



Vicarage Road,
Gresford

Ecology Report

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1 Introduction

1.1 Background

Kingdom Ecology have carried out an ecological assessment of an area of agricultural land located on the southern edge of the village of Gresford near Wrexham. The ecological 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 Extended Phase 1 Habitat survey was undertaken in August 2017 with follow-on bat activity surveys completed August-October 2017.

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 fifteen 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 an ecological desk study and field surveys undertaken in August-October 2017.

The field survey aimed to identify habitats and species which are either of importance in terms of their conservation value or are afforded statutory legal protection. The presence of such habitats or species would form a material consideration during the planning process and could pose a constraint to the redevelopment of the site.

Species considered during the assessment included breeding birds, badger, great crested newt, reptiles and bats.

The report evaluates the conservation importance of the habitats and species recorded and goes on to make recommendations for further works, mitigation and ecological enhancement measures where relevant.

1.3 Protected Species Legislation

1.4 Relevant Protected Species Legislation

1.4.1 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.

1.4.2 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.

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

1.4.4 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.

1.4.5 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.

1.4.6 Invertebrates

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.

Further protection is afforded to sixty-nine species of British invertebrates which are also protected under the Wildlife and Countryside Act (1981) (as amended). Species listed under Schedule 5 may be protected under one, some or all of the following parts of Section 9:

- Section 9, Part 1 – intentional killing, injuring, taking
- Section 9, Part 2 – possession or control (live or dead animal, part or derivative)

- Section 9, Part 4 (a) – damage to, destruction of, obstruction of access to any structure or place used by a scheduled animal for shelter or protection
- Section 9, Part 4 (b) – disturbance of animal occupying such a structure or place
- Section 9, Part 5 (a) – selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative)
- Section 9, Part 5 (b) – advertising for buying or selling live or dead animal, part or derivative

1.4.7 Great Crested Newt

The great crested newt (*Triturus cristatus*) receives full protection under the Wildlife and Countryside Act 1981 (as amended) and through their inclusion in Schedule II of the Habitats Regulations 2010. This legislation makes it an offence to:

- intentionally kill, injure or take a great crested newt;
- disturb a great crested newt;
- intentionally or recklessly damage, destroy, obstruct access to a breeding site or resting place of a great crested newt;
- sell, offer for sale, possess or transport a great crested newt for the purpose of sale.

The great crested newt is listed as a priority species under Section 7 of the Environment (Wales) Act 2016.

1.5 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.

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 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.

2 Desktop Study

2.1 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 Wakes Region. Additional records were sort from the Multi Agency Geographic Information for the Countryside website (Magic) (<http://www.magic.gov.uk>).

2.1.1 Species

COFNOD holds several records of protected species within 1km of the site including the following:

- Kingfisher
- Peregrine
- Osprey
- Barn Owl
- Water Vole
- Otter
- Badger
- Common Pipistrelle
- Soprano Pipistrelle
- Brown Long-eared Bat
- Slow-worm
- Grass Snake
- Great Crested Newt
- Adder

COFNOD holds no records of protected species within the study site itself from within the last 20 years.

COFNOD hold a record of common pipistrelle and brown long-eared bat along the eastern boundary of the site however these records date from 1993. There is also a record of a pipistrelle roost within the porch of Bank Cottage on Vicarage Lane (this record dates from 2003).

There are no records of any other protected species within 250m of the study site.

COFNOD holds records of great crested newt at Vicarage Moss SSSI which is located approximately 700m to the east of the study site.

COFNOD also holds records of great crested newt from a pond site located approximately 450m to the southwest of the site on the opposite side of Old Wrexham Road

A new housing estate located to the southwest of the site (Brn-y-groes) is currently under construction. As part of the development a great crested newt mitigation pond has been constructed within a field on the opposite side of Pikey Lane located approximately 480m to the west of the study area.

2.1.2 Designated Sites

Vicarage Moss SSSI

Vicarage Moss SSSI is located approximately 480m to the east of the study site. The Moss has been designated for its geological and botanical interest.

Pant-yr-Ochain LWS

Pant-yr-Ochain is a Local Wildlife Site located approximately 700m to the southwest of the study site. The site comprises of a series of ponds and single large waterbody (The Flash). The site is considered to be primarily of importance for birds.

Other Sites

No other statutory or non-statutory designated sites are located within 1km of the study site.

3 Field Survey Methods

3.1 Survey Aims and Objectives

The survey aim was to assess the site as to its ecological importance by assessing the value of habitats 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 Extended Phase 1 Habitat survey; follow-on bat activity surveys and an assessment of other habitats at the site in terms of their suitability to support protected species including great crested newt, reptiles, a search for evidence of badger activity and an assessment of the suitability of trees to support either roosting bats or nesting birds during the breeding bird season.

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

3.2 Extended Phase 1 Habitat Survey

3.2.1 Methods

An Extended Phase 1 Habitat Survey of the study site was undertaken on the 10th August 2017. Survey was carried out following standard methodologies as described in the '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*' (JNCC, 2004⁷).

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;
- provide additional information regarding incidental observations of protected species and the potential of habitats to support such species. Specifically, the suitability of the site to support badgers and an assessment of the suitability of surrounding trees to support either roosting bats or nesting birds during the breeding bird season.

⁷ JNCC (2004) '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*'

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.

3.3 Badger

3.3.1 Methods

The survey was undertaken on 10th August 2017 and adopted the standard approach used in the National Badger Survey (Cresswell *et al.*, 1990)⁸ and recommended by the Mammal Society (described in the booklet '*Surveying Badgers*' (Harris, Cresswell and Jefferies, 1989⁹)). It involved searching for badger signs, including setts, latrines, foraging marks, badger hairs, trails and footprints. Setts and other signs were marked on maps.

3.4 Bats

The survey objectives were to identify and evaluate bat roosting habitat on site through a daytime inspections of trees and to identify potential bat foraging and commuting habitat.

