Wrexham Road, Abermorddu

Preliminary Ecological Appraisal

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Authored by Richard Roe BSc MSc MCIEEM CEnv

CONTACT DETAILS

KINGDOM ECOLOGY LTD
6 Warwick Road
Chorlton
Manchester
M210AU

Tel: 07799844249
Email: enquiries@kingdomecology.com

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1 Introduction

1.1 Background

Kingdom Ecology have carried out a preliminary ecological appraisal of an area of agricultural land located on the western edge of the village of Abermorddu 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.

Field survey was undertaken on the 20th January 2016. 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 a Desk Study and Preliminary Ecological Appraisal Survey undertaken in January 2016.

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.

The field surveys comprised of an Extended Phase 1 Habitat assessment and a desktop study.

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 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. IEEM (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 (eg. 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)[1], *Guidelines for the selection of biological SSSIs* (JNCC, 1989)[2], *Local Sites* (Defra, 2006)[3], *Local Wildlife Site Selection Criteria for the Cheshire Region* (Cheshire Wildlife Trust 2014) [4] and also in local and national Biodiversity Plans (BAPs) including Species and Habitat Action Plans (SAPs and HAPs)(see Anon, 1995 for UK BAP)[5].

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.

The list of national priority BAP species has recently been updated (available on: http://www.ukbap.org.uk/NewPriorityList.aspx). The conservation status of declining British birds has been defined in the *Birds of Conservation Concern Report 2009* (Eaton et al. 2009)[6]; where

[1] Ratcliffe, D.A. 1977. A Nature Conservation Review. Cambridge University Press.

[2] JNCC, 1989. Guidelines for the selection of Biological SSSIs. Nature Conservancy Council, Peterborough.

[3] DEFRA 2006. Local Sites Guidance on their Identification, Selection and Management

[4] Cheshire Wildlfie Trust 2014, Local Wildlife Site Selection Criteria for the Cheshire Region

[5] Anon, 1995. Biodiversity: The UK Biodiversity Steering Group Report. Vol. 2. Action Plans. HMSO.

[6] Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) Birds of Conservation Concern 3: the population status

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.

1.4 Legislative and Policy Context

This report and its recommendations have been produced in accordance with relevant legislation, best practice guidance and local biodiversity targets. They also take into account the National Planning Policy Framework (NPPF)[7] in addition to nature conservation policies within local and regional planning policy documents.

The principal legislation relating to ecological resources that are relevant to this appraisal are as follows:

Conservation of Habitats and Species Regulations (as amended) 2010 - these Regulations implement protection for European protected sites and species, updating and consolidating the Conservation (Natural Habitats &c.) Regulations (as amended) 1994. The level of protection afforded to habitats and species remains the same. The Regulations implement the Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC).

Wildlife and Countryside Act (1981) (as amended) – this Act comprises the principal means of protecting wildlife in the UK and provides the mechanism by which a number of international directives are implemented in the UK.

Countryside and Rights of Way (CRoW) Act (2000) – this Act strengthens the Wildlife and Countryside Act in relation to SSSIs and threatened species.

Natural Environment and Rural Communities (NERC) Act (2006) – this Act places an obligation on public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

Biodiversity Action Plan (BAP) – the UK BAP and local BAPs is the UK Government's response to the Convention on Biological Diversity, signed in 1992. The BAPs describe the UK's biological resources and commits a detailed plan for the protection of these resources through the implementation of Habitat and Species Action Plans. Whilst UK BAP species and habitats are afforded no statutory protection, their conservation must be considered by a planning authority during the planning process as described under the NERC Act 2006.

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of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296–341

[7] National Planning Policy Framework (NPPF) (2012).Department for Communities and Local Government. March 2012.

1.5 Protected Species Legislation

1.5.1 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.

1.5.2 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 2012[8]). 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.

1.5.3 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 were badgers and

[8] Bat Conservation Trust (2012) 'Bat Surveys: Good Practice Guidelines 2nd Edition'

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.

1.5.4 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 within the UK Biodiversity Action Plan and under the NERC Act 2006.

1.5.5 Common Reptiles

All common reptiles, i.e. slow worm (*Anguis fragilis*), common lizard (*Lacerta vivipara*), adder (*Vipera berus*) and grass snake (*Natrix natrix),* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9(1) which makes it an offence to intentionally kill or injure the animals.

