Ecological Assessment



Tyler Grange

Cefn Park, Wrexham

22nd February 2022

TG Report No. 13539_R02b_DM_NC

Report No:	Date	Revision	Author	Checked
13539_R02b	22st February 2022	B	Dale Mortiboys BSc (Hons) ACIEEM	Joseph Dance BSc (Hons) MCIEEM

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Contents:

Summary

Section 1: Introduction and Site Context 1

Section 2: Methodology 3

Section 3: Ecological Features and Evaluation 13

Section 4: Potential Ecological Impacts, Mitigation and Enhancement 26

Section 5: Conclusions and Recommendations 36

Appendices:

Appendix 1: Site Photographs

Appendix 2: Badger Survey

Appendix 3: Phase 1 Masterplan

Appendix 4: GCN eDNA Results

Plans:

Plan Title 13539/P01: Habitat Features

Plan Title 13539/P02: Badger Survey Results [Confidential]

Plan Title 13539/P03: Breeding Bird Survey Results

Plan Title 13539/P04: GCN Survey Results

Plan Title 13539/P06: Bat Transect and Static Locations

Plan Title 13539/P07: Bat Transect Results Plan

Summary

S.1. This report has been prepared by Tyler Grange Group Ltd (TG) on behalf of Harworth Group. It relates to a parcel of land at Cefn Road, Wrexham, which is proposed for residential development for the construction of residential dwellings (use class C3) with associated infrastructure and open space, with all matters reserved except for detailed means of primary highway access and internal spine road network with enabling works. The Proposals for Phase 1 are for 425 residential properties, with Future Phases offering up to a total of 1000 residential units. The report has been informed by a suite of ecological surveys undertaken in 2020 and 2021.

S.2. The report details the existing ecological baseline based on survey results, context in terms of legislative and planning policy, recommendations for future scheme design and any further work that will be required to support a planning submission.

S.3. The site lies within proximity of a four UK National Network sites – Midland Meres and Mosses Phase 2B Ramsar, River Dee and Bala Lake SAC, Johnstown Newt Sites SAC and Berwyn and South Clwyd Mountains SAC. To assess the potential impacts and determine any mitigation that may be required, a Habitat Regulations Assessment (HRA) may be required following consultation with Wrexham Council.

S.4. Habitats of ecological importance include broadleaved woodland, mature trees, hedgerows and a pond which have been retained and protected from future development proposals across all phases. Other habitats present include arable farmland, amenity grassland, scrub and tall ruderals, the loss of which is not considered to require any specific mitigation based on their negligible importance**.** Recommendations for green infrastructure/soft landscape design are made, however, to maximise the habitat value post-development and also the secondary value such habitats offer to the protected/notable species discussed in this report.

S.5. A high level of badger activity was recorded across the site, including two main setts, and several other active setts (refer to **Appendix 2** and **Plan 2**). Future development proposals should avoid any impacts within 30m of these setts. If impacts cannot be avoided, a mitigation strategy and Natural Resources Wales (NRW) licence will be required. Consideration of available foraging areas surrounding the badger setts should also be considered at planning stage.

S.6. Bat activity surveys in 2021 have confirmed a moderate level of commuting and foraging within and adjacent to the site from species which would be expected in the landscape and given the habitats present. No specific tree loss has been identified, so as yet no roost emergence surveys have been conducted on any trees within site.

S.7. An assemblage of bird species common and expected in the area were recorded through the suite of breeding bird surveys completed. No residual adverse impacts are expected on the ornithological value of the site and development across all phases provides opportunities to enhance the site for breeding birds of conservation concern. Recommendations are made in Section 5 of this report to this regard.

S.8. GCN have been confirmed present through full presence/absence surveys and eDNA surveys in the pond within the site plus two ponds offsite to the northeast. For this reason, a European Protected Species Licence (EPSL) will be required to allow development works to proceed and a

mitigation strategy is provided in this report which demonstrates how the Favourable Conservation Status of GCN will be maintained as a result of the development.

S.9. Invasive species: presence of invasive species- Japanese Knotweed within site – requirement for eradication / control programme, plus implementation of sensitive working practices.

S.10. The detailed design of the layout should include provisions to maintain connectivity throughout the site for hedgehog (i.e. hedgehog highways within garden fencing).

S.11. The mitigation and enhancement strategy should be controlled by appropriately worded planning controls devised to:

- Secure ecological inputs to a Construction and Environmental Management Plan (CEMP) to mitigate potential impacts to non-statutory sites, habitats and protected or priority species (badger, bats nesting birds, amphibians, hedgehog) during construction and site clearance;

- Secure a sensitively designed lighting scheme to mitigate potential impacts to foraging and commuting bats; and

- Secure the provision and implementation of a Landscape and Ecological Management Plan (LEMP) detailing measures for management of retained and newly created habitats, and enhancements for protected and priority species (bats, nesting birds, GCN), to ensure biodiversity benefits are maximised in the long term.

Section 1: Introduction

Introduction

1.1. This report has been prepared by Tyler Grange Group Ltd. (TG) on behalf of Harworth Group. It sets out the findings of ecological surveys in relation to a parcel of land at Cefn Road, Wrexham (OS Grid Reference SJ 3548 5092), which is proposed for phased residential development. The application area includes an area with an outline application for the 'Phase 1' area and wider area with no current proposal information referred to as 'Future Phases'. The proposals are for an outline planning application in Phase 1 for the construction of up to 1000 residential units within the site, an illustrative masterplan for which is provided in **Appendix 3**. The wider site as referred to in this report is the Full KSS2 (south) emerging draft allocation to provide for 1,080 dwellings with associated infrastructure and connective spine/link road with the KSS2 (northern) parcel.

1.2. Where a masterplan has been provided (Phase 1 development) a full discussion of impacts and recommendations has been made. Where no plans have been available for consultation (all Future Phases) it has not been possible to fully assess impacts and recommendations. These Future Phases will require independent Ecological Assessments. This report, however, uses data collected from the wider application site to inform the scope of future assessments and likely need for mitigation.

Context

1.3. The wider site covers an area of 52 hectares and comprises mainly arable fields and amenity grassland in use as playing fields bordered by hedgerows and mature trees; public footpaths also cross the site at several points. Cefn Road runs along the western site boundary, and Bryn Estyn Road along the northern boundary. Residential development lies to the north and west of the site, and agricultural fields to the south and east. Wrexham Industrial Estate is located 1.1km east of the site. The Phase 1 application covers an area of approximately 18.4ha.



Figure 1.1 – Site Boundary (Red Line – All Phases, Blue Line – Phase 1, White Area = inaccessible
(Aerial Imagery © Google 2022)

Purpose

1.4. This report sets out the ecological issues and opportunities to be considered in respect to the planning application and aims to:

- Using available background data and results of field surveys, describe and evaluate the ecological re-sources present within the likely 'Zone of Influence' (ZoI[1]) of the proposed development;
- Assess ecological issues and opportunities as a result of development of the site; and
- Where appropriate, describe mitigation and enhancement proposals to ensure conformity
- Describes the potential ecological constraints and opportunities that might arise as a result of the site's development;
- Where appropriate, makes recommendation for mitigation of adverse effects and ecological enhancement to ensure conformity with policy and legislation listed in **Appendix 1**; and
- Identifies any further work that may be required to support a planning application for future phases.
- The assessment and terminology used are consistent with the 'Guidelines for Preliminary Ecological Appraisals' (CIEEM 2017b) and 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018).

[1] Defined as the areas/resources that may be affected by the biophysical changes caused by activities associated with a project

Section 2: Methodology

2.1 The wider application site covered by this report includes an area that no surveyor access was granted to. This area includes the rugby club buildings and grounds. The extent of access is shown in the drawings for each survey, with the unassessed areas greyed out.

Data Search

2.2 The aim of the data search is to collate existing ecological records for the site and adjacent areas. Obtaining existing records is an important part of the assessment process as it provides information on issues that may not be apparent during a single survey, which by its nature provides only a 'snapshot' of the ecology of a given site.

2.3 The data search included a 10km search radius from site for European statutory sites and a 2km radius for national statutory and non-statutory sites and protected and priority species[2] records.

2.4 The following organisations and individuals have been contacted and, where relevant, the information provided has been incorporated with acknowledgement within this report:

- Cofnod - North Wales Environmental Information Service was contacted for protected and priority species and non-statutory sites within a 2km search radius from the site. The information was received in December 2021;
- Multi-Agency Geographic Information for the Countryside (MAGIC)[3] website was accessed for information on the location of European designated sites within 10km of the site and 2km for nationally designated sites;
- The Wrexham Council website was consulted for details of relevant local planning policies and supplementary planning guidance; and
- The Wrexham Biodiversity Action Plan was consulted for priority habitats and species subject to conservation action, to assist with the evaluation of ecological features and to inform site enhancement strategies.

Extended Phase One Habitat Survey

2.5 An initial site walkover survey was conducted on the 16th October 2020 by Laura Dennis, an experienced field ecologist. The weather was dry and cloudy, with an air temperature of 11°C and a slight breeze (Beaufort Scale 2). An update walkover survey was conducted by Dale Mortiboys on 8th December 2021. The weather was dry and cloudy, with an air temperature of 8°C and a strong wind(Beaufort Scale 4). Multiple visits in optimal season were also undertaken during other survey visits within the site to verify the results of the habitat surveys in terms of floral composition.

[2] UK priority species and habitats are those subject to conservation action and referred to as Species of Principal Importance (SoPIs) or Habitats of Principal Importance (HoPIs). They are listed at Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act states that local planning authorities must have regard for the conservation of both SoPIs and HoPIs.
[3] Accessed January 2022.

2.6 The methods used during the walkover survey followed methods used in an 'extended' Phase I habitat survey. The technique is based upon Phase I survey methodology (JNCC, 2010). This 'extended' Phase I technique provides an inventory of the habitat types present and dominant species. Relative abundance of species within each habitat was recorded using the DAFOR scale, where D – dominant, A – abundant, F – frequent, O – occasional, R – rare. Note was taken of the more conspicuous fauna, and any evidence of, or potential for the presence of protected / notable flora and fauna.

2.7 A basic inventory of the habitats and a representative species list was produced. Where access allowed, adjacent habitats were also considered, to assess the site within the wider landscape and to provide information with which to assess possible impacts within the context of the site boundary.

Limitations

2.8 Accessed was not granted to the rugby club area, so full survey coverage of the application area was not possible. It is understood that the rugby club area is part of the 'Future Phases', so this area will be surveyed at a later date. When assessing potential impacts of development in this area, viewing this area from the site boundary (coupled with professional judgement) was also undertaken to assess the broad habitats present and likely presence of protected species.

Badger Survey

2.9 A badger walkover survey was completed in line with good practice guidelines (Cresswell et al., 1989) by Dale Mortiboys of Tyler Grange in December 2021. This was a follow up survey from the initial walkover survey completed by Laura Dennis in October 2020. Signs of badger activity and the location of setts were recorded and marked with Global Positioning System (GPS). Signs which are indicative of badgers, include:

- setts;
- latrines;
- hairs;
- feeding signs;
- badger paths or 'runs';
- 'push-unders' beneath fencing or through scrub where any badger hairs are identified; and
- badger tracks.

2.10 The area surveyed encompassed all land within the site illustrated in Figure 1 above and all suitable habitat within 30m of the boundary, where accessible. The land within the rugby club was not accessible.

2.11 Each sett found was classified as a main, annexe, subsidiary or outlying sett. The definitions of the various sett categories are given in the **Table 2.1** (Harris et al, 1989).

Table 2.1. Classification of badger setts.

Type of Badger Sett	Description
Main	These usually have a large number of holes with large spoil heaps, and the setts generally look well used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to excessive digging or some other reason; it should be recorded as a disused main sett.
Annex	These are often close to a main sett, usually less than 150m away, and are usually connected to the main sett by one or more obvious well-worn paths. They usually have several holes, but may not be in use all the time even if the main sett is very active.
Subsidiary	These often only have a few holes. They are usually at least 50m from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.
Outlier	These usually have only one or two holes, often have little spoil outside the hole, with no obvious path connecting with another sett and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance hole), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape. Fox and rabbit tunnels are smaller and often taller than broad.

2.12 The current levels of badger activity were assessed for any setts found, using condition and number of holes. Three levels of activity were used for recording purposes as shown in **Table 2.2**.

Table 2.2. Indicators of use of badger setts.

Classification of Use	Description
Well-Used	Clear of debris and vegetation, obviously in regular use.
Partially-Used	Not in regular use, with large amounts leaves or twigs in entrance or moss and other plants growing around the entrance.
Disused	Partially or completely blocked entrances, unable to be used without a considerable amount of clearance.

2.13 The survey effort and the data recorded for each sett followed the standard methodology used in the two most recent national surveys of badgers (Cresswell et al 1990, Wilson et al 1997) as well as the recently published Scottish Badgers guidelines (2018).

2.14 The area was searched systematically, with particular attention paid to areas where the vegetation and/or the topography offered good suitability for sett creation. Areas with dense ground cover (hedges, scrub, woodland, etc) were examined closely; if the vegetation prevented entry, then the perimeter was examined, in order to detect paths suggesting a hidden sett within the area.

2.15 Each of the sett entrances was mapped and examined to determine the level of activity and the tunnel direction.

2.16 The locations of hairs, footprints, pathways, dung pits and feeding signs were recorded to aid understanding of how badgers use the site. Where pathways were confirmed as badger pathways, i.e. there was a clear link to a sett or there was additional evidence of badger activity nearby (such as dung pits, feeding signs or hairs/footprints), these were also noted on the map. If no specific badger activity was recorded, paths were marked as general animal paths (i.e. could be used by deer or fox, as well as badger).

2.17 The 'foraging potential' of areas within the survey area was determined by a subjective assessment of the availability and number of potential food sources. Thus, areas such as short grazed permanent pasture enclosed by a network of dense hedges, which can provide badgers with a variety of opportunities for foraging throughout the year, were classified as 'good potential foraging'. Foraging opportunities in arable or grass-ley fields, woodland or scrub, can be limited by the season and the management regime, and so were classified as 'moderate potential'. Arable crops and other areas with no food value for badgers were considered 'poor potential foraging'.

Limitations

2.18 It should be noted that badger survey information is accurate at the time of survey; badgers are mobile animals and may dig new setts, abandon old setts and change the status of existing setts (e.g. extend an annexe sett to create a main sett) at any time. Furthermore, classification of setts is based on the best available evidence at the time of survey; however, there is a degree of overlap in these classifications, therefore clear distinctions are not always possible from a one-off inspection survey.

