



Holt Road,
Rossett

Ecological Assessment

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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 eastern edge of the village of Rossett 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 Phase 1 habitat survey was undertaken on the 16th February 2015. Further surveys, comprising of a great crested newt presence/absence assessment and a suite of bat activity surveys, were carried out from May to June 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 ecological field surveys undertaken in February 2015 and May-June 2016.

The field surveys 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 ecological assessment comprised of:

- a desktop study.
- an Extended Phase 1 Habitat assessment,
- a great crested newt presence/absence survey of a pond located within 500m of the site using eDNA techniques; and
- a suite of bat activity transect surveys.

Species considered during the ecological assessment included breeding birds, badger, great crested newt 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 Study Area

The study area comprises of two fields, one pasture and one arable. The fields lie either side of Holt Road on the eastern edge of the village of Rossett, near Wrexham, LL12 0DZ (Ordnance Survey Grid SJ 373573).

The site measures 6.25ha in total, with the northerly pasture field measuring approximately 2.8ha in size whilst the southerly arable field measures approximately 3.5ha in size.

The study site is bounded by the village of Rossett which is located immediately to the west of the study site, to the north by a school playing field, to the south by the Harwoods Lane and to the west by further agricultural land.

Surrounding habitats comprise of the village of Rossett and agricultural land comprising of arable and pasture. The River Alun is located approximately 200m to the south of the study site.

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

1.4 Evaluation Methodology

The results of the desktop and field surveys are used to identify ecological resources that may be of relevance to the proposals. The *IEEM Guidelines for Ecological Impact Assessment* (IEEM, 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 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 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 Wildlife 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 of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102, pp296-341

1.5 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.

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

1.6 Protected Species Legislation

1.6.1 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.

1.6.2 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 2012⁸). 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.

The UK Biodiversity Action Plan lists common pipistrelle *Pipistrellus pipistrellus* as a priority species (United Kingdom Biodiversity Partnership 2005).

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

1.6.3 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 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.

1.6.4 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.

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 National Biodiversity Network (NBN) (<http://www.nbn.org.uk/>) and the Multi Agency Geographic Information for the Countryside website (Magic) (<http://www.magic.gov.uk>).

2.1.1 Species

The NBN was interrogated to identify the presence of protected and other notable vertebrate species (apart from birds and fish) in the countryside surrounding the site. Only biological records gathered since 2000 were sought. Protected species recorded within the site's 10km grid square (SJ45) and the adjacent grid square to the west (SJ35) included the following:

- Great Crested Newt (*Triturus cristatus*)
- Hedgehog (*Erinaceus europaeus*)
- Brown hare (*Lepus europeaus*)
- Polecat (*Mustela putorius*)
- Brown Long-eared Bat (*Plecotus auritus*)
- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Noctule Bat (*Nyctalus noctula*)
- Badger (*Meles meles*)
- Otter (*Lutra lutra*)
- Water Vole (*Arvicola amphibious*)
- Slow worm (*Anguis fragilis*)
- Grass snake (*Natrix natrix*)
- Adder (*Vipera berus*)
- Common lizard (*Zootoca vivipara*)

COFNOD holds several records of protected species within 1.5km of the site including the following:

- Barn owl
- Kingfisher
- Common pipistrelle
- Badger
- Otter
- Great crested newt

COFNOD hold no records of protected species at the site itself. The nearest species record is of a hedgehog located in the playing field to the north of the site. No other protected species are recorded within 250m of the site.

The nearest record of great crested newt is located approximately 700m to the north of the site on the northern side of Rossett village.

2.1.2 Designated Sites

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

The only designated site located within 1.5km of the study site is Darland Wood Local Wildlife Site which is located approximately 600m to the northeast of the 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.

Initial field surveys undertaken in 2015 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 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.

Surveys completed during the 2016 field season comprised of further assessment of great crested newt and bat assemblages at the site.

The great crested newt assessment comprised of a presence/absence survey of a pond located to the east of the site.

The bat activity surveys comprised of three walked activity transects completed early-May, late-May and mid-June. Survey aimed to identify and evaluate bat assemblages present and to assess and evaluate existing habitats in terms of their importance to local bat populations.

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 16th February 2015. Survey was carried out following standard methodologies as described in the '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*' (JNCC, 2004⁹).

