



Land at Clywedog Rd North (Site 4) Wrexham Industrial Estate

Ecological Assessment Report

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1 Introduction

1.1 Background

Kingdom Ecology have carried out an ecological assessment of an approximate 1.1ha area of land located at the corner of Clywedog Road East and Clywedog Road North at Wrexham Industrial Estate, LL13 9XE (Ordnance Survey Grid Reference SJ 374 493). The assessment has been carried out to identify any ecological constraints which should be considered during any future development of the site.

An initial desk study and an Extended Phase 1 Habitat Survey of the site was carried out on the 12th June 2017. Further surveys comprising of butterfly, breeding bird, bat activity, reptile and badger surveys were completed in Spring/Summer 2018.

Butterfly surveys were completed by Andy Whitfield (CEcol, CEnv). Andy has over 20 years' experience of undertaking butterfly surveys and assessments and is currently undertaking a part-time PhD at Lancaster University studying habitat requirements and management techniques for maintaining the high brown and pearl bordered butterfly populations in the South Lakes and Morecambe Bay limestone area

The remaining surveys were carried out by Richard Roe (BSc, MSc, MIEEM, CEnv). Richard has extensive experience of undertaking habitat and protected species surveys as a professional ecological consultant with over seventeen years' experience. Richard is also a licensed great crested newt and bat worker.

1.2 Purpose of Report

This report provides and outlines the findings of a desk study and field surveys undertaken in September 2017 and May- September 2018. Field surveys comprised of habitat and botanical surveys plus further specific bat, reptile, breeding bird, badger and butterfly surveys.

The field surveys and desk study aimed to map and identify broad habitat types at the site and to identify and evaluate species and habitats which would be either of importance in terms of their conservation value or afforded statutory legal protection.

Following a description of the desk study results, survey findings and an overall evaluation of habitats at the site, the report goes on to make recommendations for further works, mitigation and ecological enhancement measures where relevant.

1.3 Relevant Protected Species Legislation

1.3.1 Environment (Wales) Act 2016

Section 6 of the Environment (Wales) Act 2016 places a legal obligation on public bodies in Wales to 'maintain and enhance biodiversity' whilst carrying out their functions.

Section 7 of that Act requires Welsh Ministers to publish and maintain lists of species and types of habitats in Wales that are regarded as of 'principal importance' for the purpose of maintaining and enhancing that biodiversity.

This section of the Act replaces the biodiversity duty originally outlined in Section 42 of the NERC Act 2006.

The presence at any proposed development site, of any priority habitat or priority species identified on these lists is of importance within the local authority planning process.

1.3.2 Birds

All wild birds in England and Wales are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally kill, injure or take any wild bird, or take, damage or destroy the nest (whilst being built or in use) or its eggs.

1.3.3 Bats

All British bat species are fully protected under the Wildlife and Countryside Act 1981 (as amended) and through their inclusion in Schedule II of the Habitats Regulations 2010 which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive") which defines European protected species of animals.

British bats species are afforded further protection by the Countryside and Rights of Way Act 2000; and the Natural Environment and Rural Communities Act 2006.

Taken together, this legislation makes it an offence to:

- Intentionally or deliberately kill, injure or capture bats.
- Deliberately disturb bats, whether at roost or not.
- Damage, destroy or obstruct access to bat roosts.
- Possess or transport bats, unless acquired legally.
- Sell, barter or exchange bats.

A bat roost is interpreted as “any structure or place, which any wild bat uses for shelter or protection.” (Bat Conservation Trust 2012¹). A bat roost is protected whether or not bats are present at the time.

All species of British bat are considered a European Protected Species (EPS). The Conservation of Habitat and Species Regulations (2010) provide derogation against certain offences which could potentially affect an EPS through the EPS Licensing system.

1.3.4 Badger

Badgers are afforded protection under the Protection of Badgers Act (PBA) 1992; this act was introduced on welfare grounds. The Act is based primarily on the need to protect badgers from baiting and deliberate harm or injury. Badgers are not considered to be a species of any conservation concern. However the Act contains restrictions that apply more widely and can have implications where badgers and development come into conflict. All the following are considered criminal offences:

- to willfully kill, injure, take, possess or cruelly ill-treat a badger;
- to attempt to do so; or
- to intentionally or recklessly interfere with a sett.

Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed.

1.3.5 Reptiles

All native reptiles are protected in the UK under the Wildlife and Countryside Act 1981 (as amended). The law makes it an offence to intentionally kill, injure, sell or advertise to sell any of the six native species.

The smooth snake and the sand lizard are afforded further protection under the 1981 Act, by making it an offence, to possess, handle, capture or disturb them.

¹ Bat Conservation Trust (2012) 'Bat Surveys: Good Practice Guidelines 2nd Edition'

1.3.6 Butterflies

Approximately 400 invertebrate species are listed under Section 7 of the Environment (Wales) Act 2016. Section 6 of the same Act requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. The presence at any proposed development site, of any priority species identified on these lists is of importance within the local authority planning process.

Survey at the site focused on the potential presence of Dingy skipper and Grizzled skipper which have both been recorded within the wider Wrexham Industrial Estate and are both listed under Section 7 of the Environment Act.

1.3.7 Otter

The European otter is a European protected species (EPS) and is also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981.

It is an offence to:

- capture, kill, disturb or injure otters (on purpose or by not taking enough care)
- damage or destroy a breeding or resting place (deliberately or by not taking enough care)
- obstruct access to their resting or sheltering places (deliberately or by not taking enough care)
- possess, sell, control or transport live or dead otters, or parts of otters

1.4 Evaluation Methodology

The results of the desktop and field surveys are used to identify ecological resources that may be of relevance to the proposals. The CIEEM *Guidelines for Ecological Impact Assessment* (CIEEM, 2006) sets out the recommended approach for valuing ecological resources, and for assessing the effects of proposed activities on them. It suggests that three types of value can be attributed to ecological resources – biodiversity value, community/social value and economic value, and that these should, as far as possible, be considered separately. CIEEM (2006) also advises that legal protection should be considered separately from value, and that the value of an ecological or nature conservation resource should be determined within a defined geographical context; it recommends that the following frame of reference be used:

- International
- UK
- National
- Regional
- County or Metropolitan
- District (or Unitary Authority, City or Borough)
- Local or Parish
- Within zone of influence only (this may be the project site or a larger area)

Designated sites (e.g. SSSIs, SPAs etc.) are generally straightforward to evaluate in relation to this frame of reference. Evaluation of other habitats and species needs to take into consideration a range of criteria, such as their rarity, diversity levels, population sizes and trends, whether they are replaceable or 're-creatable' (for habitats) etc. Appropriate criteria are proposed and discussed in various documents, such as in *A Nature Conservation Review* (Ratcliffe, 1977)², *Guidelines for the selection of biological SSSIs* (JNCC, 1989)³, *Local Sites* (Defra, 2006⁴; Wales Biodiversity Partnership 2008⁵) and also in local and national Biodiversity Plans (BAPs) including Species and Habitat Action Plans (SAPs and HAPs)(see Anon, 1995 for UK BAP)⁶.

Species may be evaluated by reference to their rarity and status in the national or local context. In addition to protected species, rare species, as defined in the Red Data Books/Red Lists/Scarce species lists and in the national and local Biodiversity Action Plans, are recognised to hold value.

