BASELINE ECOLOGICAL ASSESSMENT

Langwith,

Heslington, York

June 2018

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Status	**Date**	**Approved by:**
Final	29-06-2018	Giles Manners CEnv MCIEEM

Site:

Langwith,
Langwith Stray,
Heslington,
York,
YO10 5EJ

Dates:

Walkover and scoping survey: 25th January 2018

Wintering bird surveys: 20th December 2017 to 26th February 2018

Breeding bird surveys: 18th April, 24th April, 9th May, 18th May, 24th May, 26th May

eDNA analysis: 24th April 2018

Bat emergence survey dates: 16th May, 24th May, 30th May, 7th June 2018

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Local Planning Authority:

City of York Council

MAB ref:

2018-423

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1 Summary

An ecological assessment of land and buildings at Langwith near York, comprising a data search and extended Phase 1 habitat survey, was undertaken.

The site is predominantly small arable fields with a small area of semi-improved grassland. Fields are bordered with mature oaks. Many of the mature oak trees hold low to moderate potential bat roosting habitat, however emergence surveys did not identify any roosts, and activity was generally very low.

There are two ponds on site. An eDNA test was undertaken on both ponds, and both confirmed these ponds as free of great crested newts (GCN). One of the ponds (Pond 1) has good habitat suitability for other amphibians such as toads and frogs.

There are 13 buildings on site forming a farm complex, including traditional brick barn buildings, a farmhouse and modern agricultural buildings. These buildings ranged from negligible to moderate potential bat roosting habitat, with old bat droppings and feeding remains found on the upper floor of Building 3. Bat emergence surveys on the buildings identified a maternity roost within Building 7, with 12 common pipistrelles identified emerging. In addition 5 common pipistrelles were roosting in the farmhouse (Building 1). This is likely to be a satellite roost.

The small arable fields remained fallow throughout the winter and the wintering bird surveys identified usage of the site by flocks of feeding Northern Lapwing (*Vanellus vanellus*), large numbers of Fieldfare and small numbers of Redwing (*Turdus iliacus*). The site lies in the Lower Derwent Valley Special Protection Area (SPA) and Heslington Tillmire Site of Special Scientific Interest (SSSI) impact zones. Qualifying features of the SPA are Bewick's Swan, Eurasian Wigeon, Eurasian Teal, Northern Shoveler, European Golden Plover and Ruff. The water bird assemblage is also a qualifying feature. The only species using the site and thus potentially impacting on the ability of foraging species from the SPA are Lapwing.

The SSSI is notified for fen plant communities and breeding wetland bird species – including lapwing, snipe, curlew, redshank, teal and shoveler. Again lapwing are the only species using the site in winter that have relevance to the SSSI.

Breeding bird surveys demonstrated that the principle feature of value to breeding birds (other than the farm buildings) are hedgerows with trees; where in good condition sections, these are used by a good breeding population of Yellowhammer and Whitethroat. There are no nesting birds within the fields due to agricultural operations (spring sowing). Surrounding land has a high population of breeding skylark which frequent this site but were not observed to be nesting. A small wet area had some interesting spring visitors in low numbers such as Shelduck and Greylag geese but this area dried out in May and these birds were no longer seen. Curlew was seen only once, and Lapwing were present in low numbers in the spring but were not observed to nest within the site.

Barn owl roosting, not nesting, was identified in Buildings 5, 7, 9, and 11. Barn swallow nesting was identified in Buildings 2, 7 and 13. Other bird nesting, including pigeons and wren, were identified in Buildings 3, 6, 7, 9 and 13.

The site has low habitat suitability for reptiles.

Up to 6 brown hares *(Lepus europaeus)* were seen using the site in the spring. Evidence of an outlier badger sett was identified just outside the northern boundary. Evidence was also identified in the form of prints, of badgers utilising the site for foraging and commuting.

2 Introduction

MAB Environment and Ecology Ltd was commissioned by Gary Handley to undertake an baseline ecological assessment of land at Langwith for inclusion of land in City of York Council Local Plan.

This report was prepared by Ione Bareau MCIEEM.

The area of ecological assessment at Langwith is comprised of four fields - two larger arable fields (8.36 ha and 7.59 ha respectively) with two smaller grass fields – 1.54 and 1.01 ha.

Boundaries are hedged or mature oak treeline boundaries. There is a farmhouse with extensive traditional farm buildings. Two ponds are on the site. The site is located approximately 4km south-east of York (OS Grid Ref: SE 656 480). The land that this assessment refers to is shown in Figure 1.

The objectives of this report are to:

- Identify species and habitats on site, with particular reference to protected and notable species.
- Make a preliminary assessment of ecological constraints and opportunities.

Ecologists from MAB Environment and Ecology Ltd are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct when carrying out ecological work.

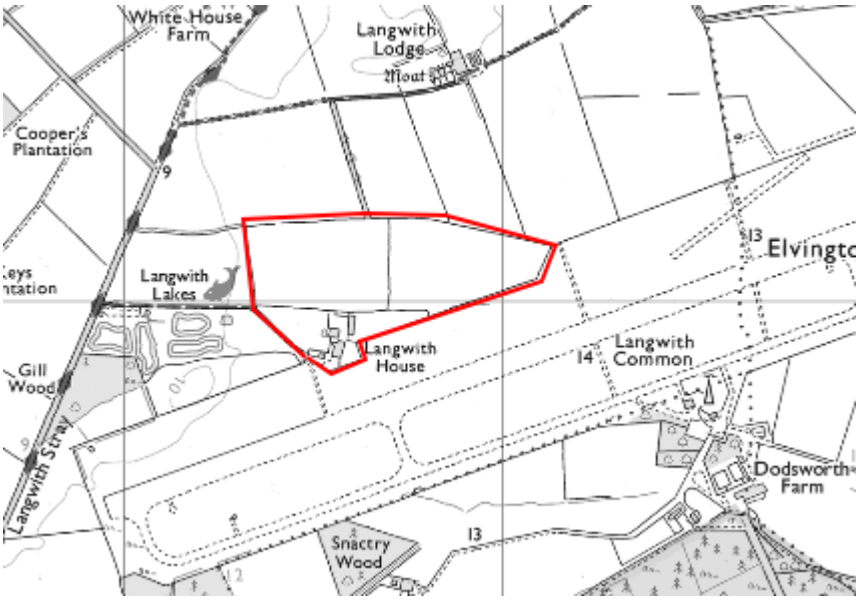


Figure 1 Site plan showing red line boundary

3 Planning policy and Legislation

3.1 Planning policy

3.1.1 National Planning Policy Framework (England) NPPF

The government published the NPPF on 27th March 2012. Text excerpts from NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

In conserving and enhancing the natural environment, the NPPF states that "the planning system should contribute and enhance the natural and local environment by:

a) Recognising the wider benefits of ecosystem services
b) minimising impacts on biodiversity and providing net gains in biodiversity where possible contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.
c) Preventing both new and existing development from contributing to or being put at unacceptable risk from or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability"

In paragraph 111, the NPPF refers to brownfield land as follows "planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value".

Where proposals or activities require planning permission, the NPPF states that "...local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

a) If significant harm resulting from a development cannot be avoided) through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning should be refused.
b) Proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse impact on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where

an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site clearly outweigh both the impacts that it is likely to have on the features of this site that make it of special scientific interest and any broader impacts on the national network of SSSI's.

c) Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted.
d) Opportunities to incorporate biodiversity in and around developments should be encouraged.
e) Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss and
f) The following wildlife sites should be given the same protection as European site:
    I. Potential Special Protection Areas (SPA) and possible Special Areas of Conservation(SAC)
    II. Listed or proposed Ramsar sites; and
    III. Sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPA's, possible SAC's and listed or proposed Ramsar sites.

In respect of protected sites, the NPPF requires the local planning authorities to make "distinctions...between the hierarchy of international, national and locally designated sites so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks"

In paragraph 125 the NPPF stipulates that "by encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation" This applies to protected species that area a material consideration in the planning process including bats and may also apply to other light sensitive species.

3.1.1 City of York Council Draft Local Plan (April 2005)

Policy NE6: Species Protected by Law.

"Where a proposal may have a significant effect on protected species or habitats, applicants will be expected to undertake an appropriate assessment demonstrating their proposed mitigation measures. Planning permission will only be granted for development that would not cause demonstrable harm to animal or plant species protected by law, or their habitats. The translocation of species or habitats will be an approach of last resort."

Policy NE7: Habitat Protection and Creation

"Development proposals will be required to retain important natural habitats and, where possible include measures to enhance or supplement these and to promote public awareness and enjoyment of them. Within new developments measures to encourage the establishment of new habitats should be included as part of the overall scheme."

3.2 Legislation

3.2.1 Natural Environment and Rural Communities (NERC) Act 2006 – Habitats and Species of Principal Importance (England and Wales)

The NERC Act came into force on 1st October 2006. Sections 41 and 42 (S41 and S42) of the Act require the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England and Wales respectively. The list has been drawn up in consultation with Natural England (NE) and Countryside Council for Wales (now NRW) as required by the Act. In accordance with the Act the secretary of state keeps this list under review and will publish a revised list if necessary, in consultation with NE and NRW.

The S41 and S42 lists are used to guide decision makers such as public bodies, including local and regional authorities, and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of

biodiversity in England and Wales, when carrying out their normal functions, including development control and planning. This is commonly referred to as Biodiversity Duty. Guidance for public authorities on implementing Biodiversity Duty has been jointly published by Defra and the Welsh Assembly. One of the key messages in this document states that "conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them". In England, local authorities are required to take measures "to promote the preservation, restoration and recreation of priority habitats, ecological networks and the protection and recovery of priority species" linking to national and local targets through policy and by association, therefore, through development control.

In 2007, the UK biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK. The UK post 2010 Biodiversity Framework, which covers the period from 2010 – 2020 now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up lists of species and habitat s of principal importance in England and Wales.

In England, there are 56 habitats of principal importance and 943 species of principal importance on the S41 list. These are all the habitats and species that are found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK post -2010 Biodiversity Framework.

In Wales, there are 54 habitats of principal importance and 557 species of principal importance on the S42 list. This includes three marine habitats and 53 species that were not on the list of UK BAP priority habitats, but which are recognised as of principal importance for Wales.

3.2.2 Government Circular 06/2005 and Standing Advice from NE

Paragraph 99 of Government Circular 06/2005 advises that "*it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted".*

The reasoning behind this statement stems from the fact that, without appropriate protected species surveys to confirm presence or likely absence and where an effect upon the species is considered likely should the development proposal proceed, planning permission may be inadvertently granted for an action that would contravene protected species legislation or the local planning authority may not have due regard to its duty in respect of protected species in advance of determination and this could result in issues in the ability to implement the planning permission. For example, if a situation were to arise where protected species were discovered after planning permission had been granted, it may not be possible to incorporate mitigation measures into the scheme, at least without a major change to the scheme design that would require re-submission to the planning authority.

Paragraph 118 of the NPPF advises that when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying certain principles. One of these principles advises that if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

Paragraph 98 of Circular 06/2005 advises that "*the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its*

habitat. Local authorities should consult with NE before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should advise developers that they must comply with any statutory species' protection provisions affecting the site concerned...."

Standing advice from NE provides advice to planners on deciding if there is a 'reasonable likelihood 'of protected species being present. It also provides advice on survey and mitigation requirement s. When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. NE advises that standing advice is a material consideration in the determination of applications in the same way as a letter received from NE following consultation.

3.2.3 European Protected Species (Animals)

The Conservation of Habitats and Species Regulations 2010 (as amended) consolidates the various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

"European protected species" (EPS) of animal are those which are present on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). They are subject to the provisions of Regulation 41 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together these pieces of legislation make it an offence to:

a) Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
b) Possess or control any live or dead specimens or any part of, or anything derived from these species
c) Deliberately disturb wild animals of any such species
d) Deliberately take or destroy eggs of such an animal or

e) Intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct such a place

For the purposes of paragraph c), disturbance of animals includes in particular any disturbance which is likely

a) To impair their ability
    I. To survive , to breed or reproduce, or to rear or nurture their young, or
    II. In the case of animals of a hibernating or migratory species, to hibernate or migrate; or
b) To affect significantly the local distribution or abundance of the species to which they belong.

Although the law provides strict protection to these species, it also allows this protection to be set aside (derogation) through the issuing of licences. The licences in England are currently determined by NE for development works. In accordance with the requirements of the Regulations (2010), a licence can only be issued where the following requirements are satisfied:

a) The proposal is necessary "to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance to the environment
b) There is no satisfactory alternative
c) The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

3.2.4 Wild mammals

Under the Wild Mammals (Protection) Act 1996, it is an offence to kill or injure any wild mammals by various means, including crushing and suffocating; therefore consideration must be given to the humane exclusion or destruction of foxes and rabbits before work starts.

3.2.5 Badgers

Badgers are protected under the Protection of Badgers Act 1992. It is illegal to willfully kill, injure, take, possess or cruelly ill-treat a badger, or attempt to do so; to intentionally or recklessly interfere with a badger sett by damaging or destroying it; to obstruct access, or any entrance of, a badger sett and to disturb a badger when it is occupying a sett.

A badger sett is defined as *'any structure or place, which displays signs indicating current use, by a badger.'* This can include culverts, pipes and holes under sheds, piles of boulders, old mines and quarries, etc. 'Current use' does not simply mean 'current occupation' and for licensing purposes it is defined as 'any sett within an occupied badger territory regardless of when it may have last been used'.
Licences are granted by Natural England to interfere with badger setts for development purposes. Licences are not normally issued during the breeding season, which is between 30th November and 1st July, and cannot be issued retrospectively

3.2.6 Birds

All nesting birds 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 its nest whilst in use of being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

The conservation of Habitats and Species (Amendment) Regulations 2012 has placed new duties on Local Authorities and National Park Authorities (and others) in relation to wild bird habitat. Regulation 9A(2) and (3) require that "in the exercise of their functions as they consider appropriate" these authorities must take steps to contribute to the "preservation, maintenance and reestablishment of a sufficient diversity and area of habitat for wild birds in the UK, including by means of upkeep, management and creation of such habitat....."These authorities are also required,

under Regulations 9A(8) to “use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds”.

3.2.7 Hedgerows

Article 10 of the Habitats Directive requires that “Member states shall endeavour..to encourage the management of features of the landscape which are of major importance to wild fauna and flora. Such features are those, which by virtue of their linear and continuous structure..or their function as stepping stones..are essential for the migration, dispersal and genetic exchange of wild species” Examples given in the Directive include traditional field boundary systems (such as hedgerows).

The aim of the Hedgerow Regulations 1997, according to guidance produced by the Department of the Environment, is to ‘protect important hedgerows in the countryside by controlling their removal through a system of notification. In summary, the guidance states that the system is concerned with the removal of hedgerows, either in whole or in part, and covers and which results in the destruction of a hedgerow. The procedure in the Regulations is triggered only when land managers or utility operators want to remove a hedgerow. Firstly, the applicant must notify the local planning authority, providing details of the hedgerow and setting out their reasons for wanting to remove the hedgerow. The local planning authority typically has 42 days from receipt of notification in which to give or refuse consent, taking account not only of whether the hedgerow is important, but also of the reasons for removing it. If the authority does not respond within this period, the hedgerow may be removed. The system is in favour of protecting and retaining important hedgerows, though the local planning authority cannot refuse consent if the hedgerow is not important.