2.19 The weather during the initial badger walkover provided good conditions for the survey. The preceding weather was not too cold, putting no limitation on recent badger movement.

2.20 No significant limitations to the surveys completed were noted. Not all land within 30m of the site boundary could be accessed to complete a badger survey, but this land could be viewed from the boundary of the site and consisted of residential properties and fenced gardens, considered to be sub optimal for sett creation. The rugby club land could not be accessed so no commentary regarding the presence or absence of badgers in this land is made.

Bat Activity Assessment

2.21 The surveys followed standard methodologies set out in the Bat Mitigation Guidelines (Mitchell-Jones, A.J., 2004), the Bat Workers Manual (Mitchell-Jones, A.J. and McLeish, A.P., 2004) and Bat Surveys - Good Practice Guidelines (Collins, 2016).

Activity Surveys – Transects

2.22 Activity surveys were conducted once per month between May and October 2021. These surveys were carried out to establish the use of the site by commuting and/or foraging bats that may roost within the vicinity. The dates, times, weather conditions and surveyor names are provided in **Table 2.3**, below. Surveyors used a combination of direct visual observation and echolocation detection techniques to identify any bat activity on the site. In line with survey guidelines, the surveys started approximately at sunset and ended up to two hours after sunset.

Table 2.3. Survey dates, times, weather conditions and surveyor names during activity surveys.

Sur-vey	Date	Survey times	Weather conditions	Surveyors and equipment
1	25/05/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	Amy Sherwin AnaBat Express & BatBox Duet
2	15/06/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	Tasha Hesketh Sophie Kirk AnaBat Express & BatBox Duet
3	12/07/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	Steven Coyne & Elizabeth Barrett AnaBat Express & BatBox Duet
4	09/08/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	AnaBat Express & BatBox Duet Elekon BatLogger M2
5	16/09/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	AnaBat Express & BatBox Duet Elekon BatLogger M2
6	20/10/21	Start: Sunset: End:	Wind (Beaufort): Temp (°C): Precipitation: None Cloud (%):	AnaBat Express & BatBox Duet Elekon BatLogger M2

2.23 The route covered field boundaries and potential features of interest on the site such as mature trees and woodland, areas of scrub, hedgerows, and woodland tracks (see **Drawing Plan 13539/P06**for transect routes).

2.24 Anabat Express and Elekon BatLogger M2 detectors were used throughout surveys; the BatLogger detector was used for active monitoring and full spectrum recording whilst the Anabat Express detectors for recording in zero crossing format. AnalookW, Anabat Insight and BatExplorer software was used to confirm the identification of bat calls recorded in the field.

Activity Surveys – Static Detectors

2.25 Further activity data was obtained from the deployment of a static bat detector per activity transect visit. The detector locations are shown on **Drawing Plan 13539/P06**

2.26 During each visit, two detectors were set to record for a minimum of five nights and were programmed to begin recording 30 minutes before sunset and continue to record until 30 minutes after sunrise. The dates and weather conditions for the automated survey are shown in **Table 2.4**, below.

Table 2.4. Survey dates, locations and weather conditions during static detector surveys (*obtained from wunderground.com from the nearest weather station at Wrexham).

Visit	Month	Dates Deployed	Overnight Weather Conditions (min max temp °C, min & max wind mph, precipitation*)
1	May	26-30/05/21	4-18 2-43 No precipitation
2	June	16-20/06/21	6-21 2-24 No precipitation
3	July	13-17/07/21	5-21 0-37 No precipitation
4	August	10-14/08/21	4-18 2-43 No precipitation
5	September	7-11/09/21*	6-21 2-24 No precipitation
6	October	21-25/10/21	5-21 0-37 No precipitation

*One of the dectectors failed after the 4th night so only recorded 07-10/09/21

Survey limitations

2.27 Bat surveys are subject to numerous variables. The echolocation calls of species such as brown long-eared bats are of low amplitude and may not always be picked up on bat detectors. Survey results represent a sample of bat activity during the surveys; it is possible that bats may use the site at other times.

2.28 Bat calls cannot always be identified to species level, either due to distant contacts or the similarity between some types of bats. Where this occurs, it is recorded as 'unidentified bat species' (Unid) or will show which bat species it is likely to be (e.g. *Pipistrelle* sp. / *Myotis* sp.).

2.29 As data from these deployments have been analysed for five nights, the influence of these weather events should not significantly changes the overall results of these surveys, and therefore the interpretation and assessments of impacts.

2.30 During the September deployment of static detectors one of the detectors failed on the final night and only recorded for four complete nights. This is not considered to be a significant constraint given the results obtained and amount of data recorded across the season.

2.31 The site boundary covered by the application includes areas that no access was granted to in the 2021 season, this includes the rugby club grounds (illustrated in **Figure 1** and the drawings appended to this report). To ameliorate, worst-case assumptions regarding bat presence in the unsurveyed land have been made in the conclusions.

Breeding Bird Surveys

2.32 The scope of the surveys included the area subject to the proposed development (see **Plan 13539/P03**) – Breeding Bird Survey Results) across all phases. Four separate survey visits were undertaken by suitably qualified ecologists experienced in undertaking bird surveys. The method used was based on a territory mapping methodology in accordance with published guidance (Bibby et al 2000, Gilbert et al 1998). The survey dates, times and weather conditions are presented in **Table.2.5**.

Table 2.5: Survey date, time and weather conditions.

Visit	Date	Time	Weather	Surveyors
1	12/05/2020	06:15 – 08:00	Wind: Beaufort Scale (BFS) 0, cloud: 10%, pre-cipitation: none, temperature 5-7°C	Joseph Dance Nick Bell
2	28/05/2021	06:00 – 08:45	Wind: BFS 1, cloud: 50%, precipitation: none, temperature 2°C	Richard Castell
3	15/06/2021	05.45 – 08:00	Wind: BFS 0, cloud: 10%, precipitation: none; temperature: 10°C	Joseph Dance
4	21/06/2021	06:00 – 08:30	Wind: BFS 2, cloud 75%, precipitation: none; temperature: 11-14°C	Richard Castell

2.33 The survey visits were conducted during the period between one hour after sunrise and approximately 09:00, as this is considered to be the best time to record bird breeding activity. The identity and activity of all birds, either seen or heard, were recorded on maps of a suitable scale.

2.34 Although the same survey route was used during all visits, the starting point and survey direction were alternated during each survey so that all areas were covered at varied times after sunrise to ensure even coverage during the peak period of bird activity.

2.35 On each survey, bird activity likely to indicate breeding was recorded on a map. Species were noted using the standard British Trust for Ornithology (BTO) codes. Behaviour considered likely to indicate breeding included: singing, display flights, mating and courtship displays, nesting, carrying of nesting material and birds showing fidelity to a particular patch of ground or vegetation. An aggregation of two or more sightings of a species was taken to be an indication that breeding was likely. Also, if specific behaviours (such as the gathering of nest material, copulations, adults carrying food or recently fledged young) were observed, this was also taken to indicate breeding.

2.36 'Probable' breeding status was attributed to those species that were regularly recorded within the site in proximity to suitable nesting habitat but with insufficient data to confirm breeding. 'Possible' breeding status was attributed to those species that were recorded within the site and with a general lack of suitable nesting habitat present within the site.

2.37 Over-flying birds such as corvids, woodpigeons and black-headed gulls were not recorded.

2.38 The results of each visit were then transcribed onto a summary map in order to identify species showing fidelity to areas of habitat over several site visits.

2.39 The conservation status of the birds observed was ascertained through consultation of national, regional and local bird reports.

Survey limitations

2.40 An April survey visit was not possible so an extra survey visit (typically only three survey visits are required between April and June for territory mapping purposes) was undertaken. Given the generally low ornithological interest recorded within the site, and using worst-case assumptions regarding species which may have been missed, this is not expected to have altered the conclusions made in this report.

2.41 As with the other surveys completed, access to the rugby club area was not permitted. Discussions are provided in this report regarding the likely value of this area to breeding birds based on viewing from the site boundaries and professional judgement.

Great Crested Newt Surveys

2.42 The general area of Wrexham which surrounds the site has been surveyed extensively for GCN in recent years and consultation was therefore undertaken with Wrexham's ecologist, Emma Broad, in May 2021 to establish the extent of survey effort. It was agreed that a proportionate survey effort would be to undertake a single traditional presence/likely absence survey of all ponds within and adjacent to the site, followed by an eDNA survey. This was confirmed in email correspondence dated the 17th of May and reproduced in **Appendix 4**.

Presence/Likely absence surveys

2.43 A single GCN presence/absence survey of the waterbodies within and adjacent to the site was carried out by a pair of experienced ecologists in May 2021 in accordance with recommended guidelines (English Nature, 2001). The surveyors acted as an accredited agent under Natural Resource Wales Survey Licence reference S089282/1, with full surveyor details provided in the table below. The location of each pond is presented in drawing xx appended to this report.

2.44 Each waterbody was surveyed using three out of the following four different methods:

- Egg searching: Although the data cannot be used to estimate population size it indicates the presence of breeding adults. All suitable submerged vegetation was carefully searched for GCN eggs which are characteristically folded individually in the submerged leaves of aquatic vegetation;

- Bottle Trapping: Setting of bottle traps (where waterbody conditions allowed). This involved the use of funnel traps (made from 2 litre clear plastic bottles) that were secured in the water at 2m intervals around the margin in the evening before dark, and left overnight to be checked and any caught animals released the following morning;

- Torch survey: The accessible margins of the waterbody were slowly walked over, searching the margins by torchlight (with torches of one million candlepower) for GCN and other amphibians; and

- Netting: Nets with a rigid metal frame and a mesh of approximately 2-3mm were used around the perimeter of the pond to net every two meters of shoreline. Netting is preferably done through aquatic vegetation in order to maximise the likelihood of catching GCN and other amphibians. This method was only used when one of the above three methods was not possible.

2.45 All amphibians observed were counted and where possible identified to species, sex and life stage. Survey dates and weather conditions are detailed in Table 2.6 below.

Visit	Waterbodies Surveyed	Date	Weather conditions	Air temperature during torching	Surveyors	Notes
1	1, 2, 3, 4, 5, 6, 7	17 – 18.05.2021	Wind BFS 2-3, Cloud 40%, no rain, 6/7°C overnight minimum temperature	8°C	John Moorcroft Sophie Kirk	None – see results for individual pond notes

Table 2.6 – GCN Survey Details

eDNA

2.46 Following on from the presence/absence surveys, eDNA samples of ponds were undertaken on the 10th of June 2021 by Amy Sherwin (NRW GCN Licenced Surveyor Ref S089282/1) and assisted by Tasha Hesketh, who are both appropriately experienced in undertaking such surveys.

2.47 As per guidance by the kit supplier, a total of 20 samples of water were collected from the perimeter of each pond. Due care and attention was observed during the sampling to avoid stirring up sediment and to take samples covering the full extent of the pond including clear areas of water, deeper areas of the pond and areas close to potential egg laying substrate. Samples were returned to NatureMetrics on the same/following day for analysis.

Limitations

2.48 No limitations to survey were noted, other than utilising alternative methodologies during the presence/absence surveys on each pond, which is discussed in the results section of this report.

Evaluation

2.49 The habitats and species in this ecological appraisal were evaluated using published guidance produced by CIEEM. The level of value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, local and lastly, within the context of the site itself.

2.50 Value judgements are based on various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include site designations (such as Sites of Special Scientific Interest (SSSIs)), or for undesignated features, the size, conservation status (locally, nationally or internationally) and the quality of the ecological resource. In terms of the latter, 'quality' can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats), or species populations or assemblages.

Quality Assurance

2.51 All ecologists at Tyler Grange Group Ltd. are members of CIEEM or are working towards membership and act under direction of members and abide by the Institute's Code of Professional Conduct.

2.52 This report is partly based on 3rd party data, of which Tyler Grange cannot guarantee the accuracy.

2.53 The findings of this report are valid at the time of writing. Owing to the dynamic nature of ecological resources, if more than 12 months have elapsed since the time of survey (i.e. 5th January 2023), advice should be sought to determine whether update work is required. The findings of the report should not be relied upon within this advice.

Section 3: Ecological Features and Evaluation

Designated Sites

Statutory Protected Sites

3.1. Four UK National Network statutory sites are located within 10km of the site and these are identified as follows:

- Midland Meres and Mosses Phase 2B Ramsar – 2.5km north, designated for the diverse range of habitats from open water to raised bog;
- River Dee and Bala Lake Special Area of Conservation (SAC) – 5.8km east, designated for the presence of Annex I habitat 3260 *'Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation'* and the Annex II species Atlantic Salmon *Salmo salar* and floating water-plantain *Luronium natans*, along with the Annex II species Sea lamprey *Petromyzon marinus*, Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis*, bullhead *Cottus gobio* and otter *Lutra lutra*;
- Johnstown Newt Sites SAC – 5.2km south-west; and
- Berwyn and South Clwyd Mountains SAC – 8.1km west, designated for the presence of Annex I habitats 4030 *'European dry heaths'* and 7130 *'Blanket Bogs'*, along with 6210 *'Semi-natural dry grasslands and scrubland facies on calcareous substrates'*, 7140 *'Transition mires and quaking bogs'*, 8120 *'Calcareous and calcshist screes of the montane to alpine levels'* and 8210 *'Calcareous rocky slopes with chasmophytic vegetation'*.

3.2. There were no national statutory designated sites (Sites of Special Scientific Interest (SSSIs), National Nature Reserves, or Local Nature Reserves) within 2 km of the site boundary. The site is within a SSSI Impact Risk Zone for more distant SSSIs but only for livestock/poultry units and general combustion processes. On this basis, Natural Resources Wales do not need to be consulted further.

Non-statutory Designated Sites

3.3. The data search returned 5 non-statutory designated sites within 5 km of the site boundary. All of these were Local Wildlife Sites (LWSs):

- Cefn Park 825m to the South East of the Site. A series of broadleaved woodlands within Cefn Park Estate.
- Borras Bog. 1.05km to the North of the Site. An acid bog with birch canopy that is in excellent condition and unusual for the Wrexham area.
- Errdig Estate. 1.5km to the South West of the Site. National Trust estate with woodlands, semi-improved neutral grasslands and marshes.
- Wrexham Industrial Estate. 2.5km to the South East of the Site.
- Pant Yr Ochain. 2.3km to the North of the Site. Historic Inn with surrounding habitats.