Section 6 of the Environment (Wales) Act 2016 places a legal obligation on public bodies in Wales to 'maintain and enhance biodiversity' whilst carrying out their functions.

² Ratcliffe, D.A. 1977. *A Nature Conservation Review*. Cambridge University Press.

³ JNCC, 1989. *Guidelines for the selection of Biological SSSIs*. Nature Conservancy Council, Peterborough.

⁴ DEFRA 2006. *Local Sites Guidance on their Identification, Selection and Management*

⁵ Wales Biodiversity Partnership (2008) *Guidelines for the Selection of Local Sites in Wales*, <http://www.biodiversitywales.org.uk/>

⁶ Anon, 1995. *Biodiversity: The UK Biodiversity Steering Group Report*. Vol. 2. Action Plans. HMSO.

Section 7 of that Act requires Welsh Ministers to publish and maintain lists of species and types of habitats in Wales that are regarded as of 'principal importance' for the purpose of maintaining and enhancing that biodiversity.

The conservation status of declining British birds has been defined in the *Birds of Conservation Concern Report 2015* (Eaton et al. 2015)⁷; where appropriate, this assigns bird species to the Red or Amber list of birds of either high or medium conservation concern, according to a range of defined criteria.

⁷ Eaton et al (2015) *The Population Status of Birds in the UK, Channel Islands and the Isle of Man*, British Birds

2 Field Survey Methods

2.1 Survey Aims and Objectives

The survey aim was to assess the site as to its ecological importance by assessing the value of habitats present and their suitability to support any protected or notable species. The purpose of this was to highlight any ecological constraints associated with future development proposals.

Field survey comprised of an initial Extended Phase 1 Habitat survey, this included an assessment of habitats at the site in terms of their suitability to support any other protected species.

Following on from the initial Extended Phase 1 Habitat survey, further targeted surveys were completed during the 2018 field season to determine the likely presence/absence and importance of the site for breeding birds, badgers, bats, great crested newt, reptiles and notable butterflies.

Species that are considered unlikely to be significantly affected by the proposed development, even if known to be present in the general vicinity, were 'scoped out' of the assessment.

2.2 Extended Phase 1 Habitat Survey

2.2.1 Methods

An Extended Phase 1 Habitat Survey of the study site was initially undertaken on the 12th June 2017 with further field visits completed throughout the summer of 2018. Survey was carried out following standard methodologies as described in the '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*' (JNCC, 2004⁸).

The aims of the Extended Phase 1 Habitat Survey were to:

- identify and map all areas of semi-natural habitat within the study area;
- provide a botanical description of the semi-natural habitats surveyed;
- identify areas or habitats that are of particular ecological interest for nature conservation and which require more detailed investigation;

⁸ JNCC (2004) '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*'

- provide additional information regarding incidental observations of protected species and the potential of habitats to support such species.

A habitat map was produced and lists of dominant or notable vascular plant species were recorded in each of the major habitat types where relevant.

2.3 Reptile Survey

2.3.1 Overview

The initial site walkover survey, carried out in September 2017, identified the site as supporting suitable habitat for reptiles with areas of bramble scrub and tall grassland habitat.

Further reptile surveys were carried out during the 2018 field season comprising of artificial refugia searches and visual surveys. Surveys were carried out following methods described in the Herpetofauna Workers' Manual (JNCC, 2003) and Froglife Advice Sheet 10, 'Reptile Surveys' (Froglife 1999).

2.3.2 Artificial Refugia Survey

Reptiles must bask in the morning and evening before becoming active. Artificial refugia surveys take advantage of this need by providing artificial basking and sheltering habitat. The artificial refugia used for this survey comprised of black corrugated roofing sheets measuring 0.5m x 0.5m.

40 artificial refugia were deployed on the 20th May 2018 in suitable locations and habitats across the site. Refugia deployment focusing on areas of open grassland habitats within the centre of the site.

The refugia were allowed to bed down for 3 weeks before being checked for the presence of reptiles. The refugia survey was carried out between 08:00-11:00 and 16:00-20:00. Survey was carried out throughout the summer 2019.

Survey took place during periods of sunshine with temperatures recorded between 14 and 21°C. Survey avoided taking place during wet or windy weather conditions.

2.3.3 Visual Survey

Visual surveys were undertaken in conjunction with and in addition to the artificial refugia checks. These surveys involved slowly walking across the study area during suitable weather conditions and watching for basking reptiles and searching beneath other refugia such as logs, stones, discarded corrugated sheeting etc for sheltering reptiles.

2.4 Bird Survey

2.4.1 Methods

Bird surveys comprised of three walked transects covering all habitat types at the site. The survey used an adaptation of the Common Birds Census (CBC) methodology (Bibby et al, 1992) as used by the British Trust for Ornithology's (BTO) Common Bird Census. The surveys involved recording all birds observed, their locations and activity/behaviour.

Bird surveys were carried out during the mornings and started within an hour and a half of sunrise. Surveys were carried out under suitable calm, dry weather conditions with unrestricted visibility.

The survey consisted of three survey visits during the bird breeding period (mid-March to mid-July) with at least 10 days between each survey visit. Surveys were conducted on the 8th May, 21st May and the 12th June 2018. Survey data was supplemented by additional bird observations recorded during other ecological surveys undertaken at the site throughout spring/summer 2018.

The transect route passed within 50m of all habitats at the site allowing all habitats to be sampled. High-powered binoculars were used to assist identification of bird species.

Observations (of song, call or sighting) were marked on the survey map using British Trust for Ornithology (BTO) two-letter species codes. Following the completion of surveys, the survey maps were analysed and the breeding status of recorded birds was split as follows:

Breeding (B)- This category includes birds confirmed as breeding or considered likely to be breeding at the site. It is assigned through a combination of registrations recorded on two or more survey visits including the following criteria:

- male in song (on the ground or in flight);
- male and/or female calling (on the ground or in flight);
- male and/or female repeatedly calling (on the ground or in flight);
- aggressive encounters between species (including the same species) perceived to be in the defence of territory, nest or young (on the ground or in flight);
- a nest (with or without an adult in attendance) or man-made structure (e.g. nest box) containing either eggs or young;
- adult bird/s carrying nesting material or entering/leaving nesting-site with nesting material;

- adult bird/s carrying food or faecal sack or entering/leaving nesting-site with food or faecal sack; and
- calling and/or silent juveniles with or without parents in attendance.

Possible breeding (P) –A combination of registrations recorded on a single survey visit including the above criteria and the following:

- pair observed in suitable habitat in breeding season; and
- building or excavating a nest site.

Non-breeding (NB) –One or more registration (not including the criteria listed above) recorded on one or more survey visit including the following criteria:

- adult bird/s carrying or foraging for food not presumed to be for young/juveniles; and
- species observed during the breeding season but not in habitat deemed to suitable for nesting.

The conservation status of all species detected was recorded according to their position in the BoCC3 Red and Amber lists, and as listed in Section 7 of the Environment (Wales) Act 2016.

2.4.2 Constraints

The recognised survey window for breeding birds is mid-March to mid-June. The first survey visit was not carried out until early-May. However had any early breeders nested on site, the first visit would still have been sufficiently early as to have detected their presence. Given this, the delay in commencement of the survey is not considered to have adversely affected the survey results obtained.