The Hedgerow Regulations set out criteria that must be used by the local planning authority in determining which hedgerows are important. The criteria relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective.

3.3 UK and Local Biodiversity Action Plans

3.3.1 The UK Biodiversity Action Plan (BAP) identified a number of species as priorities of conservation. Those of particular relevance to this site are:

- Soprano pipistrelle bat (*Pipistrellus pygmaeus*)
- Brown long-eared bat (*Plecotus auritus*)
- Noctule bat (*Nyctalus noctula*)
- Brown hare (*Lepus europaeus*)
- West European hedgehog (*Erinaceus europaeus*)
- Common toad (*Bufo bufo*)
- Great crested newt (*Triturus cristatus*)

3.3.2 Protected Species York BAP (Draft May 2013)

Priority Habitats

- Ponds Rivers and streams
- Species rich hedges
- Urban Farmland

Priority Species

- Great Crested Newt
- Water Vole
- Bats
- The Dark Bordered Beauty Moth
- Aculeate Hymenoptera (Bees and wasps)
- Rare Invertebrates
- Rare Flowers & Herbs
- Farmland Birds

4 Methodology

4.1 Desktop study

4.1.1 The North and East Yorkshire Ecological Data Centre (NEYEDC) was commissioned to provide records of protected or notable species within 2km of the site. The search was extended to include any statutory, non-statutory sites and notable habitats.

4.1.2 Bat roost records for a 2km radius around the site were commissioned from the North Yorkshire Bat Group.

4.1.3 Aerial imagery from Google Earth and government website 'MAGIC' were used to search for ponds within 500m of the site

4.2 Field survey

4.2.1 The site was surveyed by Sarah Emerson Grad CIEEM who is in her first year of working for MAB Environment and Ecology Ltd but has previously had two years' experience conducting bat surveys and holds a Class Survey Licence WML-A34 (Bat Survey Level 2) registration number: 2016-26716-CLS-CLS. She also holds a Class Survey Licence for Great Crested Newts WML-CL09 (level 2) registration number 2016-19358-CLS-CLS and Ione Bareau MCIEEM, a director of MAB Environment and Ecology Ltd. Ione holds a Class Survey Licence WML CL15 (volunteer bat roost visitor Level 1) and WML CL18 (Bat Survey Level 2) – registration number 2015-13361-CLS-CLS. Ione is licensed by Natural England to survey for GCNs (CL08 Great Crested Newt Class 1, Registration number 2015-19109-CLS-CLS)

4.2.2 A Phase 1 Habitat Survey was conducted following standard published guidelines (JNCC 2010). This involved a walkover of the site, mapping all habitats present and noting species proportions where possible using the DAFOR scale where D is dominant, A is abundant, F is frequent, O is occasional and R rare. The survey was extended to include records of protected or notable fauna and the habitats were evaluated for their potential to support such fauna.

4.2.3 Any buildings on site were assessed for their degree of potential to support roosting bats. This includes assessing the building design, materials and condition. The location of the site and the surrounding habitat were also assessed for value to bats. This includes proximity of the site to good bat foraging habitat such as woodland and water bodies and if the site is linked to such habitats by linear features like hedgerows, woodland edges or rivers which bats use to commute around the environment.

Colour code	Bat roost potential.	Roosting habitats	Commuting and foraging habitats
	Confirmed	Signs of roosting bats present (e.g. entry / exit points, accumulated bat droppings, visible bats).	
Red	High risk	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
Amber	Moderate risk	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only-the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as a line of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Yellow	Low risk	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. Unlikely to be suitable for maternity or hibernation)	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream, but isolated, i.e. Not very well connected to the surrounding landscape by other habitat. Suitable but isolated habitat that could only be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Green	Very low risk	All potential bat roost habitat *comprehensively* inspected and found to be clear of past or present bat usage.	
Grey	Negligible risk	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.

Table 1: Guidelines for assessing the suitability of proposed development sites for bats. Adapted from BCT Bat surveys for Professional Ecologists, Good Practice Guidelines 2016.

4.2.4 The interior and exterior of the buildings were inspected during the day using halogen torches (500,000 candle power), ladders, and a flexible endoscope (a Sea Snake LCD inspection scope). All normal signs of bat use were looked for, including

bats, bat droppings, feeding waste, entry and exit holes, grease marks, dead bats, and the sounds / smells of bat roosts.

4.2.5 Trees marked for removal or directly affected by the development scheme were assessed during the day from the ground using close focusing binoculars and a halogen torch (500,000 candle power). Features such as woodpecker holes, splits, cracks, rot holes, dense ivy, and peeling bark were looked for which are commonly used by bats for roosting and for shelter. Any features were then inspected for any signs of bat use, including scratches or staining around potential access points, bat droppings bats, and the sounds / smells of bat roosts.

4.2.6 Other trees within the site and areas of vegetation were also assessed for value to bats and their importance as foraging and commuting habitat.

4.2.7 Six wintering bird survey visits were conducted between 20th December 2017 to 26th February 2018. Wintering birds were recorded within the site red line boundary, using Common Birds Census (CBC) methodology, and bird registrations were entered on field survey maps using standard British Trust for Ornithology (BTO) species and activity codes. The surveys were carried out by Giles Manners CEnv MCIEEM, a director of MAB Environment & Ecology Ltd with over 20 years' experience as an ecologist, and is a full member of the Institute of Ecology and Environmental Management and a Chartered Environmentalist.

4.2.8 Breeding bird surveys were carried out in accordance with Common Bird Census (CBC) instructions as published by BTO (John Marchant 1983). Six visits were made between 18th April and 26th May 2018 starting within 2 hours of sunrise and lasting between 1 and 3 hours. Territories were mapped where appropriate.

4.2.9 Four emergence surveys were carried out on the buildings and trees between 16th May and 7th June 2018 using 5 different surveyors with ultra-sound detectors (Pettersson D240x, Pettersson D230, and BatBox Duet). The D240x detector was set to 10x expansion with manual triggering with an Edirol R09 WAV solid state recording device for the time expansion channel, with heterodyne output through the other channel. The D230 and Duet used heterodyne detection and were set to 50 kHz. Time expansion recordings were analysed with BatSound software.

Surveyors used were:

- Matt Cooke (MC) ACIEEM is a fully trained bat surveyor who has undertaken emergence surveys for MAB since 2010. He holds a Natural England bat survey licence (Licence number: 2015-10981-SCI-SCI).
- Sarah Emerson Grad CIEEM (SE) has two years' experience conducting bat surveys and holds a Class Survey Licence WML-A34 (Bat Survey Level 2) registration number: 2016-26716-CLS-CLS.
- Pip Mountjoy (PM) is an undergraduate and trainee bat surveyor
- Rosamond Clay (RC) is a trainee bat surveyor with MAB
- Anne Heathcote Grad CIEEM (AH) has undertaken emergence surveys for MAB since 2013 and has attended training courses for bat surveying and identification.

4.2.10 All signs of breeding bird activity and barn owl (*Tyto alba*) activity were looked for. Signs looked for included white droppings, often vertical down walls or beams; active nests and nesting materials; (birds flying into and out of barns: generally summer only); bird feathers, particularly swift (*Apus apus*), swallow (*Hirundo rustica*) and house martin (*Delichon urbica*), bird corpses, feeding waste (including pellets), and the sound/smell of birds.

4.2.11 Hedgerows within or forming the external boundaries to the site which have a continuous length of or exceeding 20m were surveyed in accordance with the Hedgerow Regulations 1997. Survey results were used to determine whether any of the hedgerows meet criteria listed in Part II of Schedule 1 and would therefore be deemed an 'important' hedge under the regulations. Hedgerows forming the boundary of the curtilage of a dwelling-house are not covered by the regulations and were not surveyed.

4.2.12 The site was surveyed for evidence of badgers. Field signs included setts (noting number of entrances and evidence/level of recent activity); latrines; well-worn pathways; footprints; snuffle holes; hairs caught in boundary fences; scratching posts; smells. Setts were classified using the conventions shown in Table 2, below (SNH 2003).

SETT TYPE	DEFINITION
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

Table 2 – Badger sett definitions:

4.2.13 Field samples were taken from both ponds on site on 24th April 2018 for qPCR analysis of great crested newt environmental DNA (eDNA). A single visit was made to the pond. Water sample collection followed the field protocol adopted by Biggs et al.

4.2.14 Habitat evaluation for reptiles was undertaken. Focusing on potential areas for reptile basking in sheltered locations. Potential refugia such as rabbit burrows, brash piles, cracks and gaps in rocks, stone piles etc. Throughout the walkover survey, the site was walked slowly looking out for reptiles and listening out for any rustles in the undergrowth.

5 Constraints

No significant constraints. Although the last wintering bird survey was sub-optimal due to high winds and low temperatures, target species were still present in high numbers (though passerines were almost entirely absent as they had retreated into sheltered areas).

6 Baseline ecological conditions

6.1 Designated sites

There is one statutory site within the 2km search area. This is 'Heslington Tillmire' (grid ref: SE 638 474), which is designated as a Site of Special Scientific Interest (SSSI), and is approximately 1.6 km to the west of the proposed development site. The citation below identifies notified features:

Heslington Tillmire is situated on silt and clay drift deposits on low lying, flat land in the Vale of York. It is important for its tall herb fen plant community and for its marshy grassland and associated assemblage of breeding birds.

The tall herb fen plant community is the only one of its type known within the Vale of York. It is characterised by marsh cinquefoil *Potentilla palustris*, bogbean *Menyanthes trifoliata* and common cotton-grass *Eriophorum angustifolium*, and a variety of sedges including bottle sedge *Carex rostrata*, common sedge *C. nigra*, tawny sedge *C. hostiana* and slender sedge *C. lasiocarpa*. Herbs include greater bird's-foot-trefoil *Lotus uliginosus*, marsh marigold *Caltha palustris*, meadowsweet *Filipendula ulmaria*, tubular water-dropwort *Oenanthe fistulosa*, and common marsh-bedstraw *Galium palustre*. Of particular note is the presence of the nationally scarce marsh clubmoss *Lycopodiella inundata*.

The marshy grassland provides a breeding habitat for a range of wetland bird species. Up to ten species have bred in any one year including lapwing, snipe, curlew, redshank, teal, shoveler and pintail. The fact that the site is surrounded by intensively farmed arable and improved grassland makes it of particular importance for birds.

The Lower Derwent Valley Special Protection Area SPA's qualifying features are listed below:

The site qualifies under Article 4.1. by regularly supporting nationally important winter numbers of the following Annex 1 species: 70 Bewick's swan *Cygnus columbianus bewickii* (1% of the UK wintering population), 4,120 Golden plover *Pluvialis apricaria* (2% of the UK wintering population) and 50 Ruff *Philomachus pugnax* (3.5% of the UK wintering population). The site also qualifies under Article 4.1. for holding a mean peak number of 100 Ruff during spring migration.

The site qualifies under Article 4.2. by regularly supporting a breeding population of 50 pairs of Shoveler *Anas clypeata* (3.5% of the UK breeding population).

The site also qualifies under Article 4.2. as an area of international importance to waterfowl by regularly supporting over 20,000 waterfowl in winter. In the five-winter period of 1986/87-1990/91 the site held a mean peak of 27,580 waterfowl, comprising means of 17,415 wildfowl and 10,165 waders. Within this number, the site qualifies under Article 4.2. by holding internationally important numbers of Teal *Anas crecca* and Wigeon *Anas penelope* (4,040 Teal - 4% of UK, 1% of NW Europe, 7,790 Wigeon - 3% of UK, 1% of NW Europe). The site also supports nationally important numbers of the following migratory species: 110 Shoveler *Anas clypeata* (>1% of UK wintering numbers), 740 Pochard *Aythya ferina* (>1% of the British wintering population), 100 Whimbrel *Numenius phaeopus* (2% of the UK passage numbers) and 100 Ruff *Philomachus pugnax* (7% of UK passage numbers).

As well as its importance for the individual species listed above, the site is also of strong scientific interest for its exceptionally diverse assemblage of wintering waterfowl.

The SPA is not within the 2km search radius but the Langwith site lies within the 'impact zones' of both these statutory sites.

The NEYEDC data search has also returned a total of seven non-statutory sites of importance for nature conservation (SINC's) located close by. These are:

Site code	Site name	Grid reference
7	Brinkworth Rush (Elvington Airfield)	SE 679 481
16	Fulford Golf Course	SE 623 495 & SE 632 482
41	Wheldrake Wood	SE 660 470
59	Elvington Airfield	SE 666 480
059A	Elvington Airfield	SE 665 480
059B	Dodsworth Farm	SE 669 477
179	Broad Highway Verges	SE 672 463 – SE 669 486 & SE 676 459 – SE 676 458

Table 3 Designated sites within a 2km search radius

All of the above designated sites are shown on Figure 2 below. The site is adjacent to Elvington Airfield SINC.

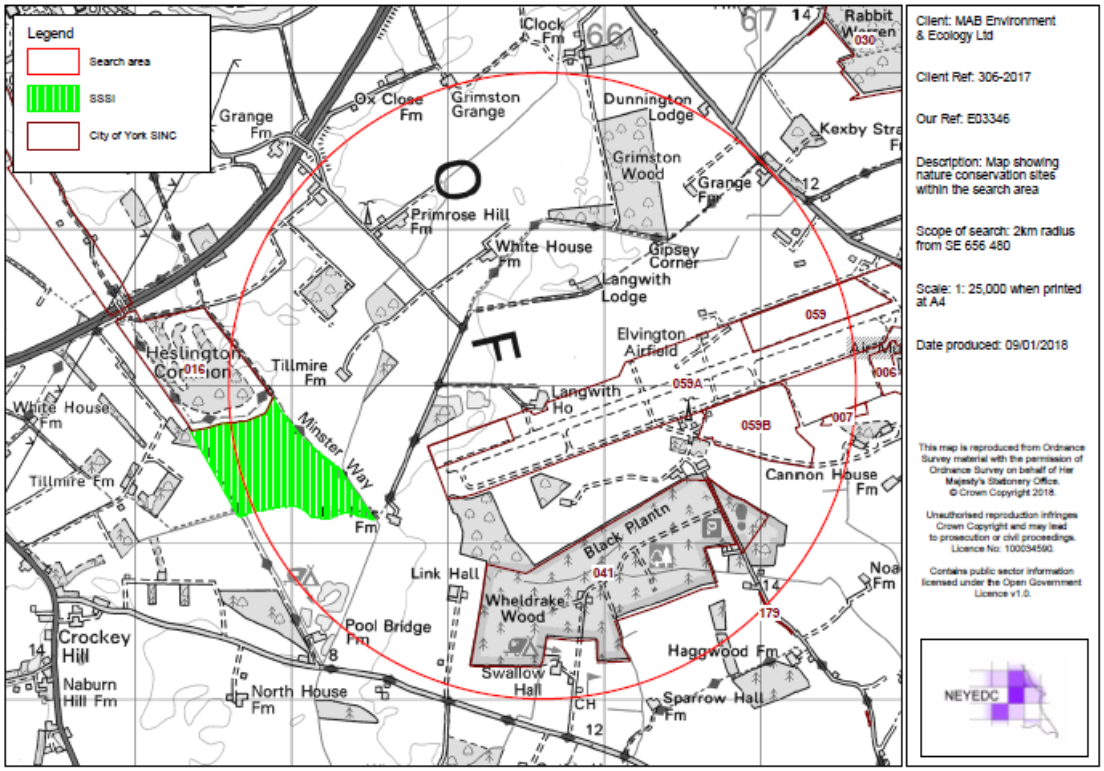


Figure 2 - Map showing conservation sites within the search area.