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:

- Barn owl
- Kingfisher
- Peregrine falcon
- Common pipistrelle
- Brown long-eared bat
- Badger
- Otter
- Great crested newt
- Adder
- Common lizard
- Grass snake
- Slow worm

COFNOD hold a record of an 'unknown bat species' at the site itself.

COFNOD holds a 2009 record of a single great crested newt located adjacent to a pond located approximately 50m from the western edge of the site (Target Note 11 on Figure 2).

No other protected species are recorded within 250m of the site other than an otter road casualty from 2001 where the A541 joins the A550.

2.1.2 Designated Sites

Caeau Abermorddu Local Wildlife Site

The non-statutory designated Caeau Abermorddu Local Wildlife Site (LWS) runs along the western and northern boundary of the study site with a small part of the LWS located within the study site itself (See Figure 3).

The LWS is 4ha in size and has been designated for the habitats present which include pasture/meadow, scrub and wet woodland.

The complete site description is as follows:

'Elongated, narrow site along a hillside with semi-improved acid grassland, marshy grassland, wet woodland and semi-improved neutral grassland. The marshy grassland at the bottom of the slope next to the Wrexham Road is dominated by sharp-flowered rush, creeping bent, lesser pond sedge, Yorkshire fog with oval sedge and ragged robin. Above this marshy grassland is a slope with acid grassland dominated by common bent and frequent heath bedstraw, bitter vetch, creeping soft grass, sweet vernal-grass and sheep's fescue. The small patch of alder dominated woodland comprises elder and holly in the shrub layer and yellow archangel, opposite-leaved golden saxifrage, bramble and meadowsweet. Next to the wood is a stand of blackthorn scrub. At the southern end of the site is a semi-improved neutral grassland with cat's-ear, black knapweed, autumn hawkbit, harebell, mouse-ear hawkbit, ribwort plantain and sweet vernal-grass'.

Other Sites

No other statutory or non-statutory designated sites are located within the study area itself.

Further non-statutory designated sites located within 1km of the study site include: Caergwrle Castle LWS, Rhydyn Hall Grassland LWS, Alyn Waters LWS,Hope Mountain and Ffrwdd Wood LWS, Bryn Yorkin LWS, Sydallt Wood LWS and Bryn y Gaer LWS

There are 21 areas of ancient woodland located within 1km of the site but non within the site or its immediately adjacent habitats. The nearest is located approximately 150m to the west at Bryn Yorkin Wood.

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, an assessment of aquatic and terrestrial habitats to support great crested newt and an assessment of other habitats at the site in terms of their suitability to support protected species including 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 20th January 2016. Survey was carried out following standard methodologies as described in the *'Handbook for Phase 1 Habitat Survey – a technique for environmental audit'* (JNCC, 2004[9]).

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 badgers and an assessment of the suitability of surrounding trees to support either roosting bats or nesting birds during the breeding bird season.

[9] 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.

3.3 Great Crested Newt

3.3.1 Habitat Suitability Index Assessment

One pond was identified from ordnance survey maps and aerial photography as being within 500m of the study area. This pond is located approximately 50m to the west of the site within an adjacent pasture field. The pond location is shown as Target Note 11 on Figure 2 in the Appendix.

The pond was visited during the Extended Phase 1 Habitat Survey and was assessed as to its 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 2008[10]) which in turn are based on a paper produced by Oldham et al. (2000[11]). 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 1.

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

[10] NARRS (2008) 'Great Crested Newt Habitat Suitability Index'
[11] Oldham R.S et al (2000) 'Evaluating the suitability of habitat of the Great Crested Newt (*Triturus cristatus*)'. Herpetological Journal 10 (4), 142-155

Table 1- HSI Score Categories

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

3.4 Badger

3.4.1 Methods

The survey was undertaken on 20th January 2016 and adopted the standard approach used in the National Badger Survey (Cresswell *et al.*, 1990)[12] and recommended by the Mammal Society (described in the booklet '*Surveying Badgers'* (Harris, Cresswell and Jefferies, 1989[13])). It involved searching for badger signs, including setts, latrines, foraging marks, badger hairs, trails and footprints. Setts and other signs were marked on maps.

3.5 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)[14] and the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 2nd Edition (BCT 2012)[15].

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

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

[14] Mitchell-Jones, A.J. 2004. Bat Mitigation Guidelines. English Nature, Peterborough.

[15] Bat Conservation Trust (2012) Bat surveys – Good Practice Guidelines 2nd Edition. Bat Conservation Trust, London.

3.5.1 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.

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 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.