⁹ JNCC (2004) '*Handbook for Phase 1 Habitat Survey - a technique for environmental audit*'

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.

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 Great Crested Newt

3.3.1 Presence/absence eDNA Survey

One pond was identified from ordnance survey maps and aerial photography as being within 500m of the study area. This pond is located approximately 260m to the east of the site within an adjacent pasture field. The pond location is shown on Figure 1 in the Appendix.

The pond was visited during the Extended Phase 1 Habitat Survey completed in February 2015 and was found to support suitable great crested newt breeding habitat.

The pond was further assessed for great crested newt presence or absence using eDNA sampling techniques. This method requires the collection of water samples which are sent to a laboratory for analysis.

This technique aims to detect DNA that is present in the environment in which an animal lives. Great crested newt DNA can enter ponds via their urine, faeces, skin cells etc. Natural Resources Wales accepts eDNA test results as evidence of presence or absence of great crested newt.

The survey was undertaken on 3rd May 2016 by Richard Roe, a licensed great crested newt worker.

The survey was carried out following the protocol recommended by Natural Resources Wales¹⁰. In summary, this involved taking 20 water samples from around the waterbody's margins using a sample kit provided by Surescreen Scientifics. The location of sub-samples was spaced evenly around the waterbody's margins and targeted areas where there is vegetation suitable for use as egg laying material but avoiding areas less than 50 - 100mm deep. Before each sample was taken, the water column was mixed gently to maximise the chances of detecting GCN eDNA. Once all the samples had been collected, they were vigorously shaken for ten seconds in a whirl bag to ensure any eDNA was mixed across the whole water sample. A pipette was then used to add water samples to sterile tubes containing ethanol to preserve any eDNA present. Each tube was then mixed for a further ten seconds to prevent eDNA degradation. Preserved samples were then stored at a cool ambient temperature before being returned to Surescreen Scientifics on the 4th May 2016 for analysis.

3.4 Bats Roost Assessment

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

Surveys followed methodologies prescribed in English Nature's *Bat Mitigation Guidelines* (Mitchell-Jones 2004)¹¹ and the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 3rd Edition (BCT 2016)¹².

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.

In addition to identifying actual bat roosts the surveys also aimed to assess the suitability of the trees to support bats and consequently the

¹⁰ Biggs J et al (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford

¹¹ Mitchell-Jones, A.J. 2004. Bat Mitigation Guidelines. English Nature, Peterborough.

¹² Bat Conservation Trust (2016) Bat surveys – Good Practice Guidelines 3rd Edition. Bat Conservation Trust, London.

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 February 2015 which is a good time of year to carry out surveys as potential roosting features are not obscured by foliage.

3.5 Bat Activity Transects

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

Surveys were based upon recommendations provided in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 3rd Edition (BCT 2016)¹³.

¹³ Bat Conservation Trust (2016) Bat surveys – Good Practice Guidelines 3rd Edition. Bat Conservation Trust, London.

3.5.1 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, arable land, hedgerows, country lanes and mature trees.

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 the number of bat passes at each point count location was taken for the entire survey period to produce an index of activity. Where constant bat activity was recorded at a point count location, 20 bat passes were attributed. The bat activity index was scored as follows:

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

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

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

Surveys were carried out using time expansion (Petterson D240x) bat detectors 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 3rd May, 24th May and the 15th June 2016.

The 1st and 2nd 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 was walked twice during the 1st and 2nd transects allowing sampling of bat activity both immediately following sunset and also later in the same evening. The start of the 3rd transect was delayed due to heavy rain and so commenced half an hour after sunset. Only one circuit of the transect route was completed during this survey owing to further heavy rain starting approximately 2 hours after sunset.

In spite of this, it is considered that an appropriate level of assessment has been undertaken to achieve the survey objectives with a total of five courses of the transect route assessed during the full survey period.

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

3.6 Badger

3.6.1 Methods

The survey was undertaken on 16th February 2015 and adopted the standard approach used in the National Badger Survey (Cresswell *et al.*, 1990)¹⁴ and recommended by the Mammal Society (described in the booklet '*Surveying Badgers*' (Harris, Cresswell and Jefferies, 1989¹⁵)). It involved searching for badger signs, including setts, latrines, foraging marks, badger hairs, trails and footprints. Setts and other signs were marked on maps.