Habitats within Site

3.4. The habitats present on site are summarised below, along with a description of the composition of the main plant species present and an assessment of their ecological importance. The location of the habitats are shown on the Habitats Features Plan (see **13539/P01**).

- Amenity grassland;
- Arable;
- Buildings, and bare ground;
- Hedgerows;
- Invasive Non-native Species (Japanese knotweed);
- Pond;
- Scrub;
- Semi-natural broadleaved woodland and Scattered Trees; and
- Tall ruderals.

3.5. For ease of reference, habitat types have been described alphabetically, below.

Arable

3.6. A large proportion of the site is given over to arable crop production, mostly maize. At the time of the survey all fields had been harvested and left as stubble, except one in the south-east which was fallow. This habitat type is of **negligible ecological importance**.

Amenity Grassland

3.7. Areas of amenity grassland are present towards the north and west of the site. One section forms part of a local rugby club (inaccessible but viewed from the site boundaries), and the rest is used for informal sports pitch and public recreation. All areas are maintained as short-mown grassland and are dominated by common grasses and forbs. The survey was undertaken in sub-optimal conditions, and the shortness of the sward made a full species record difficult, but species present include cock's-foot *Dactylis glomerata* (A), white clover *Trifolium repens* (A), greater plantain *Plantago lanceolata* (F), dandelion *Taraxacum officinale agg.* (F), ragwort *Senecio jacobaea* (O) and chickweed *Stellaria media* (O). This habitat type is of **negligible ecological importance**.

Buildings and Bare Ground

3.8. Two buildings associated with the rugby club are in the north of the site, inspected from site boundaries. An area of bare ground, which acts as a car park for the rugby club is also present. These habitats have no inherent ecological value and are of **negligible ecological importance** but may be of importance for bats (discussed below). These buildings have not been surveyed and require detailed inspections prior to discussion of their importance to bats as roosting resource.

Hedgerows

3.9. A network of hedgerows is present along field boundaries throughout the site. They vary in condition, but include examples of species-rich, intact hedgerows with mature trees. Most are dominated by Hawthorn *Crataegus monogyna,* (D) or holly *Ilex europaeus* (A), but other species present include elder *Sambucus nigra* (F), hazel *Corylus avellana* (O), sycamore *Acer pseudoplatanus* (O), and pedunculate oak *Quercus robur* (O). The hedgerows provide habitat connectivity through the site and to habitats beyond the site boundary and collectively are of **local ecological importance**.

Invasive Non-native Species

3.10. A stand of Japanese knotweed *Reynoutria japonica* is present at the boundary of the amenity grassland in the west of the site. This is of **negligible ecological importance**, but a strategy for treatment and/or removal will be required prior to development to adhere to current legislation (Schedule 8 of the WCA 1981).

Pond

3.11. A pond is present within woodland at the west of the site. It is shallow and heavily shaded by woodland vegetation throughout the year. Very little aquatic or marginal vegetation is established, and the waterbody is full of leaf litter. It provides aquatic habitat not present elsewhere on the site but is of **ecological importance within the context of the site only**. It also provides breeding habitat for great crested newt *Triturus cristatus* (discussed below).

3.12. A small and very shallow ephemeral pool was noted in the centre of the south-eastern parcel of arable land in May 2021, which subsequently dried up during the course of the species surveys completed within the site. This habitat is considered to be of **negligible ecological importance**.

Scrub

3.13. Small areas of scrub are distributed through the site which include areas dominated by bramble *Rubus fruticosus agg* (D), and other areas of mixed scrub including hawthorn (A), holly (F), hazel (F) and blackthorn *Prunus spinosa* (O). An area of scrub is also present in the north of the site, which is dominated by coppiced willow *Salix sp.* (O)

3.14. The scrub is of **negligible ecological importance** but is likely to provide foraging and nesting opportunities for wildlife including birds and small mammals.

Semi-natural broadleaved woodland and Scattered Trees

3.15. A block of semi-natural broadleaved woodland is located in the west of the site, at the centre of the amenity grassland area. The canopy is dominated by oak, with ash *Fraxinus excelsior* (F), silver birch *Betula pendula* (F), cherry *Prunus avium* (O) and hazel (O). The understorey is mostly holly (A) and hawthorn (A) and the field layer is dominated by common nettle *Urtica dioica.*

3.16. A number of scattered mature trees are also present which are mostly located within the amenity grassland at the west of the site, with additional specimens present within some of the hedgerows. Species include pedunculate oak and sycamore.

3.17. These habitats are of **local ecological importance**. The woodland and mature trees also provide foraging and nesting habitat for a range of species, including birds and amphibians.

Tall Ruderals

3.18. Several areas dominated by tall ruderal vegetation are present, mostly associated with arable field boundaries. Species include common nettle (A), hogweed *Heracleum spondylium* (F), cow parsley (F) and bracken *Pteridium aquilinum* (O). The tall ruderal is of **negligible ecological importance** but is likely to provide foraging and nesting opportunities for wildlife including birds and small mammals.

Adjacent Habitats

3.19. Areas of woodland lie directly adjacent to the site boundary in the north-east (part of Erlas House) and south-east (Fox Covert). Arable land lay to the south and east of site. To the west and north there are residential properties.

Fauna

Badger

3.20. The data search returned 51 records of badger within 2km of the site in the past ten years, with several within the site itself.

3.21. A high level of badger activity was recorded across the site, including two main setts, and several other active setts (refer to **Appendix 2** and **Plan 2**).

Bats

3.22. The Data search returned 60+ records of bats within 2km of the site. A known lesser horseshoe bat *Rhinolophus hipposideros* maternity roost is present within the Erlas Victorian estate adjacent to the north west corner of the site with the roost being approx. 100m from the wider application boundary.

3.23. The following bat species were also recorded in flight in the locality: common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus,* pipistrelle species *Pipistrellus*, noctule *Nyctalus noctula,* Brown Long-eared bat *Plecotus auratus,* Daubenton's bat *Myotis daubentonii*, Brandt's bat *Myotis brandtii,* Whiskered bat *Myotis mystacinus* myotis bat Myotis, Lesser horseshoe bat *Rhinolophus hipposideros* and unidentified bat Chiroptera. The nearest records were present within the site boundary.

3.24. The wider site offers roosting potential for bats within the trees and in the buildings associated with the rugby club. Further surveys will be needed to assess the potential of these habitats and possible further once a plan showing loss is generated. The tree loss plan for Phase 1 was generated recently and as such it has not been possible to visit site and assess the trees identified as being removed for bat roosting potential. This requirement is discussed in later sections.

Transect Activity Survey

3.25. A total of 287 bat passes were recorded during the transect survey visits. These passes were from four distinct species and two species groups which were:

- common pipistrelle (184 passes);
- soprano pipistrelle (78 passes);
- noctule (12 passes);
- *Myotis* species group (9 passes);
- *Pipistrelle* species group (2 passes).

3.26. . Common pipistrelle were recorded in visits 1-5. All species were recorded in visits 3-5 suggesting widespread use of the site during the summer months by a variety of species.

3.27. Activity was recorded along most field boundaries with trees lines, hedgerows and other linear features. Notable bat activity hotspots were identified at the hedgerows in the centre of site.

3.28. Activity relating to the more light-intolerant species, i.e. *Myotis* group bats, was recorded adjacent to the southern boundary of the site as well as the centre of the site and larger fields. This is to be anticipated as the site is largely unlit and well connected to the wider landscape with woodlands blocks and hedgerows.

3.29. Figure **3.1** and **Table 3.1** shows the number of passes recorded for each species on each visit. **Drawing Plan 13539/P07** shows the spatial distribution of these bat records.

Figure 3.1. Summary of bat passes for each species during each activity survey visit.

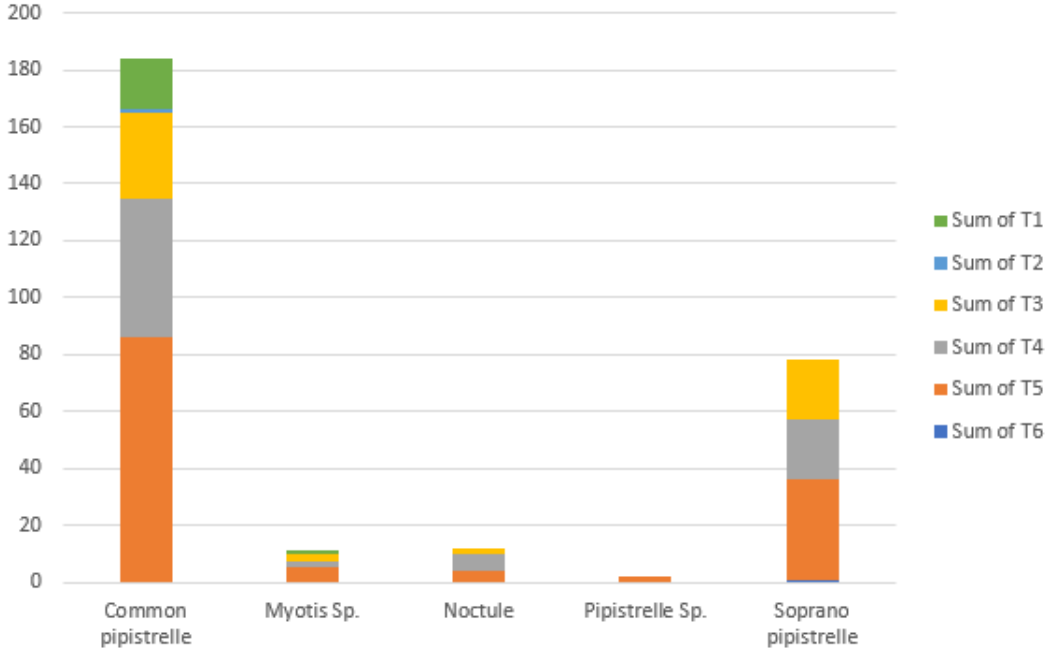


Table 3.1 **Summary of bat passes for each species during each activity survey visit.**

Species	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Total
Soprano pipistrelle	0	0	21	21	35	1	78
Noctule	0	0	2	6	4	0	12
Common pipistrelle	18	1	30	49	86	0	184
Myotis sp.	1	0	3	2	5	0	9
Pipistrelle sp.	0	0	0	0	2	0	2

Activity Surveys – Static Detectors

3.30. A total of4973 bat passes were recorded during the static detector visits. These passes were from:

- common pipistrelle (3035 passes);
- soprano pipistrelle (1367 passes);
- *Myotis* species bats (138 passes);
- noctule (269 passes);
- lesser horseshoe bat (2 passes);
- brown long-eared (34 passes);
- Myotis Sp./brown long-eared bat (26 passes); and
- Unidentified *Pipistrelle* bat species (102 passes).

3.31. Common pipistrelle was the most commonly recorded bat group with over 60% of all passes attributed to this species. Of the 3035 common pipistrelle recordings, 1331 of these were recorded during the second visit, however the species was recorded across all recording locations and visits.

3.32. Soprano pipistrelle was also a consistently recorded species during each individual static monitoring period.

3.33. Light intolerant species (*Myotis* group bats and brown long-eared) were record at all locations although both were noted inconsistently across recording locations. This could in part be due to the habitat and flying behaviour typically adopted by these species as well as the very quiet calls of brown long-eared bats limiting successful recording rates.

3.34. Lesser horseshoe bats are known to be roosting in the wider area with a maternity colony noted immediately to the north of the wider site application boundary. These species was recorded only in small levels. This could be in part due to the quiet and directional nature of this species echolocation calls. This species is also known to commute large distances using hedgerows, as recording locations for the detectors covered hedgerows as well as woodland and open field habitat it is to be anticipated that the survey effort deployed had inconsistent recording success of this species.

3.35. A summary of total bat passes from each species during each visit are shown in **Table 3.2** and **Figure 3.2.**

Figure 3.2. Summary of all bat passes from each species recorded across all static detectors during bat activity surveys.

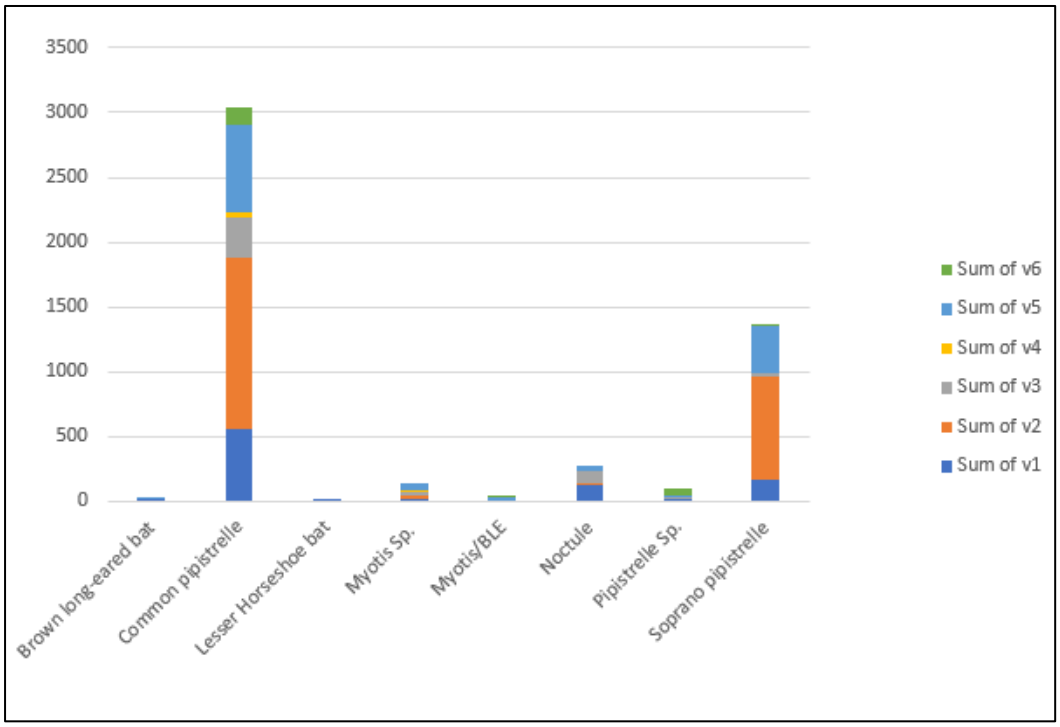


Table 3.2 Summary of bat passes for each species during each static monitoring period. The percentage figures relate to the contribution of each species to the species composition during that visit or across all visits.