Surveys followed methodologies prescribed in English Nature's *Bat Mitigation Guidelines* (Mitchell-Jones 2004)¹⁰ and the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 3rd Edition (BCT 2016)¹¹.

3.4.1 Tree Surveys

A visual inspection of mature trees within the site was made to assess their bat roosting potential. The inspection was made from ground level during daylight conditions using binoculars and a high-powered torch to assess the potential of any cracks and holes to support bat roosts, and to search for evidence of bat use such as droppings, scratch marks, staining etc. Surveys were undertaken on the 10th August 2017.

In addition to identifying actual bat roosts the surveys also aimed to assess the suitability of the trees to support bats and consequently the likelihood of a bat roost being present that did not exhibit obvious field signs. Roost suitability was assessed by examining structural features

⁸ Cresswell, P., Harris, S., and Jeffries, D.J., 1990. The history, distribution, status and habitat requirements of the badger in Britain. Nature Conservancy Council.

⁹ Harris, S., Cresswell, P. and Jefferies, D., 1989. *Surveying Badgers*. Occasional Publication of the Mammal Society, No.9. Mammal Society, London.

¹⁰ Mitchell-Jones, A.J. 2004. *Bat Mitigation Guidelines*. English Nature, Peterborough.

¹¹ Bat Conservation Trust (2016) *Bat surveys – Good Practice Guidelines* 3rd Edition. Bat Conservation Trust, London.

and surrounding habitat. Structural features that could influence the suitability of a tree to support roosting bats include:

- frost cracks
- trunk and branch splits
- woodpecker holes
- rot holes where branches have been removed
- hollow sections of trunk, branches and roots
- loose bark
- cavities beneath old root buttresses and coppice stools
- dense ivy
- bat or bird boxes

Important habitat features surrounding individual trees, which could influence roost potential include; whether the trees are in a semi-rural or parkland location, proximity to a significant linear feature (e.g. watercourse, mature hedgerow, wooded lane) or proximity to known bat roosts etc.

Taking account of these structural and habitat features, trees were assigned a level of roost suitability based upon professional judgement.

3.5 Bats Activity Transects

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

3.5.1 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, hedgerows and treelines.

Transects were interspaced by seven '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. An average 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

Notes on weather conditions and survey times were also recorded. Surveys were undertaken during suitable weather conditions i.e. >8°C at sunset with minimal rainfall and wind.

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.

Three transects were walked in total on the 30th August, 18th September and the 8th October 2017.

Transect surveys commenced within 10 minutes of sunset and ended approximately two hours after thus coinciding with the peak periods of bat activity.

The transect route, covering Point Counts 1-7, was walked twice allowing sampling of bat activity both immediately following sunset and also later in the same evening.

During the second transect survey (18th September 2017) the first route was walked once at sunset and then walked a second time an hour and a quarter before sunrise.

Activity transects were carried out by Richard Roe (BSc, MSc, MCIEEM, CEnv). Richard has over fifteen years' experience as a professional bat consultant and is a licensed bat worker.

3.5.2 Evaluation of Bat Habitats

Using the activity 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 3.1 below.

Table 3.1 - 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 2005¹²). 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.

¹² 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.

Scores are attributed as follows:

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

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

3.6 Great Crested Newt

3.6.1 Habitat Suitability Index Assessment

No ponds are located within 250m of the proposed development site. However, four ponds were identified within 500m of study site from ordnance survey maps, aerial photography and the site walkover (Ponds 1-4 on Figure 1).

Pond 1 is a large duck/fish pond located 290m to the north-west of the site within the centre of Gresford village.

The remaining 3 ponds are located to the southwest of the site. These ponds range between 300m-385m from the study area.

Great crested newt had been previously recorded within Pond 2 which is located approximately 385m to the southwest of the site on the opposite side of Old Wrexham Road.

The ponds were visited during Extended Phase 1 Habitat Surveys and were assessed as to their suitability to support great crested newt by assessing habitats present. This assessment followed the Habitat Suitability Index (HSI) Guidelines as produced by the National Amphibian and Reptile Recording Scheme (NARRS 2008¹³) which in turn are based on a paper produced by Oldham et al. (2000¹⁴). The HSI examines ten key habitat features of a site in order to produce a numerical score of between 0 and 1. This score signifies the suitability of a pond as defined in Table 3.2.

The habitat features evaluated/measured to obtain the habitat suitability index are as follows: -

- Geographic location,
- Pond area,
- Pond permanence,
- Water quality,
- Pond shading,
- Number of waterfowl,
- Occurrence of fish,

¹³ NARRS (2008) 'Great Crested Newt Habitat Suitability Index'

¹⁴ Oldham R.S et al (2000) 'Evaluating the suitability of habitat of the Great Crested Newt (*Triturus cristatus*)'. Herpetological Journal 10 (4), 142-155

- Pond density,
- Terrestrial habitat,
- Macrophyte cover.

Table 3.2- HSI Score Categories

<i>HSI</i>	<i>Pond Suitability</i>
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Above Average
>0.8	Excellent

3.7 Hedgerow Regulations 1997

Hedgerows at the site have been assessed to determine whether they qualify as 'important' under the Hedgerow Regulations 1997 which are the main regulations aimed at protecting hedgerows in their own right. These regulations are a part of the planning regulations and are administered by the local planning authority in England and Wales. The regulations are in place to allow planning authorities to protect important hedgerows from removal. Removal is uprooting or otherwise destroying a hedgerow, this includes serious damage to the root system or over-maintenance resulting in the death of the hedgerow.

Hedges that are less than 20m long (with some exceptions), garden hedges and former hedgerows that have grown to a line of trees are not covered by the Regulations. Trees within a hedgerow are considered to be a part of the hedge. If a hedge is removed without permission (whether important or not) the land owner may face an unlimited fine and may have to replace the hedge.