¹⁴ Cresswell, P., Harris, S., and Jeffries, D.J., 1990. The history, distribution, status and habitat requirements of the badger in Britain. Nature Conservancy Council.

¹⁵ Harris, S., Cresswell, P. and Jefferies, D., 1989. Surveying Badgers. Occasional Publication of the Mammal Society, No.9. Mammal Society, London.

4 Results

4.1 Habitats and Flora

4.1.1 Overview

The study site comprises of two agricultural fields located either side of Holt Road. The field located to the north of the road comprises of an improved pasture field measuring approximately 2.8ha in size. The field to the south of the road comprises of an arable field and measures approximately 3.5 ha in size.

The site is partially bounded by hawthorn and holly hedgerows with occasional standard trees.

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 Northern Field

The northern field (Target Note 1 on Figure 2) comprises of a horse grazed, improved pasture field. Plants present within the sward comprised of typical improved grassland species including frequent perennial rye grass (*Lolium perenne*), Yorkshire fog (*Holcus lanata*) and cock's-foot (*Dactylis glomerata*) with herbs including occasional broadleaved dock (*Rumex obtusifolius*) creeping buttercup (*Ranunculus repens*) and common mouse ear (*Cerastium fontanum*). There is a single mature alder (*Alnus glutinosa*) tree located in the centre of the field (Target Note 2 on Figure 2). The alder tree is not considered to support suitable bat roosting features.

A fence divides the site from a housing estate located to the west of the site. A managed, species-poor hawthorn (*Crataegus monogyna*) hedge runs between the south boundary of the field and Holt Road. Further unmanaged, outgrown hedgerow runs along the eastern and northern boundary of the field. The hedgerow is dominated by hawthorn with occasional hazel (*Corylus avellana*) and standard trees including oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*). The ash tree (Target Note 3 on Figure 2) was found to offer 'low' bat roosting potential within light ivy growth around the tree's main trunk. None of the other trees within the hedgerow are considered to support suitable bat roosting features.

There is a fringe of tall herb vegetation comprising of nettle (*Urtica dioica*) and rosebay willowherb (*Chamerion angustifolium*) running along the base of the northern hedgerow.

4.1.3 Southern Field

The southern field (Target Note on Figure 2) comprises of an arable field. The field was sown with a crop of winter wheat at the time of survey.

Lane Farm, which comprises of a detached house and gardens is located at the northeast corner of the field, immediately outside of the study area. The house and gardens are separated from the site by a species-poor laurel hedge. There is no boundary marking the eastern edge of the site which continues as further arable land. The western boundary of the site comprises of a species-poor holly hedge with occasional young oak standards. Beyond the hedge are the gardens of residential properties associated with Rossett village. A managed, species-poor hawthorn hedge runs between the south boundary of the field and Harwood's Lane. There is a single mature oak tree standard located within the hedge. The oak tree (Target Note 5 on Figure 2) is considered to offer moderate bat roosting potential within a large crevice on its main trunk (see Photograph 6).

4.1.4 Evaluation and Conclusions

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

The hedgerows and individual trees are considered to be the features of greatest value at the site chiefly as they are likely to offer suitable refuge and foraging habitat for birds 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.

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 field 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 Wrexham County Borough 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 within the centre of an adjacent pasture field and is located approximately 260m to the east of the site (National Grid Reference SJ 377 573).

The pond itself is considered to support good suitability great crested newt habitat. It is reasonably large and unshaded, with a good coverage of suitable great crested newt egg laying plants (floating sweet-grass, *Glyceria maxima*). However the pond is relatively isolated from other ponds in the locality with the surrounding road network likely to act as a partial barrier to any potential newt dispersal.

The pond achieved a HSI score of 0.65 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 location is shown on photograph 4 in the Appendix and on Figure 1. Full HSI results are given in Table 2 below.

4.3.2 Presence/absence eDNA Survey

Water samples from the pond were collected in May 2016 and these were analysed for great crested newt eDNA. The laboratory at Surescreen Scientifics returned a negative result for great crested newt eDNA.

Consequently it is considered very unlikely that great crested newt are present within the pond or the proposed development site.