Species	**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**Total**
Common pipistrelle	551	1331	305	38	683	127	3035
Soprano pipistrelle	161	802	27	3	356	18	1367
Pipistrelle Sp.	9	4	11	6	16	56	102
Noctule	120	14	92	4	39	0	269
Myotis Sp.	14	23	36	16	49	0	138
Myotis/BLE	7	0	0	0	18	1	26
Brown long-eared bat	9	0	6	0	19	0	34
Lesser Horseshoe bat	2	0	0	0	0	0	2
Grand Total	873	2174	477	67	1180	202	4973

Breeding Birds

3.36. The data search by COFNOD confirmed the presence of a large number of bird species in the surrounding area, which are expected given the habitats present. The majority were common urban/suburban species, with records of Schedule 1 species also returned. No evidence of such species was noted within the site during the surveys completed, however, but some habitat does exist for nesting Hobby *Falco subbuteo*. Other Red/Amber list species were also identified but they were not recorded during the surveys completed within the site.

3.37. **Table 3.3** below summarises the results of the bird surveys completed within the site in relation to species encountered, breeding status, likely number of territories and distribution within the site. Additional descriptions follow the table where necessary.

Species	Conservation Status[4]	Site Breeding Status	No. Territories	Summary
Lapwing *Vanellus vanellus*	Red List	Probable breeder	Up to three	This species was confined to the south-eastern arable fields within the site, with a maximum count of six birds on a single survey visit (first may visit). No active nests were observed, but behaviour indicative of nesting (adults attacking corvids and fake feeding/injury feigning) was noted. The number of birds recorded decreased throughout the surveys, with no birds recorded on the final survey visit. The peak of activity (i.e. mid-May) is consistent with early season (i.e. April) breeding attempts before the adults and their young disperse once mature enough.
Song Thrush *Turdus philomelos*	Amber List	Probable breeder	Up to three	At least two territories of this species, confirmed by singing males or repeated observations, were noted in the central tree and hedgerow line which follows the public footpath in the north of the site. A further territory was suspected in the woodland in the centre of the playing fields (confirmed by a singing male at the same time as another bird alarm calling), but this was only recorded on the last survey visit. No conclusive evidence of breeding was noted.
House Sparrow *Passer domesticus*	Red List	Non-breeder	None	Although the site itself offers no potential breeding habitat for this species (excluding the possibility in the rugby club building due to lack of access), this species was regularly recorded foraging and 'loafing' in boundary hedgerows within the site adjacent to residential estates. The most regular occurrences were noted in the far south-western hedgerow adjacent to Cefn Road, the hedgerow between the site and the farmstead to the south, and the far north-western hedgerow. Limited activity was noted in the central tree and hedgerow line which follows the public footpath within the site.
Starling *Sturnus vulgaris*	Red List	Non-breeder	None	Although no evidence of breeding activity was recorded within the site (excluding the possibility of the rugby club facilities due to lack of access), it was evident that adult birds used the site for foraging and collecting food to return to young off-site in the residential estate. On the final survey visit, up to 50 birds (a combination of adults and juveniles) were recorded foraging in the playing fields in the west of the site. Prior to this, all fields in the west of the site (principally the playing fields) were noted to support foraging adults who were then observed flying off-site (with food in some instances) to the adjacent residential estates.
Hirundines: Swallow *Hirundo rustica*, Swift *Apus apus* and House Martin *Delichon urbicum*	House martin and swift Red List	Non-breeders	None	No nesting habitat for these species was recorded within the site, excluding the possibility of the rugby club facilities due to lack of access although the likelihood is very low. All of these species were regularly recorded foraging within the site, however, and it is likely they nest in the adjacent farm complex and residential estate and use the site for foraging only.
Dunnock *Prunella modularis*	Amber List	Probable breeder	Unknown (Up to 10)	Many birds were recorded singing within the site in association with internal and boundary hedgerows, with a maximum count of 10 individual singing males recorded on the final June visit. This could indicate the presence of 10 breeding territories within the site but due to the breeding ecology and behaviour of this species, it cannot be confirmed. At least five territories are considered to be present based on the aggregation of sightings and singing males in similar locations across visits. These were restricted to the central area of the site in the hedgerow and scrub belt which separates the playing fields from arable land to the south, and between the site and the farmstead to the south. No conclusive evidence of breeding was recorded within the site.
Whitethroat *Sylvia communis*	Amber List	Probable breeder	Three	A maximum number of seven males were recorded singing on the first visit in May but this subsequently decreased to aggregations of singing males and sightings in three locations, indicating three territories. It is suspected that the birds singing in May were still establishing territories and subsequently dispersed. The areas where the territories were recorded were along the central tree/hedge line and within scrub between the site and the farmstead to the south.
Little owl *Athene noctua*	Green List	Confirmed breeder	One	A little owl nest was recorded within a mature oak tree in the centre of the playing fields in the west of the site.
Reed bunting *Emberiza schoeniclus*	Amber List	Non-breeder	None	A single bird was noted to fly through the site and the site generally offers no suitable breeding habitat for this species.
Herring gull *Larus argentatus*	Red List	Non-breeder	None	Although the site offers no suitable habitat for breeding attempts for this species, a number of birds were regularly recorded foraging and resting in the arable and playing fields within the site, at a maximum count of 34 birds on the first may visit.
Lesser black-backed gull *Larus fuscus*	Amber List	Non-breeder	None	Although the site offers no suitable habitat for breeding attempts for this species, a number of birds were regularly recorded foraging and resting in the arable and playing fields within the site, at a maximum count of 15 birds on the second may visit.
Greenfinch *Cardeulis chloris*	Red List	Possible breeder	None	A single bird was heard calling within the site on one occasion but the site and adjacent residential estates do provide some suitable habitat for nesting attempts.

[4] Birds of Conservation Concern 5 -RSPB/BTO – December 2021

General	Green/Amber List	See individual species list	N/A	A number of other common/widespread urban/suburban green list species were recorded within the site and treated as probable breeders given the presence of suitable habitat or observing confirmed breeding behaviour (i.e. adults with young), or either noted as foragers/passing through. These species were: • Magpie *Pica pica* (possible) • Chiff chaff *Phylloscopus collybita* (probable) • Carrion crow *Corvus corone* (possible) • Wren *Troglodytes troglodytes* (probable) • Wood pigeon *Columba palmubus* (probable) • Blue tit *Cyanistes caeruleus* (probable) • Great tit *Parus major* (probable) • Blackbird *Turdus merula* (confirmed) • Robin *Erithacus rubecula* (probable) • Rook *Cornus frugilegus* (possible) • Blackcap *Sylvia atricapilla* (probable) • Chaffinch *Fringilla coelebs* (probable) • Goldfinch *Cardeulis cardeulis* (probable) • Moorhen *Gallinula chloropus* (possible) • Mallard *Anas platyrhynchos* (possible) • Jackdaw *Corvus monedula* (possible) • Stock dove *Columba oenas* (possible)

Table 3.3 – Bird Survey Summary

3.38. It is considered that the principal ornithological value of the site for nesting is within the boundary vegetation comprising hedgerow and scrubby margins, which were noted to support probable breeding from a number of birds of conservation concern and other 'green list' species. The central woodland copse within the site was also noted to support a wide range of both amber and green list species.

3.39. The arable fields also provide value for two or three pairs of breeding lapwing.

3.40. Whilst the playing fields within the site offer no suitable habitat for nesting, they are obviously important in maintaining bird populations locally for those species which utilise such grassland for foraging and rearing young, principally starling and thrushes.

3.41. Overall, the site is considered to be of **local ecological importance** for birds.

Great crested newt (and other amphibians)

Table 3.4 below presents the results of the single presence/absence survey completed of the ponds within the site on the 17th/18th May 2021.

Water-body No.	Torching			Trapping			Netting			Other spe-cies	Eggs Found (Y or N)	Notes
	GCN	SN	PN	GCN	SN	PN	GCN	SN	PN			
1	0	0	0	0	0	0	-	-	-	-	No	
2	Too dense with leaf litter and duckweed to trap or torch – eDNA undertaken											
3	Dry											
4	**0**	0	0	**2M**	0	0	-	-	-	-	No	
5	0	0	**1F**	**-**	-	-	-	-	-	-	No	Heavy duck-weed and shallow – no traps and limited torching.
6	0	0	0	0	0	0	0	0	0	-	No	
7	0	0	0	-	-	-	-	-	-	-	No	Only torching un-dertaken, too shallow to set traps.
Key – GCN= Great crested newt, SN= Smooth newt, PN = Palmate newt. M = Male, F = Female, JV = Juvenile												

Table 3.4 – GCN survey results

3.42. As a precaution, a very shallow ephemeral pool in the centre of one of the arable fields (see drawing xx) was also subject to a presence/absence survey at the same time, with no evidence of any amphibians returned and it was noted to dry shortly afterwards when inspected on other site visits.

3.43. As presented in Table 3.4 two male GCN were recorded in Pond 4 but in no other ponds.

3.44. The eDNA results are presented in **Appendix 4**. Ponds 1, 2, 3, 5, and 6 were surveyed. Pond 4 was not included given the positive result during the presence/absence surveys and Pond 7 was too

dry to survey. The eDNA sampling confirmed GCN presence in Ponds 5 and 6, with an inconclusive result in Pond 3, so therefore assumed present. No GCN were detected in Ponds 1 or 2.

3.45. Although the results of the presence/absence surveys would indicate that only a small GCN metapopulation (i.e. 1-10 individuals) exists across the ponds surveyed, based on previous surveys in the area and known GCN distribution across Wrexham, it is considered that the ponds form part of a single **medium-sized metapopulation**.

3.46. The terrestrial habitat within the site of suitability to GCN is the woodland containing Pond 6 and the connecting hedgerows through the site and associated field margin vegetation, which also provide connectivity to the wider landscape. The majority of the site (i.e. intensive agricultural land/short-mown playing fields) is unsuitable for GCN and is not considered important in maintaining populations locally.

3.47. The data search completed by COFNOD returned multiple records of GCN, smooth newt, common frog and common toad both within the site and in adjacent land.

3.48. The site, overall, is considered to be of **local ecological importance** for GCN and other amphibians.

Reptiles

3.49. Two records of grass snake *Natrix natrix helevetica* were returned from 2010 and 2016, c.1.2km distant respectively. Records for adder *Vipera berus* slow worm *Anguis fragilis* and common lizard *Zootoca vivipara* were all returned in the wider landscape but were close to the 2km buffer. There is some limited habitat suitable for reptiles within the site, such as along field margins, where a longer grassland sward, scattered scrub and tall ruderals are present. However, this is very limited in extent and is mostly located around the amenity areas of the site which are subject to a high level of human disturbance. It is considered the likelihood of reptiles being present on site is low, and so there is no recommendation for further surveys to this regard.

Other Species

3.50. Five records for European hare *Lepus europaeus* were returned from the data search within the last ten years. The closest of which was 335m from the site boundary from 2019. This species is was not observed on site during works and is therefore not considered further for survey or mitigation.

3.51. Numerous records for hedgehog were returned close to site and in the wider area for hedgehog *Erinaceus europaeus*. The closest of which 24m from the site. This species is certainly present on site and mitigation is considered later in this report.

3.52. Five records of polecat *Mustela putorius* were returned in the data search. All of these were in excess of 1500m from the site, and associated with the Wrexham industrial park wildlife site, there is no recommendation for further surveys to this regard.

3.53. A single record of water vole *Arvicola amphibius* was returned from the data search This 2015 record is from the River Gwenfro approximately 840m to the west of the site. Six records of otter *Lutra lutra* were returned by the data search, the closest of which sits 790m to the west of the site Caia park. The majority of the otter records are as a result of killed animals on the roads in the

wider area. No rivers, streams or suitable habitat for either of these species is present on site, therefore is no recommendation for further surveys to this regard.

Section 4: Potential Ecological Impacts, Mitigation and Enhancement

Proposed Development

4.1. The proposed development is for the removal of arable, amenity and semi-improved grassland on site for the construction of a residential development of 425 dwellings, this is the section of the development known as Phase 1 that has an outline masterplan (Strategic Masterplan B024030-17 as shown in **Appendix 3**). The remainder of the application area has no set development masterplan as yet. Consideration for this area known as Future phases is given assuming all significant ecological impacts will be avoided, or mitigated for in line with the recommendations made in this report, where possible.

4.2. The potential consequences with respect to development of the site are set out below, with reference to relevant legislation and planning policy, summarised in Appendix 1.

4.3. Ecological issues associated with the proposed development include the loss of foraging and potential roost habitat for bat species, loss of nesting and foraging habitat for birds, potential loss of foraging habitat for badgers and hedgehogs, and the potential spread of invasive species (Japanese knotweed) and the fragmentation of a medium sized meta population of GCN across the wider area.

Designated Sites

Statutory Sites

4.4. Four European sites – Midland Meres and Mosses Phase 2B Ramsar, River Dee and Bala Lake SAC, Johnstown Newt Sites SAC and Berwyn and South Clwyd Mountains SAC – are present within the ZoI and it is possible that future re-development of the site may result in ecological impacts on these designated sites, such as through increased recreational pressure. Upon consultation with Wrexham Council, a Habitat Regulations Assessment of the proposals may be required to detail how recreational impacts will be mitigated for. No other impacts are anticipated on these sites as a result of the proposals.

4.5. A lack of direct habitat or hydrological link between the site and statutory designated sites is sufficient to conclude no direct impacts on the statutory sites identified within the ZoI around the site.

Non-Statutory Sites

4.6. Five LWS sites are within the surrounding area. A lack of direct habitat or hydrological link between the site and these sites is sufficient to conclude no direct impacts. The closest site, Cefn Park is 800m to the south of the site but this woodland habitat will not be impacted by construction works or residential impacts associated with the application

Habitats within the Site

4.7. Where habitats with importance within the boundary of the site exist, effort has been made to retain these habitats within the design of the proposed masterplan. Where this is not possible, replacement planting or creation of new habitats using native species will be included within the indicative landscape design for Phase 1. **It is assumed this will be the case for Future Phases too.**

4.8. The proposed residential development of the site (see **Appendix 3**) will result in the loss of a small number of trees of site ecological importance; all other habitat losses are of negligible ecological importance. There will be minor hedgerow loss as a result of link road through site, subject to a separate application, but that the development overall can mitigate for this partial loss through increased hedgerow planting across the site.

