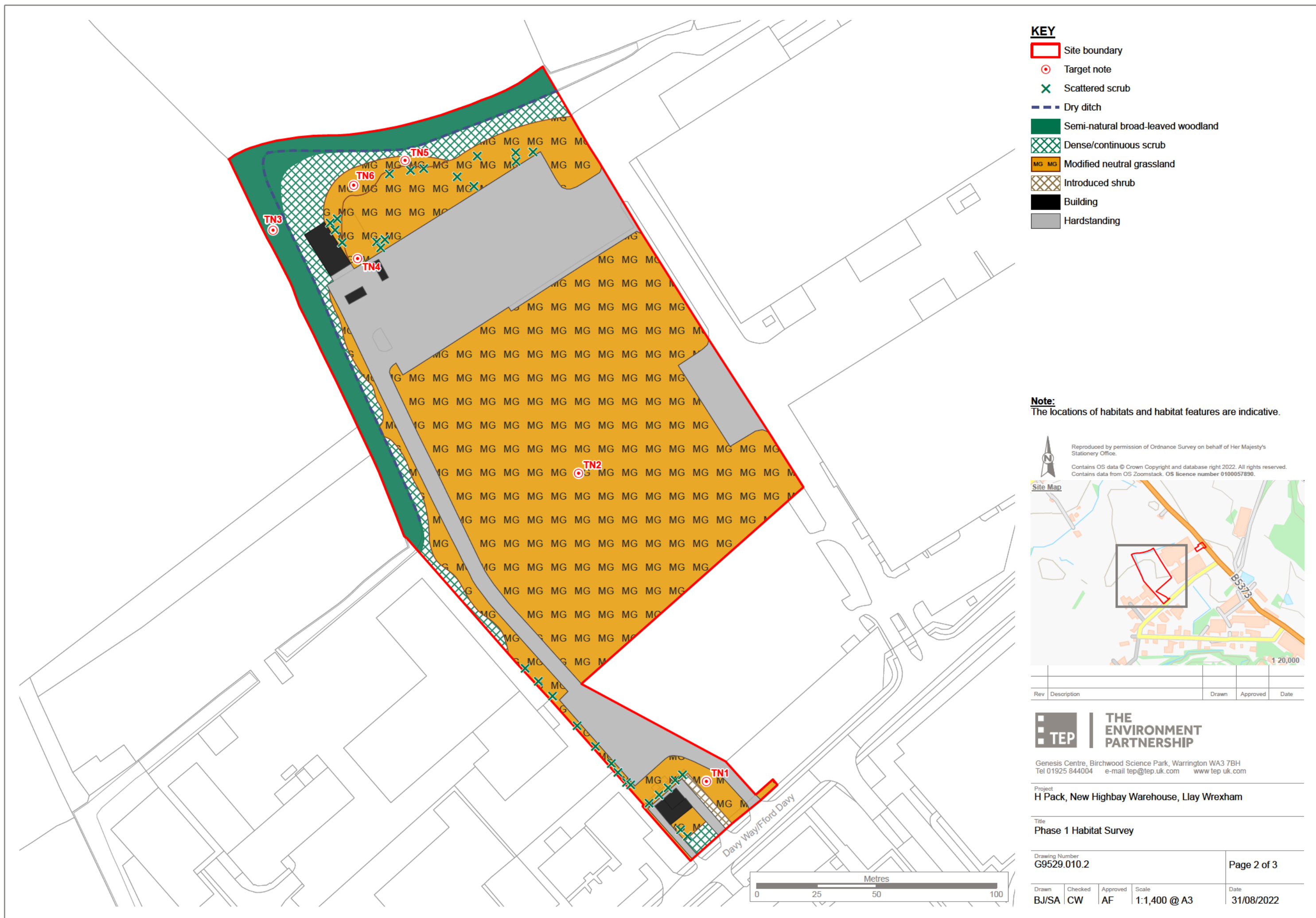
Project
H Pack, New Highbay Warehouse, Llay Wrexham