6.2 Habitats

6.2.1 Surrounding Habitats

Natural England Habitat inventories.

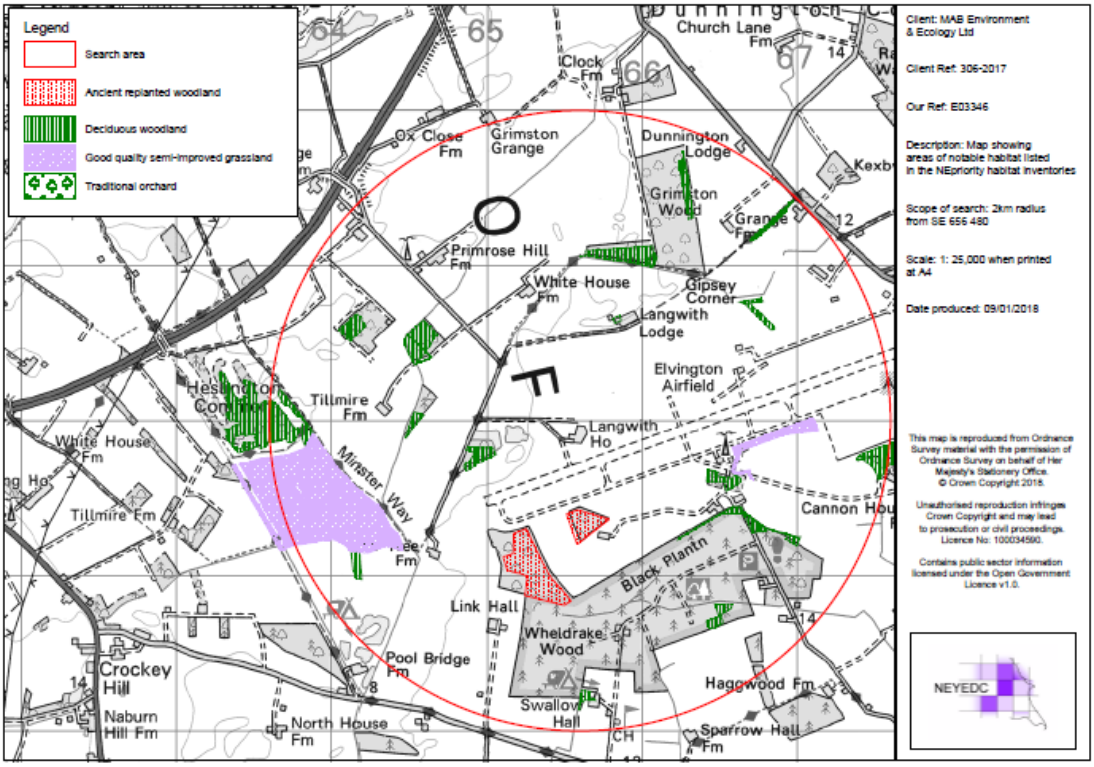


Figure 3 - Map showing areas of notable habitat listed on the Habitat Inventories.

The Natural England Habitat Inventories were searched (including ancient woodland and Priority Habitats), and the following areas of interest are indicated within Figure 4 and Table 4. None of these habitats are found on site, with Snactry Wood approximately 420m to the south of the proposed development site, and no priority habitats within 350m of the proposed development site.

Habitat	Name or location of site	Grid reference
Ancient Woodland		
Ancient Replanted Woodland	Snactry Wood and Langwith Great Wood	SE 656 473 and SE 652 470
Priority Habitats		
Deciduous woodland	Various parcels through search area	
Good quality semi-improved grassland	S side of Elvington Airfield; Heslington Tilmire	SE 672 480 and SE 637 475
Traditional orchard	Langwith Lodge	SE 657 486

Table 4 Notable habitats within 2km search radius

Aerial imagery

Figure 4 - Aerial view of the site and surrounding area.

Ponds

From Magic OS maps and aerial imagery of the site and local area, there are two ponds within the proposed development site, the duck pond (Pond 1), and the cattle pond (Pond 2). There is also a pond approximately 390m to the north of the site associated within Langwith Lodge (Pond 3), and a network of fishing lakes approximately 70m to the west of the site boundary (Pond 4). These are shown in Figure 5 and 6 below.

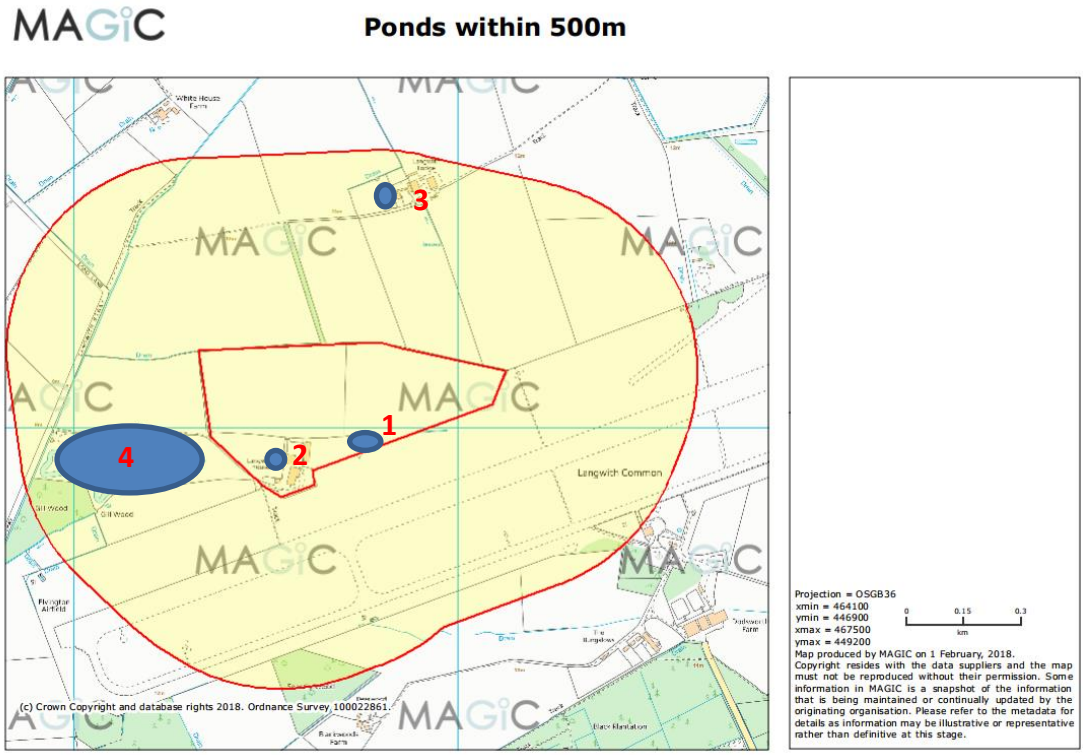


Figure 5 - OS map showing location of ponds within the local area and 500m search area.

Figure 6: Aerial map showing location of ponds in relation to the site and intermediate habitats.

6.2.2 Habitats on site.

Phase 1 survey.

The habitats found on site are highlighted within the Phase 1 habitat plan (**Error! Reference source not found.**). Target notes are included in

Target note (TN)	Description	Notes on potential faunal /habitat value
1	Tall *leylandii* hedge adjacent to access track.	Value for nesting birds.
2	Treeline hedge on edge of farmhouse garden, mostly semi-mature beech (*Fagus sylvatica*), some semi-mature birch (*Betula pendula*) and semi-mature sycamore (*Acer pseudoplatanus*).	Value for nesting birds.
3	Young ash on 3 strand barbed wire fence field boundary	Negligible value for nesting birds
4	Improved grassland field, species noted include; cock's foot grass (*Dactylis glomerata*), common ragwort (*Jacobaea vulgaris*), white clover (*Trifolium repens*), spear thistle (*Cirsium vulgare*), creeping buttercup (*Ranunculus repens*).	Low botanical interest
5	Very narrow semi-improved grassland verge under boundary fence. Species noted included; cat's ear (*Hypochaeris radicata*), ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), teasel (*Dipsacus fullonum*), and fescue grasses.	Low botanical interest
8	Old muck heap, close to farm, some colonising plant species, generally following species composition of the adjacent improved grassland field	Low botanical interest. Value for nesting birds.
9	Line of elder (*Sambucus nigra*) scrub	Value for nesting birds
10	Pond evident, anecdotally dries up in summer, drainage from the nearby cattle shed.	Habitat Suitability Index of 0.50 = Below average for GCN. Value for other amphibians
11	Arable field, species noted included; common nettle (*Urtica dioica*), chickweed (*Stellaria media*), yarrow, pineapple weed (*Matricaria discoidea*), field speedwell (*Veronica persica*).	Low botanical interest. Value for ground nesting birds.
12	Hedge with trees, and numerous rabbit holes. Multi-stem sycamore. hawthorn, hazel and blackthorn (*Prunus spinosa*), understorey of	Not 'important'under Hedgerow Regs.,

	bramble (*Prunus spinosa*), and bracken (*Pteridium* sp.).	value for commuting and foraging fauna. Value for nesting birds
13	Small oak trees within a hawthorn hedgerow, species also noted include; willow (*Salix* sp.), hazel (*Corylus avellana*), elder, crab apple (*Malus sylvestris*), holly (*Ilex aquifolium*). Hedgerow is generally gappy, with bramble, and bracken in gaps. Some mature oak within hedgerow, which has numerous crevices for roosting bats.	Potentially important under hedgerow regulations. Value for nesting birds and commuting and foraging fauna. Moderate value for roosting bats.
14	Potential badger holes within tree line, and under dense bramble. Outliers or annex.	Badgers protected under Badger Act 1992.
15	Outliers or annex sett: collection of entrance holes to sett, and numerous scrapings and prints in area.	Badgers protected under Badger Act 1992.
16	Badger holes- outliers or annex.	Badgers protected under Badger Act 1992.
17	Approximately 25m of ditch with water running towards site, likely feeding pond on site. Species around ditch noted include; blackthorn, soft rush (*Juncus effusus*), and reed canary grass (*Phalaris arundinacea*).	Potential value for amphibians, no evidence of water vole.
18	Poor semi-improved grassland field, species noted include; vetch (*Vicia sativa*), ribwort plantain, creeping buttercup, creeping thistle (*Cirsium arvense*), germander speedwell (*Veronica chamaedrys*) and cock's foot grass.	Low botanical interest
19	Pond within a semi-improved grassland field. Very little emergent vegetation at the time of the survey. GCN have been recorded in this pond in the past, and there could still be a population of GCN within.	Prior record of GCN from 2003 however eDNA is negative for GCN. Pond will have value for other amphibians
20	Mound boundary with cow parsley (*Anthriscus sylvestris*), mugwort (*Artemisia vulgaris*) and cock's foot grass with some badger prints.	Low botanical interest
21	Small hazel hedge, generally overgrown, also with some elder and some hawthorn.	Value for nesting birds, and commuting and foraging fauna

22	Elder scrub with bramble.	Value for nesting birds, and commuting and foraging fauna
23	Tall ruderal plant species around assorted farm scrap. Species noted include bramble, rosebay willowherb (*Chamerion angustifolium*), mugwort, elder, hawthorn.	Value for nesting birds, and commuting and foraging fauna

Table 4, which gives more detailed information about the habitats present, along with species lists.

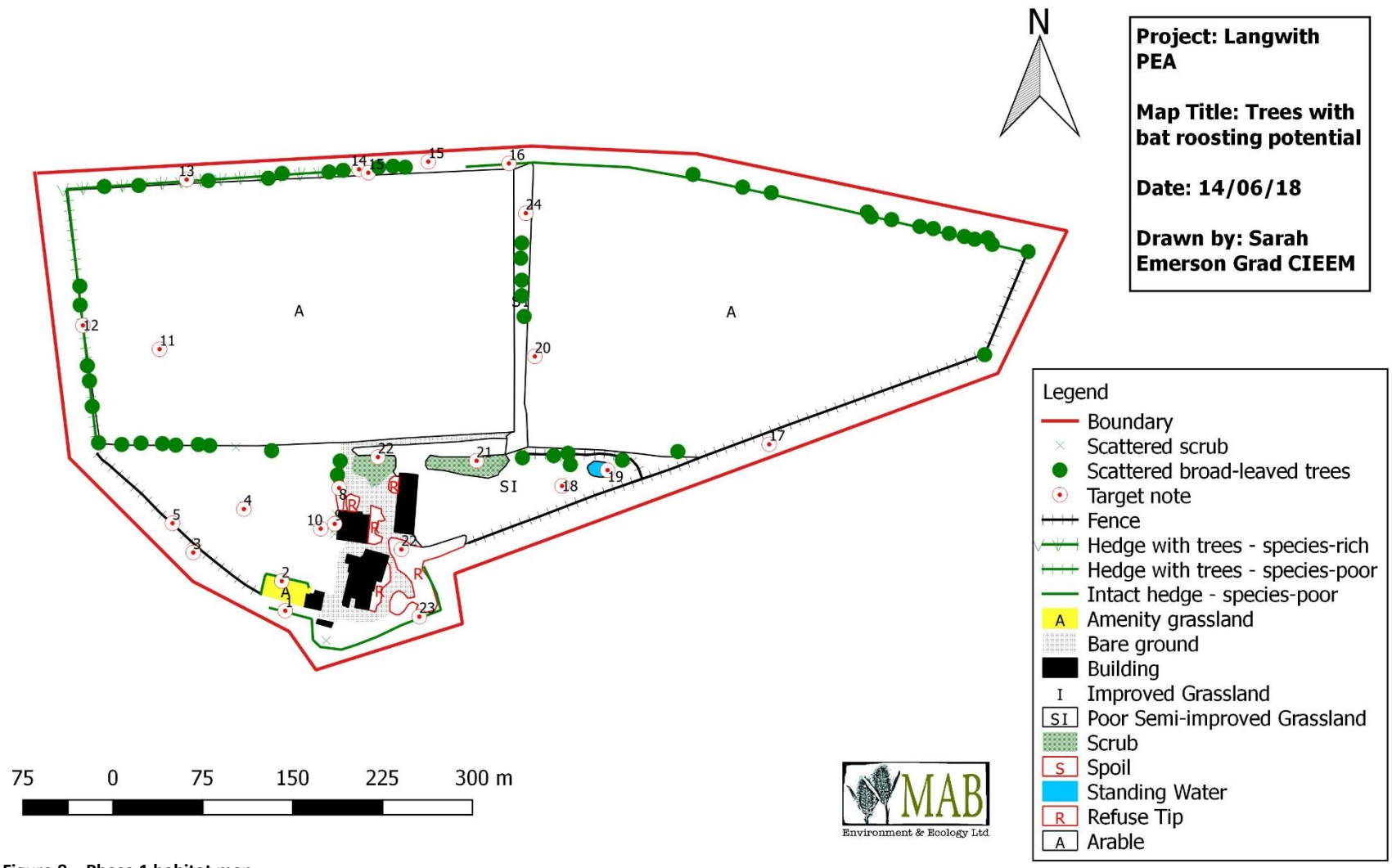


Figure 8 – Phase 1 habitat map.