2.5 Bat Surveys

The initial site survey, carried out in June 2017, identified the site as supporting suitable foraging habitat for bats with areas of woodland and scrub present around the fringes of the site.

Consequently, further bat activity transects and an automated detector survey were completed at the site during the 2018 field season.

The bat activity surveys comprised of four walked activity transects completed each month May-August 2018. Survey aimed to identify and evaluate bat assemblages present and to assess and evaluate existing habitats in terms of their importance to local bat populations.

The activity transects at this study site were conducted in conjunction with other bat activity surveys being completed on other small sites within the wider Industrial Estate.

2.5.1 Bat Activity Transects

The survey objectives were to identify and evaluate bat foraging and commuting habitat at the site and to identify and evaluate bat species assemblages present.

Surveys were based upon recommendations provided in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 3rd Edition (BCT 2016)⁹.

Transect Methodology

Bat activity transect surveys were targeted at identifying the type and intensity of bat activity, both spatially and temporally, as well as the bat species present. The survey also aimed to assess the relative abundance of species present and the importance of different habitat features/areas.

Surveys were carried out along a pre-determined transect route, devised to encompass a wide range of habitats within the assessment area including grassland, woodland and bramble scrub habitats.

Transects were interspaced by two 'listening station' stops or 'point counts', where the surveyor would pause for four minutes to record levels of bat activity, including the number and species of bat, number of bat passes (discrete bursts of echolocation) of each species, and activity types i.e. commuting, foraging and/or social calling. Each listening station was visited twice during each survey visit. An average of the number of the number of bat passes at each point count location was taken for the entire survey period to produce an index of activity. Where constant bat activity was recorded at a point count location, 20 bat passes were attributed. The bat activity index was scored as follows:

- 0.1-3 passes- Low bat activity
- 3.1-7 passes- Moderate bat activity
- 7.1-12 passes- High bat activity
- 12.1-20 passes- Very high bat activity

Information on incidental bat activity and species encountered were also target noted when walking between point counts, including direction of bat travel and bat use of features in the landscape.

⁹ Bat Conservation Trust (2016) Bat surveys – Good Practice Guidelines 3rd Edition. Bat Conservation Trust, London.

Notes on weather conditions and survey times were also recorded. Surveys were undertaken during suitable weather conditions i.e. $>8^{\circ}\text{C}$ with minimal rainfall and wind. Weather conditions during survey are shown in Table 7 in the Appendix.

Surveys were carried out using heterodyne and time expansion bat detector (Anabat Walkabout) combined with an Anabat Express frequency division bat detector to record calls in real time in a zero crossing format to permit further call analysis with AnalookW software.

Four dusk transects were walked in total on the 20th May, 12th June, 30th July and 22nd August. This level of survey effort allowed assessment of the site across the main bat activity season.

Dusk transect surveys commenced within 10 minutes of sunset and continued through the following two hours thus coinciding with the peak periods of bat activity.

The transect route followed a circular route taking in all habitat types at the site.

2.5.2 Automated Detector Survey

An automated bat detector (Titley Anabat Express) was deployed at the site between the 15th and 23rd August 2018 in order to provide further information on bat species present.

2.5.3 Evaluation of Bat Habitats

Using the activity and automated survey results, the site was assessed in terms of its value as foraging and commuting habitat for bats.

The process for determining this evaluation is based upon a scoring system presented at the Mammal Society/CIEEM *Advances in Ecological Impact Assessment for Mammals Symposium* 2007 (Wray *et al.* unpublished).

This scoring system assesses the following factors when determining the value of a site for bats:-

- Rarity of species present
- Numbers of bats of each species encountered
- Presence of roosts nearby
- Landscape characteristics

Each of these factors is examined and allocated a 'point score'. The points are then totalled to produce a value for the site based upon the CIEEM *Guidelines for Ecological Impact Assessment* geographical frames of reference as described in Section 1.4 and shown in Table 1 below.

Table 1 - Bat habitat evaluation - Assessment score in relation to ecological evaluation category

Score	Evaluation Category
0-10	Site only
11-20	Locally important
21-30	Important at District Level
31-40	Important at County Level
41-50	Regionally important
>50	Nationally/internationally important

Each individual factor is determined and scored as follows:-

Rarity of Species

The rarity of each species encountered on site is determined using the JNCC's UK Mammals: Species *Status and Population Trends* (Battersby 2005¹⁰). This document provides an estimate of population number, rarity and conservation status in Wales and the rest of the UK.

- Common species (population over 100,000) include: common pipistrelle, soprano pipistrelle, brown long-eared, Natterer's and Daubenton's bat.
- Rarer species (population between 10,000-100,000) include: lesser horseshoe, whiskered, Brandt's, Leisler's and noctule bat
- Rarest species (population less than 10,000) include: Nathusius' pipistrelle, greater horseshoe, barbastelle, Bechstein's and serotine bat.

Scores are attributed as follows:

- Common species – 2 points
- Rarer species – 5 points
- Rarest – 20 points

¹⁰ Battersby, J. (Ed) & Tracking Mammals Partnership. 2005. *UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership*. JNCC/Tracking Mammals Partnership, Peterborough.

The presence of bat species at the site is determined from the evening activity surveys.

Number of bats encountered

Across the three activity surveys, the highest numbers of bats recorded is used to determine the points score for the 'number of bats encountered'.

- Individual bats – 2 points
- Small numbers – 5 points
- Moderate numbers – 10 points
- Large numbers – 20 points

The number of bats present at the site is determined through the evening activity surveys.

Proximity of roosts/potential roosts

The score for the proximity of actual or potential roosts is determined as follows:-

- No roosts or suitable roosting habitat – 1 point
- Small number of roosts – 3 points
- Moderate number of roosts/unknown number of roosts – 4 points
- Large number of roosts or close to SSSI for species – 5 points
- Close to SAC for species – 20 points

Habitat Characteristics

Habitat at the study site is assessed and scored with regards to suitability for foraging or commuting bats. This assessment takes account of likely aerial insect densities, connectivity of habitats, diversity of habitats available and suitability of foraging habitat.

Where habitats do not fit in to the descriptions below, a score has been attributed based upon professional judgement. Scores are calculated as follows:-

- Limited suitable habitat e.g. industrial landscape or new housing estate with no established planting – 1 point
- Low value suitable habitat e.g. suburban or intensive agricultural landscape – 2 points
- Moderate value suitable habitat e.g. isolated patches of woodland within less intensive agricultural landscape – 3 points
- High value suitable habitat e.g. mixed agricultural landscape with small patches of woodland – 4 points
- Very high value suitable habitat e.g. complex mosaic – 5 points

2.6 Butterfly Survey

2.6.1 Methods

Survey at the site focused on the potential presence of dingy skipper and grizzled skipper which have both been recorded within the wider Wrexham Industrial Estate and are both listed under Section 7 of the Environment Act.

The site was visited on five occasions throughout the flight period of the two butterflies (May – June) and when other populations in the area were known to be on the wing. All visits were undertaken in accordance with the United Kingdom Butterfly Monitoring Scheme (UKBMS), Fixed-route Transects climatic protocols (<http://www.ukbms.org/methods.aspx>) and were walked between 11.00 and 16.00 during periods with temperatures above 14°C, low winds and at least 60% sunshine.