4.9. Potential impacts to retained hedgerows and trees may occur during construction resulting from issues including inadvertent damage, or inappropriate storage of materials. Measures to mitigate impacts include hedgerow planting. Potential impacts to retained habitats of ecological importance (hedgerow and trees), including inadvertent damage or degradation, pollutant run-off and inappropriate storage of materials will be mitigated through the implementation of an Arboricultural Method Statement (AMS) and CEMP.

4.10. Invasive non-native species are present in the west of site and mitigation will be required to control the potential spread of these species beyond the site boundary to ensure compliance with legislation. An appropriate management strategy for removal and/or treatment of invasive non-native species (including Japanese knotweed) to control their spread beyond the site boundary should be devised and implemented by a specialist contractor prior to the commencement of site clearance or construction activities.

4.11. The indicative landscaping scheme for Phase 1 (see Appendix 3) has been designed to include creation of new habitat within the buffer area adjacent to eastern and southern boundaries of Phase 1 surrounding the SUDS ponds. This includes attenuation features (which should be designed to permanently hold some water when considering detailed landscape proposals), wildflower meadow, hedgerow and trees which will maximise use of native and/or wildlife-friendly species.

4.12. A Landscape and Ecological Management Plan (LEMP) should be devised and implemented to ensure success and long-term viability of retained and newly created habitats.

4.13. A detailed habitat survey of the rugby club land will be required to determine the habitats and floral composition of said habitats. The results of this survey should be used to inform the need for any specific habitat mitigation for grassland/tree loss, and included in the landscape strategy for this phase.

Protected and Notable Species

Badger

4.14. Several active outlier setts are present within the wider application site. There is a single entrance outlier site to the east of the Phase 1 works that is on the boundary hedgeline of the application phase. The masterplan indicates that this sett is 30m beyond any residential properties and therefore is likely to not be impacted. The landscaping of the green area proposed to in the vicinity

of the active outlier has not yet been confirmed. If landscaping works are substantial, there may be a need for NRW to be consulted about a licence to temporarily close the sett whilst the works are completed. It is recommended that, unless there is a reason to prevent it, the sett only be temporarily closed during any works to ensure that existing badger setts and access to shelter is not diminished long term.

4.15. A large main sett is within the centre of the wider application site. Another main sett sits immediately adjacent to the south eastern boundary of the application. Neither are within the redline boundary covered by the Phase 1 application. The northern most main sett is approximately 20m from the boundary of the Phase 1 boundary. The closest area of site being allocated as green landscaping. Once the details of the works taking place within 30m of the main sett are confirmed further mitigation can be recommended. With green landscaping at 20m from the active sett it is likely that the works will cause no significant disturbance and can be completed at a suitable time of year under supervision. Use of heavy machinery for the green landscaping works within 30m of the main sett will prompt the need for NRW consultation about the provision of a licence.

4.16. Both main setts will not be impacted directly by the Phase 1 works, however with no masterplan for the Future Phases at the time of writing the impacts, both direct and indirect, of the Future Phases cannot be commented on.

Wider application site

4.17. Mitigation for the loss of a main sett (if impacted) would necessitate the provision of an artificial replacement sett, and the siting of such would need to be considered in any future masterplan layout. Due to the presence of several badger clans in the wider area extensive bait marking surveys would need to be completed prior to works commencing to ensure any proposed artificial sett was placed in an appropriate area to avoid cross-clan confrontation. Bait marking surveys are seasonally limited and are to be completed between February and April.

4.18. The design of the site layout should also have consideration for existing levels of badger activity within and through the site, to prevent any severing of connectivity between setts and regular commuting or foraging routes, which may also constitute disturbance of the resident population.

4.19. Foraging habitats need to be considered during the project planning stage as access to foraging is deemed a material consideration in Technical Advice Note 5 Wales: nature conservation and planning:

4.20. "The likelihood of disturbing a badger sett, or adversely affecting badgers foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being a material considerations in the planning process."

4.21. Future development proposals should avoid any impacts within 30m of these setts. If impacts cannot be avoided, a mitigation strategy and NRW licence will be required.

Bats

4.22. The site is considered to be of moderate level for local bat commuting and foraging. There are known important roosts of Annex II species close to the north eastern boundary. The mature trees scattered across site are likely to offering roosting resources to a selection of bat species

throughout the year. Good connectivity through unlit hedgerows and enhanced planting of green spaces will be important to maintain the wider bat populations.

4.23. Minor tree loss of mature trees, or other trees assessed as providing bat roost potential, is anticipated within the Phase 1 of the application, therefore it is assumed the roosting resources will remain available. Detailed Preliminary Bat Roosting Assessments of the trees identified as being removed needs to be completed for Phase 1 to determine if mitigation and NRW licences are required for the works to take place.

4.24. A sensitive lighting scheme will need to be developed to ensure this is the case. Future Phases should continue this approach of retaining mature trees in the masterplan. Where this is not possible any trees to be removed will require thorough inspection and potentially emergence surveys to assess any features for roosting potential. The Future Phases also include the removal of the existing rugby club buildings. These should be surveyed with a Preliminary Bat Roosting Assessment at a suitable time to inform further mitigation. This may result in the need for a NRW licence if roosts are identified within site that are proposed to be impacted.

4.25. The only expected hedgerow loss for Phase 1 would be in the far south of the site and would be partial loss of a very gappy species-poor and intensively managed hedgerow. Similarly, insertion of a hedgerow gap would be required to facilitate the link road in the south of the site. Neither of these losses are considered to result in a significant adverse impact on bats, subject to the inclusion of other mitigation measures, which are discussed below.

4.26. It is also recommended for Phase 1 that a bat box scheme is implemented which targets species of conservation concern that are found locally such as common pipistrelle and myotis species.

Wider application site

4.27. Future Phases will also consider how hedgerows and unlit bat flight lines can be maintained across the wider application site. Good unlit and well vegetated connectivity between landscaped green spaces, SUDS ponds, retained woodlands and the wider landscape should be strived towards as a design principle.

Birds

4.28. The proposed development within Phase 1 of the site would comprise development within the most northern parcel of arable land, part of the playing field area and also across the arable fields in the far southwest of the site. This loss is not considered to result in any adverse significant impact on birds. No tree loss is expected as a result of Phase 1.

4.29. The only expected hedgerow loss for Phase 1 would be in the far south of the site and would be partial loss of a very gappy species-poor and intensively managed hedgerow. Similarly, insertion of a hedgerow gap would be required to facilitate the link road in the south of the site. Neither of these losses are considered to result in a significant adverse impact on birds, subject to the inclusion of other mitigation measures, which are discussed below.

4.30. The development within Phase 1 accounts for additional tree/SUDs/scrub habitat (see **Appendix 3**) around the parcels of residential development, which would also in future contain rear gardens, shrubberies and a habitat mosaic for birds which is otherwise absent. Whilst a detailed soft landscape detail is not available at this point, the proposed layout of Phase 1 would retain the most valuable habitat to breeding birds (woodland, hedgerows, marginal habitat) and introduce a habitat mosaic which would enhance the value of the site for a wide range of red-green list species and generally enhance the ornithological value of the site. The final landscape detail for Phase 1 should include a range of plant species which offer a diverse structure and berry-producing species to maximise the attractiveness of these habitats for birds.

4.31. It is also recommended for Phase 1 that a nest box scheme is implemented which targets species of conservation concern that would otherwise be absent as breeders but are known to be in adjacent land i.e. swift, house sparrow and starling.

Wider application site

4.32. Whilst a detailed masterplan for the wider site is not available at this point, the remaining habitats across the wider site which would be affected are the parcels of arable land to the east of Phase 1 and the rugby club land, which contains species-poor playing fields bound by woodland and interspersed with trees, with an area of more species-diverse meadow also present.

4.33. The playing fields in the west of the site would remain in their current state (albeit re-configured) and it is considered that, overall, the value of this land to the birds which rely on it for foraging and chick-rearing (starling, thrushes) would be retained in the overall site. Similarly, it is expected that the hedgerows and green corridors within the site would be retained in the final site, which would retain their value to the birds they are currently known (or are likely to support) in terms of nesting and foraging.

4.34. Development within the additional arable fields within the site in later phases would ultimately remove habitat which is known to support breeding lapwing. Given the breeding requirements of this species (i.e. flat, open land), it is likely that mitigation for this species could not be accommodated on-site as it is not compatible with Public Open Space or other typical residential green infrastructure. It is likely, therefore, that development in the wider site would result in the permanent loss of habitat which supports up to three pairs of breeding lapwing. The wider landscape contains large areas of similarly suitable habitat for this species to move into, but the development in the later phases must seek to mitigate for this by offering mitigation and enhancements which benefit a wider range of birds than would otherwise be present. As with Phase 1, this can be achieved by:

- Creating SUDs features and specific wildlife ponds (see also GCN section) which offer additional nesting and foraging opportunities for birds which are known to be present in the area (i.e. reed bunting) and would otherwise be absent;
- Implementing a bird box scheme which targets species of conservation concern (house sparrow, starling, swift) integrated within the new residential dwellings;
- Creating a soft landscape scheme which uses native species and provides a thick, layered structure which is favoured by nesting birds and also provides foraging opportunities for both breeding and over-wintering bird species.

Table 4.1 below summarises the residual impacts on the bird species known to be present within the site, taking into account the mitigation measures outlined above.

Species	Conservation Status[5]	Site Breeding Status	Mitigation and residual impacts
Lapwing *Vanellus vanellus*	Red List	Probable breeder	Unable to adequately mitigate for this species on-site in the overall development beyond Phase 1 – additional enhancements for other species are recommended to offset this loss.
Song Thrush *Turdus philomelos*	Amber List	Probable breeder	Overall enhancement through the introduction of rear gardens and native scrub planting.
House Sparrow *Passer domesticus*	Red List	Non-breeder	Overall enhancement through the introduction of nest boxes.
Starling *Sturnus vulgaris*	Red List	Non-breeder	Overall enhancement through the introduction of nest boxes.
Hirundines: Swallow *Hirundo rustica*, Swift *Apus apus* and House Martin *Delichon urbicum*	House martin and swift Red List	Non-breeders	Overall enhancement through the introduction of nest boxes.
Dunnock *Prunella modularis*	Amber List	Probable breeder	Overall enhancement through the introduction of rear gardens and native scrub planting.
Whitethroat *Sylvia communis*	Amber List	Probable breeder	Neutral – development would retain linear hedgerow/marginal habitat within the site which is favoured by this species for nesting. Residential development itself not compatible with this species.
Little owl *Athene noctua*	Green List	Confirmed breeder	Neutral – The overall development would retain the tree containing the nest, and the development itself would ensure this species retains access to foraging habitat for chick-rearing.
Reed bunting *Emberiza schoeniclus*	Amber List	Non-breeder	Overall enhancement through the introduction of SUDs features.
Herring gull *Larus argentatus*	Red List	Non-breeder	None – not a breeder.
Lesser black-backed gull *Larus fuscus*	Amber List	Non-breeder	None – not a breeder.
Greenfinch *Cardeulis chloris*	Red List	Possible breeder	Overall enhancement through the introduction of rear gardens and native scrub planting.

[5] Birds of Conservation Concern 5 -RSPB/BTO – December 2021

General	Green/Amber List	Confirmed breeders	Overall enhancement through the introduction of rear gardens and native scrub planting, along with the introduction of residential habitat mosaics including tree planting, bird feeders and hedgerows which will inevitably benefit a wide range of more common and widespread species.

Table 4.1 Summary of residual impacts on bird species known to be present on site

4.35. Regardless of mitigation to be implemented in the operational phase of development, all wild bird nests are protected whilst active. For this reason, all woody vegetation clearance (and arable land clearance) should be undertaken outside of the core nesting bird season (i.e. completed between October and February) to avoid conflicts with active nests. Where this is not possible, site clearance activities must be preceded by a search for active nests by a Suitably Qualified Ecologist (SQE) if conducted in the 'core' nesting season (i.e. between March and August inclusive). If an active nest is found, it must be retained in a no-work buffer zone until the nesting attempt is complete. The size of the buffer zone will be commensurate with the species concerned, tolerance of disturbance and stage of nesting.

4.36. Some species (i.e. pigeons/doves, known to be present on-site) can nest-year round and even though there is no requirement for an SQE to attend the site outside of the core nesting season, contractors must show due diligence at all times. If an active nest is suspected, the SQE should be contacted for further advice.

4.37. Access has not been available to the rugby club land and whilst it is likely to be of limited importance to breeding birds, any future proposals for this plot and associated mitigation should be informed by bird surveys. These surveys would serve to understand the assemblage present and provide specific mitigation requirements if certain species are known to be present.

4.38. It is expected, however, based on viewing this area from site boundaries and interrogating google earth imagery that future phases of development could accommodate any mitigation requirements by continuing the recommendations for mitigation made above.

GCN

4.39. The proposals across all phases would not result in the loss of any GCN ponds, or any other ponds which do not support GCN. Development would, however, occur within 50m (i.e. the core terrestrial zone) of known breeding ponds and also extend up to 500m distant (the extended terrestrial range of this species. The development across all phases would not remove significant areas of suitable terrestrial habitat, however, as the most important areas of terrestrial habitat (woodland copse, hedgerows) in both Phase 1 and the wider site would be retained.

4.40. The majority of the site is dominated by habitat which is unsuitable for GCN in all phases (i.e. arable land, short-mown species-poor pasture) but the hedgerows across the site do provide connectivity between known breeding ponds at Pond 6 and Ponds 4-5. Whilst GCN would not be reliant on the areas of arable land and species-poor grassland for sustaining the metapopulation present, this species will inevitably cross such habitat when dispersing through the landscape.

4.41. In the absence of any mitigation, the proposals in both Phase 1 and the wider site have the potential to kill/injure GCN, damage or destroy a resting place and/or disturb a GCN whilst using a place of shelter. Any of these actions would be an offence under the Conservation of Habitats and Species Regulations 2010 (as amended). For this reason, a licence to derogate will be required from Natural Resources Wales. To acquire a licence, it must be demonstrated (amongst other issues) that the Favourable Conservation Status of GCN will be maintained. In this instance, this means maintaining a medium-sized metapopulation. To achieve this and to remain compliant with legislation and policy surrounding GCN, two phases need to be considered: ensuring GCN are not harmed during site clearance works and that sufficient habitat and opportunities for dispersal are provided post-development. The following section provides an outline mitigation strategy, which should form the basis of a licence application to Natural Resource Wales should consent be granted.