Title
Phase 1 Habitat Survey

Drawing Number
G9529.010.1

Page 1 of 3

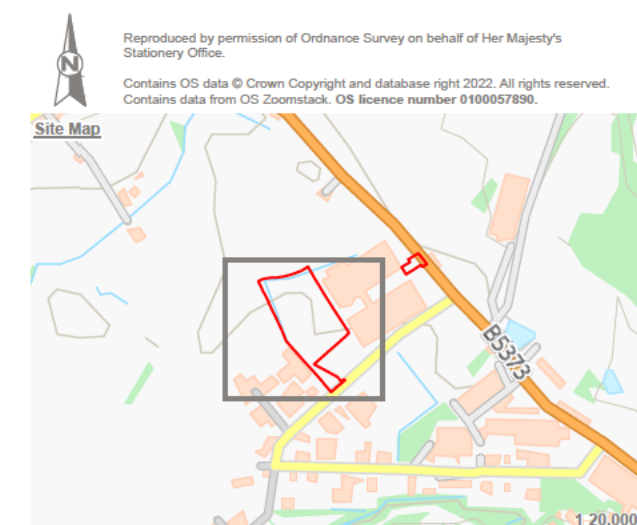
Drawn	Checked	Approved	Scale	Date
BJ/SA	CW	AF	1:2,200 @ A3	31/08/2022



KEY

- Site boundary
- Target note
- Scattered scrub
- Dry ditch
- Semi-natural broad-leaved woodland
- Dense/continuous scrub
- Modified neutral grassland
- Introduced shrub
- Building
- Hardstanding

Note:
The locations of habitats and habitat features are indicative.