The site was walked such that all suitable areas of habitat for butterfly ovipositing and nectaring were recorded and surveyed from at least a 2m vantage point and areas of potential ovipositing and/or nectaring habitat surveyed.

2.6.2 Survey timing

The site was visited on five optimal dates:

- 08/05/2018- light wind, sunny, 19°C
- 14/05/18 – light wind, sunny, 17°C
- 19/05/18 – light wind, sunny, 22°C
- 23/05/18 – light wind, sunny, 21°C
- 13/06/18 – light wind, sunny, 21°C

3 Desktop Study

3.1 Sources of Information

Ecological information on habitats, species and designated nature conservation sites has been sought from COFNOD who are the local biological records centre for the North Wales Region.

3.2 COFNOD Data

3.2.1 Species

COFNOD holds several records of protected species within 2km of the site including the following:

- Barn owl
- Goshawk
- Common pipistrelle
- Whiskered bat
- Polecat
- Badger
- Otter
- Great crested newt
- Adder
- Slow-worm

COFNOD hold no records of any protected species within the study site itself.

COFNOD holds records of whiskered bat and hedgehog from approximately 225m to the east of the site.

COFNOD holds records of small heath, dingy and grizzled skipper butterfly within approximately 200-300m of the site.

The nearest record of great crested newt is from a drainage ditch located approximately 450m to the northwest of the study site. This record is from 1992.

There are no records of great crested newt or any other amphibians within 500m of the site from within the last 20 years.

3.2.2 Designated Sites

No statutory designated sites are located within 1km of the study area itself.

Three Local Wildlife Sites (LWS) are located within 2km of the study site comprising of the Wrexham Industrial Estate LWS (comprising of Bryn Road Grassland, Erlas Black Wood and the Oaks), Peter's Dingle LWS and Cefn Park LWS.

4 Survey Results

4.1 Site Description

The study site measures approximate 1.1ha in area. It comprises of an area of grassland habitat that has undergone limited management over recent years. The initial 2017 surveys recorded a range of successional habitats including areas of coarse semi-improved grassland which grades into areas of tall herb community, bramble scrub and hawthorn scrub. The site appears to be irregularly mowed/flailed during the late winter/early spring.

It was observed in May 2018, that all scrub and grassland habitats had been recently cut back with a tractor mower. However, by late summer, dense bramble scrub had returned to recolonise the previously identified areas of bramble/hawthorn scrub with the remainder of the site returning to typical tall, coarse grass and herb habitat.

There is a band of broadleaved woodland which runs along the south-eastern boundary of the site. The woodland is located either side of a watercourse.

The woodland and watercourse form part of a more-or-less unbroken corridor of semi-natural vegetation which runs from the southwestern edge of the Industrial Estate, through the estate itself, before joining Redwither Brook approximately 500m to the east of the site. Redwither Brook eventually flows into the River Clywedog at the south-eastern edge of the Industrial Estate.

The woodland and its associated watercourse is likely to function as a wildlife corridor through the industrial estate.

The site is bounded to the northwest by Clywedog Road North, to the northeast by an access road and industrial units with associated amenity grassland; to the southwest by Clywedog Road East and to the south by the band of broadleaved woodland described above. The site boundary is marked with barbed-wire stock fencing.

Surrounding habitats comprise principally of industrial units, hardstanding plus occasional areas of amenity grassland and unmanaged rough grassland. As described above, there is a ribbon of broadleaved woodland running through the site and which joins with the woodland located at the site's south-eastern boundary.

Development proposals are to develop the area of derelict grassland/bramble scrub. The area of broadleaved woodland lies outside of the proposed development area.

The site location is shown on Figure 1 in the Appendix.

A habitat map of the site is shown on Figure 2 in the Appendix. Photographs showing typical habitat at the site are also given in the Appendix.

4.2 Habitats

As described above, the site supports a range of successional habitats that have developed within the area of derelict grassland. These habitats comprise of a mosaic of semi-improved grassland, tall herb and scrub communities which have developed through neglect of the grassland.

The habitats are mostly representative of a typical MG1 community (false oat-grass grassland community) as defined by the National Vegetation Classification system (Rodwell 1992¹¹) with zonation's of various MG1 sub-communities including areas dominated by meadow sweet in moister areas (MG1c), more varied grassland areas indicative of the common knapweed sub-community (MG1e); areas dominated by bramble underscrub with false-oat grass and hogweed (W24b) plus areas of scattered hawthorn scrub W21.

It is likely that if left unmanaged, the site would ultimately develop into continuous hawthorn scrub and ultimately further broadleaved woodland.

The grassland and scrub habitats present are of relatively low botanical interest and are commonly occurring throughout the UK.

There is a band of broadleaved woodland which runs along the south-eastern boundary of the site. The woodland is located either side of a watercourse.

Habitats encountered are Target Noted on Figure 2 and described in full within Table 1 below. Habitats are evaluated and discussed in Section 5.1.

¹¹ Rodwell, J.S. (ed) 1992. *British Plant Communities. Volume 3. Grassland and Montane Communities*. Cambridge University Press.

Table 1- Habitat Descriptions

Target Note	Habitat	Description
1	Roadside verge (poor semi-improved grassland)	This comprises of a fringe of mown grassland that runs along Clywedog Road North. The grassland comprises of frequent perennial ryegrass, cock's-foot, red fescue, rough meadow-grass and Yorkshire fog with forbs present including frequent white clover, daisy, dandelion and ribwort plantain with occasional ox-eye daisy, common knapweed, creeping cinquefoil, bird's-foot trefoil, selfheal and black medick.
2	Rough grassland (semi-improved neutral grassland)	This comprises of course, semi-improved, neutral grassland within the site itself with scattered patches of hawthorn scrub. The sward is largely grass dominated with occasional herbs. Grasses comprise of frequent cock's-foot, tufted hair-grass, common bent, meadow-foxtail, false oat-grass, Yorkshire fog and red fescue with forbs comprising of occasional ox-eye daisy, broad-leaved dock, common knapweed, cow parsley, hedge, parsley, hoary ragwort, meadowsweet, creeping thistle, cleavers, meadow vetchling, common vetch and tufted vetch with rare grass vetchling, false-fox-sedge, meadow buttercup, crosswort, bird's-foot trefoil, cowslip, agrimony and common spotted orchid. The grassland is interspersed with patches of dense bramble with nettle and hogweed. There are also patches of scattered hawthorn scrub.
3	Dense bramble scrub	This comprises of patches of continuous scrub dominated by bramble with occasional nettle, great willowherb, broadleaved willowherb, teasel and hogweed.
4	Tall herb community	This comprises of stands of tall herb community comprising of frequent great willowherb, creeping thistle and meadowsweet with occasional grasses, bird's-foot trefoil, water figwort, wild angelica, cow parsley, hedge woundwort and vetches as described in Target Note 2 along with encroaching bramble scrub as described in Target Note 3.
5	Dense bramble scrub	The eastern end of the site was found to be overgrown with dense hawthorn scrub with occasional bramble and dog rose during the 2017 survey. This was mechanically flailed in early 2018 and developed into a further area of dense bramble scrub.