Outline Mitigation Strategy

4.42. The proposals will be phased and whilst it is not confirmed at this stage the order of the phases, the below process will need to be implemented per development phase. Starting with Phase 1, the whole phase will need to be enclosed with the use of Temporary Amphibian Fencing (TAF), an indicative layout of which is provided in drawing xx appended to this report. The fencing can only be installed in the 'active' season for GCN (i.e. between March and October). Once the fencing is in place, a 60-day trapping period will commence based on the presence of a medium-sized metapopulation and in line with mitigation guidelines. This will comprise installing buckets sunk into the ground on the inside of the fenceline, and checking these buckets on a daily basis for a 60-day period, with any GCN or amphibians caught moved off-site to a receptor area. For Phase 1, this will be the woodland surrounding Pond 6. Once the 60-day period is over (and with a period of 5 days of no GCN caught at the end), development works can commence, with the TAF maintained and monitored for the duration of the construction period. Only when all development works are complete in Phase 1 (or any other phase) can the fencing be removed and GCN allowed to move through the developed site. It may also be necessary for destructive searches of certain areas to be undertaken during the 60-day exclusion period to facilitate the exclusion efforts. This will be at the discretion of the licensed ecologist.

4.43. The remaining phases will proceed in the same fashion and any GCN caught relocated to the most suitable receptor site. A number of options are available (see drawing xx) to act as the receptor site, depending on the proximity to where the GCN is caught.

4.44. As there is no loss of breeding habitat for GCN associated with the development, there is no recommendation for replacement pond features in any phase. The proposals across all phases account for the creation of SUDs features, which will offer some limited suitability for GCN if designed appropriately. Phase 1 does not account for the creation of any specific ponds created for GCN but it is recommended that the detailed design of the remaining phases do include specific wildlife ponds to act as enhancements for GCN and other amphibians. Across all phases, there is also the ability to create GCN hibernacula around SUDs features to provide additional opportunities for hibernation/refuge.

4.45. It is considered, overall, that the loss of terrestrial habitat overall across all phases would not be significant and therefore would not require significant amounts of mitigation. The green infrastructure strategy in Phase 1 accounts for areas of grassland planting associated with SUDs

features which, if designed and managed correctly could introduce more suitable terrestrial habitat than is currently present.

4.46. The most significant consideration with regards to maintaining the Favourable Conservation Status of GCN within and around the site is ensuring that GCN have the continued ability to disperse between breeding habitat. Specifically, this will mean allowing GCN to disperse between Pond 6 in the west and Ponds 4-5 in the west, and from Pond 6 to other breeding opportunities south. The Phase 1 masterplan as shown would retain this connectivity, but future phases to the east of Pond 6 will need a masterplan which responds to this by providing continued green linkages between Pond 6 and the ponds to the east in the shortest distance possible (i.e. a straight line). This can be achieved through the wholesale hedgerow retention through the site, particularly the central tree line and hedgerow which separates the arable fields from the rugby club. This can be supplemented by green corridors associated with this central hedgerow.

4.47. It is expected, however, that the link road which bisects Phase 1 and the future phases will run directly between Pond 6 and the ponds to the east and provide a partial barrier. To allow continued dispersal of GCN, it will be necessary for the detailed design of the link road (subject to a separate planning application) to be permeable for GCN and other amphibians in certain locations, and this can be achieved by dropped kerbs or underground passages.

4.48. It is considered, overall, that Phase 1 provides adequate green/blue infrastructure to maintain the Favourable Conservation Status of GCN and other amphibians in the landscape with the recommendations for mitigation set out in the report, and that the design of future phases should use the mitigation framework and recommendations put forward in this report to ensure GCN have continued access between breeding ponds and access to terrestrial habitat.

4.49. The detailed design for each phase must also ensure that the risk of amphibian mortality is reduced in the operational phase of development by introducing modified kerbs around gulley pots in the site.

Other

4.50. Although hedgehogs are not afforded any legal protection, they are in population decline and efforts should be made to conserve this species and enhance sites for hedgehog wherever possible.

4.51. Hedgehogs should also be allowed continued access through the site post-development. The detailed design of the layout should include provisions to maintain connectivity throughout the site for hedgehog (i.e. hedgehog highways within garden fencing).

4.52. The likelihood of reptile presence within the site is considered to be exceptionally low, and the suitable habitat which is present in all phases (woodland copse, hedgerows) will be retained. The mitigation measures suggested for GCN will be sufficient to protect any individual reptiles which are encountered during the construction phase of works.

4.53. The mitigation and enhancement strategy should be controlled by appropriately worded planning controls devised to:

- Secure ecological inputs to a CEMP to mitigate potential impacts to non-statutory sites, habitats and protected or priority species (badger, bat, nesting birds, amphibians, hedgehog) during construction;

- Secure a sensitively designed lighting scheme to mitigate potential impacts to foraging and commuting bats; and

- Secure the provision and implementation of a LEMP detailing measures for management of retained and newly created habitats, and enhancements for protected and priority species (bats, nesting birds), to ensure biodiversity benefits are maximised in the long term.

Section 5: Conclusion and Recommendations

Conclusions

5.1 For the reasons provided in **Section 4** development proposals are unlikely to result in an adverse impact to statutory and non-statutory designated sites, but consultation should be undertaken with Wrexham Council to establish if a Habitat Regulations Assessment of the proposals is required.

5.2 **Amphibians:** Requirement for a licence from NRW to be obtained to allow development in any phase to proceed. The licence application should follow the outline mitigation strategy put forward in this report and revised as detailed plans emerge for each phase of development.

5.3 **Badgers**: An updated badger survey should be conducted within the 3 months prior to the commencement of construction works within Phase 1 to ensure previous findings are still valid and to reconfirm the locations of any active badger setts.

5.4 Ahead of the Future Phases, the two main setts on and adjacent to site should be considered and planned for. If the impacts to these main setts cannot be kept to a minimum it may be necessary to complete extensive site wide bait marking and to consult with NRW about closure of the setts and provision for artificial setts ahead of disturbance works.

5.5 **Bats**: Sensitive lighting strategies based on the results of the activity surveys should be adopted to minimise the effect of development on foraging and commuting bats on site, and the need for hedgerow planting to compensate for the loss on-site will also serve to replace the value the existing hedgerows offers to bats. Enhancements for roosting bats can also be achieved through the implementation of a bat box strategy across all phases.

5.6 **Future Phases will require the inspection of the buildings at the rugby club and any tree highlighted for removal to assess the bat roosting potential**. Following on from these initial inspections there may be a need for further nocturnal emergence/re-entry surveys to determine the presence/absence of a roost. No trees with bat roost potential are anticipated for removal as part of Phase 1, so there is no need for further surveys for this Phase at this stage.

5.7 **Birds**: Implementation of suitable landscape design following the recommendations made in this report, along with inclusion of nest boxes targeting species of conservation concern. Removal of trees and other woody vegetation/scrub must be completed outside of nesting bird season (March to August inclusive) or be preceded by a check for active nests by a suitably qualified ecologist. Should an active nest be discovered on site, work should be stopped, and a suitably experienced ecologist should be consulted.

5.8 **Hedgehogs:** The reasonable avoidance measures will need to be provided ahead of commencement site works.

5.9 **Invasive species:** A suitably qualified contractor should be employed to treat/remove the Japanese Knotweed and rhododendron present on site.

5.10 Provided the recommendations outlined in this report can be implemented fully and successfully, then development proposals would comply with relevant wildlife legislation and planning policy.

Recommendations

5.11 Detailed layout and design proposals for the Future Phases of the site are not yet known but will comprise development of the site to provide new residential dwellings with associated roads and open space facilities. Consideration will need to be made with respect to potential impacts on protected sites and protected/priority fauna as detailed below. Recommendations are also made for further ecological surveys and other work that will be required to support a future planning submission.

5.12 Future design proposals should apply the mitigation hierarchy (avoid – mitigate – compensate) and seek to retain habitats of greatest ecological importance in the first instance (i.e., woodland, hedgerows, ponds, and mature trees). Where avoidance of impacts is not possible, they should be mitigated or appropriately compensated through the creation and management of new and existing habitats to provide an overall biodiversity gain.

5.13 Design proposals should also include a minimum 10m buffer offset to all woodland habitats, including offsite areas (Fox Covert and Erlas House woodland), and an 8m buffer offset to retained hedgerows. In the case of Fox Covert, the buffer should be extended to a minimum of 30m if possible, to avoid impacts on the main badger sett.

5.14 The site-wide green infrastructure strategy should be designed to maintain connectivity of habitats, which can be achieved through retention and buffering of green corridors, such as the existing hedgerow network, and creating/strengthening connections to existing ponds and woodland. This will also help to mitigate impacts to wildlife, such as amphibians, bats, birds and badgers.

Recommended Further Work

Protected Species and Habitat Surveys

Phase 1

5.15 The following surveys will be necessary to establish the need for further mitigation and NRW licencing:

- Bat PRA of trees proposed for removal (any time of year);

Wider Application

5.16 The following surveys will be necessary to establish the baseline ecological importance of the site in areas of the site that have not been accessed in 2021 (Rugby Club grounds), which will then be used to inform the design of the site and quantum of development which could be achieved to ensure all local and national policies relating to protected sites, species and habitats are complied with:

- Bat PRA of buildings and trees (any time of year);
- Badger Survey (any time of year);
- Habitat Survey (April – August)

Appendix 1: Planning and Legislative Context

Legislation

A1.1 Specific habitats and species receive legal protection in the UK under various pieces of legislation, including:

- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2018;
- The Countryside and Rights of Way Act 2000;
- The Environment (Wales) Act 2016;
- The Natural Environment and Rural Communities Act 2006;
- The Hedgerows Regulations 1997; and
- The Protection of Badgers Act 1992.

A1.2 The European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, 1992, often referred to as the 'Habitats Directive', provides for the protection of key habitats and species considered of European importance. Annexes II and IV of the Directive list all species considered of community interest. The legal framework to protect the species covered by the Habitats Directive has been enacted under UK law through The Conservation of Habitats and Species Regulations 2018 (as amended).

A1.3 In Britain, the WCA 1981 (as amended) is the primary legislation protecting habitats and species. SSSIs, representing the best examples of our natural heritage, are notified under the WCA 1981 (as amended) by reason of their flora, fauna, geology or other features. All breeding birds, their nests, eggs and young are protected under the Act, which makes it illegal to knowingly destroy or disturb the nest site during nesting season. Schedules 1, 5 and 8 afford protection to individual birds, other animals and plants.

A1.4 The CRoW Act 2000 strengthens the species enforcement provisions of the WCA 1981 (as amended) and makes it an offence to 'recklessly' disturb a protected animal whilst it is using a place of rest or shelter or breeding/nest site.

A1.5 The Environment (Wales) Act 2016 introduced a Section 6 Duty which applies to public authorities to help maximise contributions to well-being goals. As stated in Planning Policy 11: "The Nature Recovery Action Plan supports this legislative requirement to reverse the decline in biodiversity, address the underlying causes of biodiversity loss by putting nature at the heart of decision-making and increasing the resilience of ecosystems by taking specific action focused around the 6 objectives for habitats and species".

A1.6 The NERC Act also places a duty on public authorities to have a regard for biodiversity when considering planning applications.

Local Planning Policy

A1.7 The site falls within the administrative borough of Wrexham. Wrexham County Borough Council's planning policies are set out in the Unitary Development Plan (UDP) which was adopted in February 2005. It will be replaced by the Local Development Plan (LDP 2, 2013 – 2028), which is currently being prepared. Local Policies relating to ecology and biodiversity that will need to be considered as part of development proposals include:

- Policy PS2: "Policy PS2 Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment."
- Policy PS11: "Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature conservation and landscape interest of the land will be protected and enhanced."
- Policy GDP1: All new development should:
    - "Ensure the safety and amenity of the public and safeguard the environment from the adverse effects of pollution of water, land or air, hazards from industry and quarrying, and associated noise, odour or vibration arising from development."
    - "Safeguard sites and areas of nature conservation and wildlife interest, and to provide new habitats where there is an unavoidable loss of existing habitats and areas of wildlife interest."
- Policy EC4: "Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted."
- Policy EC6: "Development either within or close to sites of biodiversity interest will only be permitted where it can be clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve the biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves, will be supported."

A1.8 Wrexham County Borough Council is preparing LDP2, which will replace the current adopted UDP. Policies in the preferred strategy of the LDP span economic, social and environmental objectives16. The environmental objective relevant to ecology is:

- Objective SO9: protect, manage and enhance the natural and historic environment and landscapes.

Appendix 2: Badger Survey (confidential)

Appendix 3: Phase 1 Development Masterplan

TTE_UD_v2



TETRA TECH

tetratecheurope.com

KEY

- Site boundary
- Phase 1 area
- Proposed residential parcel
- Potential location for primary school
- Retained Rugby Club
- Retained sports pitch
- Proposed public open space
- Retained trees / hedgerows
- Proposed trees / hedgerows
- Existing pond
- Proposed SUDS ponds
- Proposed spine road with green verge
- Proposed road network
- Road feature / traffic calming
- Placemaking / gateway feature
- Retained / proposed pedestrian / cycle link
- Retained / proposed pedestrian / cycle route
- Existing bridge linking Ysgol Morgan Llwyd School to sports pitches to be retained

Document control

Rev	Description	Date	Dwn	Chk	App
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Cefn Park Wrexham

Harworth Group

STRATEGIC MASTERPLAN

TTE Proj No	Drwn/date	Checked/date	Appr'd/date	Scale @ A3	Suitability
B024030	BR / Jan '22	AC / Jan '22	AC / Jan '22	1:5000	S0

Client Proj No	Originator	Vol/System	Level/Location	Type/Code	Role	Number	Revision
-	TTE	00	XX	DR	UD	17	-

Issuing office

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Appendix 4: GCN eDNA Results

GREAT CRESTED NEWT **DETECTION RESULTS**

Company:	Tyler Grange
Order number:	102385
Project code:	Cefn Road, Wrexham
Date of Report:	29 June 2021
Number of samples:	5

Thank you for sending your samples for analysis by NatureMetrics. Your samples have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014).

Summary of the results

Results indicate GCN presence in 'Pond 5 ' and 'Pond 6 '.

No GCN were detected in 'Pond 1 ' and 'Pond 2 '.

The negative controls were blank, the extraction blank control was negative, and the positive controls and their replicates were standard.