Surveys were undertaken in January 2016 which is a good time of year to carry out surveys as potential roosting features are not obscured by foliage.

4 Results

4.1 Habitats and Flora

4.1.1 Overview

The study area is located adjacent to Wrexham Road on the western edge of the village of Abermorddu, near Wrexham, LL12 9DG (Ordnance Survey Grid SJ 308568). The site measures approximately 3.5ha in area.

Wrexham Road runs along the eastern boundary of the site. The playing fields of Abermorddu CP School are located immediately to the south of the site. Further agricultural land lies to the north and west of the site. A small unnamed brook flows along part of the site's western boundary and passes through the site.

The site largely comprises of two improved pasture fields with associated boundary features. The site slopes down from the west towards Wrexham Road on the site's eastern boundary. The site is managed as grazed pastureland but is also used regularly by local dog walkers.

Wider habitats comprise of the village of Abermorddu and further pasture land. The River Alyn is located approximately 300m to the east of the study site.

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.

Habitats are described below.

4.1.2 Habitats

The site principally comprises of two improved pasture fields (Target Notes 1 and 2) which are grazed by livestock. The northeast corner of the site is boggy and supports marshy grassland habitat (Target Note 3) with frequent Yorkshire fog, sharp-flowered rush, soft rush, sedges, tufted hair-grass and creeping bent.

The eastern boundary of the site is marked by a species-poor hedgerow (Target Note 4) of hawthorn with hazel, elder and willow with occasional oak and alder standards. A drainage ditch runs along the western edge of the hedge. Beyond the drain a tall herb community has developed with frequent bramble, rosebay willow-herb, creeping thistle, soft rush, sharp-flowered rush and curled dock. The drainage ditch itself is overgrown with bramble.

A watercourse (Target Note 5) divides the larger northern field at Target Note 1 from the smaller southern field at Target Note 2. The watercourse is approximately 1m wide and has a silty substrate. The water was found to be approximately 20cm deep at the time of survey.

Occasional patches of fool's water-cress are present within the channel. The watercourse is wooded with tall hazel and hawthorn scrub with occasional semi-mature sycamore trees and single mature ash tree. The watercourse is fringed with a tall herb community of nettle, creeping thistle and bramble.

There is a small stand of wet woodland at the western edge of the site (Target Note 6). The woodland comprises principally of alder with sycamore and holly. There are some dead alder trees within the woodland block that support suitable bat roosting features within woodpecker holes. This woodland forms part of the Caeau Abermorddu Local Wildlife Site (See Figure 3).

The southern boundary of the site (Target Note 7) is marked by a fence line and a species-poor, gappy hedgerow of beech, hawthorn and elder which divides the site from the adjacent school playing fields. There are several mature poplar standards located on this hedgeline.

The western boundary of the southerly field is marked by a species-poor hedgerow (Target Note 8) of hawthorn, hazel and elder with mature oak and ash standards.

The western boundary of the northern field is marked by a band of young scrubby broadleaved woodland comprising of willow, sycamore, hazel, hawthorn, blackthorn, holly, elder and silver birch (Target Note 9). There are also occasional mature sycamore and oak trees located within this woodland belt. The remnants of a dry stone wall and dry ditch also run along the field boundary. Adjacent to the woodland, tall herb vegetation of bramble and nettle encroaches into the field.

The northern boundary of the site (Target Note 10) comprises of a belt of hawthorn, elder, holly and sycamore scrub with two mature alder trees.

4.1.3 Evaluation and Conclusions

The habitat/botanical survey has demonstrated that the majority of the site contains agriculturally improved grassland of negligible nature conservation value according to the CIEEM (2006) framework guidelines with limited semi-natural habitats present.

However the site includes several habitats and features that are considered to be of greater conservation value including the following:

- The hedgerow habitats and mature trees located around the boundaries of the site at Target Notes 4, 7 and 8;
- The scrubby woodland at Target Note 9
- The scrub habitat at Target Note 10
- The wet woodland at Target Note 6
- And the watercourse and associated woodland belt at Target Note 5

These features are considered to represent the habitats of greatest value at the site chiefly as they 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.

The woodland at Target note 6 forms part of the Caeau Abermorddu Local Wildlife Site.

The Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 provides a list of habitats and species of principal importance in Wales. The list is a key reference for all statutory and non-statutory bodies involved in operations that affect biodiversity in Wales. The Section 42 list provides a guide for decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act 2006 "to have regard" to the conservation of biodiversity in all their activities.