Table 2- Habitat Suitability Index Results

<i>HSI Feature</i>	<i>Pond 1</i>
Location	1
Pond area	1
Pond drying	0.9
Water quality	0.67
Shade	1
Fowl	1
Fish	0.67
Ponds	0.1
Terrestrial habitat	0.67
Macrophytes	0.5
HSI Score	0.65

4.3.3 Evaluation

Survey has identified a single pond located approximately 260m to the east of the study site. The pond supports suitable habitats but is considered to be relatively isolated from other ponds in the locality by the surrounding network of roads. This isolation could reduce the viability of the pond to support a healthy great crested newt population owing to a limited gene flow potentially leading to inbreeding depression.

The nearest record of great crested newt held by COFNOD is located approximately 600m to the north of the site on the northern side of Rossett village.

Water samples from the pond (the only pond located within 500m of the site) were collected and were analysed for great crested newt eDNA. The laboratory at Surescreen Scientifics returned a negative result for great crested newt eDNA.

Consequently it is considered highly unlikely that great crested newt are present at the proposed development site.

4.4 Breeding Birds

4.4.1 Results

Tree and hedgerow habitats at the site are likely to be used by nesting birds during the breeding bird season. Likewise arable fields could support ground nesting birds including skylark, meadow pipit, grey partridge or lapwing.

4.4.2 Evaluation and Conclusions

The site is likely to support farmland and garden bird species that are common in rural parts Wrexham County Borough. 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 Bat Surveys

4.5.1 Bat Tree Roost Surveys

All trees at the site were assessed as to their suitability to support bat roosts.

The ash tree located at Target Note 3 (see Figure 2) is considered to offer 'low' bat roosting potential within ivy growth around its trunk.

The oak tree at Target Note 5 (see Figure 2) is considered to offer 'moderate' bat roosting potential within a large crevice in its trunk.

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

4.5.2 Bat Activity Survey Results

Bat activity surveys were carried out on the 3rd May, 24th May and the 15th June 2016 under suitable weather conditions. Dates, weather conditions and sunset times are given in Table 1 in the Appendix.

Results of surveys are shown on Figure 3 in the Appendix. Figure 3 shows the walked transect route, Point Count locations (with activity index levels) and Target Note locations overlaid on top of the Phase 1 Habitat Survey results. Summary data of the Target Note descriptions and Point Counts results are given in Tables 2 and 3 in the Appendix.

4.5.3 Results Summary and Evaluation of Habitat Features for Bats

The activity surveys identified the site as supporting relatively low numbers of foraging common pipistrelle and soprano pipistrelle bat. These species are common in the Wrexham area and the UK as a whole. Noctule were recorded overflying the site but were not recorded using the site as a foraging resource.

Overall, the surveys recorded relatively low levels of bat activity at the site with bats principally encountered foraging along hedgerows associated with the site's boundary features.

The open grassland and arable habitats are considered to be of negligible value with limited bat activity recorded in these areas away from the hedgerows.

The greatest level of bat activity was recorded along the hedgerow at Target Note 2 (See Figure 3) which runs along the eastern and northern boundary of the land parcel located to the north of Rossett Road. Point count 4, which is located along this hedgerow recorded a 'moderate' level of bat activity across the three surveys. In terms of habitats present within the study site, this hedgerow is considered likely to be the feature of greatest importance to local bat populations. All other point count locations recorded 'low' levels of bat activity.

Low levels of bat commuting activity were recorded along the lanes leading out from the village of Rossett (Harwood's Lane and Rossett Road). Bats were generally observed to be commuting west to east i.e. travelling away from their likely roosts within the village of Rossett into the wider countryside to forage. Both of these roads are illuminated by sodium-vapour street lamps of an evening.

The linear commuting habitat offered by these two roads is also considered likely to be of some importance to local bat populations.

4.5.4 Evaluation of Bat Assemblages

Taking the survey data results into consideration the site is assessed as being of '**Zone of Influence**' or '**Site only**' importance with regards to the bat assemblages it supports.

5 Summary and Recommendations

5.1 Potential Constraints and Recommendations

5.1.1 Habitats

The majority of the site comprises of intensively managed farmland comprising of arable and pasture. These habitats are considered to be of negligible conservation value. However any development of the site should aim to avoid impacting existing hedgerow networks

Whilst the hedgerow features are of limited botanical interest as they are generally species-poor, they offer suitable refuge and foraging habitat for birds and other wildlife. They are also likely to act as linear wildlife corridors through the landscape.