Target note (TN)	**Description**	**Notes on potential faunal /habitat value**
1	Tall *leylandii* hedge adjacent to access track.	Value for nesting birds.
2	Treeline hedge on edge of farmhouse garden, mostly semi-mature beech (*Fagus sylvatica*), some semi-mature birch (*Betula pendula*) and semi-mature sycamore (*Acer pseudoplatanus*).	Value for nesting birds.
3	Young ash on 3 strand barbed wire fence field boundary	Negligible value for nesting birds
4	Improved grassland field, species noted include; cock's foot grass (*Dactylis glomerata*), common ragwort (*Jacobaea vulgaris*), white clover (*Trifolium repens*), spear thistle (*Cirsium vulgare*), creeping buttercup (*Ranunculus repens*).	Low botanical interest
5	Very narrow semi-improved grassland verge under boundary fence. Species noted included; cat's ear (*Hypochaeris radicata*), ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), teasel (*Dipsacus fullonum*), and fescue grasses.	Low botanical interest
8	Old muck heap, close to farm, some colonising plant species, generally following species composition of the adjacent improved grassland field	Low botanical interest. Value for nesting birds.
9	Line of elder (*Sambucus nigra*) scrub	Value for nesting birds
10	Pond evident, anecdotally dries up in summer, drainage from the nearby cattle shed.	Habitat Suitability Index of 0.50 = Below average for GCN. Value for other amphibians
11	Arable field, species noted included; common nettle (*Urtica dioica*), chickweed (*Stellaria media*), yarrow, pineapple weed (*Matricaria discoidea*), field speedwell (*Veronica persica*).	Low botanical interest. Value for ground nesting birds.
12	Hedge with trees, and numerous rabbit holes. Multi-stem sycamore. hawthorn, hazel and blackthorn (*Prunus spinosa*), understorey of bramble (*Prunus spinosa*), and bracken (*Pteridium* sp.).	Not 'important'under Hedgerow Regs., value for commuting and foraging fauna. Value for nesting birds

13	Small oak trees within a hawthorn hedgerow, species also noted include; willow (*Salix* sp.), hazel (*Corylus avellana*), elder, crab apple (*Malus sylvestris*), holly (*Ilex aquifolium*). Hedgerow is generally gappy, with bramble, and bracken in gaps. Some mature oak within hedgerow, which has numerous crevices for roosting bats.	Potentially important under hedgerow regulations. Value for nesting birds and commuting and foraging fauna. Moderate value for roosting bats.
14	Potential badger holes within tree line, and under dense bramble. Outliers or annex.	Badgers protected under Badger Act 1992.
15	Outliers or annex sett: collection of entrance holes to sett, and numerous scrapings and prints in area.	Badgers protected under Badger Act 1992.
16	Badger holes- outliers or annex.	Badgers protected under Badger Act 1992.
17	Approximately 25m of ditch with water running towards site, likely feeding pond on site. Species around ditch noted include; blackthorn, soft rush (*Juncus effusus*), and reed canary grass (*Phalaris arundinacea*).	Potential value for amphibians, no evidence of water vole.
18	Poor semi-improved grassland field, species noted include; vetch (*Vicia sativa*), ribwort plantain, creeping buttercup, creeping thistle (*Cirsium arvense*), germander speedwell (*Veronica chamaedrys*) and cock's foot grass.	Low botanical interest
19	Pond within a semi-improved grassland field. Very little emergent vegetation at the time of the survey. GCN have been recorded in this pond in the past, and there could still be a population of GCN within.	Prior record of GCN from 2003 however eDNA is negative for GCN. Pond will have value for other amphibians
20	Mound boundary with cow parsley (*Anthriscus sylvestris*), mugwort (*Artemisia vulgaris*) and cock's foot grass with some badger prints.	Low botanical interest
21	Small hazel hedge, generally overgrown, also with some elder and some hawthorn.	Value for nesting birds, and commuting and foraging fauna
22	Elder scrub with bramble.	Value for nesting birds, and commuting and foraging fauna

23	Tall ruderal plant species around assorted farm scrap. Species noted include bramble, rosebay willowherb (*Chamerion angustifolium*), mugwort, elder, hawthorn.	Value for nesting birds, and commuting and foraging fauna

Table 4: Target notes

Site photographs:

Photo 1: Target note (TN) 1, *leylandii* hedge

Photo 2: TN 3 & 5. Young ash and semi-improved grassland verge

Photo 3: TN 4. Improved grassland field

Photo 4: TN 8. Old muck heap behind farm

Photo 5: TN 9. Elder scrub

Photo 6: TN 10. Pond

Photo 7: TN 11. Arable field

Photo 8: TN 12. Hedgerow boundary.

Photo 9: TN 13. Hedgerow boundary.

Photo 10: TN 14, 15, & 16. Badger print

Photo 11: TN 14, 15, & 16. Potential badger hole

Photo 12: TN 14, 15, & 16. Potential badger hole

Photo 13: TN 17, overgrown ditch

Photo 14: TN 17, overgrown ditch

Photo 15: TN 18, semi improved grassland field

Photo 16: TN 19, Pond….

Photo 17: TN 20 earth mound acting as field boundary.

Photo 18: TN 21, small hedge to north of farm buildings

Photo 19: TN 22, scrub habitat near farm buildings

Photo 18: TN 23, tall ruderal plant growth around scrap farm equipment.

Building inspections

Figure 7 Building layout

Building ref	Description	Notes on potential faunal /habitat value
1 – Farmhouse. Moderate potential for roosting bats	Brick built farmhouse, with pitched clay pan tiles roofs, with a single storey extension the south eastern corner, and a conservatory on the north eastern corner. The brick work is generally well-sealed, however, there were small gaps under eaves, and under tile edges. In addition to the occasional small section of raised lead flashing. Internally, the main roof is lined with a bitumastic liner which is in a very good condition, with no gaps evident. The internal ridge was also cobwebbed, and no evidence of bats was noted in the void . Photo 19 - 22.	**Moderate potential for crevice roosting bats.**
2 – Negligible potential for roosting bats	Open sided shed, with a corrugated asbestos sheeting roof. No evidence of bats. Old barn swallow nests. Photo 23.	**Negligible potential for bats. Barn swallow nesting.**
3 – Moderate potential for roosting bats	Two storey brick barn with a pitched asbestos sheeting roof. There are several cracks within the brickwork and gaps in the window lintels, which would be suitable for crevice dwelling roosting bats. Internally, there is some access at the ridge, and there was a collection of droppings and butterfly wings on the upper floor characteristic of a feeding perch. The droppings had begun to dissolve in the damp. Photo 24 – 27.	**Moderate potential for roosting bats. Olds bird nests evident throughout the building.**
4 – Low potential for roosting bats	Similar construction as Building 3, with a similar number of crevices within brickwork. No evidence of bats found, and no bird nests noted. Photo 28	**Low potential bat roosting habitat**
5 - Negligible potential for roosting bats	Open agricultural sheds, with mostly asbestos sheeting roof. Bird nests noted in rafters, and some barn owl streaking identified on some of the support beams. Approximately 10 fresh barn owl pellets also noted under one of the beams. No evidence of barn owl nesting. Photo 29 & 30.	**Negligible risk for roosting bats. Roosting, not nesting, barn owl.**
6 - Low potential for roosting bats	Construction follows that of Buildings 3 and 4. No evidence of bats noted internally. Large access gap on eastern aspect. Evidence of bird nesting on wall tops, and a large jackdaw type nest within the ridge. Photo 31 & 32.	**Low potential for roosting bats. Previous bird nesting evident.**
7 - Low potential for roosting bats	Brick construction with pitched asbestos sheeting roof. High density of owl streaking was noted on beams, and approximately 10 barn owl pellets noted. Large platform which could be utilised for barn owl nesting, but no evidence of previous use. Barn swallow nests, and pigeon nests noted within the building. Very low number of old bat droppings noted scattered across floor. Photo 33 & 34.	**Low potential for roosting bats. Previous pigeon, and barn swallow nesting. Barn owl roosting. Potential barn owl nesting location.**
8 - Negligible potential for roosting bats	Foldyard with asbestos sheeting roof. Open sided to south and east. Open ridge, and straw floor which could hide evidence of bats and barn owls. No streaking noted, and no old nests noted. Photo 35 & 36.	**Negligible potential for roosting bats.**

9 - Low potential for roosting bats	Brick building, which is open sided into the foldyard, with an asbestos sheet roof. Barn owl streaking on beams but no pellets noted. Other bird nests on wall top. Photo 37.	**Low value for roosting bats. Barn owl roosting. Bird nest.**
10 - Low potential for roosting bats	Open sided brick building with an asbestos roof which is boarded out to create a false ceiling. No access into this small void. Low numbers of barn owl pellets found, and potential nesting locations, but no barn owl nesting material noted. Other bird nests evident within building. Photo 38.	**Low potential bat roosting habitat. Barn owl roosting and other bird nesting.**
11 – Negligible potential for roosting bats	Open Dutch barn used for straw and hay storage. Some barn owl streaking on beams but no pellets found. Photo 39.	**Negligible potential for roosting bats. Barn owl roosting.**
12 - Low potential for roosting bats	Brick building of the same construction as 2, 3, and 10. Open sided building with dirt floors, which could hide evidence of bats. Crevices within brickwork. Photo 40	**Low potential for roosting bats.**
13 - Low potential for roosting bats	Brick building, with a clay pantile roof, which is bitumastic lined, low number of gaps under tiles. Three barn swallow nests and two wren nests noted inside the building.	**Low potential for roosting bats. Barn swallow and wren nesting.**

Table 5 Building inspection results

Building photographs:

Photo 19: farm house exterior, eastern aspect

Photo 20: western aspect of farmhouse

Photo 21: crevice on southern aspect, on edge of extension

Photo 22: lifted tiles at eaves on farmhouse

Photo 23: Building 2 external

Photo 24: Building 3 external

Photo 25: Building 3 crack in external wall

Photo 26: Building 3 crevices in window lintel

Photo 27: Building 3 old droppings internally, disintegrating in damp

Photo 28: Building 4 external, and the gable of Building 7

Photo 29: Building 5 external, southern aspect

Photo 30: Building 5 evidence of recent barn owl roosting

Photo 31: Building 6 external

Photo 32: Building 6 internal

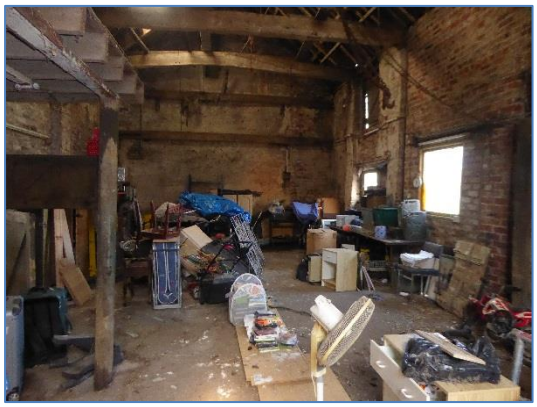


Photo 33: Building 7 internal

Photo 34: Building 7 internal, evidence of use by barn owl

Photo 35: Building 8 internal, fold yard.

Photo 36: Building 8, entrance to fold yard.

Photo 37: Building 9, western aspect

Photo 38: Building 10, eastern aspect

Photo 39: Building 11

Photo 40: Building 12. Southern aspect

Tree inspections

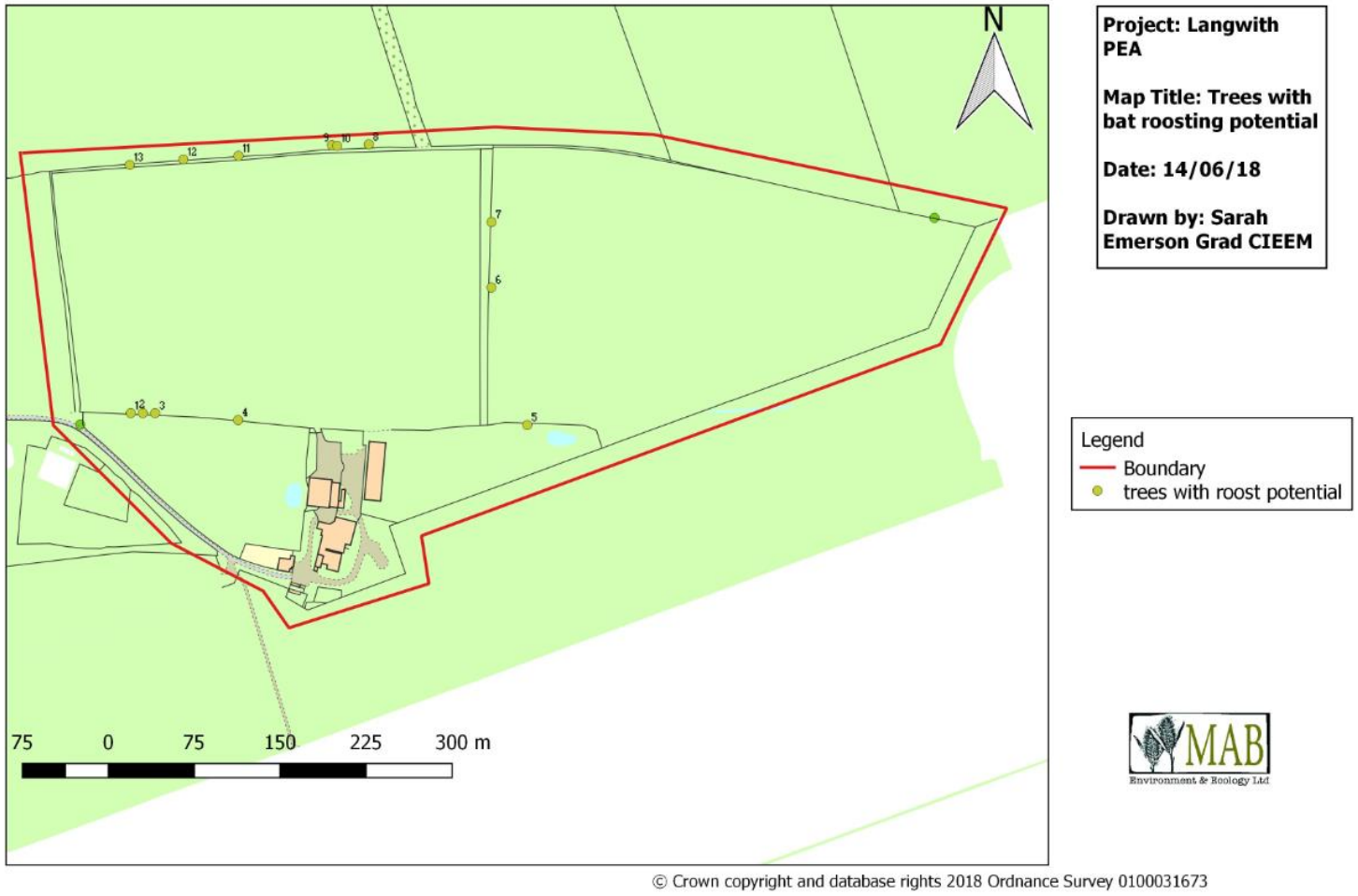


Figure 8 Trees with bat roosting potential

Tree map ref	Species and age class	Potential bat roost habitat	Photo ref	Further survey
1 Moderate potential for roosting bats	Oak – Young	Hollow trunk	41	Emergence survey (completed 07/06/2018)
2 High potential for roosting bats	Oak – mature / veteran.	Extensive rot and bark peel	42, 43	Emergence survey (completed 07/06/2018)
3 Low potential for roosting bats	Unknown – dead	Stump, hollow	44	Emergence survey (completed 07/06/2018)
4 Low potential for roosting bats	Oak – semi-mature	2 small holes, low down	45	Emergence survey (completed 07/06/2018)
5 Very low potential for roosting bats	Oak - mature	2 high splits	46	None required
6 Moderate potential for roosting bats	Oak – semi-mature	Dead wood in lower portions	47	Emergence survey (completed 07/06/2018)
7 High potential for roosting bats	Ash – semi-mature	Large areas of dead wood high in crown	48	Emergence survey (completed 07/06/2018)
8 Very low potential for roosting bats	Oak – mature	Single split branch high in crown	49	Emergence survey (completed 16/05/2018)
9 + 10 M High potential	Oak and ash – mature/dead	Ivy covered split branches, trees entwined, on partially dead	50	Emergence survey

for roosting bats				(completed 16/05/2018)
11 Low potential for roosting bats	Oak – mature	Large amounts of dead hung-up wood, but not large pieces.	51	Emergence survey (completed 16/05/2018)
12 Moderate potential for roosting bats	Oak – mature	Split branches, lots of hung-up wood	52	Emergence survey (completed 16/05/2018)
13 Very low potential for roosting bats	Oak – semi-mature	Split branches, lots of hung-up wood	53	None required.