Target Note	Habitat	Description
6	Amenity grassland	This is a band of closely mown amenity grassland located on a slope at the north-eastern end of the site. The sward comprises of frequent Yorkshire fog and perennial ryegrass with occasional, daisy, creeping cinquefoil, ribwort plantain and dandelion. There is a band of scrub at the top of the embankment which has developed from a former hedgerow. The scrub comprises of elm, blackthorn and hawthorn with scattered young ornamental trees comprising of Italian alder and sycamore.
7	Broadleaved woodland	There is a large block of broadleaved woodland which runs along the south-eastern boundary of the site. The woodland comprises mostly of young/semi-mature self-seeded hawthorn, sycamore, hazel, elder and ash with occasional mature white poplar which are likely to be of plantation origin. The woodland field layer comprises principally of ivy with dog's mercury plus occasional wood avens, herb Robert, male fern, wood meadow-grass and hairy wood-rush. The woodland is unmanaged and consequently dense and scrubby.
8	Badger sett	A single hole, badger sett was located within the woodland at SJ 375 493. The badger sett entrance was found to be filled with leaf litter and appeared to be inactive in both 2017 and 2018. The sett is considered likely to be an infrequently used outlier sett.
9	Watercourse	There is a small watercourse that flows through the woodland (TN7) and which joins Redwither Brook approximately 500m to the east of the site. The watercourse has a silty bottom, is shallow (less than 10cm deep) and does not support any aquatic vegetation. The watercourse is strewn with litter.

4.3 Protected Species Surveys

4.3.1 Overview

The Extended Phase 1 Habitat Survey completed in 2017 considered the site's suitability to support protected species. Following on from the 2017 survey, further targeted surveys were completed during the 2018 field season to determine the likely presence/absence of and importance of the site for breeding birds, badgers, bats, reptiles and notable butterflies.

4.4 Reptile Survey

4.4.1 Overview

The study site supports some low value reptile foraging habitat in areas of grassland and scrub. However, given the relatively tall height of vegetation present, suitable basking sites are restricted.

Nevertheless, the site is partly linked to other areas of suitable reptile habitat comprising of further areas of neglected grassland located to the southeast of the site and to the southwest on the opposite side of Clywedog Road East.

Common reptile species are known to be present within other suitable habitats at the Industrial Estate albeit, in relatively low numbers (small numbers of adder, slow-worm and grass snake were recorded at the nearby HMP Berwyn Prison Site during pre-construction site clearance).

4.4.2 Results

Artificial refugia checks were completed on the 12th, 13th, 20th June; the 3rd and 30th July and on the 4th and 15th August 2018. Forty refugia were deployed within open grassland habitats within the centre of the site.

Survey was carried out in warm, dry and calm conditions with the surveys conducted on days with sunshine.

No reptiles were recorded at the site whatsoever during refugia and visual surveys or incidentally during other field surveys undertaken at the site.

It is considered to be unlikely that the site supports any significant reptile population.

Weather conditions during survey are provided in Table 5 in the Appendix.

4.5 Breeding Birds

4.5.1 Overview

Breeding bird surveys were undertaken on the 8th May, 21st May and the 13th June 2018. All surveys were completed within four hours of sunrise. Weather conditions during all surveys were dry with no more than a light breeze.

In total, 23 bird species were recorded during surveys. Habitats at the study site can be divided into two broad habitat types- open grassland/bramble mosaic along the northern edge of the site and broadleaved woodland along the southern edge of the site. Most birds were recorded within the woodland and along the woodland edge habitats.

A full list of bird species encountered with breeding and conservation status is presented in Table 6 in the Appendix. Figure 3 in the Appendix shows the approximate location of assumed bird territories overlaid on a habitat map for the site. Territory location is based upon where 'possible breeding' or 'breeding' birds were encountered across the three surveys.

4.5.2 Breeding status

Following survey, 8 species (35%) are categorised as 'breeding' at the site, 13 (56%) are categorised as 'possible breeding species' and 2 species (9%) were not considered to be breeding on site. The non-breeding birds mainly comprise of colonially nesting birds and birds requiring suitable buildings in which to nest including swallow and grey heron.

4.5.3 Conservation Status

Details of the conservation status of individual birds recorded are given in Table 4 and summarised as follows:-

- No red list species were recorded on site;
- 3 amber listed species were recorded on site (willow warbler, dunnock and bullfinch).
- No Schedule 1 Wildlife and Countryside Act Species were recorded at the site.
- Species listed under Section 7 of the Environment Act recorded at the site include dunnock and bullfinch.

4.6 Bats

4.6.1 Initial Habitat Assessment

There are no mature trees within the proposed development area consequently no suitable bat roosting habitat is present.

However, the woodland and woodland edge habitats offer suitable bat foraging and commuting opportunities.

Although the site offers suitable bat foraging habitat, its location within the centre of the Industrial Estate mean that the site is relatively isolated from other areas of extensive good quality bat foraging habitat. Such habitats are offered beyond the Industrial Estate within the wider countryside.

Bat activity within areas of suitable habitat at the Wrexham Industrial Estate has been found by the author to be relatively low.

It is therefore considered likely that the site is used as foraging habitat but only by relatively low numbers of common bat species.

Following this initial assessment of habitats, further bat activity surveys were undertaken in Summer 2018.

4.6.2 Activity Survey Results

Bat activity surveys were carried out from May through to August 2018.

Figure 4 shows the walked transect route and Point Count locations (with activity index levels) overlaid on top of the Phase 1 Habitat Survey results. Summary data of Point Count Results are given in Tables 7 and 8 in the Appendix.

Dates, weather conditions and sunset times are given in Table 9 in the Appendix.

An automated bat detector was also deployed at the site from the 15th-23rd August 2018. Figure 4 shows where the Anabat was positioned.

4.6.3 Results Analysis

The bat activity surveys identified the site as supporting low numbers of foraging bats. Bats were generally encountered individually, either commuting along or foraging over the woodland habitats along the south eastern boundary of the site. Bats were not recorded foraging over the open grassland habitats.

Low levels of bat activity were recorded at both point counts

Species encountered comprised of foraging and commuting common pipistrelle and soprano pipistrelle.

Other species occasionally recorded included noctule commuting over the site and myotis species (considered likely to be whiskered bat) foraging along the eastern boundary of the site.

Encounters with bats between point counts were also infrequent, with general activity over the site considered to be limited.

The automated bat detector principally recorded common pipistrelle and soprano pipistrelle activity. Noctule were recorded passing over the site each evening. Whiskered bat was recorded foraging at the site on the 20th and 21st August 2018.

4.6.4 Habitat Evaluation

The overall value of the site has been assessed and scored following the methods described in section 2.5.

In summary the site was found to generally support common species of bats in individual numbers with low numbers of surrounding bat roosts. The habitats at the site and surrounding the site are considered to be of moderate value for bats.

The assessment scored a total of **10 points** which equates to an assessment of '**site only**' value for the study area with regards to the CIEEM (2006) evaluation framework.

The assessment results and scores are given in Table 3 below.

Table 3 - Site Results and Evaluation Score

Category	Results	Score
Species rarity?	Common species	2
Numbers of bats?	Individual bats	2
Nearby roosts?	Low number of roosts	3
Landscape character?	Moderate	3
Total Score		10

4.7 Butterflies

4.7.1 Overview

The study site comprises of a large area of semi-improved grassland, scattered scrub and tall ruderal vegetation with areas of recently cut bramble. Occasional foodplants for larva and adult grizzled and dingy skipper butterflies present were found to present at the site.