Any development of the site should also aim to avoid impacts to mature trees at the site particularly the trees located at Target Notes 2, 3 and 5.

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.

5.1.2 Great Crested Newt

Water samples from the only pond located within 500m of the site were collected and were analysed for great crested newt eDNA. The laboratory at Surescreen Scientifics returned a negative result for great crested newt eDNA.

Consequently it is considered highly unlikely that great crested newt are present at the proposed development site.

5.1.3 Birds

The hedgerows, trees and cereal fields could be used by nesting birds during the breeding bird season.

Any future development of the site 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.

5.1.4 Bat Tree Roosts

Whilst no field signs of roosting bats were found, field survey identified two trees which support suitable bat roosting features (trees located at Target Notes 3 and 5 on Figure 2).

If development of the site were to require the removal of these trees, further nocturnal bat surveys should be carried out to establish likely bat presence or absence.

5.1.5 Bat Activity Survey Results Summary

Bat activity transects have identified two species of common bat (common pipistrelle and soprano pipistrelle bat) to be using the site as a foraging resource in relatively low numbers. A further bat species (Noctule) has been recorded over flying the site.

The site is considered to support bat assemblages that are of '**Zone of Influence**' or '**Site only**' value in terms of their conservation importance.

5.2 Ecological Mitigation and Enhancements

5.2.1 Bat and Bird Box Scheme

It is recommended that a bat and bird box scheme is designed for the site. The scheme can incorporate the bat and bird boxes into any new structures or could have them positioned on retained mature trees.

5.2.2 Bat Habitat Mitigation

The existing hedgerows at the site offer foraging habitat to the local bat populations. The hedgerow that runs along the eastern and northern boundary of the land parcel located to the north of Rossett Road is considered to be the feature of greatest value to bats at the site.

The current masterplan proposals for the housing development will see the retention of this hedgerow along with all existing associated trees. Bat foraging habitat associated with the hedgerow will be enhanced through pockets of additional tree and shrub planting along its length.

Harwood's Lane and Rossett Road are also likely to be of some value to local bat populations as they offer linear commuting habitat linking likely roost sites within Rossett village with the wider countryside.

Bat commuting and foraging habitat will be enhanced along the site's boundary with Harwood Lane through additional wildflower grassland creation; tree and scrub planting plus the creation of a new pond.

New bat roosting habitat will be provided at the site through the design and implementation of a bat box scheme. Bat boxes can be built into new housing at the site and can be positioned on retained mature trees.

5.2.3 Bats and Lighting

A lighting plan will be produced for the site at the detailed design stage. The lighting plan will be designed with consideration to bat foraging, commuting and roosting habitat at the site.

The appointed 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.