The hedgerows, wet woodland, lowland mixed deciduous woodland, and the stream present on the site all represent Priority habitats as listed under Section 42 of the NERC Act.

4.2 Badger

4.2.1 Results

No field signs indicative of badgers were found within the proposed development site or within immediately adjacent habitats.

4.2.2 Evaluation and Conclusions

It is possible that badgers reside in the general area however no field signs or badger setts were identified within the proposed development site or adjoining habitats. It is possible that any unidentified badger social group in the area could use the pasture fields at the study site for earthworm foraging, but, judging by the absence of field signs, such usage would be infrequent. Improved pasture 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 Flintshire 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 there is no possibility that it would infringe this legislation.

4.3 Great Crested Newt

4.3.1 Pond Survey Results

A single pond is located within 500m of the study site. The pond is located approximately 50m to the west of the site in an area of improved pasture (National Grid Reference SJ 306 566). The pond is shown at Target Note 11 on Figure 2. The stream that flows through the site is fed by the pond. The COFNOD data search provided a record of a great crested newt identified in 2009 within terrestrial habitats adjacent to this pond. A dog walker at the site reports that the pond supports coarse fish and that heron, kingfisher and cormorant occasionally visit the pond.

The pond itself is considered to support good suitability great crested newt habitat. It is large and partially shaded, with a good coverage of suitable great crested newt egg laying plants (floating sweet-grass, fool's water-cress and Canadian pondweed). However the pond is relatively isolated with no other accessible ponds in the locality.

The pond achieved a HSI score of 0.63 and so is considered to be of 'average' suitability. This relatively low score is attributable to the pond's isolated location in the landscape.

The pond is shown on Photograph 8 in the Appendix and on Figure 2. Full HSI results are given in Table 2.

4.3.2 Evaluation

Survey has identified a single pond located approximately 50m to the west of the study site.

Biological records provided by COFNOD included a record of a great crested newt adjacent to this pond. The pond was found to support great crested newt breeding habitat.

Given the proximity of the site to the pond, if the pond is found to support great crested newt, it is likely that terrestrial habitats within the proposed development site could also be used by great crested newt.

Further surveys would be required in order to fully evaluate the pond and any great crested newt population present.

Great crested newt is a European Protected Species and is listed under Section 41 of the NERC Act (2006).

Table 2- Habitat Suitability Index Results

HSI Feature	*Pond 1*
Location	1
Pond area	0.95
Pond drying	0.9
Water quality	0.67
Shade	1
Fowl	1
Fish	0.67
Ponds	0.1
Terrestrial habitat	0.67
Macrophytes	0.4
HSI Score	0.63

4.4 Breeding Birds

4.4.1 Results

Tree, scrub and hedgerow habitats at the site are likely to be used by nesting birds during the breeding bird season. Likewise the area of marshy grassland located at the northeast corner of the site (Target Note 3) could support ground nesting birds including skylark, lapwing and meadow pipit.

4.4.2 Evaluation and Conclusions

The site is likely to support farmland and garden bird species that are common in rural parts Flintshire. 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:

- An ash tree located at Target Note 12 is considered to offer 'moderate' bat roosting potential within rot holes on the tree's main trunk and on one of its limbs (see Photograph 9).
- A dead alder tree at Target Note 13 and located within the wet woodland block at Target Note 6 is considered to offer 'high' bat roosting potential within woodpecker holes on the tree's main trunk.
- An ash tree located at Target Note 14 is considered to offer 'low' bat roosting potential behind thick ivy vines on its main trunk (see Photograph 10).

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

4.5.2 Habitats

The boundary features at the site are likely to be used by foraging bats. Identified features include:

- The hedgerow habitats and mature trees located around the boundaries of the site at Target Notes 4, 7 and 8;
- The scrubby woodland at Target Note 9;
- The scrub habitat at Target Note 10;
- The wet woodland at Target Note 6; and
- The watercourse and associated woodland belt at Target Note 5

The hedgerow which runs along Wrexham Road (Target Note 4) is illuminated by street lighting of an evening and so is likely to be of less importance to foraging bats. The remaining features are likely to be unlit and relatively dark of an evening.

The improved grassland habitats are unlikely to be of any significant value to local bat populations.

4.5.3 Evaluation and Conclusions

The site is likely to support bat species that are common in rural parts Flintshire. Bat assemblages are therefore assessed as being of **Local** value.