A landowner wishing to remove a hedgerow must serve a Hedgerow Removal Notice in writing to the local planning authority. The authority then has 42 days to determine whether or not the hedgerow is 'important' under the Regulations, and whether or not to issue a Hedgerow Retention Notice. The authority must consult the local parish/ community council and consider their views when making the decision. A Hedge Retention Notice is permanent, although a planning authority may withdraw it at any time.

If the hedgerow is not 'important', the authority cannot refuse a permission to remove it under the Regulations. If the hedgerow is important, the authority can issue a Retention Notice unless they are satisfied that circumstances justify the removal.

Important Hedgerows

To qualify as 'important', a hedgerow must be at least 30 years old and meet at least one of the following eight criteria, which identify hedgerows of particular archaeological, historical, wildlife and landscape value:

1. The hedgerow marks the boundary of a historic parish or township existing before 1850.
2. The hedgerow incorporates an archaeological feature.
3. The hedgerow is a part of or associated with an archaeological site.
4. The hedgerow marks the boundary of or is associated with a pre-1600 AD estate or manor.
5. The hedgerow forms an integral part of or is associated with a field system pre-dating the Enclosures Act.
6. The hedgerow contains a protected species listed under schedule 1, 5 or 8 of the Wildlife and Countryside Act 1981. In addition, species listed in certain red data books qualify.
7. The hedgerow includes, on average, in a 30 metre length one of:
 - a) at least 7 woody shrub and tree species listed in the regulations
 - b) at least 6 woody species and has at least 3 associated features.
 - c) at least 6 woody species including a black-poplar tree, large-leaved lime, small-leaved lime or wild service tree.
 - d) at least 5 woody species and has at least 4 associated features.

In northern England, the number of woody species is reduced by one.

8. The hedgerow runs alongside a bridleway, footpath, road used as a public path or a byway open to all traffic, and includes at least four woody species, on average, in a 30m length and has at least two associated features.

The associated features are:

- A bank or wall supporting the hedgerow along at least half of its length.
- Less than 10% gaps.
- On average, at least one tree per 50 metres of hedge
- At least three species from a list of 57 herbaceous woodland plants, including bluebell, primrose, wild strawberry and assorted ferns and violets
- A ditch along at least a half of the length of the hedge.
- A number of connections with other hedgerows, ponds or woodland.
- A parallel hedge within 15 metres of the hedgerow.

With regards to this report, the importance of hedgerows at the site have been assessed against ecological criteria only (criteria 7 and 8 within the Regulations).

4 Results

4.1 Habitats and Flora

4.1.1 Overview

The study area comprises of a large agricultural field located on Vicarage Lane, Gresford, LL12 8UR, (Ordnance Survey Grid SJ 351 545). The site measures 2.6ha in area. The field is managed as a rye grass-clover ley and is farmed for silage. The site location is shown on Figure 1 in the Appendix.

The study site is bounded to the north by Vicarage Lane; to the east and west by residential housing and gardens and to the south by arable fields.

Surrounding habitats principally comprise of residential housing and gardens associated with the village of Gresford and further agricultural land.

There is a residential care home (Trewythen Hall) located to the north of the site. The hall supports parkland habitat with scattered mature broadleaved trees within areas of open grassland.

There is a derelict grassland field located to the west of the site. The field is unmanaged and comprises of rough grassland and bramble.

4.1.2 Habitats

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.

The following habitats were recorded within or immediately adjacent to the study site:

- Arable land
- Hedgerows
- Amenity grassland gardens
- Semi-improved neutral grassland
- Scrub
- Tall ruderal herbs
- Scattered broadleaved trees

Recorded habitats are Target Noted on Figure 2 and described below

4.1.3 Arable land

The survey area comprises predominantly of an arable field (Target Note 1). The field is dominated by Perennial rye-grass with extensive Red and White Clover. The field is farmed as a silage crop.

There is a band of unmanaged grassland/ruderal herb running around the perimeter of the field adjacent to the site's hedgerow boundaries. Plant species present comprise of false oat-grass, cock's-foot, perennial rye-grass and Yorkshire fog with common ragwort, red clover, creeping thistle, hogweed, cleavers, bramble and nettle.

There is a single mature oak tree located within the centre of the field at Target Note 4. The oak tree offers some 'low' value potential bat roosting habitat within a shallow split up its main trunk. The split was observed to extend no more than 1cm back and so offers only limited potential bat roosting habitat.

4.1.4 Boundary Features/Hedgerows

The northern, eastern, western and southern boundaries of the site are marked by hedgerows.

Hedgerow 1 & 2- along northern boundary/Vicarage Lane

The northern boundary of the site comprises of two lengths of hedgerow broken up by gaps and a field gate. The boundary runs along Vicarage Road.

Hedgerow 1 forms the first part of the field boundary (Target Note 8 on Figure 2) and runs from the north-western corner of the site to a field gate at the centre of the hedge; there is then a large gap in the hedge. Hedgerow 2 (Target Note 9) forms the second part and runs from the field gate and gap to the north-eastern corner of the site.

Hedgerow 1 was found to be intact and species-rich comprising predominantly of hawthorn with blackthorn, ash, sycamore, oak, holly, elder and dog rose.

The hedgerow supports two mature oak standard trees and is located on a short hedge bank.

The ground flora of the hedge comprises of typical ruderal species with false-oat grass, cock's foot, red fescue, bramble, ivy, nettle, cow parsley etc but also includes several woodland indicator species including herb Robert, lord and ladies and wood avens.

There is a short section of garden hedge located on the opposite side of Gresford Road to the hedge.

In accordance with the Hedgerow Regulations 1997, Hedgerow 1 is considered to be 'important' as it supports at least 5 woody species on average, and has at least 4 associated features.

Hedgerow 2 was found to be very gappy with short sections of intact hedge ranging from 5m-23m in length with large intervening gaps measuring 6-23m in length.

The short sections of intact hedgerow comprise of single blocks of holly and oak hedge with short sections of mixed species including hawthorn, holly, oak, sycamore and ash.