6 Appendix

Figure 1- Site Location Showing Pond 1

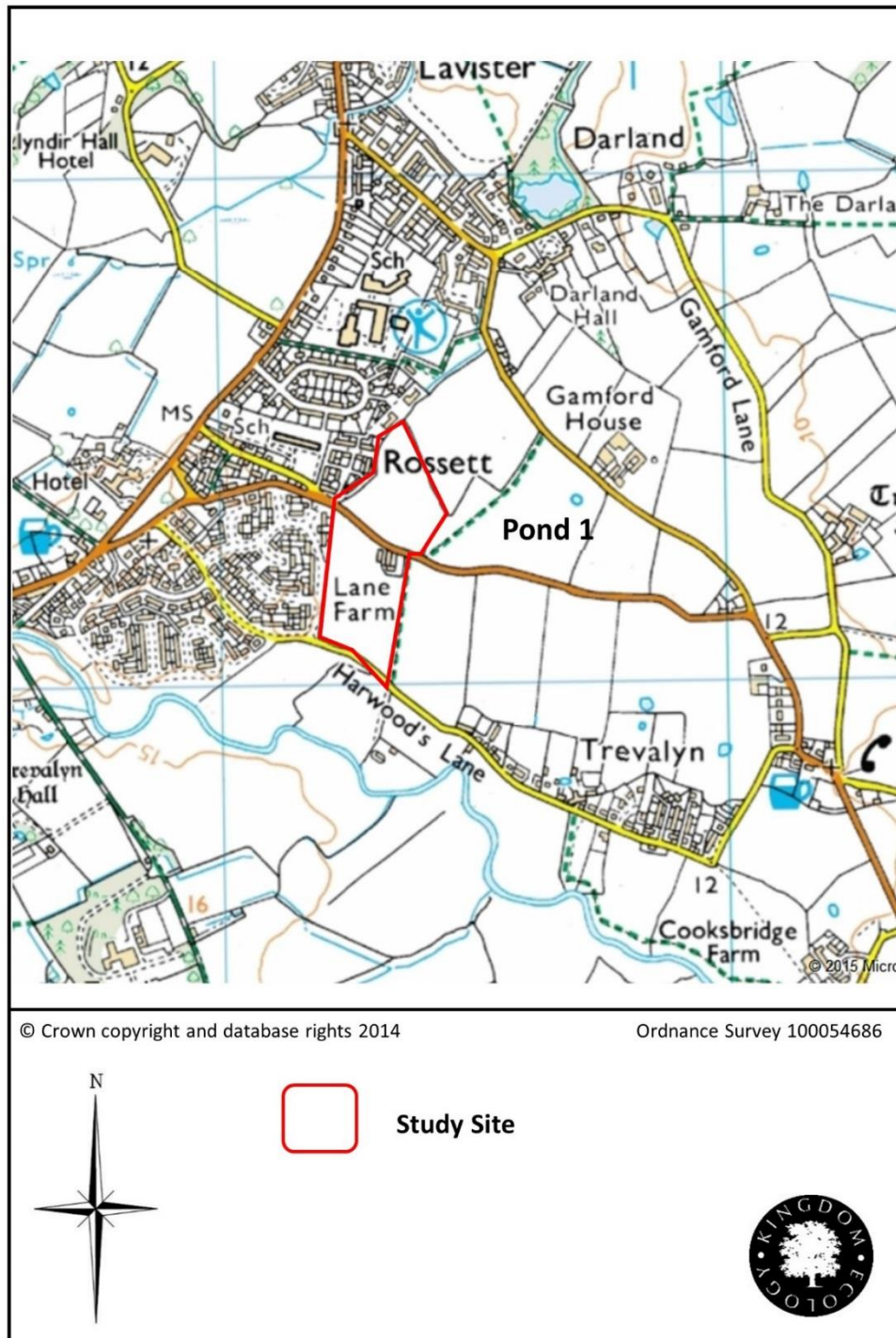