Table 6 Tree assessment results

Tree photographs:

Photo 41: Tree 1

Photo 42: Tree 2

Photo 43: crevice tree 2

Photo 44: Tree 3

Photo 45: Tree 4

Photo 46: Tree 5

Photo 47: Tree 6

Photo 48: Tree 7

Photo 49: Tree 8

Photo 50: Tree 9 and 10

Photo 51: Tree 11

Photo 52: Tree 12

Photo 53: Tree 13

6.3 Species and Species Groups

6.3.1 Plants

The data search identified the following protected or notable plant species present within the 2km search area, majority of which are from Wheldrake Woods, approximately 800m from the proposed development. No records relate to the site itself.

- Heath cudweed (*Gnaphalium sylvaticum*)
- Bee Orchid (*Ophrys apifera*)
- Bluebell (*Hyacinthoides non-scripta*)

6.3.2 Invertebrates

The desk study identified records for;

- *Helochares punctatus*
- *Hydroporus neglectus*
- *Stictonectes lepidus*

All records were identified from Wheldrake Wood, approximately 800m from the site. Habitats on site are likely to provide limited habitat for a range of invertebrates, with the majority of site improved grassland or arable. The mature trees on the boundaries contain dead wood, some of which will provide habitat for saproxylic invertebrates.

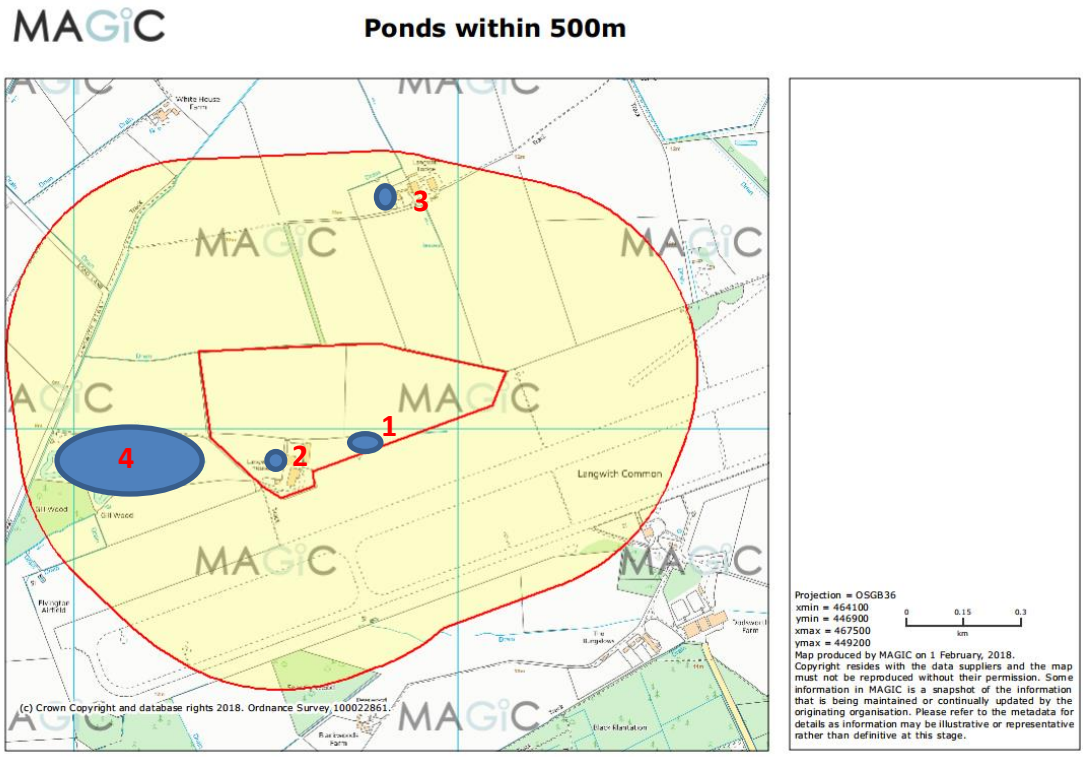
6.3.3 Amphibians

Data search for species records within 2km radius of SE 656 480 NEYEDC, 09/01/2018

Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Triturus cristatus	Great Crested Newt	amphibian	Wheldrake Wood (East)	SE6647	neyedc.org.uk	YNU Amphibian and Reptile Records	Richard Sunter	24/04/2003	1 Count
Triturus cristatus	Great Crested Newt	amphibian	Black Plantation - pond W Has	SE66304720	neyedc.org.uk	York Pond Survey 2003	Claire Storey; David Pandon	03/06/2003	1 Count of Adult Male; 1 Count of Adult Female;
Triturus cristatus	Great Crested Newt	amphibian	Heslington - pond 14a	SE65774796	neyedc.org.uk	York Pond Survey 2003	Unknown	24/04/2003	

The data search returned 27 records for great crested newt (GCN) within the 2km search area. See Appendix 1 for full records. A single record is noted for one of the ponds on site from 2003 (Pond 1) highlighted but there is no recorder or abundance noted. The closest record after this one is approximately 900m to the south of the

site. There are also records of common toad, common frog, smooth newt and palmate newts returned within the 2km search area. In addition, there is suitable habitat on site in the form of refugia/hibernacula, particularly around the farmyard, where there are piles of rubble, and general farm scrap.



There was no access to the pond to the north (Pond 3).

Network of ponds (Pond 4) are all fishing lakes making it unlikely to support breeding GCN.

eDNA was undertaken on Pond 1 and Pond 2. A negative result was returned for presence of eDNA on both ponds. eDNA testing is very accurate so we assume the GCN record for the Langwith pond has been mistakenly recorded. Full results are in Appendix 5.

6.3.4 Reptiles

There are three records of common lizards within the search area, from Wheldrake Wood. There are small parcels of land on site which may be of value for basking reptiles, in particular the mound to centre of site, however, this is a very small area; It

is also quite isolated in the arable landscape and is not likely to support populations of reptiles. No reptiles were noted on any of the survey visits. Habitat suitability is therefore low.

6.3.5 Birds

The NEYEDC data search returned eleven bird species of conservation concern within 2km of the site:

- Sparrowhawk (*Accipiter nisus*)
- Tree pipit (*Anthus trivialis*)
- Long-eared owl (*Asio otus*)
- Nightjar (*Caprimulgus europaeus*)
- Great spotted woodpecker (*Dendrocopos major*)
- Grey partridge (*Perdix perdix*)
- Coal tit (*Periparus ater*)
- Willow warbler (*Phylloscopus trochilus*)
- Marsh tit (*Poecile palustris*)
- Goldcrest (*Regulus regulus*)
- Song thrush (*Turdus philomelos*)

6.3.5.1 Wintering Bird Survey

See Table 7 for list of birds list of birds and survey maps.

The site is being well-used by large winter foraging flocks of Fieldfare (up to 220 made up of several flocks) and Lapwing (up to 240 in a single flock). This is likely to be related to the fact that the field was not ploughed last year, providing a rich food source through the winter, plus its location close to many other large grass fields and green open space. The surrounding trees do not seem to have discouraged the foraging flocks, despite observed hunting by Sparrowhawk. Redwing were seen only occasionally (up to 9), but together with Lapwing and Fieldfare, these 3 species make the site relatively valuable for wintering birds, as they are all red listed, and Lapwing

are a UK BAP species. Starling were observed to join the foraging flocks on occasion. Goldfinch were also present in very high numbers on all surveys, again due to the available seed source. These wintering bird populations are all dependent on the seed source present in the overwintered stubble.

Typical overwintering hedgerow birds of open farmland are present in reasonable numbers, including Yellowhammer, Song Thrush and Tree Sparrow, the first two of which are now threatened and red-listed. We would expect these birds to breed, and to be joined by other farm birds which do not winter in the UK.

The hedge structure is poor around the eastern part of the site, but in the western area it is good and to the north the hedge joins a small copse which is always busy with passerines.

Skylark started to be seen in these fields towards to the end of Feb: 3 were heard singing over neighbouring fields and one over this site. Bad weather delayed any further establishment of territories. Skylark have been reported by residents as present in neighbouring grassland on the airfield in January, and it is likely that will breed in these and neighbouring fields depending on agricultural rotation. Residents have also reported that lapwing nest in the field when they have been in a grass ley.

The boundary trees are also a good resource for both nesting and foraging birds.

The farmhouse and farm buildings are home to a decent sized group of House Sparrow which are red listed due to severe decline; other more common species such as Pied Wagtail, Dunnock, Blue Tit and Great Tit are also present, the wagtail around the small pond and Dunnock in the yard. Woodpigeon are present in large numbers, along with smaller number of Rock Dove (feral pigeon) and Collared Dove.

Recent evidence of Barn Owl is present in the buildings (pellets, no nests); the grass fields around the site will be a good hunting resource. Other predators seen were an

Sparrowhawk (actively hunting ground-feeding Goldfinch and Fieldfare, along with Kestrel Barn Swallow (nests).

The pond to the east of the farmstead often has a group of Mallard, but no other water bird species has been observed.

Fox have been seen crossing the site in broad daylight; predation of ground nesting birds is likely to be high due to proximity to the City of York.

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 20-12-2017	#2: 06-01-2018	#3: 25-01-2018	#4: 01-02-2018	#5: 21-02-2018	#6: 26-02-2018	Maximum count
Fieldfare	*Turdus pilaris*	Y		70	87	114	224	44	22	224
Redwing	*Turdus iliacus*	Y		0	9	4	3	0	0	9
Lapwing	*Vanellus vanellus*		Y	120	80	240	104	0	84	240
Common Starling	*Sturnus vulgaris*		Y	0	2	0	50	69	29	69
House sparrow	*Passer domesticus*		Y	4	6	6	3	0	0	6
Yellowhammer	*Emberiza citrinella*		Y	3	1	0	1	0	0	3
Tree Sparrow	*Passer montanus*		Y	9	0	1	1	8	0	9
Marsh Tit	*Poecile palustris*		Y	1	5	0	0	0	0	5
Herring gull	*Larus argentatus*		Y	12	4	0	0	0	0	12
Song thrush	*Turdus philomelos*		Y	1	2	0	0	0	0	2
Bullfinch	*Pyrrhula pyrrhula*		Y	0	4	0	0	1	0	4
Skylark	*Alauda arvensis*		Y	0	0	0	0	1	0	
Dunnock	*Prunella modularis*		Y	1	5	1	0	2	0	5
Mallard	*Anas platyrhynchos*			13	12	0	0	0	0	13
Wren	*Troglodytes troglodytes*			3	3	1	0	3	0	3

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 20-12-2017	#2: 06-01-2018	#3: 25-01-2018	#4: 01-02-2018	#5: 21-02-2018	#6: 26-02-2018	Maximum count
Rook	*Corvus frugilegus*			28	20	80	10	42	0	80
Treecreeper	*Certhia familiaris*			0	1	0	0	0	0	1
Long-tailed Tit	*Aegithalos caudatus*			0	8	0	0	6	0	8
Chaffinch	*Fringilla coelebs*			2	1	5	2	4	0	5
Greenfinch	*Chloris chloris*			2	0	0	0	7	0	7
Grey heron	*Ardea cinerea*			1	1	1	0	0	0	1
Robin	*Erithacus rubecula*			3	5	1	1	3	0	5
Buzzard	*Buteo buteo*			1	1	0	4	2	0	4
Blue tit	*Cyanistes caeruleus*			0	0	4	2	5	0	4
Sparrowhawk	*Accipiter nisus*			1	1	0	0	0	0	1
Great tit	*Parus major*			3	0	0	1	0	0	3
Jay	*Garrulus glandarius*			1	0	0	0	0	0	1
Blackbird	*Turdus merula*			6	6	3	6	6	0	6
Feral pigeon	*Columba livia*			0	0	10	0	0	0	10
Goldfinch	*Carduelis carduelis*			38	38	60	3	28	22	60
Collared dove	*Streptopelia decaocto*			0	0	0	2	0	0	2
Woodpigeon	*Columba palumbus*			20	50	130	50	48	240	130
Magpie	*Pica pica*			0	0	0	0	1	0	

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 20-12-2017	#2: 06-01-2018	#3: 25-01-2018	#4: 01-02-2018	#5: 21-02-2018	#6: 26-02-2018	Maximum count
Red-legged partridge	*Alectoris rufa*			0	8	0	0	0	0	8
Pheasant	*Phasianus colchicus*			0	0	1	0	0	0	1
TOTAL NUMBER OF SPECIES RECORDED										30
RED LISTED*										11
AMBER LISTED*										2
GREEN LISTED*										18
SCHEDULE 1 PROTECTED										2
UK BAP										10

Table 7 Wintering bird survey results

6.3.5.2 Breeding bird surveys

Please see appended results and Table 8 below.
The following birds were not mapped: Red-legged partridge, Pheasant, Rook, Wood pigeon, Magpie, Herring gull, and Jackdaw.

The breeding bird population is restricted to the hedgerows and farm buildings. Around the perimeter lies the airfield, with a high population of Skylark – these were regularly seen on the survey area, but there were no signs of nesting.