This section of hedge has no standard trees. The ground flora of the hedge comprises typical ruderal species with false-oat grass, cock's foot, red fescue, bramble, ivy, nettle, cow parsley, herb Robert and wood avens.

Hedgerow 2 does not qualify as 'important' under the Hedgerow Regulations.

Hedgerow 3- Eastern Boundary of the Site

The eastern boundary of the site (Target Note 2) is marked by a species-poor hedge of cypress, hawthorn, holly and elder. The hedge runs along a footpath and divides the site from the neighbouring gardens of an adjacent residential property (Bryn Issa).

Hedgerow 3 does not qualify as 'important' under the Hedgerow Regulations.

The adjacent gardens comprise of amenity grassland lawn with scattered mature trees comprising principally of beech and sycamore.

The footpath is divided from the site by a barbed wire fence and a ribbon of ruderal herbs comprising principally of coarse grasses with nettle, bramble and hogweed plus scattered sycamore, ash, holly and oak scrub.

Hedgerow 4- Southern Boundary of the Site

The southern boundary of the site (Target Note 3) is marked by a species-rich hawthorn hedgerow with holly, oak, ash, hazel, sycamore, blackthorn, elder and dog rose. The hedgerow supports three standard trees comprising of mature sycamore, ash and oak.

The ash tree at Target Note 11 offers potential bat roosting habitat (low value) within a split where one of the main limbs joins the tree's trunk.

There is a narrow fringe of false-oat grass, nettle and bramble at the base of the hedge with wood avens, lords and ladies and comfrey.

The hedgerow divides the site from an adjacent arable field which was being farmed for maize at the time of survey. A badger latrine was identified within the maize field at Target Note 12.

Hedgerow 5- Western Boundary of Site

The western boundary of the site (Target Note 5) is marked by a species-rich hawthorn hedgerow with holly, hazel, oak, blackthorn, elder and dog rose. The hedgerow supports oak and sycamore standard trees.

There is a narrow fringe of bracken plus false-oat grass, nettle and bramble at the base of the hedge.

A badger path was identified passing through the hedge at Target Note 15.

The hedgerow divides the site from an adjacent arable field and an area of unmanaged grassland (Target Note 10). The adjacent grassland has developed into semi-improved neutral grassland comprising principally of false-oat grass with occasional meadow foxtail, cock's-foot and red fescue with bramble, nettle, cow parsley, creeping thistle, common ragwort and hogweed and with scattered oak, hawthorn and hazel scrub. There are dense patches of bramble and blackthorn scrub around the edges of the field.

Hedgerow 6- Southern Boundary of Site

Hedgerow 6 (Target Note 6 on Figure 2) forms a continuation of Hedgerow 5. It is a further species-rich hedge with hawthorn, hazel, oak, holly, elder and dog rose.

The hedgerow supports three short (approximately 8m in height), ivy-clad oak tree standards.

A badger path was identified passing through the hedge at Target Note 16.

The hedgerow divides the site from the adjacent area of unmanaged grassland at Target Note 10.

Western Boundary of the Site

The site's western boundary (Target Note 7) is marked by a fenceline which divides the site from adjacent residential gardens. The boundary is marked by ruderal herbs of nettle, bramble, creeping thistle and ragwort.

4.1.5 Evaluation and Conclusions

The habitat/botanical survey has found the majority of the site to comprise of intensively farmed rye-grass ley (arable land). Such a habitat is considered to be of negligible nature conservation value according to the CIEEM (2006) framework guidelines.

However, the hedgerows and associated mature standard trees (particularly the species-rich hedgerows at Target Notes 3, 5, 6 and 8 along the site's northern, southern and western boundaries) are considered to be the features of greatest ecological value present.

These features are likely to offer suitable refuge and foraging habitat for birds, bats and other wildlife. They are also likely to act as linear wildlife corridors through the landscape. These features are considered to be of **local** conservation value.

Hedgerows are listed under Section 7 of the Environment (Wales) Act 2016 as a habitat of 'principal importance' in Wales.

4.2 Badger

4.2.1 Results

Field signs indicative of badger activity were found throughout the site with badger paths identified passing through hedgerows at Target Notes 13, 15 and 16.

Further badger field signs encountered within proximity to the site included badger prints encountered within the arable field to the south of the site at Target Notes 14 and a badger latrine at Target Note 12.

No badger setts were identified within the site itself or within habitats within 30m of the site boundary.

4.2.2 Evaluation and Conclusions

Badgers have been confirmed as present within the study site and the wider landscape however no badger setts are present at or immediately adjacent to the site. It is likely that badgers use the study site for earthworm foraging and also pass through the site to access potential foraging/setting habitat located on the opposite side of Vicarage Road.

Agricultural grassland is widespread in the surrounding countryside, so it is very unlikely that the application site would represent a significant part of any local badger clan's foraging resource.

The badger is a widespread and common mammal in rural parts of Wrexham and it is therefore assigned to the **Local** value category in this assessment.

Badgers and their setts are protected under the Protection of Badgers Act 1992. However, the proposed development would not affect any setts or individuals, so it is unlikely to infringe this legislation.

4.3 Great Crested Newt

4.3.1 Pond Survey Results

No ponds are located within 250m of the proposed development site. However, four ponds were identified within 500m of study site from ordnance survey maps, aerial photography and the site walkover (Ponds 1-4 on Figures 8.1 & 8.3).

Pond 1 is a large duck/fish pond located approximately 290m to the north-west of the site, within the centre of Gresford village.

Pond 1 is isolated from the site by surrounding housing and roads and in any case, is considered unlikely to support great crested newt owing to the presence of coarse fish and high densities of wild fowl.

The pond achieved a HSI score of 0.22 and so is considered to be of 'poor' suitability. This low score is attributable to the pond's isolated location in the landscape, the presence of coarse fish and high densities of wild fowl. This pond was scoped out of the assessment.

Pond 2 is located approximately 385m to the south of the site on the opposite side of Old Wrexham Road. The pond is located within a small oak copse in an arable field. There are historic records of great crested newt within this pond (records from 2005).