Inhibition was detected in 'Pond 3 ', which was not resolved with DNA dilution, we therefore return this result as inconclusive.

Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.

Methods

eDNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen Blood and Tissue extraction kits. qPCR amplification was carried out in 12 replicates per sample, using GCN specific primers and probes described in Biggs et al. (2014), in the presence of positive controls, extraction controls, and template negative controls. A score is given for the number of positive replicates out of 12.

The qPCR method follows the recommendations set out by NatureMetrics for Natural England in the qPCR validation project and helps improve the reliability of the interpretation of the data. Results from the assay are considered to have a high rating of confidence according to our Validation Scale (Harper et al. 2021).

The quality control methods exceed the requirements outlined in Biggs et al. (2014) Appendix 5. These consist of the use of kit blanks, additional extraction blanks and template negative controls, and positive controls standards of known concentration in triplicate to generate limits of detection and give confidence to the low and late amplifications.

Kit ID	Pond ID	Arrived	Inhibition	Degradation	Score	Status
2718	'Pond 1 '	15-Jun	No	No	0	Negative
2719	'Pond 2 '	15-Jun	No	No	0	Negative
2722	'Pond 3 '	15-Jun	Yes	No	0	Inconclusive
2723	'Pond 5 '	15-Jun	NA	No	12	Positive
2721	'Pond 6 '	15-Jun	NA	No	10	Positive

END OF REPORT

Report issued by: **Thomas Shannon**

Contact: **team@naturemetrics.co.uk**

Understanding your results

Positive Target DNA has been detected in this sample, meaning that at least 1 of the 12 qPCR replicates has amplified. This is not a quantitative test, so you should not interpret a high number of positive replicates (e.g. 12/12) as necessarily indicating a larger population of GCN than a low eDNA score (e.g. 1/12).

Negative No target DNA has been detected in this sample, and the internal and external controls worked as expected. This tells us that if there had been GCN DNA in the sample, we would have detected it, so we can be confident in its absence from the sample provided.

Inconclusive No GCN DNA was detected in the sample, but the internal controls failed to amplify as expected. This means that any GCN DNA in the sample might also have failed to amplify properly, so we cannot have confidence in this negative result. Inconclusive results can be caused by the degradation of the DNA (when the DNA marker contained in the ethanol in the kits fails to amplify) or by inhibition of the reaction (when the marker added in the lab fails to amplify) caused by certain chemicals or organic compounds that may be present in the water sample.

Validation Scale We have developed our own confidence assessment tool for qPCR eDNA assays that builds upon the Thalinger et al. (2021) validation scale and helps end-users to interpret the qPCR outputs but also contextualise these with the level of validation that the assay itself has gone through. Briefly, the level of confidence that can be assigned to results coming from an assay is derived from several validation steps:

- Basic analysis - can the assay work in principle on the computer?
- PCR protocol - has the protocol been optimised in the lab?
- Specificity analysis - has the assay been tested in the lab against other co-inhabiting and/or closely related species?
- How extensive has the assay been tested with natural samples?
- Have the theoretical limits of detection been established?
- Have detection probabilities been estimated with extensive site occupancy modelling?
- Have external factors affecting detectability been extensively tested (e.g. seasonality, spatial heterogeneity)?

- Low Results from these assays are difficult to interpret with confidence. It is impossible to conclusively tell if the target species is present or absent because of the limited amounts of *in silico*, *in vitro*, and *in vivo* testing.

- Medium Assays with this rating have been tested *in silico*, have optimised lab protocols, specificity and sensitivity tested in and out of the lab, but with no estimates of detection probabilities or extensive testing of external factors that may affect the detectability of the target. Positive results can be interpreted as meaning the target species DNA is present (assuming the correct sampling conditions), but negative results could mean that the target is absent or that external factors such as ecology, seasonality, spatial scales are influencing the detections.

- High High rating assays have everything that a Medium assay has, in addition to site occupancy modelling and extensive testing of external influencers such as ecological, temporal and spatial factors. Positive results can be conclusively interpreted, and negative results can be interpreted as meaning the target species DNA is absent (assuming the correct sampling conditions). In some instances, a probability of target species presence at a site and in a sample can be given.

Glossary

controls Controls are used to monitor both the performance of the assays but also any contamination. These samples are treated in the same way as a normal sample. This is particularly important given the sensitivity of these eDNA qPCR methods. Our full complement of controls enables us to fully monitor the whole GCN eDNA process from kits to data.

- kit blank Used to determine if the kits are contaminated but also to monitor the early stages of the pipelines - e.g. sample reception. These samples also act as uninhibited samples that can be used as a baseline to compare against. This is an additional control not specifically mentioned in the Biggs et al. 2014 protocol.

- EB Extraction blank. Used to monitor potential contamination during the DNA extraction process.

- TNC Template negative control. Used to monitor potential contamination during the qPCR setup process. For every qPCR reaction, we run we include more template negative controls than are prescribed in the Biggs et al. 2014 protocol.

- positive Used to determine whether the assay is working correctly. In addition to the 4 standard dilutions prescribed by the Biggs et al. 2014 protocol, we include an additional standard dilution and amplify all standards in triplicate. We can use this increased number of replicates and standards to generate standard curves that will allow us to calculate the limit of detection (LOD).

- LOD Limit of detection. The lowest concentration of positive control DNA that amplifies. LOD is determined for every single reaction performed. Target amplification below the LOD cannot automatically be considered as negative but should be further investigated as spurious amplifications are more prevalent at these low concentrations.

eDNA Short for 'environmental DNA'. Refers to DNA deposited in the environment through excretion, shedding, mucous secretions, saliva etc. This can be collected in environmental samples (e.g. water, sediment) and used to identify the organisms that it originated from. eDNA in water is broken down by environmental processes over a period of days to weeks. It can travel some distance from the point at which it was released from the organism, particularly

in running water. eDNA is sampled in low concentrations and can be degraded (i.e. broken into short fragments), which limits the analysis options.

inhibitors Naturally-occurring chemicals/compounds that cause DNA amplification to fail, potentially resulting in false-negative results. Common inhibitors include tannins, humic acids and other organic compounds. Inhibitors can be overcome by either diluting the DNA (and the inhibitors), but dilution carries the risk of reducing the DNA concentration below the limits of detection.

qPCR Stands for 'quantitative PCR', a PCR reaction incorporating a coloured dye that fluoresces during amplification, allowing a machine to track the progress of the reaction. Often used with species-specific primers where detection of amplification is used to infer the presence of the target species' DNA in the sample. If the species is not present in the sample, no fluorescence will be detected.

- primers Short sections of synthesised DNA that bind to either end of the DNA segment to be amplified by PCR.

- probe A short section of synthesised DNA that binds to a specific section of the target species' DNA within the section flanked by the primers. The probe is designed to be totally specific to that species. The probe is labelled such that it fluoresces during amplification, which is used to infer the presence of the target species' DNA in the sample.

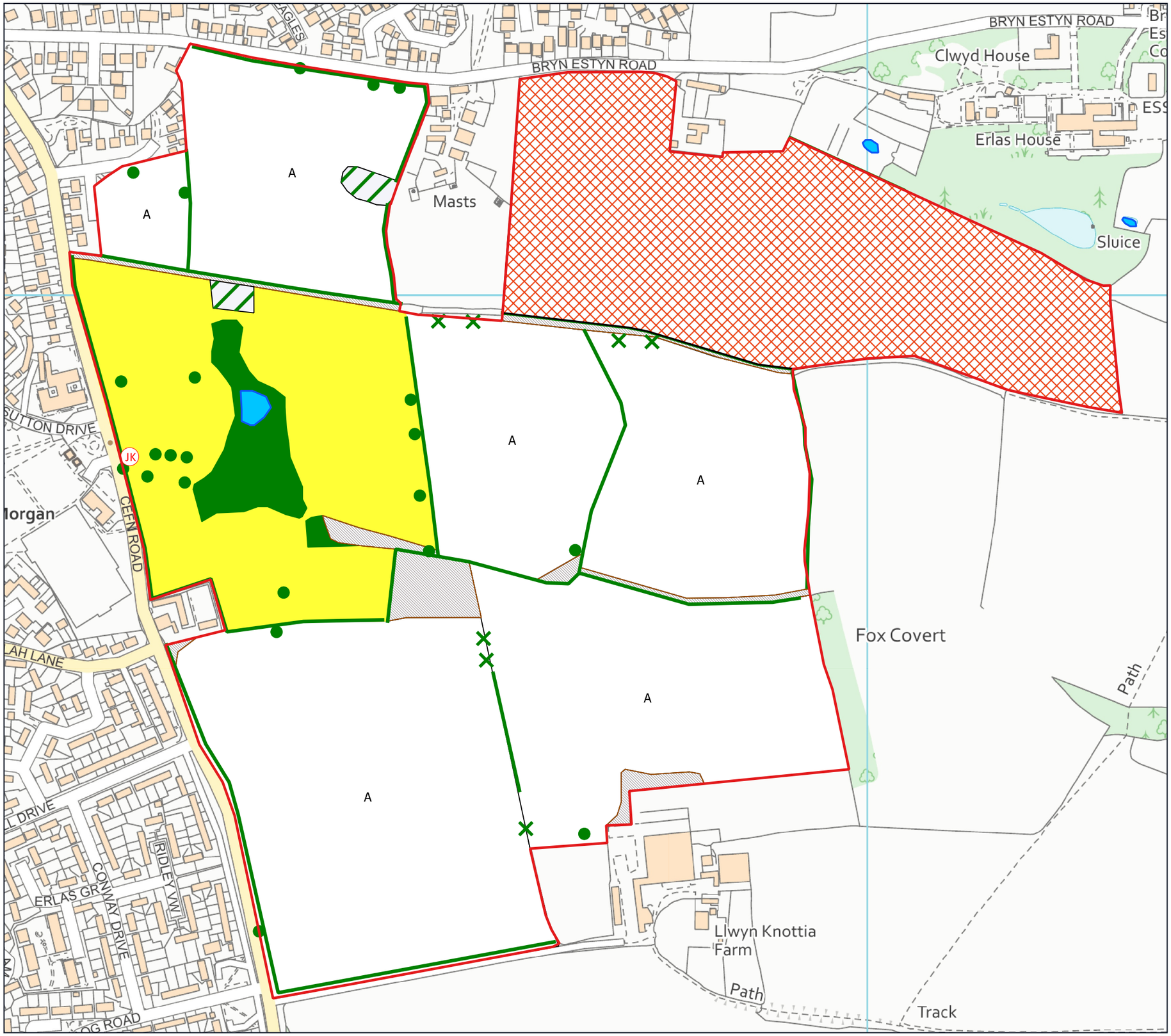
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Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

Harper KJ, Tang CQ, Bruce K, Ross-Gillespie A, Ross-Gillespie V, and Egeter B 2021. A framework for assessing confidence in environmental DNA qPCR assays and results. Natural England Report.

Thalinger B, Deiner K, Harper LR, Rees HC, Blackman RC, Sint D, Traugott M, Goldberg CS, and Bruce K (2021). A validation scale to determine the readiness of environmental DNA assays for routine species monitoring. bioRxiv 2020.04.27.063990; doi: https://doi.org/10.1101/2020.04.27.063990

Plan 1: Habitat Features (13539/P01)



Legend

- Site Boundary
- Not Surveyed
- Amenity grassland
- A — Arable
- Bare ground
- Broadleaved woodland
- Buildings
- Dense scrub
- Hedgerows
- JK — Japanese Knotweed
- I — Pasture
- Ponds
- Scattered scrub
- Scattered trees
- Semi-improved grassland
- Tall ruderal

0 100 m

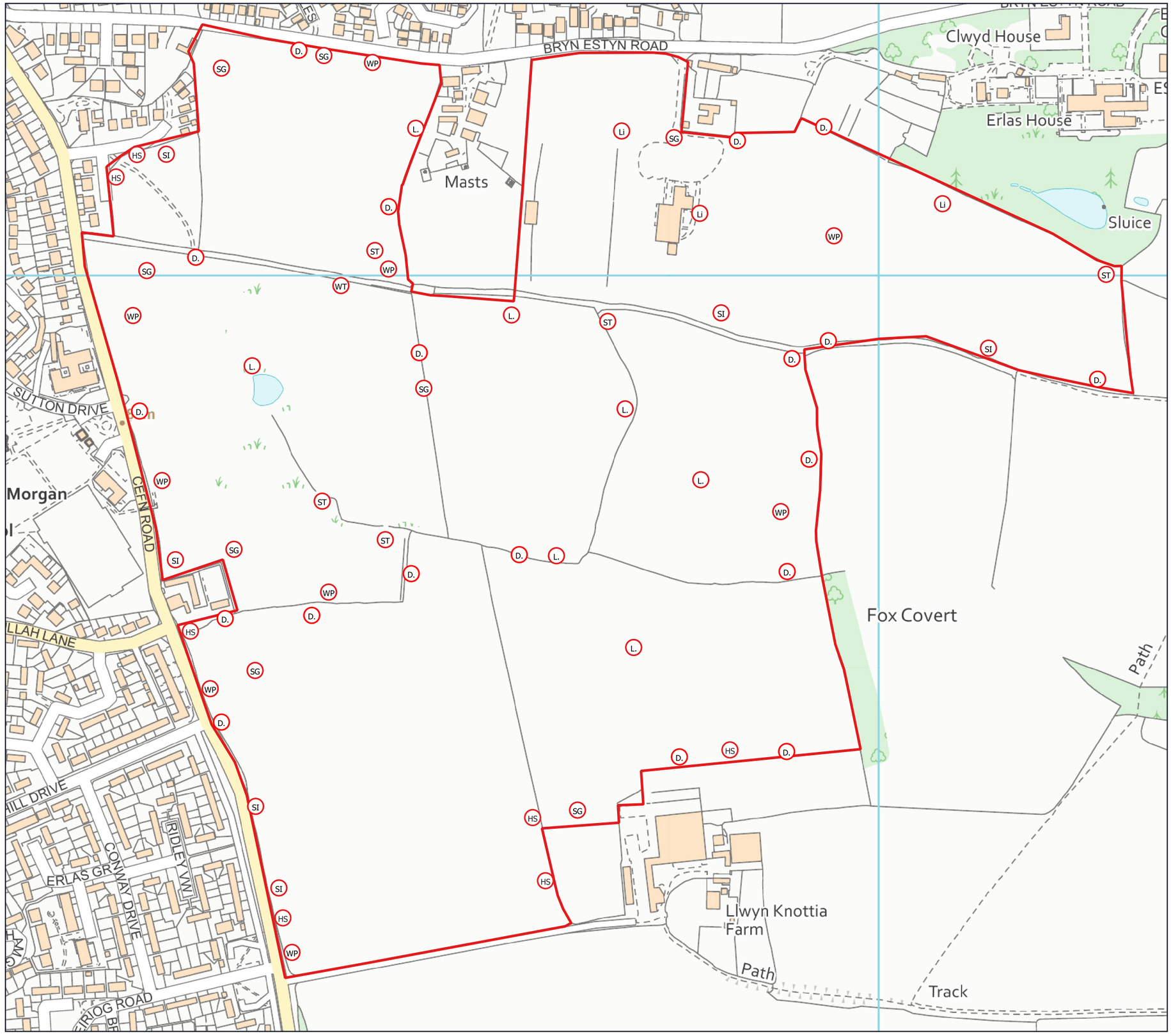
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Drawing Title	Habitat Features Plan
Scale	As Shown (Approximate)
Drawing No.	13539/P01
Date	January 2022
Checked	DP/DM