Bat species are likely to use identified linear habitat features at the site as commuting habitat and foraging habitat and may use identified potential roosting features within trees at the site. The precise status and conservation value of these features cannot be known without further field survey.

4.6 Reptiles

Habitats within the site itself are largely considered to be unsuitable for reptiles as they principally comprise of improved grassland which offers limited shelter. Habitats adjacent to the site which are sloping in

aspect and offer suitable basking and refugia sites within semi-improved grassland and bracken are considered to offer more suitable reptile habitat.

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

5 Potential Constraints and Recommendations

5.1 Great Crested Newt

There is a significant risk that the pond located at Target Note 11 supports a breeding population of great crested newt. Any newts within this pond are likely to use terrestrial habitats within the proposed development site.

It is recommended that great crested newt surveys are carried out at the pond to determine the presence of newts and to identify the status and size of any population present.

Great crested newt surveys should follow standard methodologies as prescribed in English Nature's 'Great Crested Newt Mitigation Guidelines' (2001) with 4-6 surveys of the pond completed between mid-March and mid-June.

If great crested newt are found to be present the development of the site would need to be carried out under a European Protected Species License. An outline mitigation strategy would need to be developed and submitted as part of the planning application.

5.2 Birds

The hedgerows, trees and marshy grassland habitats 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 mature trees.

5.3 Bats

5.3.1 Trees

Whilst no field signs indicative of roosting bats were found, field survey identified three trees which support suitable bat roosting features (trees located at Target Notes 12-14).

If development of the site were to impact upon these trees (either through removal or due to impacts relating to artificial lighting), further nocturnal bat surveys should be carried out to establish likely bat presence or absence and to determine the value of any bat roosts identified.

5.3.2 Activity Surveys

It is recommended that bat activity surveys are carried out at the site in order to determine:

- The assemblage of bat species using the site.
- The relative frequency with which the site is used by the different species.
- The spatial and temporal distribution of activity for different species.
- The nature of activity for different bat species, for example foraging, commuting and roosting

Bat activity surveys should comprise of at least three site visits carried out during the active bat season (April-September). Surveys should follow standard methodologies as prescribed in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 2nd Edition (BCT 2012).

The bat survey results will be used to evaluate habitats within and adjacent to the site for bats and will be used to feed into the detailed design of any lighting strategy for the site.

5.3.3 Bats and Lighting

Following the completion of the additional bat surveys, an outline bats and lighting mitigation plan should be produced. This plan should aim to retain dark corridors along key bat foraging and commuting routes (in this case, this is likely to be along the western boundary of the site and along the watercourse that flows through the site). The plan should also aim to limit any light trespass from the development into the surrounding landscape.

A lighting designer will 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. Street lighting should be limited by restricting lighting to the central spine roads where possible with no new lighting proposed along any proposed side roads within 15m of the site boundaries. The lighting within the central spine roads and along the side roads should be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls.

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.

5.3.4 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 7 bat boxes which should be built into the south facing gable ends of new houses ideally adjoining the northern or western site boundary. Suitable models of bat box include the Habibat 003 or 005 which can be built into the brickwork of the new houses.

5.4 Habitats

The majority of the site comprises of intensively managed improved pasture. This habitat is considered to be of negligible conservation value.

Habitats of greater value mainly comprise of features around the site's field boundaries. These include:

- The hedgerow habitats and mature trees located around the boundaries of the site at Target Notes 4, 7 and 8;
- The scrubby woodland at Target Note 9;
- The scrub habitat at Target Note 10;
- The wet woodland at Target Note 6; and
- The watercourse and associated woodland belt at Target Note 5

Of these features the eastern and western boundaries of the site and the stream that flows through the site are considered to be the habitats of greatest value.

The area of wet woodland at Target Note 6 forms part of the Caeau Abermorddu Local Wildlife Site.

It is recommended that development of the site should retain and enhance these identified habitat features where possible.

The identified features can be ecologically enhanced by retaining adjacent buffer areas which would comprise of habitats manged principally for their ecological value as opposed to comprising of landscaping managed exclusively for amenity value.

These buffer areas could be managed to provide a species-rich grassland similar in composition to grassland habitats located within the adjacent Caeau Abermorddu Local Wildlife Site.

It will be important to retain a minimum 5m buffer between the edge of the small woodland at Target Note 6 and any gardens associated with

housing at the site. This will reduce the risk of habitats within the woodland being negatively affected by tipping of garden waste or colonisation of the woodland by garden escape plants.