The pond was visited on the 10th August 2017 and was found to be almost dry. The pond supports two small areas of water which measure approximately 25m² in area. The areas of water supported no aquatic vegetation other than duckweed.

The pond achieved a HSI score of 0.42 and so is considered to be of 'poor' suitability. This low score is attributable to the pond drying out annually, poor water quality, poor quality surrounding terrestrial habitat (arable land) and absence of aquatic vegetation.

Pond 3 is located approximately 330m to the south of the site at Caia Farm. The pond is located within a hollow within a small copse of willow, blackthorn and cypress. The copse is surrounded by bare earth and hardstanding associated with the farmyard. Water levels within the pond were found to be low with the pond surface area measuring approximately 200m² and the pond itself was approximately 15cm in depth. The pond is heavily shaded and supports no aquatic vegetation. The farmer at Caia Farm reported that the pond regularly dries out.

The pond achieved a HSI score of 0.50 and so is considered to be of 'below average' suitability. This low score is attributable to the pond drying out frequently, poor water quality, poor quality surrounding terrestrial habitat (predominantly hardstanding/bare ground) and absence of aquatic vegetation.

Pond 4 was found to be no longer present. There is a drainage ditch present in this location which runs along the southern edge of the Bryn-y-groes housing development site. The water was very turbid and appeared to be fed by run-off from the adjacent building site. The drain supports no aquatic vegetation. The drainage ditch is considered unlikely to support great crested newt.

4.3.2 Evaluation

Four ponds were identified within 500m of study site. Pond 1 was found to be of very low suitability and is isolated from the study site, Ponds 2 and 3 regularly dry out and offer low value aquatic habitat, Pond 4 was found to be no longer present.

Ponds 2 and 3 are located over 300m away from the site.

COFNOD holds records of great crested newt at Pond 2. However, these records are from 2005 when the pond was assessed as part of the ecological assessment for the adjacent Bryn-y-groes site. The surveys recorded a 'low' population of breeding great crested newt within this pond.

Conditions at the pond appear to have since deteriorated and the pond may no longer offer suitable newt breeding habitat.

The study site itself offers terrestrial habitats of limited value for great crested comprising principally of rye grass ley. Hedgerows at the site offer some suitable great crested newt habitat around the periphery of the site.

Taking into account the low suitability of ponds within the wider landscape; the distance of the study site from the ponds (over 300m) and the relatively low value of terrestrial habitats at the study site, it is considered to be very unlikely that any great crested newt would be present within the proposed development area.

Table 2- Habitat Suitability Index Results

<i>HSI Feature</i>	<i>Pond 1</i>	<i>Pond 2</i>	<i>Pond 3</i>
Location	1	1	1
Pond area	0.8	0.4	0.4
Pond drying	0.9	0.1	0.5
Water quality	0.33	0.33	0.33
Shade	1	0.2	0.2
Fowl	0.01	1	1
Fish	0.01	1	1
Ponds	0.1	0.7	0.7
Terrestrial habitat	0.33	0.33	0.33
Macrophytes	0.4	0.3	0.3
HSI	0.22	0.42	0.50

4.4 Breeding Birds

Tree, scrub and hedgerow habitats at the site are likely to be used by nesting birds during the breeding bird season.

The site is likely to support farmland and garden bird species that are common in rural parts Wrexham. Bird assemblages are therefore assessed as being of **Local** value.

All wild birds in England and Wales are protected during the breeding season under Section 1 of the Wildlife and Countryside Act 1981 (as amended).

4.5 Bats

4.5.1 Tree Surveys

All trees at the site were assessed as to their suitability to support bat roosts. The following trees were identified as offering suitable bat roosting habitat:

- There is a single mature oak tree located within the centre of the field at Target Note 4. The oak tree offers some 'low' value potential bat roosting habitat within a shallow split up its main trunk. The split was observed to not extend no more than 1cm back and so offers only limited potential bat roosting habitat.
- The ash tree at Target Note 11 offers potential bat roosting habitat (low value) within a split where one of the main limbs joins the tree's trunk.

None of the other trees present within the study site were found to support any obvious suitable bat roosting features.

4.5.2 Bat Activity Transects

Bat surveys were carried out on the evenings of the 30th August, 18th September and 8th October 2017.

Dates, weather conditions and sunset times are given in Table 6 in the Appendix.

Results of surveys are shown on Figure 3 in the Appendix. Figure 3 shows the walked transect route with Point Count locations (with activity index levels) overlaid on top of the Phase 1 Habitat Survey results. Summary data of the Point Count results are given in Table 7 in the Appendix.

4.5.3 Results Summary and Evaluation of Habitat Features for Bats

The activity surveys identified the site as supporting generally low levels of bat activity with moderate levels of bat foraging activity recorded along the hedgerow at the southern boundary of the site (Target Note 3 on Figure 2) and along Vicarage Road (Target Note 8 on Figure 2). Bats were generally encountered individually.

Species encountered during activity surveys comprised mainly of common pipistrelle bat with occasional soprano pipistrelle bat and noctule bat with infrequent Natterer's bat, Daubenton's bat and whiskered bat also recorded.

Common pipistrelle, soprano pipistrelle, Natterer's bat, whiskered bat and Daubenton's bat are considered common in the North Wales area and the UK as a whole.

Noctule bat is considered to be a rarer species of bat. Noctule was recorded commuting over the site and was not recorded foraging.

Bats were generally recorded foraging along hedgerows at the site with the greatest activity recorded along the southern boundary of the site. Moderate levels of bat activity were also recorded along Vicarage Road but this was generally attributable to individual pipistrelle bats foraging around street lighting and around one of the oak tree standards located within the hedgerow at Target Note 8.

It was observed that the open grassland habitats are not generally used as a significant foraging resource with low levels of activity recorded along other boundary features at the site.

Potential bat roosting habitat is offered within various residential housing located to the north, east and west of the site.