Figure 2- Habitat Map

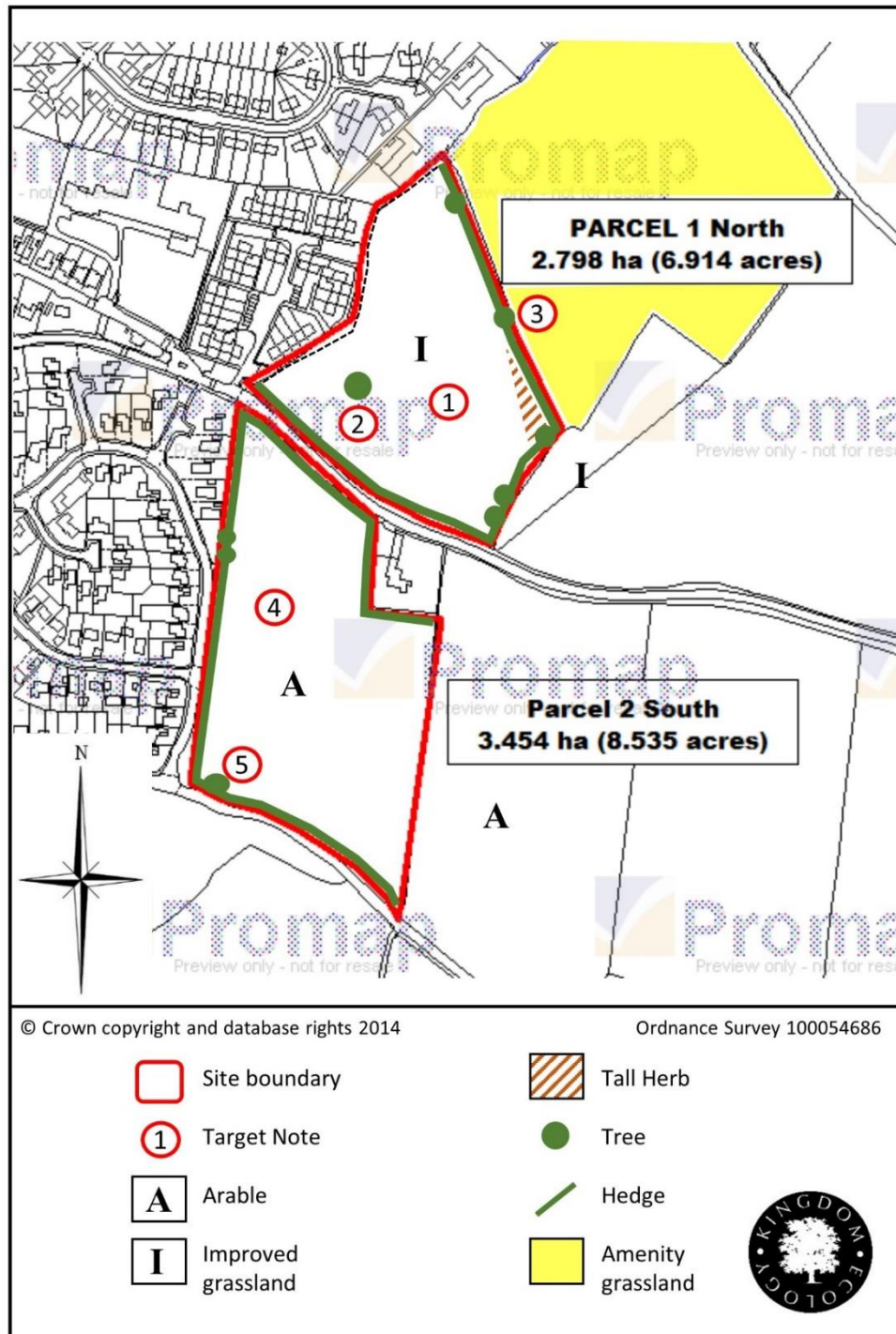
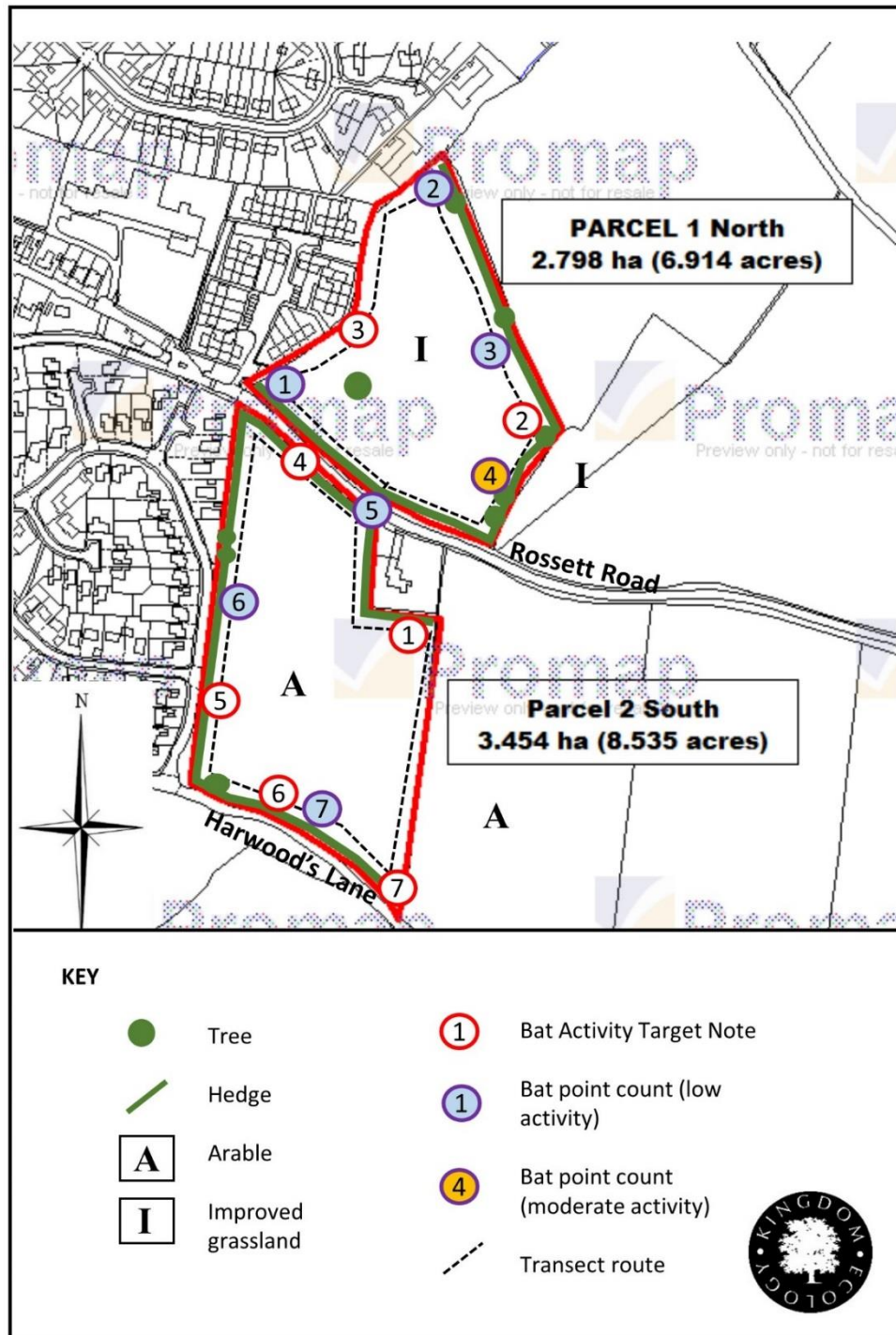