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.

It is recommended that the nature, scale and layout of the proposed development is designed with cognisance of the described constraints and recommendations for site enhancement. It is recommended that any ecological enhancement features are designed in collaboration with an appropriately qualified ecologist.

6 Appendix

PHOTOGRAPHS

Photograph 1- Field at Target Note 1 looking north

Photograph 2- Field at Target Note 2 looking north towards watercourse at Target Note 5

Photograph 3- Marshy Grassland at Target Note 3 looking south

Photograph 4- Watercourse at Target Note 5 looking south

Photograph 5- Field boundary at Target Note 7

Photograph 6- Wet woodland at Target Note 6

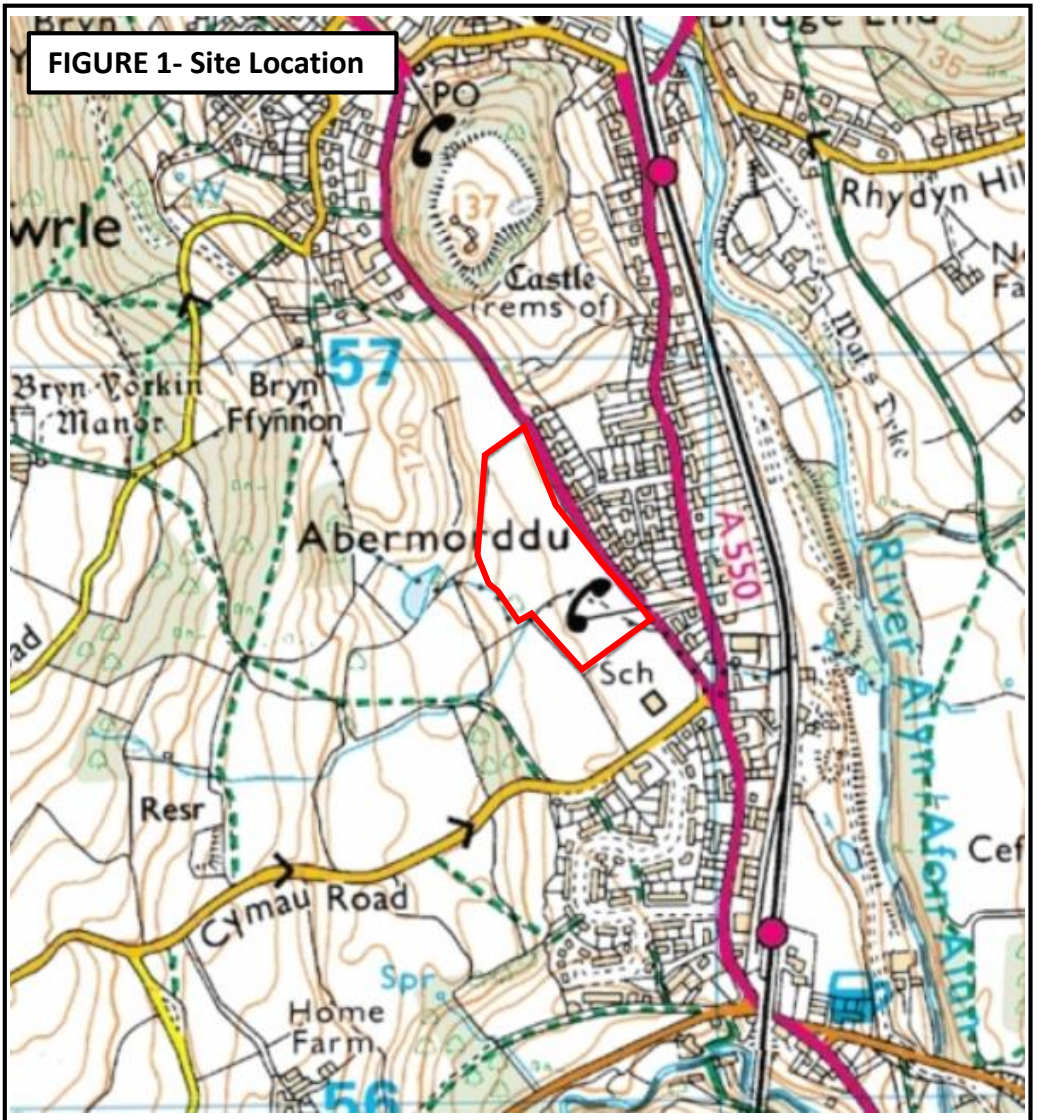
Photograph 7- Field boundary at Target Note 9 looking north