Rev	Description	Drawn	Approved	Date

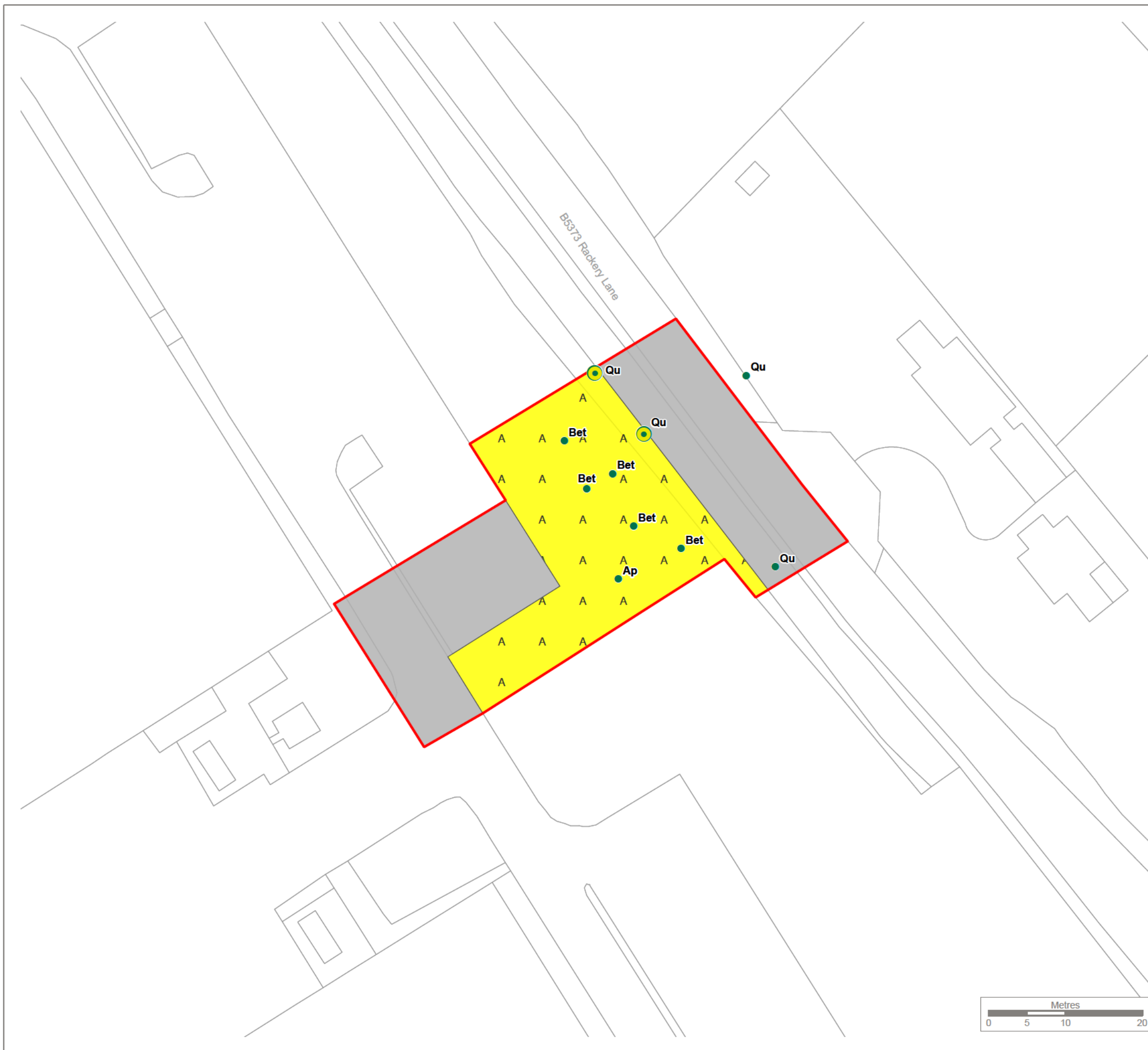


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Project
H Pack, New Highbay Warehouse, Llay Wrexham

Title
Phase 1 Habitat Survey

Drawing Number G9529.010.2				Page 2 of 3	
Drawn BJ/SA	Checked CW	Approved AF	Scale 1:1,400 @ A3	Date 31/08/2022	

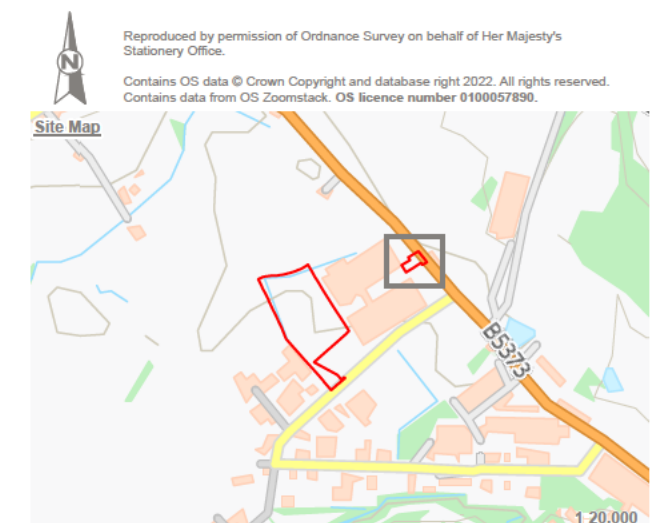


KEY

- Site boundary
- Scattered broad-leaved tree
- Broad-leaved tree with low bat suitability
- Amenity grassland
- Hardstanding
- Ap** Sycamore
- Bet** Birch species
- Qu** Oak

Note:

The locations of habitats and habitat features are indicative.



Rev	Description	Drawn	Approved	Date



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Project
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Title
Phase 1 Habitat Survey

Drawing Number G9529.010.3				Page 3 of 3
Drawn BJ/SA	Checked CW	Approved AF	Scale 1:500 @ A3	Date 31/08/2022



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