Figure 3- Bat Activity Survey Results



Bat Activity Survey Results Tables

Table 1- Dates, sunset times and weather

Date	Sunset Time	Temp. (°C)	Rain	Wind
3/5/2016	20.32	11	Dry	Calm
24/5/16	21.19	14	Dry	Calm
15/6/16	21.45	15	Dry- Heavy rain until 22.15 and from 23.32; survey completed during dry intervening period	Calm

Table 2- Target Note Results

Target Note	Description
1	Noctule recorded commuting over site on 2nd survey. Individual common pipistrelle bat recorded foraging over garden during 3rd survey.
2	Common pipistrelle foraging activity recorded along hedgeline during 1st survey. Soprano pipistrelle recorded foraging within corner of field during 1st and 2nd circuit of 2nd survey.
3	Noctule recorded commuting over site 2nd survey. Common pipistrelle recorded commuting along fence line during 2nd survey.
4	Individual common pipistrelle bat recorded commuting and foraging over road during 1st and 3rd survey.
5	Individual soprano pipistrelle recorded commuting along opposite side of hedge (outside of site) during 1st survey. Individual common pipistrelle bat recorded foraging over road during 2nd survey.
6	Individual common and soprano pipistrelle recorded commuting west to east along lane during 1st survey.
7	Common pipistrelle foraging below street lamp, 1st survey.

Table 3- Point Count Results

Point Count	Habitat	Species	No. Passes 3rd May		No. Passes- 24th May		No. Passes- 15th June	Average	Activity Index
			1st Circuit	2nd Circuit	1st Circuit	2nd Circuit	1st Circuit		
1	Hedge, grassland & gardens		0	0	0	0	0	0	Low
2	Hedge, grassland & gardens	P45 P55	0	6	0	4	0	2.2	Low
3	Hedge, mature trees and grassland	P45, P55	0	7	0	0	2	1.8	Low
4	Hedge, mature trees and grassland	P45 & P55	0	20	0	0	7	5.4	Moderate
5	Hedge, road, and arable	P45	1	0	2	1	1	1	Low
6	Hedge and arable	P45, P55	0	1	4	5	2	2.4	Low
7	Hedge, road, and arable	P45	2	7	1	0	4	2.6	Low

P45- Common pipistrelle, P55- Soprano pipistrelle

PHOTOGRAPHS

Photograph 1- Field at Target Note 1 looking north



Photograph 2- Field at Target Note 4 looking north



Photograph 3- Hedge line at northern boundary of Target Note 1 looking west



Photograph 4- Pond 1



Photograph 5- Alder tree at Target Note 2



Photograph 6- Oak tree at Target Note 5