COFNOD holds records of small heath, dingy and grizzled skipper butterfly within approximately 200-300m of the site.

These species of notable butterfly have been recorded at the HMP Berwyn site located approximately 400m to the south of the site. The ecology mitigation area for the Prison Site is being actively managed to promote habitats for dingy and grizzled skipper butterflies. There are further areas of rough, unmanaged grassland linking the study site to the Prison site Ecology Area.

4.7.2 Survey Results

Survey at the site focused on the potential presence of dingy skipper and grizzled skipper which have both been recorded within the wider Wrexham Industrial Estate.

The study site was visited on five occasions throughout the flight period of the two butterflies (May – June). Other populations of dingy skipper and grizzled skipper in the local area were known to be on the wing during this period. Neither species was recorded at the site during survey.

In terms of suitable habitats for the dingy and grizzled skipper, the site was found to be of marginal value comprising principally of rank grassland habitats with scattered scrub, tall herb vegetation and woodland.

Occasional foodplants were found to be present at the site. Although larval foodplants are present, the habitats are considered to be of low suitability for both dingy and grizzled skipper due to the dense grassland sward and the lack of open, non-vegetated areas.

The presence of larval foodplants on the site and the presence of nectaring resources means that the site may be visited by these butterflies but the habitats are considered suboptimal for the maintenance of dingy and grizzled skipper butterfly populations.

The results of the surveys showing butterfly species recorded are presented in the Table 4 below with weather data presented in Table 10 in the Appendix.

Table 4- Butterfly Survey Results

Date	Results
08/05/18	-
14/05/18	-
19/05/18	-
23/05/18	Green veined white (2)
13/06/18	Green veined white

4.8 Badgers

A single hole, badger sett was located within the woodland at SJ 375 493 (see Target Note 8 on Figure 2). The badger sett entrance was found to be filled with leaf litter and appeared to be inactive during survey in on the 12th June 2017 and the 20th May 2018. The sett is considered likely to be an infrequently used outlier sett. No other badger setts were identified within the woodland.

No field signs indicative of badger activity were found within the grassland/scrub habitats of the proposed development area however it is likely that badgers occasionally forage within these habitat.

It is considered unlikely that the proposed development site is used frequently by badger and is likely to be of low importance.

4.9 Otters

Otter was recorded on Redwither Brook in 2016, approximately 600m to the east of the study site.

However, no field signs indicative of otter were found along the watercourse within the woodland block and no suitable otter holt sites are located along the watercourse. The watercourse is also considered unlikely to offer any valuable foraging opportunities for otter

Nevertheless, it is possible that otter will occasionally move along the watercourse. Such usage is likely to be infrequent and the watercourse is likely to be of low importance to otter.

4.10 Great Crested Newt

The study site does not support any suitable aquatic habitats for great crested newt and the site is isolated from any suitable waterbodies in the wider landscape by surrounding roads and industrial units.

The nearest record of great crested newt is from a drainage ditch located approximately 450m to the northwest of the study site. This record is from 1992.

There are no records of great crested newt within 500m of the site from within the last 20 years.

Taking this into account it is considered very unlikely that great crested newt would be present at the site.

5 Evaluation

5.1 Habitats

The site comprises of an area of grassland habitat that has undergone limited management over recent years. The site supports a range of successional habitats including areas of coarse, semi-improved grassland which grades into areas of tall herb community, bramble scrub and hawthorn scrub

There is a band of broadleaved woodland and a watercourse which runs along the south-eastern boundary of the study site.

The woodland and watercourse form part of a more-or-less unbroken corridor of semi-natural vegetation which runs from the southwestern edge of the Industrial Estate, through the estate itself, before joining Redwither Brook approximately 500m to the east of the site. Mixed broadleaved woodland is listed under Section 7 of the Environment Wales Act 2016 as habitats of 'principal importance' in Wales.

The woodland and its associated watercourse is likely to function as a wildlife corridor through the industrial estate.

The scrub and grassland habitats present are of low botanical interest and are commonly occurring throughout the UK within similar neglected agricultural and industrial sites. Nevertheless, they provide an area of relatively undisturbed, semi-natural habitat along the woodland wildlife corridor. The habitats are also likely to offer foraging and refuge habitat for various common wildlife including birds, small mammals and invertebrates.

The woodland is also of considered to be of relatively low botanical interest, however owing to its function as one of the main wildlife corridors through the Industrial Estate, the woodland is considered to be a feature of locally important biodiversity value.

Development proposals are to develop the area of derelict grassland/bramble scrub. The area of broadleaved woodland lies outside of the proposed development area.

If left unmanaged, it is likely that the site would develop into continuous bramble scrub, followed by dense thorn scrub and ultimately further broadleaved woodland.

5.2 Protected Species

Targeted surveys were completed during the 2018 field season to determine the likely presence/absence of and importance of the site for breeding birds, badgers, bats, great crested newt, reptiles and notable butterflies.

The findings of these surveys are summarised and evaluated below.

5.2.1 Reptiles

No reptiles were recorded at the site whatsoever during targeted reptile refugia and visual surveys or incidentally during other field surveys undertaken at the site.

It is considered to be unlikely that the site supports any significant reptile population.

5.2.2 Breeding birds

In total 23 bird species were recorded during surveys. A full list of species recorded along with their conservation status is presented in Table 4 in the Appendix.

The site is considered to offer good habitat for breeding birds with nesting and foraging opportunities offered within areas of woodland and scrub along the southeast boundary of the site whilst further foraging opportunities are offered within the adjacent grassland and scrub areas. These areas are likely to attract nectar feeding insects and will also provide seed and fruits.

Moderate numbers of individual birds were recorded at the site, with most birds recorded within the woodland and along the woodland edge habitats.

Although the site was found to support moderate numbers of individual birds, the bird species recorded are considered to be relatively common.

Several species recorded at the site, although relatively common, are considered to be species whose populations are in decline and are so are listed as either red or amber species on the list of Birds of Conservation Concern¹².

This includes bullfinch, dunnock and willow warbler. These species were either recorded as breeding or possibly breeding at the site.

Given the moderate numbers of individual birds recorded at the site, albeit of relatively common species, the site is considered to be of **site only** conservation importance for breeding birds.

5.2.3 Bats

The woodland present along the south east boundary of the site was found to offer limited bat roosting opportunities within occasional

¹² Eaton *et al* (2015) *The Population Status of Birds in the UK, Channel Islands and the Isle of Man*, British Birds

mature trees. Most of the trees present are of a relatively young age and have not yet developed any suitable bat roosting features.

The bat activity surveys identified the site as supporting relatively low numbers of foraging bats. Bats were generally encountered individually either commuting along or foraging over the woodland habitats. Bats were not recorded foraging over the open grassland habitats.

Common bat species were generally recorded at the site principally comprising of common pipistrelle and soprano pipistrelle with noctule and whiskered bat also infrequently recorded.

The surrounding, wider Industrial Estate offers fragmented pockets of suitable bat foraging habitat with small areas of woodland and scrub interspersed amongst large areas of hardstanding, amenity grassland and industrial units.