The larger western field was ploughed and sown in the spring, mid-way into the surveys; the eastern field remained fallow. The two smaller fields on either side of the farmstead remained in grass; the western one was grazed, the eastern one unmanaged.

The larger eastern field had an area of standing water for the first four visits, but this was dried out by the fifth visit. The species associated with this area of water (Shelduck, Greylag goose) disappeared as soon as the water had gone.

Lapwing were seen regularly throughout the survey, despite dry conditions, but there was no evidence of nesting. Curlew was seen only once in early May.

A small pond to the east of the farmstead remained wet throughout, but was little used – only Mallard were seen. A moorhen was seen at the other pond, to the west, without nesting.

The hedge to the west of the site, and on the western part of the northern boundary, is sufficiently dense and connected to other areas to support a good range of nesting birds such as Whitethroat and Yellowhammer. Most other parts of the site have relatively light cover with few nesting opportunities. There is some scrub just north of the centre of the site, which has nesting Garden warbler.

The farmstead has a thriving population of Barn swallow and House sparrow. There are also nesting Dunnock, Robin, Blackbird and Blue tit.

A good sized colony of Goldfinch were present throughout, but the nest site was not identified.

Mammals were noted, and hare were present in all surveys; fox was seen once, as was a stoat. Fox and stoat along with Magpie, Kestrel and Sparrowhawk, may give relatively high predation risk to many species.

In all, the site is quite typical of lowland arable farmland, with additional interest from visitors when the conditions are wet.

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 18-04-2018	#2: 24-04-2018	#3: 09-05-2018	#4: 18-05-2018	#5: 24-05-2018	#6: 26-05-2018	Maximum count
=Lapwing	*Vanellus vanellus*		Y	0	3	4	4	3	3	4
=House sparrow	*Passer domesticus*		Y	6	6	6	6	8	8	8
=Yellowhammer	*Emberiza citrinella*		Y	2	5	3	1	5	3	5
=Tree Sparrow	*Passer montanus*		Y	0	1	3	0	0	0	3
=Song thrush	*Turdus philomelos*		Y	0	0	0	1	0	0	1
=Bullfinch	*Pyrrhula pyrrhula*		Y	0	0	0	0	2	0	2
=Skylark	*Alauda arvensis*		Y	5	5	4	4	5	3	5
= Curlew	*Numenius arquata*		Y	0	0	1	0	0	0	1
=Dunnock	*Prunella modularis*		Y	8	5	0	5	3	4	8
=Mallard	*Anas platyrhynchos*			2	1	2	1	0	0	2
=Greylag goose	Anser anser			0	2	8	2	0	0	8
= Shelduck	*Tadorna tadorna*			0	0	2	1	0	0	2
=Oystercatcher	*Haematopus ostralegus*			0	1	0	0	0	0	1
= Kestrel	Falco tinnunculus			1	0	0	0	0	0	1
= Reed bunting	*Emberiza schoeniclus*		Y	2	0	2	1	2	2	2
=Wren	*Troglodytes troglodytes*			1	1	0	1	1	1	1

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 18-04-2018	#2: 24-04-2018	#3: 09-05-2018	#4: 18-05-2018	#5: 24-05-2018	#6: 26-05-2018	Maximum count
=Barn swallow	*Hirundo rustica*			0	4	5	3	4	5	5
=Garden warbler	*Sylvia borin*			0	0	1	1	1	1	1
=Pied wagtail	*Motacilla alba*			0	0	4	2	0	1	4
=Chaffinch	*Fringilla coelebs*			5	6	8	6	7	6	8
=Robin	*Erithacus rubecula*			1	1	2	2	0	2	2
=Buzzard	*Buteo buteo*			2	1	1	0	0	0	2
=Blue tit	*Cyanistes caeruleus*			6	4	6	2	7	2	7
=Greater spotted woodpecker	*Dendrocopos major*			1	0	0	0	0	0	1
=Great tit	*Parus major*			1	1	2	1	1	1	2
= Whitethroat	*Sylvia communis*			0	0	1	3	3	3	3
=Blackbird	*Turdus merula*			2	4	2	6	9	7	9
=Goldfinch	*Carduelis carduelis*			5	6	10	16	5	4	16
=Moorhen	*Gallinula chloropus*			0	1	0	0	0	0	1
TOTAL NUMBER OF SPECIES RECORDED										29
RED LISTED*										8
AMBER LISTED*										7

Site name	Langwith Farm			Visit number & date						
Common name	Latin name	WCA Schedule 1 **	UK BAP	#1: 18-04-2018	#2: 24-04-2018	#3: 09-05-2018	#4: 18-05-2018	#5: 24-05-2018	#6: 26-05-2018	Maximum count
GREEN LISTED*										14
SCHEDULE 1 PROTECTED										0
UK BAP										9

Table 8 Breeding bird survey results

6.3.5.3 Bird surveys - buildings

The farmhouse and farm buildings are home to a decent sized group of House Sparrow which are red listed due to severe decline; other more common species such as Pied Wagtail, Dunnock, Blue Tit and Great Tit are also present, the wagtail around the small pond and Dunnock in the yard. Woodpigeon are present in large numbers, along with smaller number of Rock Dove (feral pigeon) and Collared Dove.

Recent evidence of Barn Owl (pellets, no nests) is present in Buildings 5, 7, 9 and 10. Barn Swallows were noted within Buildings 2, 7 and 13, and there was evidence of other bird nesting, such as pigeon, House Sparrow and Wren within Buildings 3, 6, 7, 9, 10 and 13.

Other predators seen were a Sparrowhawk (actively hunting ground-feeding Goldfinch and Fieldfare).

6.3.6 Bats

Records held by the North Yorkshire Bat Group (NYBG) are provided below. The data search has returned roost records primarily from bat boxes in Wheldrake Forest. Species recorded locally include; Brandt's, whiskered, Natterer's, common pipistrelle, soprano pipistrelle, and brown long-eared bats. In addition, there are two unconfirmed records of Nathusius's pipistrelle from the City of York.

Species	Site	Grid ref.	Quantity	Date	Comment
Brandt's Bat	Wheldrake Forest	SE6546		02-Jul-97	
Whiskered Bat	Wheldrake Wood	SE6546	1	10-Oct-09	Roost in bat box
Natterer's Bat	Wheldrake Forest	SE6546	2	16-Sep-06	Roost in bat box
Nathusius's Pipistrelle	City of York	SE6449	5	04-Sep-11	In flight (unconfirmed record)
Nathusius's Pipistrelle	City of York	SE6447	8	19-Sep-11	In flight (unconfirmed record)
Common Pipistrelle	Wheldrake Forest	SE6546		05-Aug-05	Feeding
Common Pipistrelle	Wheldrake Forest	SE6546	39	16-Sep-06	Roost in bat box
Common Pipistrelle	Wheldrake Forest	SE6546	22	12-Oct-08	Roost in bat box
Common Pipistrelle	Wheldrake Wood	SE6546	20	10-Oct-09	Roost in bat box

Common Pipistrelle	Wheldrake Wood	SE6546	44	05-Sep-10	Roosts in bat box
Common Pipistrelle	SE656466	SE656466	1	18-Sep-05	Dead bat
Common Pipistrelle	City of York	SE6449	19	04-Sep-11	
Common Pipistrelle	City of York	SE6447	159	19-Sep-11	
Brown Long-eared Bat	Wheldrake Forest	SE6546	2	12-Oct-08	Roost in bat boxes
Soprano Pipistrelle	City of York	SE6449	4	04-Sep-11	
Soprano Pipistrelle	City of York	SE6447	7	19-Sep-11	
Pipistrelle species	Wheldrake Forest	SE6546		02-Jul-97	Maternity roost
Myotis bat sp.	City of York	SE6449	1	04-Sep-11	
Myotis bat sp.	City of York	SE6447	5	19-Sep-11	
Unknown	3 Dodsworth Farm, Broad Highway, Wheldrake	SE664474		09-Jul-08	Roost

Table 9 Bat records from North Yorkshire Bat Group (NYBG)

Full bat emergence survey results are appended.

6.3.6.1 Bat Results Summary

Figure 8 Emergence survey results. Buildings with confirmed roosting locations are black, with red star to highlight the roosting location.

Survey	Feature surveyed	Species and count	Emergence/roost location
Visual 25/01/2018	All Buildings on site.	Old brown long-eared or Natterer's bat droppings in Building 3.	No other evidence noted in any other buildings. Buildings ranged from negligible to moderate potential bat roosting habitat.
Emergence - 24/05/2018	Building 2-12 (excluding 5 & 11)	Common pipistrelle maternity roost *Pipistrellus pipistrellus* (x12).	All emerged from Building 7. Southern internal gable, northern barn door, & vent in the western wall.
Emergence - 31/05/2018	Building 1 & 13	Common pipistrelle satellite roost *Pipistrellus pipistrellus* (x5)	All emergences from Building 1. Masonry crevice under guttering on east facing wall.
Infrared Camera survey – 31/05/2018	Building 7	Pipistrelle sp	Three emergences from 2 masonry crevices on internal southern gable.
Emergence – 16/05/2018	Trees 8, 9, & 10	None	No emergences
Emergence – 07/06/2018	Trees 2, 3, & 7	None	No emergences

Table 10 Results Summary

6.3.7 Badgers

The data search has returned six local records for badger, five of which are from Wheldrake Wood, and one from approximately 1.4 km south east of Elvington Airfield. Badger holes, were noted along the northern boundary just outside the Langwith site; these are likely to be outlier or annex setts. Further field signs, in particular prints, were noted following the central field boundary, and along the northern boundary.
A main sett is in the edge of the field to the north of the site (not in our survey boundary).

6.3.8 Other Mammals

The desktop search identified records for hedgehogs, and brown hare. Brown hare have been seen in the arable fields. Maximum count of 6 on one survey visit.

6.3.9 Other notable species

There was no evidence of any other protected or notable species within the development area or close to the development site and no records are held for any other species.

7 Description of the proposed development

Inclusion in the local plan to form part of a wider residential development.

8 Provisional assessment of impacts, constraints and opportunities.

8.1 Designated sites

The Langwith site lies within the impact zones of the Derwent valley SPA and Heslington Tillmire SSSI. Both the SSSI and SPA sites are notified for wintering bird assemblages (SPA) and breeding waders (SSSI). The arable fields were left fallow this winter and large numbers of lapwing were foraging; these are the only species that overlap between the SPA and the Langwith site in the winter. No waders are

breeding on the Langwith site though curlew, lapwing, Shelduck and greylag goose were all noted in the breeding bird survey. Personal communication with the tenants has confirmed that lapwing have bred in the past when arable fields were in grass leys. There is, therefore, some crossover between the sites but only really affecting Lapwing. In conclusion, the development of this site will have negligible impact on the SSSI and SPA sites.

8.2 Habitats

Habitats on site are predominantly arable so there will be little impact if these are lost, as the arable rotation currently prevents any habitat of value being created.

There are several mature trees which provide good potential habitat for bats and breeding birds (though not being used) and associated invertebrates. Some of these may have to be lost due to safety and / or site layout, which will lower the ecological value of the site. Retained trees and hedgerows are likely to be negatively affected by lighting.

8.3 Species and species groups

Development of the site has the potential to result in the loss of a maternity roost and satellite roost of common pipistrelles in the farm buildings.

There will be loss of winter foraging for farmland birds; this will impact mainly on Lapwing and Fieldfare.

The loss of wet areas will have a negligible effect on the wetland visitors such as Shelduck, as the numbers are very low, and the resource is ephemeral.

There will be little impact on ground-nesting birds, as the arable rotation plus high predation risk prevents usage by ground-nesting birds. Nesting sites in the hedgerows will be affected even if hedges are retained, as there is likely to be loss of

foraging habitat for Yellowhammer and warblers, as well as disturbance and lighting and predation from cats.

There would be little direct impact on badgers (setts are all outside the development boundary) but there will be loss of badger pathways through the site which would affect ability to reach foraging sites. Some mitigation measures may need to be employed where works take place near to the setts.

Brown hare will be negatively affected by loss of open land.

Barn Owl roost sites will be lost, hunting habitat (field edges and grassland) will be lost.

There would be no impact on GCN, but some minor loss of habitat for other breeding amphibians.

8.4 Draft mitigation proposals

The boundary trees and hedgerows should be buffered from development by establishing a strip of unmanaged land between the boundary and the development.

Trees and hedges should be retained where possible.

Loss of barn owl roost should be mitigated through erection of a barn owl box, providing hunting habitat is provided (see 8.5).

Demolition / restoration of existing buildings should be done outside of nesting season and replacement habitat for swallows and house sparrows should be designed into the development proposals.

Replacement roosting habitat for pipistrelles can be integrated into new builds or a purpose built building with barn owl and pipistrelle roost habitat could be built within the development.

8.5 Opportunities for enhancement

The field boundaries present a good opportunity to enhance the habitat provision - most of the boundaries are not hedged, and much of the hedging is thin and in poor condition. This could be planted up to create a thicker and more valuable habitat, and it could be extended around the site.

Wet areas are clearly of value to local visiting birds, even when very small, so a small pond / wetland area in the right location could form a useful ecological enhancement.

Grassland on site is species-poor; creation of public open space could be used for creation of species-rich swards which would also be valuable for birds and invertebrates.

9 References

BS42020. Biodiversity - Code of Practice for planning and development. British Standards Institution 2013.

Circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System. http://www.communities.gov.uk/publications/planningandbuilding/circularbiodiversity

The Conservation of Habitats and Species Regulations 2017. http://www.legislation.gov.uk/uksi/2017/1012/contents/made

National Planning Policy Framework: http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf

UKBAP 1995. *UK Biodiversity Action Plan*. http://www.ukbap.org.uk/

JNCC (2007): Handbook for Phase 1 habitat survey – a technique for environmental audit.

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

Altringham, John (2003). *British Bats*. The New Naturalist. Harper Collins.

Mitchell-Jones, A.J. (2004). *Bat Mitigation Guidelines*. English Nature.

Mitchell-Jones, A.J. & McLeish, A.P. (2004). *Bat Workers Manual*. JNCC

Richardson, P. (2000). *Distribution atlas of bats in Britain and Ireland 1980-1999.* The Bat Conservation Trust.

Russ, J. (2012). B*ritish Bat Calls. A guide to Species Identification.* Pelagic Publishing 2012

Schofield, H.W. & Mitchell-Jones, A.J. (2004). *The bats of Britain and Ireland.* Vincent Wildlife Trust.

Stebbings, R.E., Yalden, D.W., & Herman, J.S. (2007). *Which bat is it? A guide to bat identification in Great Britain and Ireland.* The Mammal Society

Strachan, Moorhouse and Gelling (2012). *Water Vole Conservation Handbook (3rd edition).* Wildlife Conservation Research Unit, University of Oxford.