4.5.4 Habitat Evaluation

The overall value of the site has been assessed and scored following the methods described in section 3.5.2.

In summary the site was found to support common species of bats in individual/low numbers with possible nearby roosts (good roosting opportunities are offered within the housing around the site). The habitats at the site and surrounding the site are considered to be of moderate value for bats with good corridors of linear habitats offered by hedgerow networks and good foraging habitat offered within parkland habitats at Trewythen Hall on the opposite side of Vicarage Lane).

The assessment scored a total of 11 points which equates to an assessment of 'local' value for the site with regards to the CIEEM evaluation framework.

The assessment results and scores are given in Table 5 below.

Table 5- Site Results and Evaluation Score

Category	Results	Score
Species rarity?	Common species	2
Numbers of bats?	Individual bats	2
Nearby roosts?	Unknown/moderate	4
Landscape character?	Moderate	3
Total Score		11

4.6 Reptiles

Habitats within the site itself are largely considered to be of low value for reptiles as they principally comprise of a mono-culture of perennial rye-grass ley. There is some limited reptile habitat offered around the periphery of the field with ruderal habitats located at the hedge bottoms however these habitats are considered to be limited in extent.

More suitable reptile habitat is offered within the semi-improved grassland field located to the west of the site at Target Note 10. However, both this area of grassland and the site itself are relatively isolated from areas of more suitable reptile habitat by surrounding arable fields and housing to the north, east and west.

It is considered unlikely that reptiles would use the site itself in any significant numbers.

5 Potential Constraints and Recommendations

5.1 Habitats

The majority of the site comprises of intensively managed, perennial rye-grass ley. This habitat is considered to be of negligible conservation value.

Habitats of greater value mainly comprise of the boundary features at the site. These include the hedgerows and associated mature standard trees (particularly the species-rich hedgerows at Target Notes 3, 5, 6 and 8 along the site's northern, southern and western boundaries). These are considered to be the features of greatest ecological value present.

It is recommended that development of the site should retain, protect and enhance the boundary features where possible.

Where possible the development should seek to retain the existing lengths of hedgerow. Some short sections of hedgerow may need to be removed to provide site access. Where this is necessary, this should be kept to a minimum.

New housing at the site should be set as far back from the existing boundary features as practicably possible.

It is recommended, that new lengths of hedgerow are planted at the site. This should include in filling of gaps along Hedgerow 2 (Target Note 9 on Figure 2) on Vicarage Lane.

It is recommended that a further length of hedgerow is planted along the eastern boundary of the site running parallel to the existing footpath. This double lined hedgerow will provide a green corridor linking habitat to the north and south of the site.

It is recommended that a further length of hedgerow is planted running through the site and linking up with the proposed ecology areas (see below). This would seek to provide a further habitat linkage running through the site.

New hedgerows should aim to recreate the existing species-rich hedgerows that run around the site boundaries. The hedgerows should comprise principally of hawthorn with blackthorn, hazel, holly, elder, oak and dog rose included in the species mix. It is also recommended that larger standard oak trees are planted along the hedgeline where possible.

It is recommended that the two proposed areas of open green space at the site are managed for their ecological benefit.

It is recommended that a parkland habitat is created in these areas comprising of occasional, oak tree standards with scattered fast growing silver birch and alder. The field layer should be sown with a wildflower grassland mix and managed as wildflower meadow.

Development of the site should also aim to avoid impacts to mature trees at the site.

Mature trees, as well as being culturally and ecologically valuable in their own right, are also of importance to invertebrates, birds, mammals and other associated ecological groups through the provision of foraging resources and a variety of ecological niches including standing dead wood and the fungi and other organisms associated with decay.

Dead wood can support nationally rare, highly specialised invertebrates which often have limited abilities to disperse.

5.2 Badgers

Evidence of badgers has been found at the site and within adjacent habitats. Badger field signs have included paths and latrines.

No badger setts were identified within 30m of the study site.

The proposed development will result in the loss of potential badger foraging habitat within the affected intensively managed grassland however such habitat is ubiquitous around the Gresford area. Therefore, the effects of habitat loss on badgers are considered to be negligible.

Nevertheless, as badgers occasionally access the site, badgers could be harmed during construction if works are carried out in an insensitive manner. It is therefore recommended that during construction:

- Where any trenches or other excavations are to be left open overnight, these should be fitted with mammal ramps or should have the sides battered to form a slope to allow badgers to escape.
- A tidy works area should be maintained during construction and any hazardous substances would be fenced off to remove any badger hazards from the site.

Following the implementation of these measures, it is considered to be unlikely that the proposed development will have a significant negative impact upon the local badger population.

5.3 Great Crested Newt

It is considered to be very unlikely that great crested newt would be present at the proposed development site.

Nevertheless, measures are proposed to provide and maintain a series of green corridors through the site including additional hedgerow planting and the creation of a band of parkland/wildflower meadow habitat through the centre of the site.

5.4 Birds

The hedgerows habitats and mature trees could be used by nesting birds during the breeding bird season.

Where possible, development of the site should avoid impacting upon these habitats.

Where this is not possible, removal of these habitat features should be timed to avoid impacting upon birds during the breeding season (March-August inclusive).

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.

A bird nest box scheme should be developed for the site. Nest boxes should offer suitable breeding habitat for a variety of bird species and can be built into new housing and fitted to retained mature trees.

5.5 Bats

5.5.1 Trees

Whilst no field signs indicative of roosting bats were found, field survey identified two trees which support suitable bat roosting features (trees located at Target Notes 4 and 11).

These trees will not be affected by development proposals.

5.5.2 Bats and Lighting

Lighting proposals will need to ensure that additional light spill on to the proposed ecology areas is kept to a minimum, with dark corridors retained along both the site's boundaries.

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 boundaries and should be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls.

Where possible the use of artificial lighting should be avoided. Street lighting should be limited with no new lighting within 15m of the site boundaries. The lighting should be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls. The lighting should also face away from the proposed ecology areas and should avoid trespass onto proposed bat box locations.