Photograph 8- Pond at Target note 11

Photograph 9- Tree at Target Note 12 showing bat roosting potential

Photograph 10- Tree at Target Note 14 showing bat roosting potential

FIGURE 1- Site Location



Ordnance Survey 100054686

N

Study Area

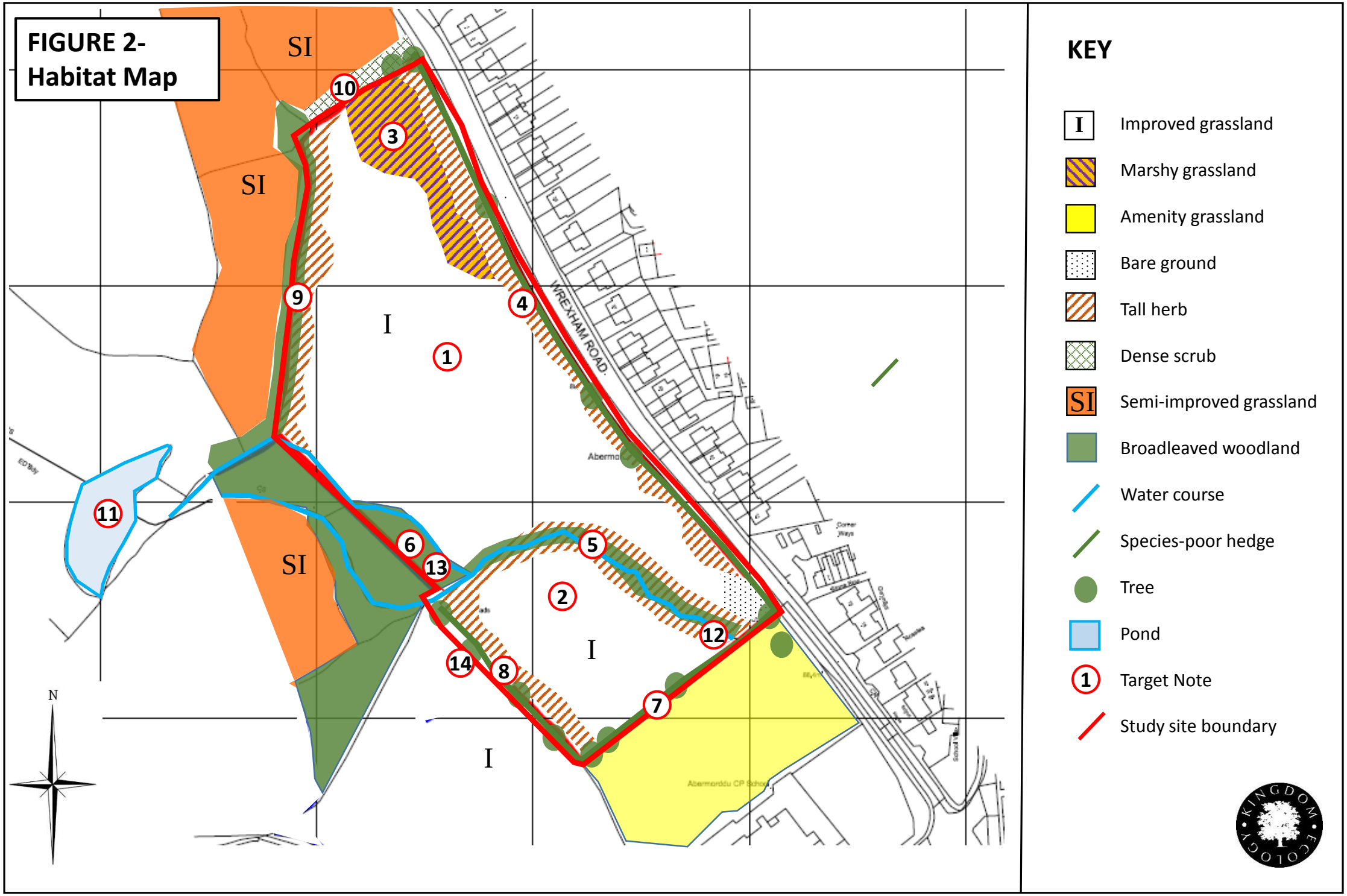
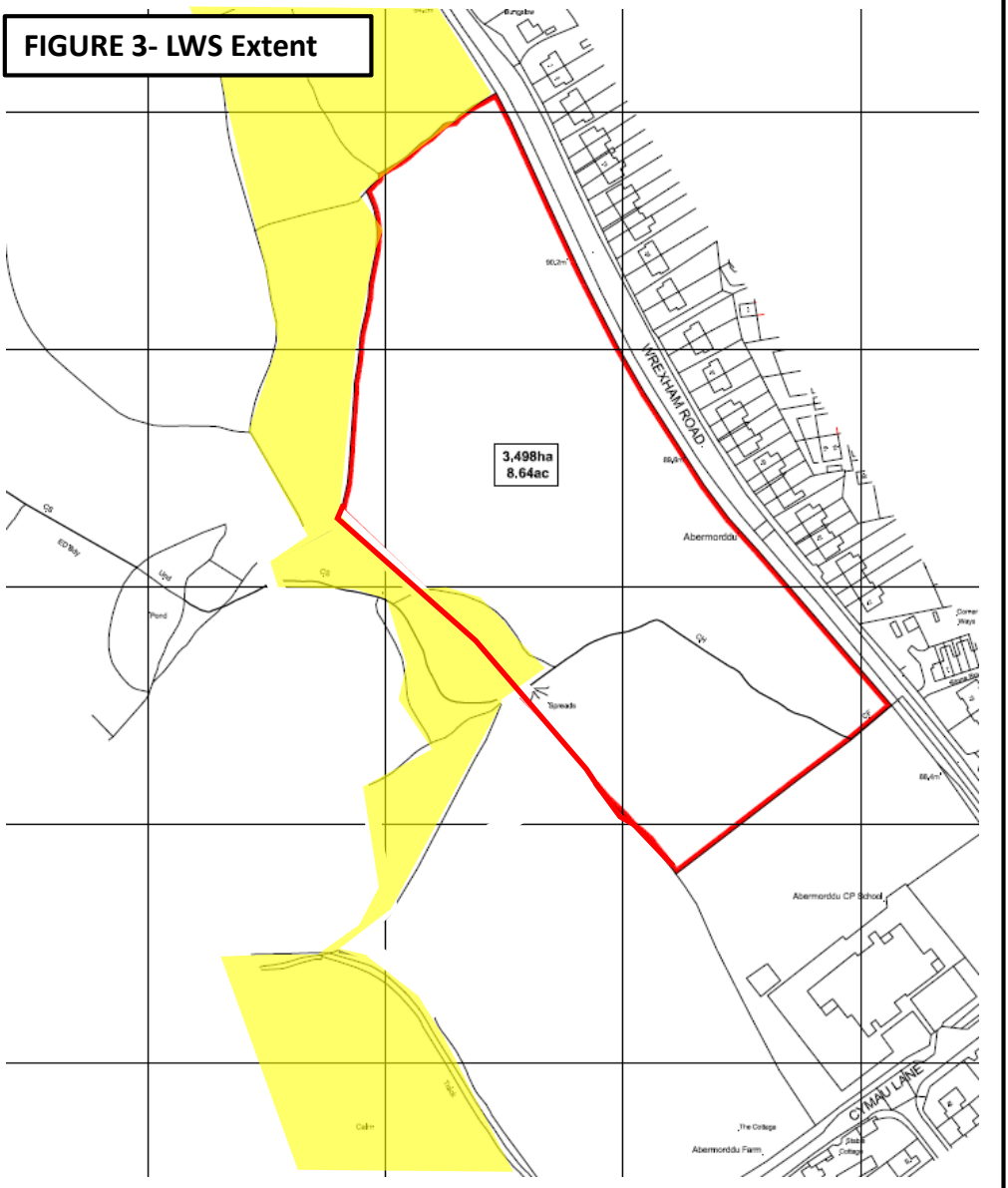


FIGURE 2-
Habitat Map
SI
SI
SI
I
I
I
1
2
3
4
5
6
7
8
9
10
11
12
13
14
WREXHAM ROAD
N
KEY
I
Improved grassland
Marshy grassland
Amenity grassland
Bare ground
Tall herb
Dense scrub
SI
Semi-improved grassland
Broadleaved woodland
Water course
Species-poor hedge
Tree
Pond
1
Target Note
Study site boundary
KINGDOM ECOLOGY

FIGURE 3- LWS Extent



Ordnance Survey 100054686

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Proposed development site

Caeau Abermorddu Local Wildlife Site extent

KINGDOM ECOLOGY