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

English Nature (2001). Great Crested Newt Mitigation Guidelines

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.
JNCC (2012) Herpetofauna Workers Manual

Natural England (2011) TIN 102 Reptile Mitigation Guidelines

RSPB (2009) Barn owls and the law:
http://www.rspb.org.uk/advice/law/barn_owls_law/index.aspx

The Barn Owl Trust (http://www.barnowltrust.org.uk/)

Barn Owl Trust (2012) *Barn Owl Conservation Handbook*, Pelagic Publishing, Exeter

Appendix 1: NEYEDC records

Data search for species records within 2km radius of SE 656 480 NEYEDC, 09/01/2018

Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Bufo bufo	Common Toad	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	22/04/2014	2 Count of Individuals
Bufo bufo	Common Toad	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	Apr-14	2 Count of Individuals
Bufo bufo	Common Toad	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	10/04/2014	1 Count of Individuals
Bufo bufo	Common Toad	amphibian	Wheldrake Wood Pond	SE6546	neyedc.org.uk	YNU Amphibian and Reptile Records	Richard Sunter	04/09/2004	
Bufo bufo	Common Toad	amphibian	Heslington - pond HT12	SE64574897	neyedc.org.uk	York Pond Survey 2003	Unknown	Apr-03	
Bufo bufo	Common Toad	amphibian	Heslington - pond 14a	SE65774796	neyedc.org.uk	York Pond Survey 2003	Unknown	Apr-03	
Bufo bufo	Common Toad	amphibian	Dunnington - pond DN3	SE66284969	neyedc.org.uk	York Pond Survey 2003	Unknown	Spring 2003	
Bufo bufo	Common Toad	amphibian	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	
Bufo bufo	Common Toad	amphibian	Wheldrake Wood Pond	SE65594621	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Lissotriton helveticus	Palmate Newt	amphibian	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Lissotriton helveticus	Palmate Newt	amphibian	Wheldrake Wood Pond	SE6546	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	April 1997 - October 1997	
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	10/04/2014	13 Count of Male; 13 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	22/04/2014	12 Count of Male; 17 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	27/05/2014	18 Count of Female; 19 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	09/06/2014	12 Count of Male; 14 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	29/04/2014	15 Count of Female; 50 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	08/05/2014	25 Count of Male; 6 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	14/05/2014	1 Count of Female; 10 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/05/2012 - 29/05/2012	1 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	17/05/2012 - 18/05/2012	1 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	19/04/2011 - 20/04/2011	1 Count of Female
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	19/04/2011 - 20/04/2011	1 Count of Individuals

On behalf of MAB Environment and Ecology Ltd 1 NEYEDC Ref: E03346

Data search for species records within 2km radius of SE 656 480 NEYEDC, 09/01/2018

Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE676478	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	23/06/2011 - 24/06/2011	1 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	09/06/2011 - 10/06/2011	1 Count of Female; 2 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	09/06/2011 - 10/06/2011	1 Count of Male
Lissotriton vulgaris	Smooth Newt	amphibian	Black Plantation - pond WH36	SE66304720	neyedc.org.uk	York Pond Survey 2003	Claire Storey; David Randon	03/06/2003	1 Count of Adult Male; 1 Count of Adult Female; present Count of Juvenile
Lissotriton vulgaris	Smooth Newt	amphibian	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Lissotriton vulgaris	Smooth Newt	amphibian	Wheldrake Wood Pond	SE6546	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	April 1997 - October 1997	
Lissotriton vulgaris	Smooth Newt	amphibian	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	
Lissotriton vulgaris	Smooth Newt	amphibian	Wheldrake Wood Pond	SE65594621	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Rana temporaria	Common Frog	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	22/04/2014	1 Count of Individuals
Rana temporaria	Common Frog	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	10/04/2014	1 Count of Individuals
Rana temporaria	Common Frog	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/03/2012 - 29/03/2012	1 Count of Individuals
Rana temporaria	Common Frog	amphibian	Black Plantation - pond WH36	SE66304720	neyedc.org.uk	York Pond Survey 2003	Claire Storey; David Randon	03/06/2003	
Rana temporaria	Common Frog	amphibian	Dunnington - pond DN3	SE66284969	neyedc.org.uk	York Pond Survey 2003	Unknown	Spring 2003	
Rana temporaria	Common Frog	amphibian	Heslington - pond 14a	SE65774796	neyedc.org.uk	York Pond Survey 2003	Unknown	24/04/2003	
Rana temporaria	Common Frog	amphibian	Heslington - pond HT5	SE63754777	neyedc.org.uk	York Pond Survey 2003	Unknown	15/05/2003	2 Count of Adult
Rana temporaria	Common Frog	amphibian	Heslington - pond HT12	SE64574897	neyedc.org.uk	York Pond Survey 2003	Unknown	24/04/2003	
Rana temporaria	Common Frog	amphibian	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Rana temporaria	Common Frog	amphibian	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	
Rana temporaria	Common Frog	amphibian	Wheldrake Wood Pond	SE65594621	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	14/05/2014	1 Count of Male; 1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	27/05/2014	4 Count of Female

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Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	09/06/2014	7 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	29/04/2014	3 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	22/04/2014	1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Fulford Golf Course	SE637478	neyedc.org.uk	Ecological Consultant Survey Data: Peak Ecology	N. Dunn	10/04/2014	1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/03/2012 - 29/03/2012	3 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/03/2012 - 29/03/2012	1 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	02/05/2012 - 05/05/2012	3 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	02/05/2012 - 05/05/2012	2 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	17/05/2012 - 18/05/2012	2 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/05/2012 - 29/05/2012	1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	28/05/2012 - 29/05/2012	4 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	19/05/2011 - 20/05/2011	2 Count of Male; 2 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	05/05/2011 - 06/05/2011	2 Count of Male; 4 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	06/04/2011 - 07/04/2011	1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	19/04/2011 - 20/04/2011	3 Count of Male; 3 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	19/04/2011 - 20/04/2011	1 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	23/06/2011 - 24/06/2011	1 Count of Male; 5 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	23/06/2011 - 24/06/2011	3 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE676478	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	23/06/2011 - 24/06/2011	1 Count of Male; 1 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	09/06/2011 - 10/06/2011	2 Count of Female; 6 Count of Male
Triturus cristatus	Great Crested Newt	amphibian	Elvington	SE674477	neyedc.org.uk	Great Crested Newt Survey: Elvington. 2009-2012	Katie Lawrence	09/06/2011 - 10/06/2011	1 Count of Male; 2 Count of Female
Triturus cristatus	Great Crested Newt	amphibian	Wheldrake Wood Pond	SE6546	neyedc.org.uk	YNU Amphibian and Reptile Records	Richard Sunter	04/09/2004	6 Count Count of Larvae

Data search for species records within 2km radius of SE 656 480 NEYEDC, 09/01/2018

Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Triturus cristatus	Great Crested Newt	amphibian	Wheldrake Wood (East)	SE6647	neyedc.org.uk	YNU Amphibian and Reptile Records	Richard Sunter	24/04/2003	1 Count
Triturus cristatus	Great Crested Newt	amphibian	Black Plantation - pond WH36	SE66304720	neyedc.org.uk	York Pond Survey 2003	Claire Storey; David Randon	03/06/2003	1 Count of Adult Male; 1 Count of Adult Female; present Count of Juvenile
Triturus cristatus	Great Crested Newt	amphibian	Heslington - pond 14a	SE65774796	neyedc.org.uk	York Pond Survey 2003	Unknown	24/04/2003	
Accipiter nisus	Sparrowhawk	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	2000	
Accipiter nisus	Sparrowhawk	bird	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Anthus trivialis	Tree Pipit	bird	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Asio otus	Long-Eared Owl	bird	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Caprimulgus europaeus	Nightjar	bird	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Corvus frugilegus	Rook	bird	Gypsy Wood Farm	SE67034932	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	2000	
Dendrocopos major	Great Spotted Woodpecker	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	2000	
Perdix perdix	Grey Partridge	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	12/02/2000	8 Count of Birds
Perdix perdix	Grey Partridge	bird	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Periparus ater	Coal Tit	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	2000	
Phylloscopus trochilus	Willow Warbler	bird	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	
Poecile palustris	Marsh Tit	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	12/02/2000	1 Count of Birds
Regulus regulus	Goldcrest	bird	Grimston Wood	SE66194938	neyedc.org.uk	Dunnington Bird and Wildlife Survey	Terry Weston	2000	
Turdus philomelos	Song Thrush	bird	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	
Calluna vulgaris	Heather	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Calluna vulgaris	Heather	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Calluna vulgaris	Heather	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Campanula rotundifolia	Harebell	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Cruciata laevipes	Crosswort	flowering plant	Broad Highway Verges [2 parcels]	SE670465	neyedc.org.uk	City of York SINC Survey 2009	Martin Hammond	01/06/2009	o DAFOR of DAFOR

Data search for species records within 2km radius of SE 656 480 NEYEDC, 09/01/2018

Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Cruciata laevipes	Crosswort	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Cruciata laevipes	Crosswort	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Erica tetralix	Cross-leaved Heath	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Erica tetralix	Cross-Leaved Heath	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Erica tetralix	Cross-Leaved Heath	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Eriophorum angustifolium	Common Cottongrass	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Eriophorum angustifolium	Common Cottongrass	flowering plant	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	VL DAFOR of 01
Fragaria vesca	Wild Strawberry	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Fragaria vesca	Wild Strawberry	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Gnaphalium sylvaticum	Heath Cudweed	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Gnaphalium sylvaticum	Heath Cudweed	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Gnaphalium sylvaticum	Heath Cudweed	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Hyacinthoides non-scripta	Bluebell	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Hydrocotyle vulgaris	Marsh Pennywort	flowering plant	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	VL DAFOR of 01
Hydrocotyle vulgaris	Marsh Pennywort	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Mentha arvensis	Corn Mint	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Mentha arvensis	Corn Mint	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Mentha arvensis	Corn Mint	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Ophrys apifera	Bee Orchid	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Potentilla erecta	Tormentil	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Potentilla erecta	Tormentil	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Ranunculus flammula	Lesser Spearwort	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count

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Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Ranunculus flammula	Lesser Spearwort	flowering plant	Wheldrake Wood Pond	SE6546	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	April 1997 - October 1997	
Ranunculus flammula	Lesser Spearwort	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Sagina nodosa	Knotted Pearlwort	flowering plant	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	1 Count
Sagina nodosa	Knotted Pearlwort	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Sagina nodosa	Knotted Pearlwort	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Spergula arvensis	Corn Spurrey	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Veronica officinalis	Heath Speedwell	flowering plant	Wheldrake Wood	SE665473	neyedc.org.uk	Wheldrake Wood (plants)	Martin Hammond	1996	
Veronica officinalis	Heath Speedwell	flowering plant	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Veronica scutellata	Marsh Speedwell	flowering plant	Brinkworth Rush	SE675478	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	L DAFOR of 01
Helochares punctatus	Helochares punctatus	insect - beetle (Coleoptera)	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Helochares punctatus	Helochares punctatus	insect - beetle (Coleoptera)	Wheldrake Wood	SE665473	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	1997 - 1998	1 Count of Default
Hydroporus neglectus	Hydroporus neglectus	insect - beetle (Coleoptera)	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Hydroporus neglectus	Hydroporus neglectus	insect - beetle (Coleoptera)	Wheldrake Wood	SE665473	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	1997 - 1998	1 Count of Default
Stictonectes lepidus	Stictonectes lepidus	insect - beetle (Coleoptera)	Wheldrake Wood	SE665473	neyedc.org.uk	Water Beetles in Forest Enterprise Woodlands	Martin Hammond	1997 - 1998	1 Count of Default
Zootoca vivipara	Viviparous Lizard	reptile	Wheldrake Wood	SE659468	neyedc.org.uk	City of York SINC Survey 2003	Martin Hammond	01/09/2003	
Zootoca vivipara	Common Lizard	reptile	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	
Zootoca vivipara	Common Lizard	reptile	East Yorkshire	SE64T	neyedc.org.uk	Herpetofauna records from The Naturalist	Unknown	Unknown	
Erinaceus europaeus	Hedgehog	terrestrial mammal	East of Fulford	SE6348	neyedc.org.uk	Yorkshire Mammal Group Records	Geoff Oxford; Roma Oxford	17/06/2003	
Erinaceus europaeus	Hedgehog	terrestrial mammal	North Yorkshire	SE643463	neyedc.org.uk	Yorkshire Mammal Group Records	Lisa Kerslake	08/08/2000	
Lepus europaeus	Brown Hare	terrestrial mammal	North Yorkshire	SE665465	neyedc.org.uk	Yorkshire Mammal Group Records	Ann Hanson	05/03/2000	
Lepus europaeus	Brown Hare	terrestrial mammal	North Yorkshire	SE6546	neyedc.org.uk	Yorkshire Mammal Group Records	Ann Hanson	01/02/2000	
Lepus europaeus	Brown Hare	terrestrial mammal	Wheldrake Wood	SE660470	neyedc.org.uk	City of York Wildlife Sites	Unknown	1996	

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Scientific Name	Common Name	Taxonomic group	Location	Grid Reference	Custodian	Survey	Recorder	Dated	Abundance
Meles meles	Badger	terrestrial mammal	North Yorkshire	SE6546	neyedc.org.uk	Yorkshire Mammal Group Records	Ann Hanson	01/02/2000	
Meles meles	Eurasian Badger	terrestrial mammal	Area C - Brinkworth Rush	SE675477	neyedc.org.uk	City of York Wildlife Sites	Martin Hammond	07/05/1997 - 13/05/1997	1 Count of Burrow
Meles meles	Badger	terrestrial mammal	Wheldrake Wood	SE65474665	neyedc.org.uk	English Nature amphibians/ badgers/ otters	Unknown	Unknown	
Meles meles	Badger	terrestrial mammal	Wheldrake Wood	SE662470	neyedc.org.uk	Forest Enterprise Badger Setts	Unknown	Unknown	
Meles meles	Badger	terrestrial mammal	Wheldrake Wood	SE65854674	neyedc.org.uk	English Nature amphibians/ badgers/ otters	Unknown	Unknown	
Meles meles	Badger	terrestrial mammal	Wheldrake Wood	SE66124702	neyedc.org.uk	English Nature amphibians/ badgers/ otters	Unknown	Unknown	
Pipistrellus pipistrellus	45 Khz Pipistrelle	terrestrial mammal	Wheldrake Forest	SE660470	neyedc.org.uk	Forestry Commission bat box survey	Charles Critchley	08/06/2001	1 Count of Adult Male
Pipistrellus pipistrellus	45 Khz Pipistrelle	terrestrial mammal	Wheldrake Forest	SE660470	neyedc.org.uk	Forestry Commission bat box survey	Charles Critchley	08/06/2001	1 Count of parous female

Appendix 2: Glossary of bat roost terms

Bat Roost Definitions:

Day roost: a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

Night roost: a place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.

Feeding roost: a place where individual bats or a few individuals rest or feed during the night but are rarely present by day.

Transitional / occasional roost: used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.

Swarming site: where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.