Taking all of this into account, the study area was assessed as being of 'site only' value with regards to bats.

5.2.4 Butterflies

The Wrexham Industrial Estate is acknowledged as maintaining important populations of the dingy and grizzled skipper butterfly. Both of these butterflies are Species of Principal Importance.

Review of existing data and site surveys did not record the presence of either of these butterflies at the proposed development site. In addition, the habitat assessments of these sites did not indicate that they were potentially viable for the presence of these species.

Although neither species was recorded within the study site, the adoption of habitat creation and management within and outside of the site has the potential to provide additional resources and contribute to the maintenance and enhancement of the butterfly, and other invertebrate, populations within the Wrexham Industrial Estate.

5.2.5 Badgers

An inactive badger sett has been identified within the woodland block to the southeast of the proposed development area. No field signs indicative of recent badger activity were found within the grassland/scrub habitats of the proposed development area however it is likely that badgers occasionally forage within these habitat.

It is considered unlikely that the proposed development site is used frequently by badger and is likely to be of low importance.

5.2.6 Otters

Otter was recorded on Redwither Brook in 2016, approximately 600m to the east of the study site.

However, no field signs indicative of otter were found along the watercourse within the woodland block and no suitable otter holt sites are located along the watercourse. The watercourse is also considered unlikely to offer any valuable foraging opportunities for otter

Nevertheless, it is possible that otter will occasionally move along the watercourse. Such usage is likely to be infrequent and the watercourse is likely to be of low importance to otter.

6 Recommendations

6.1 Habitats

6.1.1 Habitat Management and Creation

It is recommended that development avoids negative impacts upon the woodland block along the site's south-eastern boundary (Target Note 7).

Where possible an appropriate buffer area should be retained between the edge of the developed area and this feature. Landscaping proposals should aim to strengthen the woodland corridor through additional planting which will also help to screen any increases in light levels associated with the development.

Landscaping in this area should comprise of native broadleaved trees and shrubs including oak, silver birch, alder, willow, hawthorn, blackthorn, hazel and holly.

It is recommended that the woodland is enhanced through the implementation of a woodland management plan. The current woodland is very dense and scrubby. To increase the value of this woodland it is recommended that it is thinned out and that any higher value trees are encouraged to come through. This can be achieved through 'haloing' (haloing involves the felling and pruning back of surrounding low-value trees and scrub so that they do not shade out and stunt the development of the more valuable adjoining trees). The thinning out of the woodland should allow more light through to the field layer potentially enhancing conditions for woodland ground flora.

The proposed development will result in the loss of some semi-improved grassland. Whilst this habitat is considered to be of limited botanical interest, it provides an area of relatively undisturbed, semi-natural habitat alongside the woodland wildlife corridor. The habitat is likely to offer foraging and refuge habitat for various common wildlife including birds, small mammals and invertebrates.

A habitat management plan should be developed for the site and these habitats should be managed for their biodiversity value.

Should it prove practical, areas within the development site or other nearby, off-site land should be managed for invertebrate conservation in general, and dingy and grizzled skipper butterflies in particular.

The establishment of features such as bunds, mounds and other areas should be created using nutrient poor soils. Medium-coarse aggregate material should be used for such features with a limestone or other high pH material preferable as it facilitates the development and maintenance of an open, species-rich sward.

Bare ground areas should be orientated, where possible, such that they are exposed to the full sun during much of the day, i.e. south facing.

The banks should be sown with an appropriate wildflower mix (e.g. Emorsgate Seeds EM6F) and/or a translocation of species from within the development site such as common birds-foot trefoil, creeping cinquefoil and agrimony.

Other areas should be created/managed that maintain species-rich grassland flowers for nectaring butterflies.

Other opportunities to enhance the biodiversity of the site should be taken such as the creation of wildlife ponds and areas of managed wildflower meadows within any amenity areas.

It is recommended that such areas to be retained and managed for their biodiversity value are sited alongside the retained block of woodland where they can be connected to the wider woodland wildlife corridor. This would provide a larger continuous block of valuable habitat as opposed to creating less valuable, small fragments of habitat scattered about the proposed development.

It is recommended that any loss of grassland habitats at the site is compensated through off-site habitat management and/or habitat creation where possible.

Off-site, habitat creation and management should include similar grassland/scrub mosaics to that already present at the site and should also include habitats of value to dingy and grizzled skipper butterflies—such as the development and maintenance of areas of open ground and early successional grassland.

This will require many of the techniques outlined above as general principles but will require the adoption of ongoing management comprising rotational disturbance on certain areas to prevent succession to grassland and scrub. It should however, be noted that any management plan will also need to acknowledge the importance of later successional stages for these butterflies and other invertebrates.

6.1.2 Bat and Bird Mitigation

New bird nesting and bat roosting habitat can be provided through the implementation of a bat and bird box scheme. Bat and bird boxes can be installed on suitable trees within the retained woodland and can be built into proposed new buildings at the site.

Lighting proposals will need to ensure that additional light spill on to the woodland areas is kept to a minimum, with dark corridors retained along both the southern site boundary.

A lighting designer would likely be appointed during the detailed design stage of the project. The lighting designer should consult the 'Bats and Lighting Research Project' (Stone 2013) which provides recommendations for limiting the negative effects of lighting on bats.

Where possible the use of artificial lighting should be avoided. Lighting should be directed away from the site's southern boundary and should be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls.

Lighting sources should be 'bat friendly' using LEDs or low wattage lamps.

All wild birds in England and Wales are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally kill, injure or take any wild bird, or take, damage or destroy the nest (whilst being built or in use) or its eggs.

The scrub and trees present could be used by nesting birds during the breeding bird season. Where possible, any future vegetation clearance of the site should be timed to avoid impacting upon suitable nesting habitat during the breeding season (March-August inclusive).

6.1.3 Badgers

An inactive badger sett has been identified within the woodland block to the southeast of the proposed development area. It is likely that badgers are active within proximity to the study site.

Given the badger sett's location approximately 10m into the adjacent woodland block, it is considered unlikely that development works will directly affect the badger sett. However, this will need to be confirmed once the detailed design and layout of proposals is known.

If it is found that works will likely result in damage or disturbance to the badger sett, works may need to be carried out under a Natural Resources Wales Badger Disturbance License.

It is recommended that a badger method statement is produced for the site once the detailed design and layout of proposals is known.

The method statement should include:

- a timetable for update badger surveys to ensure that no new setts are present within the proposed development site prior to site clearance;
- measures to avoid impacts upon the identified badger sett at Target Note 8;
- generic measures to avoid impacts upon badgers in the surrounding landscape that could visit the site during the construction phase- such as the maintenance of a tidy works area with hazardous substances fenced off from badger.

6.1.4 Otter

Otters may occasionally use the watercourse at Target Note 9. The development proposals will not directly affect this watercourse. It is considered unlikely that otter would use habitats within the proposed development area.

Nevertheless, it is recommended that a tidy works area is maintained throughout construction with any hazardous substances fenced off from otters overnight.

6.2 Further Enhancements

It is recommended that the overall ecological value of the wider Industrial Estate is enhanced where possible either through the implementation of a bat and bird box scheme or by taking opportunities to offer off-site habitat management and/or habitat creation.