Tyler Grange

3 Jordan Street, Deansgate, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk

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Plan 3: Breeding Bird Survey Results (13539/P03)



Legend

- Site Boundary

Bird Territories

- D. Dunnock
- HS House Sparrow
- L. Lapwing
- Li Linnet
- ST Song Thrush
- SG Starling
- SI Swift
- WT Willow Tit
- WP Woodpigeon

0 100 m

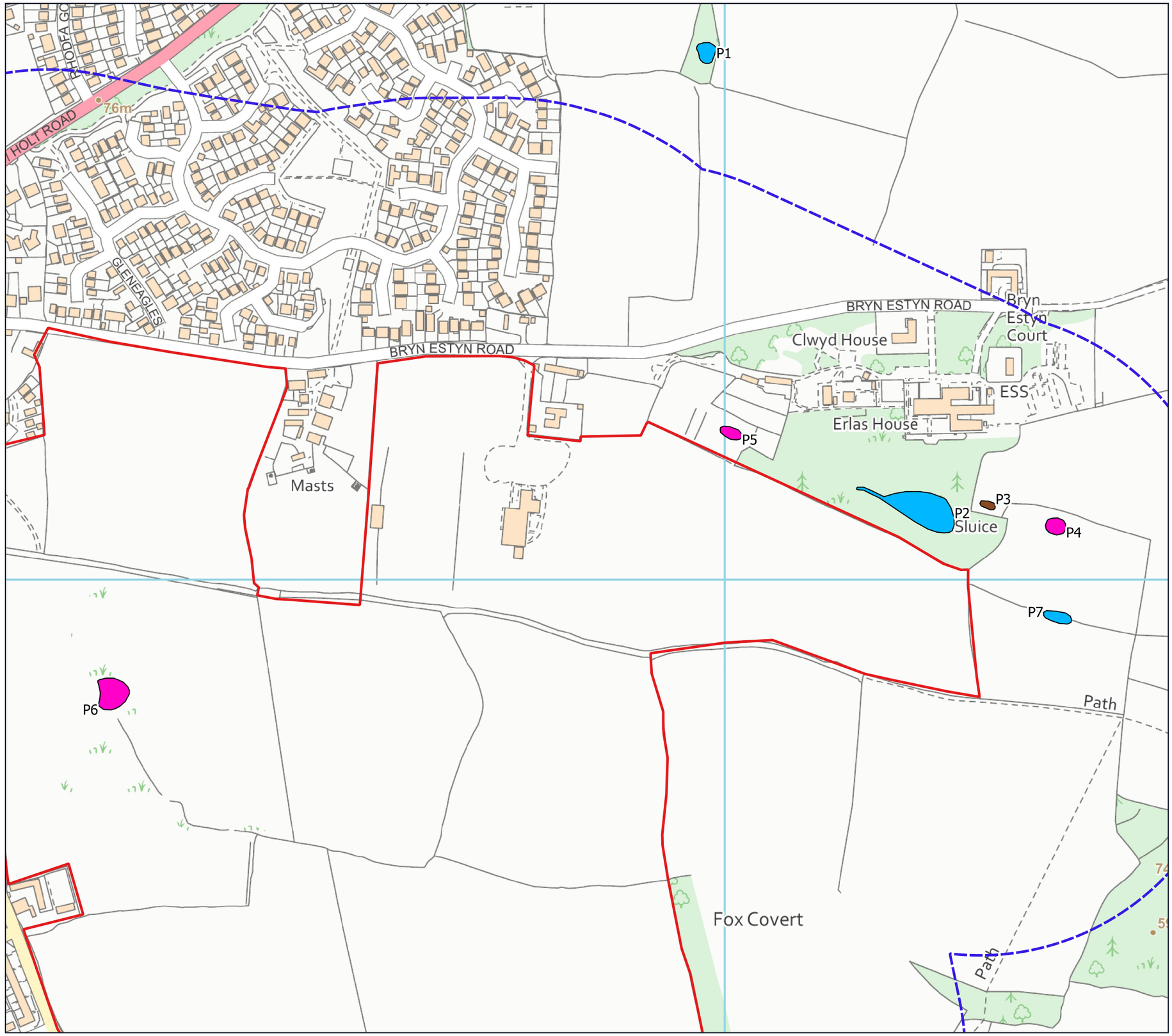
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Drawing Title	Breeding Bird Survey Results
Scale	As Shown (Approximate)
Drawing No.	13539/P03
Date	February 2022
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3 Jordan Street, Deansgate, Manchester, M15 4PY
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Plan 4: GCN Survey Results (13539/P04)



Legend

- Site Boundary
- 250m Site Buffer
- Surveyed Ponds (No GCN Recorded)
- Surveyed Ponds (GCN Recorded)
- Surveyed Ponds (Dry)

0 100 m

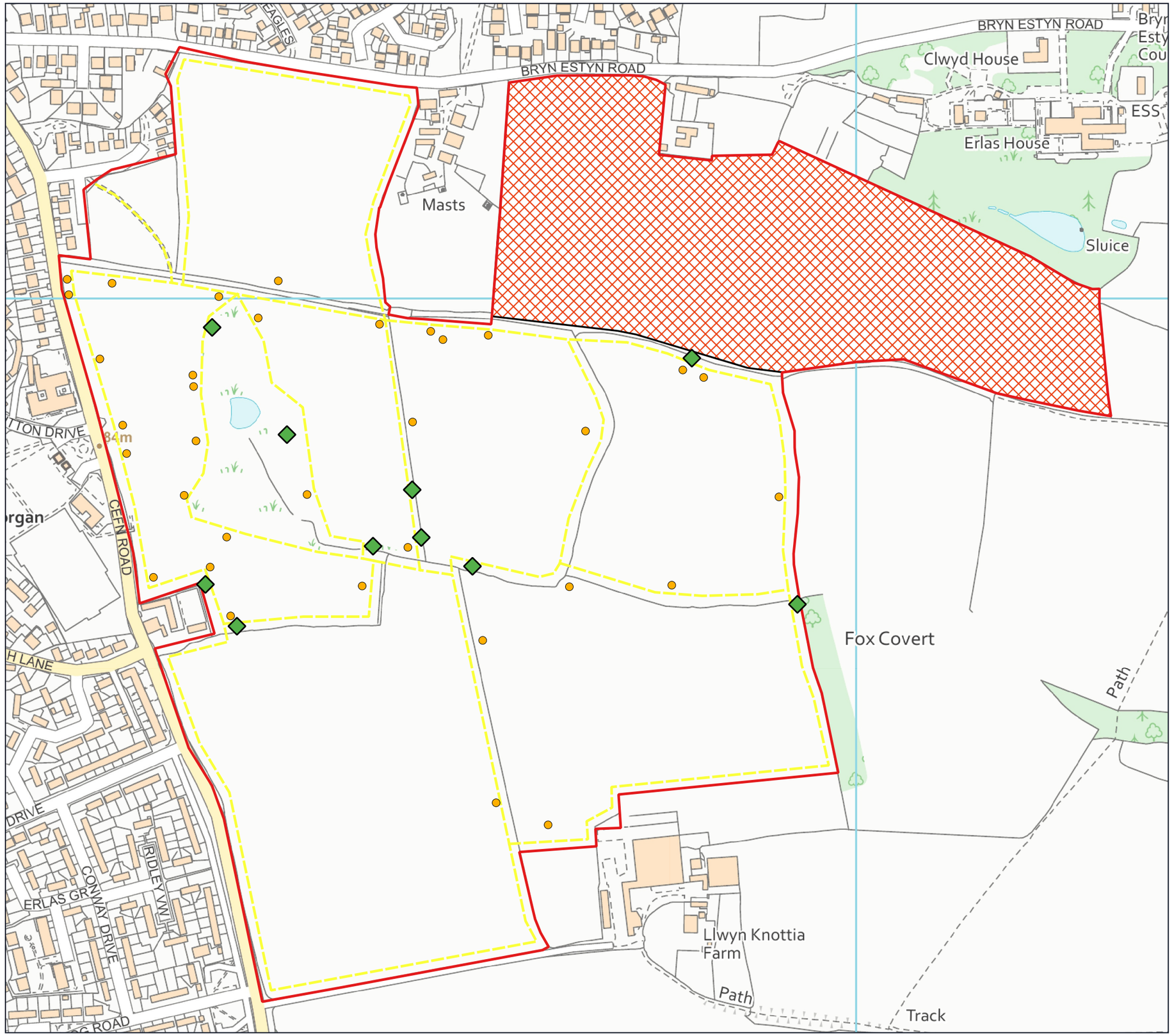
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Drawing Title	GCN Survey Results
Scale	As Shown (Approximate)
Drawing No.	13539/P04
Date	February 2022
Checked	DP/DM

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3 Jordan Street, Deansgate, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk

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Plan 6: Bat Transect and Static Locations (13539/P06)



Legend

- Site Boundary
- Not Surveyed
- Bat Detected
- Static Detector Location
- Transect Route

0 100 m

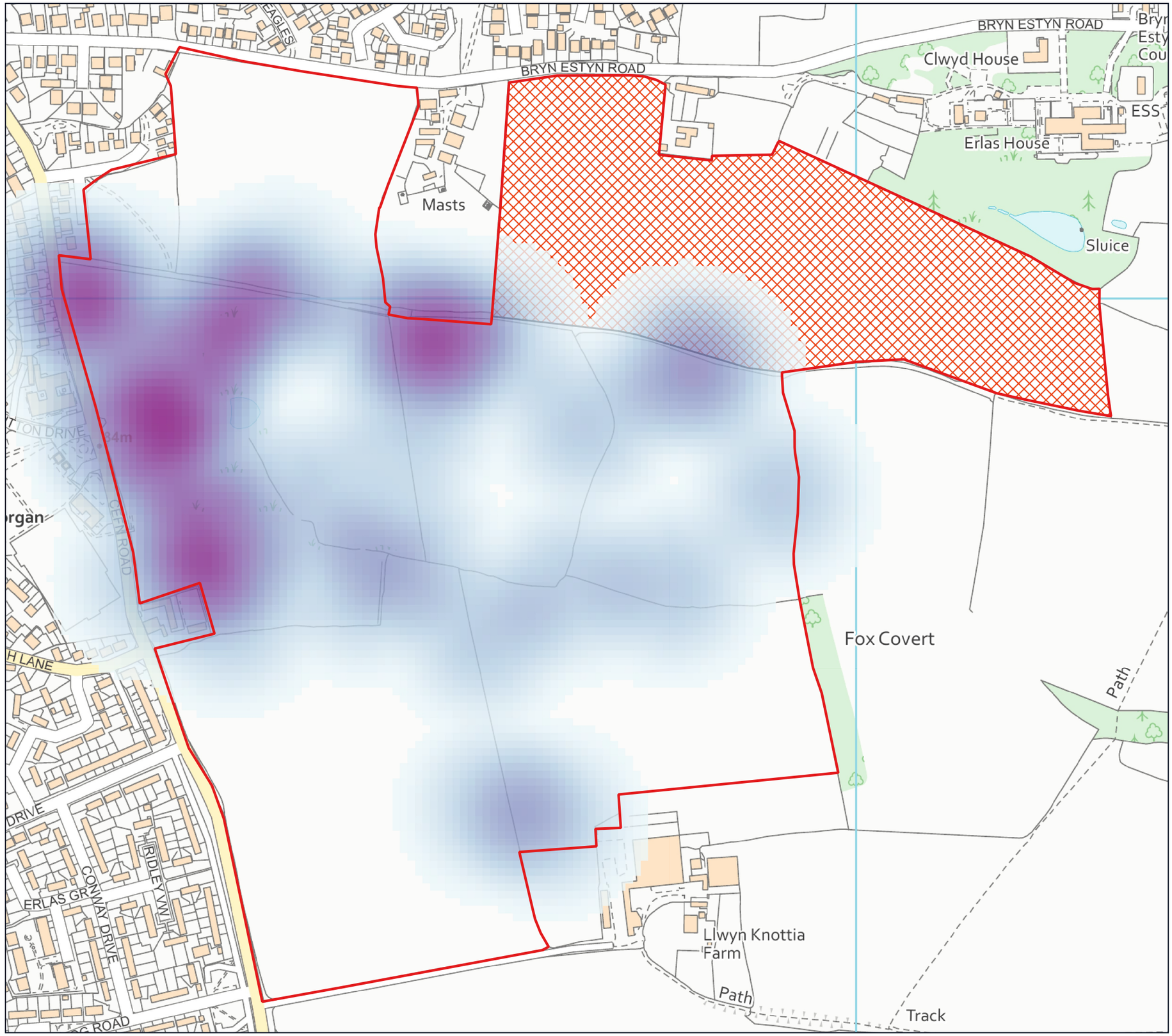
Project	Cefn Road, Wrexham - DRAFT
Drawing Title	Bat Transect and Static Results Plan
Scale	As Shown (Approximate)
Drawing No.	13539/P06
Date	January 2022
Checked	DP/DM

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3 Jordan Street, Deansgate, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk

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Plan 7: Bat Transect Results Plan (13539/P07)



Legend

- Site Boundary
- Not Surveyed
- High Concentration
- Low Concentration

0 100 m

Project	Cefn Road, Wrexham - DRAFT
Drawing Title	Bat Transect Results
Scale	As Shown (Approximate)
Drawing No.	13539/P07
Date	January 2022
Checked	DP/DM

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3 Jordan Street, Deansgate, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk

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