The front and rear gardens of properties located adjacent to site boundaries should be lit with low intensity porch lights as opposed to with security flood lights. The porch lights should be fitted with screens to limit further light spill onto boundary features.

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

5.5.3 Bat Boxes Scheme

It is recommended that a bat box scheme is produced for the site. The scheme should include the incorporation of at least 8 bat boxes which should be built into the south facing gable ends of new houses ideally adjoining the southern and eastern site boundaries. Suitable models of bat box include the Habibat 003 or 005 which can be built into the brickwork of the new houses.

6 Appendix

Bat Activity Survey Results

Table 6- Weather Conditions

Date	Sunset	Sunrise	Weather	Temperature
19/08/2016	20.08	-	Dry, Calm, Overcast	15°C
18/09/2017	19.21	-	Intermittent rain, Calm, Overcast	14°C
19/09/2017	-	6.50	Dry, Misty, Calm, Clear	7°C
08/10/2017	18.33	-	Dry, Calm, Overcast	14°C

Table 7- Point Count Results

		19/08/2016						13/09/2016						27/09/2016				Average	Activity Index
Point Count	Species	Circuit 1		Circuit 2		Species	Circuit 1		Circuit 2		Species	Circuit 1		Circuit 2					
		Time	Passes	Time	Passes		Time	Passes	Time	Passes		Time	Passes	Time	Passes				
1	P45	20.08	0	20.59	1	P45	19.12	0	5.45	1		18.30	0	19.14	0	4.89	Moderate		
2		20.13	0	21.05	0	P45	19.18	0	5.52	1	P55, P45	19.07	4	19.49	13	3.00	Low		
3	P45	20.19	3	21.11	2	P55, P45	19.24	5	5.58	2	P45, Nn, Myo	19.01	4	19.44	2	3.00	Low		
4	P45, Mn, Mm	20.26	4	21.19	8	P55	19.38	1	6.04	0	P55, Nn	18.55	16	19.38	1	5.00	Moderate		
5	P55, Myo, Nn	20.34	4	21.26	3		20.16		6.15	0	P45, Nn	18.48	3	19.32	0	1.67	Low		
6	P45, P55	20.40	1	21.33	3	Myo	20.11	1	6.22	0	P45	18.43	0	19.26	2	1.17	Low		
7	P45, Nn	20.47	2	21.39	1		20.05		6.30	0		18.36	0	19.20	0	0.50	Low		
1	P45	-	-	21.47	20	P45	20.22	20	6.40	0	P45	-	0	19.55	2	n/a	n/a		