7 Appendix

FIGURE 1- Site Location



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Ordnance Survey 100054686



Study Area



FIGURE 2- Habitat Plan

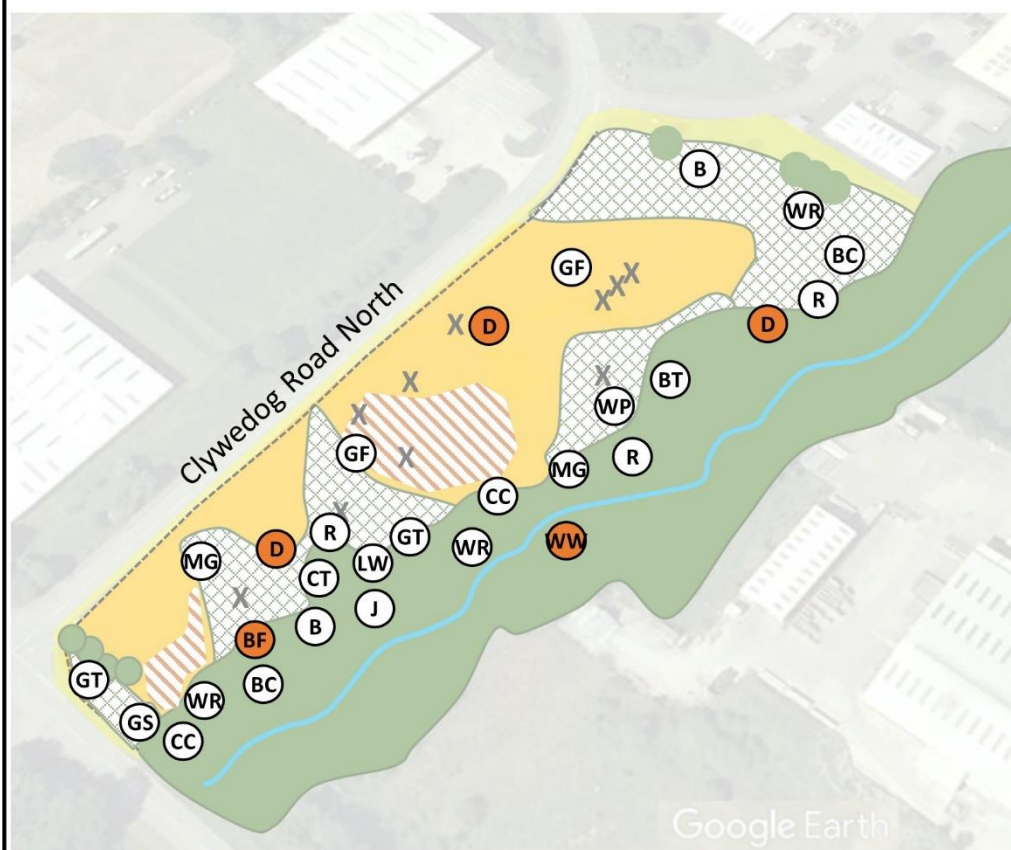


KEY

- | | |
|-------------------------|-------------|
| Semi-improved grassland | Tall herb |
| Broadleaved woodland | Fence |
| Amenity grassland | Watercourse |
| Dense scrub | Target Note |
| Scattered scrub | Study site |
| Tree | |



**FIGURE 3- Breeding
 Bird Survey Results**



B	Blackbird	MG	Magpie
BC	Blackcap	R	Robin
BT	Blue tit	WW	Willow warbler
BF	Bullfinch	WR	Wren
CC	Chiffchaff		
CT	Coal tit		
D	Dunnock		
GF	Goldfinch		
GS	G. Spotted w/pecker		
GT	Great tit		
LW	Lesser whitethroat		

- Red list species
- Amber list species
- B Green list species



**FIGURE 4- Bat Activity
Survey Results**



-  Transect Route
-  Point count (low activity)
-  Point count (moderate activity)
-  Automated bat detector location



PHOTOGRAPHS

Photograph 1- Road verge habitat at Target Note 1



Photograph 2- Grassland habitat at Target Note 2



Photograph 3- Grassland scrub mosaic habitat at the site



Photograph 4- Habitats at Target Note 2 (August 2018)



Photograph 5- Tall herb habitat at Target Note 4



Photograph 6- Woodland habitat at Target Note 7



Photograph 7- Watercourse at Target Note 9



Photograph 8- Badger Sett at Target Note 8



Table 5- Reptile Survey Weather Conditions

Date	Temperature °C	Weather
12/06/18	18	Hazy sunshine, light breeze
13/06/18	19	Hazy sunshine, light breeze
20/06/18	17	Hazy sunshine, light breeze
03/07/18	18	Clear, light breeze
30/07/18	19	Intermittent sun after rain, calm.
04/08/18	21	Sunny, calm
15/08/18	17	Calm, clear, sunny

Table 6- Bird Species Recorded and Conservation Status

Species	Breeding Status	BOCC Status
Blackbird	B	
Blackcap	B	
Blue tit	B	
Bullfinch	P	Amber
Carrion crow	P	
Chiffchaff	B	
Coal tit	P	
Collared dove	P	
Dunnock	B	Amber
Goldfinch	P	
Great spotted woodpecker	P	
Great tit	B	
Grey heron	NB	

Species	Breeding Status	BOCC Status
Jackdaw	P	
Jay	P	
Lesser whitethroat	P	
Long-tailed tit	P	
Magpie	P	
Robin	B	
Swallow	NB	
Willow warbler	P	Amber
Wood pigeon	P	
Wren	B	

B- Breeding/Probable Breeding, P- Possible Breeding, NB- Non-breeding

Table 7- Bat Activity Survey Results

Survey Results- 20/05/18

Point Count	Species	Circuit 1		Circuit 2	
		Time	Passes	Time	Passes
1	P45, P55	21.51	8	23.01	0
2	P45	21.59	2	23.07	0

Survey Results- 12/06/18

Point Count	Species	Circuit 1		Circuit 2	
		Time	Passes	Time	Passes
1	P45	21.48	0	22.50	1
2		21.54	0	22.57	0

Survey Results- 30/07/18

Point Count	Species	Circuit 1		Circuit 2	
		Time	Passes	Time	Passes
1	P45	21.54	0	22.53	1
2	P45, P55	22.00	4	22.59	0

Survey Results- 23/08/18

Point Count	Species	Circuit 1		Circuit 2	
		Time	Passes	Time	Passes
1	P55	20.22	1	21.22	P55
2		20.27	0	21.28	

Table 8- Activity Survey Results Summary

Point Count	Average Passes	Activity Index
1	1.38	Low
2	0.75	Low

Table 9- Bat Survey Weather Conditions

Date	Sunset	Weather	Temperature
20/05/2018	20.59	Dry, calm, high cloud	16°C
12/06/2018	21.38	Light breeze, clear, dry	16°C
30/07/2018	21.10	Dry, calm, 60% cloud	18°C
23/08/2018	18.33	Dry, calm, clear	14°C

Table 10- Butterfly Survey Weather Conditions

<i>Date</i>	<i>Temperature °C</i>	<i>Notes</i>
08/05/2018	19	Light winds, sunny
14/05/2018	17	Light winds, sunny
19/05/2018	22	Light winds, sunny
23/05/2018	21	Light winds, sunny
13/06/2018	21	Light winds, sunny