PHOTOGRAPHS

Photograph 1- Habitats at the site viewed from southeast corner



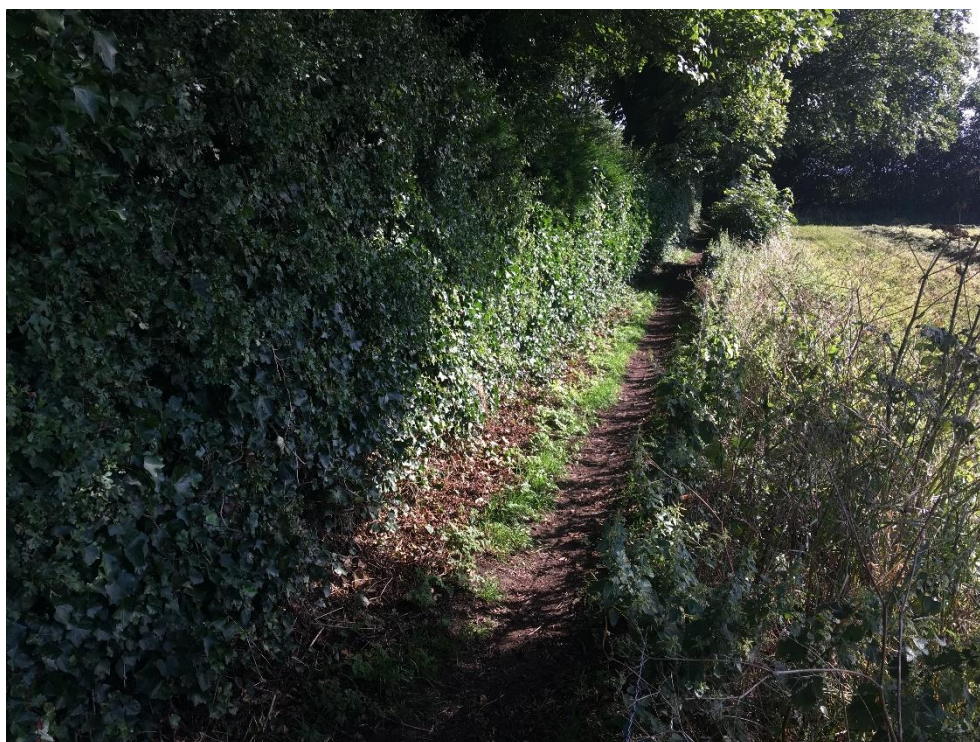
Photograph 2- Hedgerow at Target Note 8



Photograph 3- Gappy hedgerow at Target Note 9



Photograph 4- Footpath at Target Note 2



Photograph 5- Hedgerow at Target Note 3



Photograph 6- Field boundary at Target Note 7



Photograph 7- Pond 2



Photograph 8- Pond 3

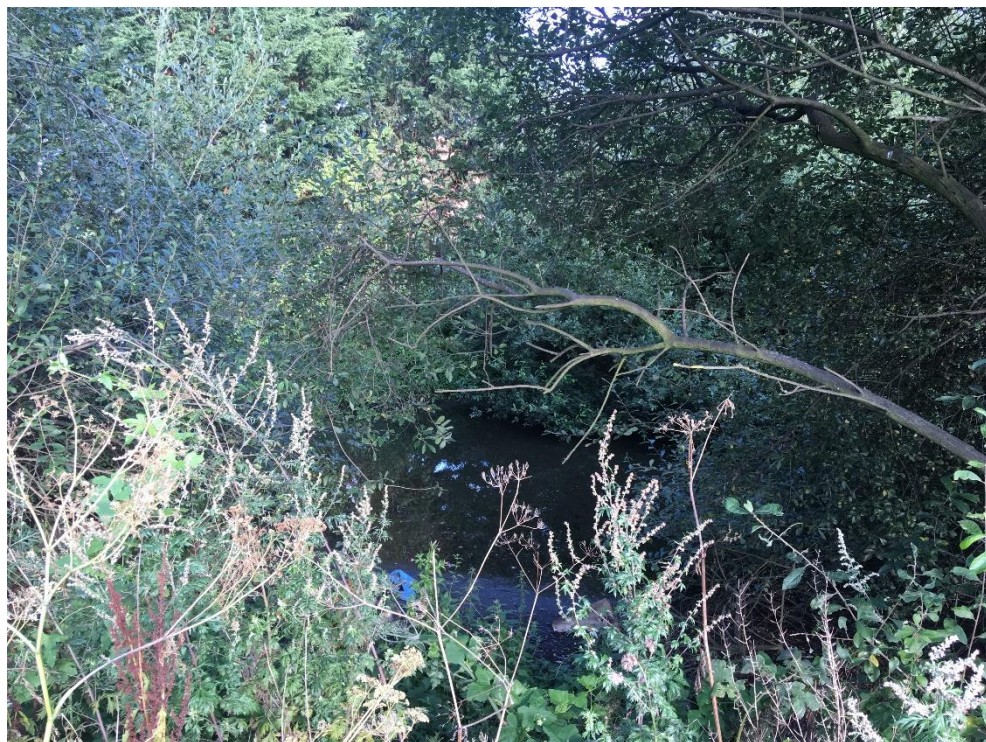
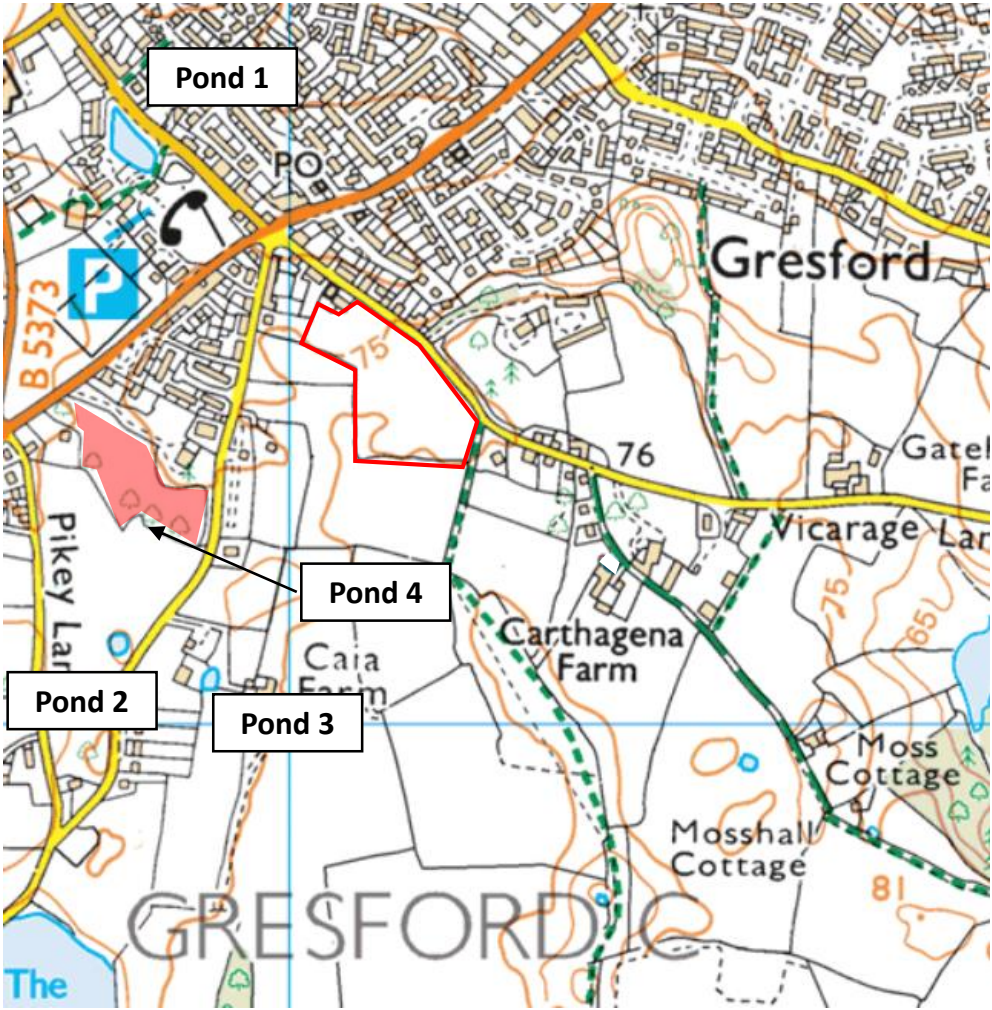


FIGURE 1- Site Location



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Ordnance Survey 100054686



-  Study Area
-  Brn-y-groes Housing development



FIGURE 2- Habitat Map



KEY

Habitat Key

- A** Arable
- Tree
-  Tall herb
-  Dense scrub
- SI** Semi-improved grassland
- 1** Target Note
-  Fence
-  Hedgerow
-  Study site



FIGURE 3- Bat Survey Results



KEY

Bat Activity Survey Key

- ③ Point Count- low activity
- ④ Point Count- moderate activity
- Transect route

Habitat Key

- A Arable
- Tree
- ▨ Tall herb
- ▩ Dense scrub
- SI Semi-improved grassland
- ① Target Note
- Fence
- Species-poor hedge