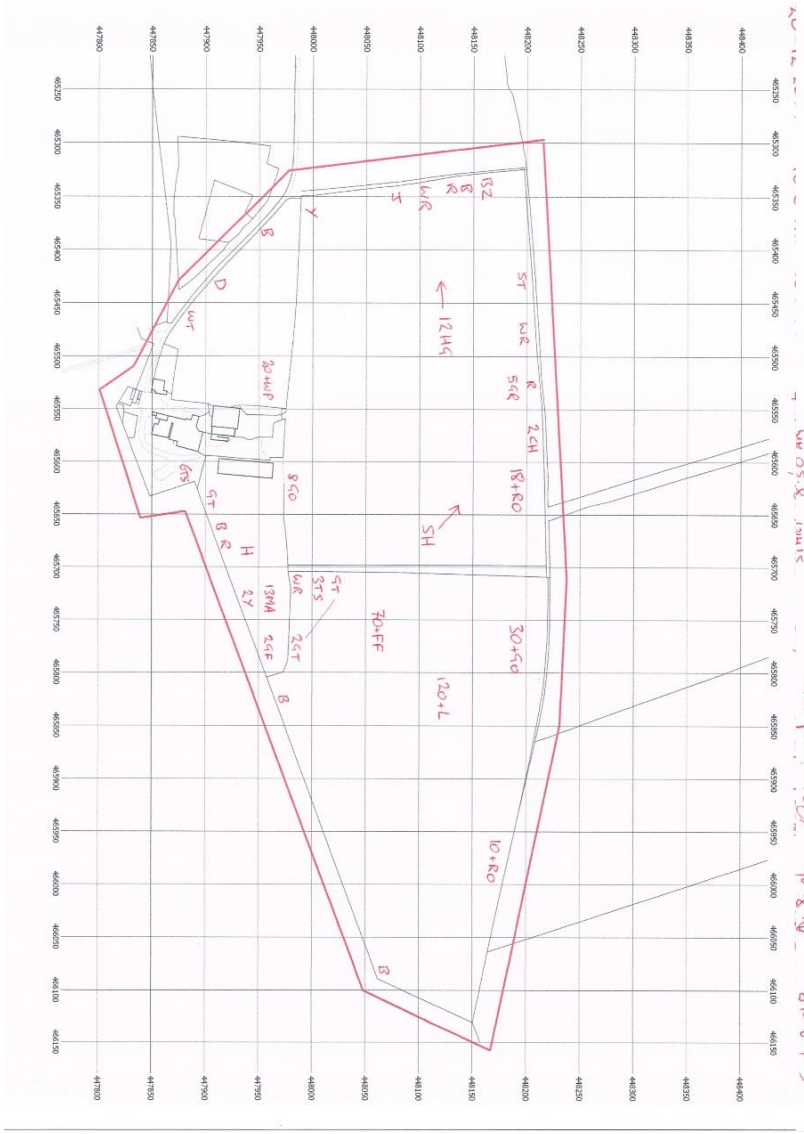
Mating sites: where mating takes place from later summer and can continue through winter.

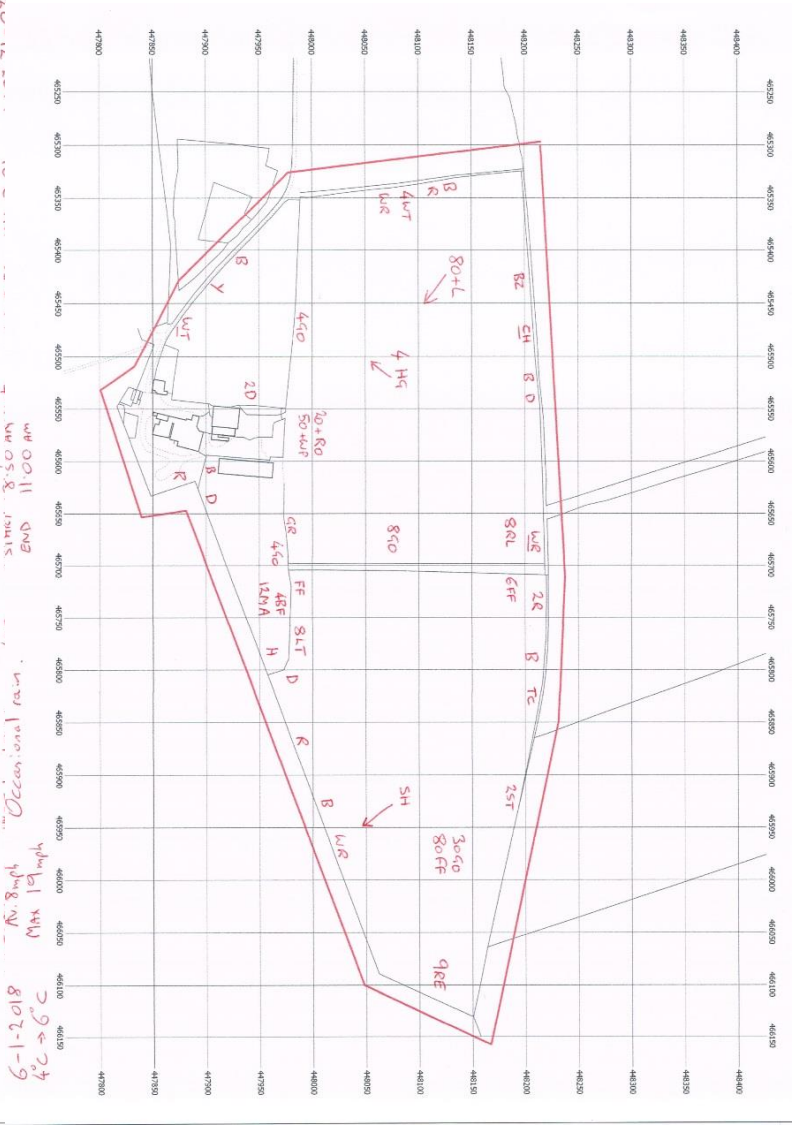
Maternity roost: where female bats give birth, and raise their young to independence.

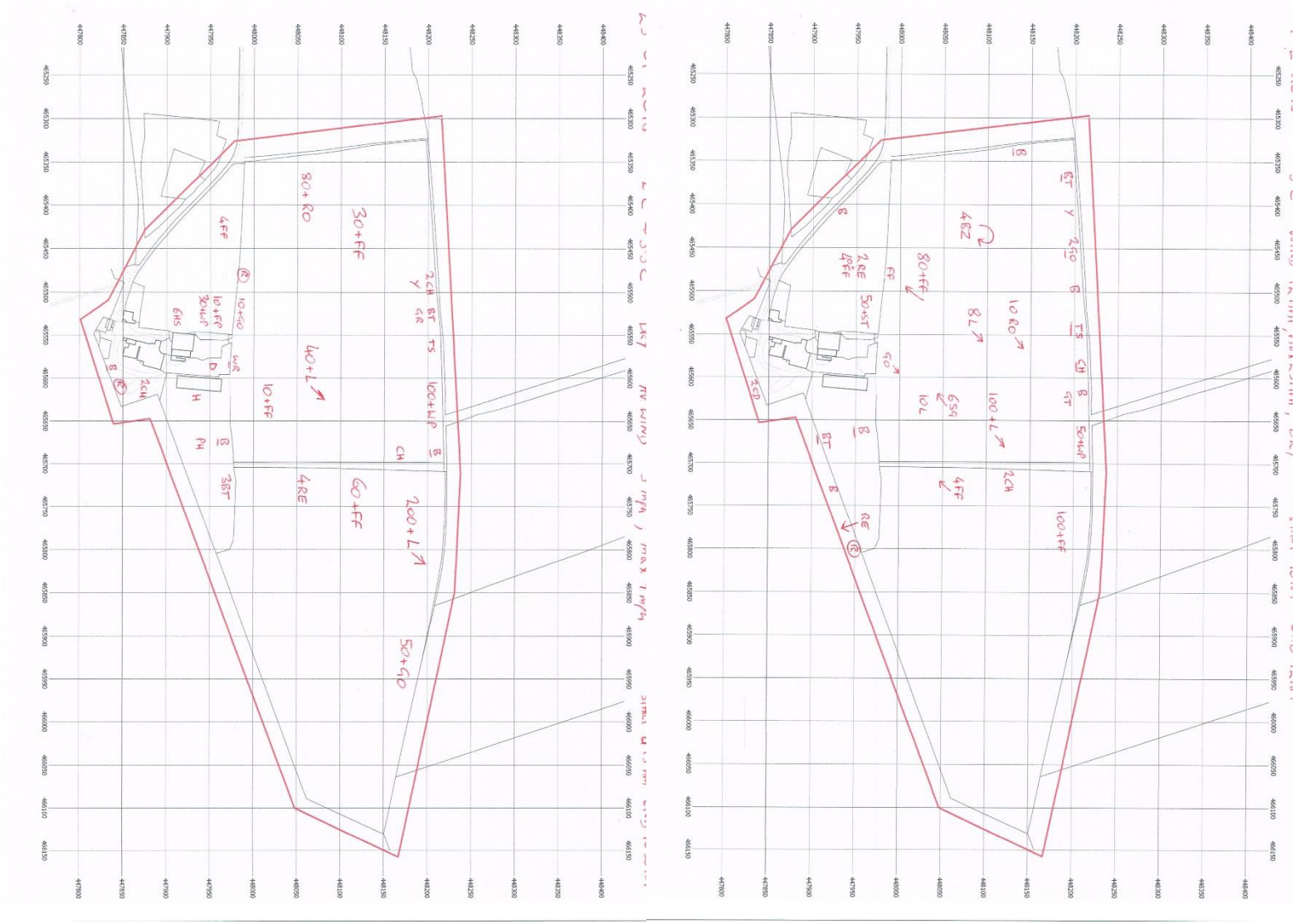
Hibernation roost: where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.

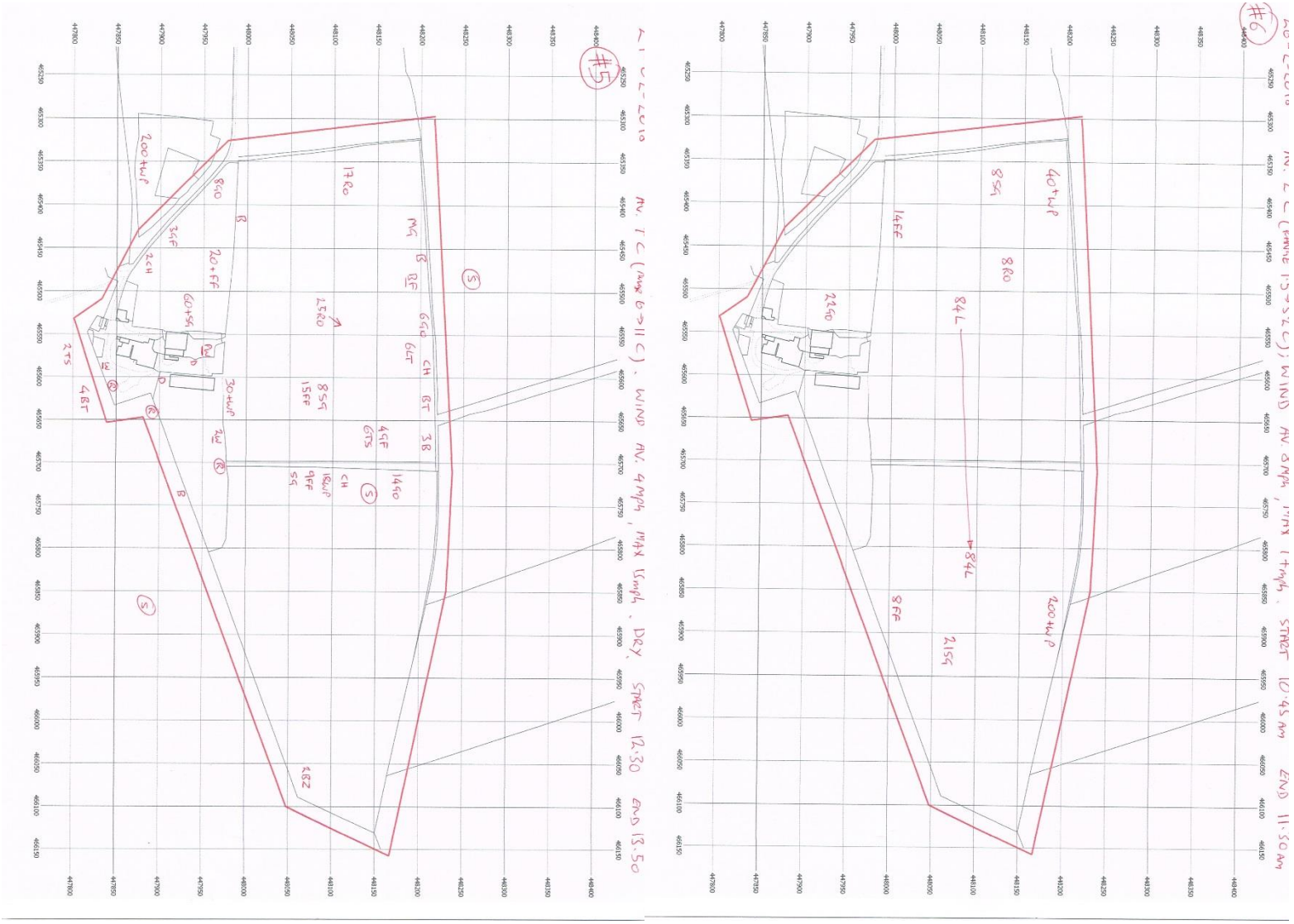
Satellite roost: an alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

Appendix 3 Wintering Bird Survey Results









Appendix 4: Bat Emergence Survey Results

Emergence surveys (Buildings)

(Buildings 2-12, excluding Building 5 and 11)

Date: 24/05/2018
Start time: 20:59 **End time:** 22:45 **Sunset:** 21:14

	Temp (°C)	Wind (mph/BF)	Humidity (%rh)	rain	Cloud cover (%)
Start	14	5	70	Dry	5
Finish	10	15	90	Dry	15
Max	14	19	-	-	-
Min	10	0	-	-	-
Ave	11	12	-	-	-

Table 11 Environmental conditions

Surveyors: Matt Cooke (MC); Sarah Emerson (EM); Pip Mountjoy (PM); Rosamund Clay (RC)

Equipment used: 3x Pettersson D240x time expansion ultrasound detector with Edirol R09 recorder; 1x BatBox Duet Heterodyne detectors set to 50KHz.

Results summary:

12 bat emergences were recorded from one building on site; building 7. All emergences were identified as common pipistrelle bats. They emerged from 3 locations; likely separate access points to a single roost. An internal inspection of building 7 revealed the location of the roost, as bats were seen flying inside the building and re-entering a crevice in the internal gable.

Building Ref.	Species	Count	Roost type	Emergence location/access point
7	Common pipistrelle, *Pipistrellus pipistrellus*	12	Maternity roost	Roost identified in southern internal gable of building 7, where bats were seen re-entering. Emergences occurred from 3 access points; southern gable end (photo 1), northern barn door (photo 2) & a vent in the western wall (photo 3).

Table 12 Roosts identified (Survey 24/05/2018 – B2-12 excluding B5 &11)

Observations:

Surveyor	Time	Species	Number	Activity	Annotation
MC	21:45	Common pipistrelle, *Pipistrellus pipistrellus*	1	Emerged from building 7; south gable end	
MC	21:45 – 21:50	Common pipistrelle, *Pipistrellus pipistrellus*	5	Emerged from building 7; into building 8	
RC & PM	21:46 – 21:53	Common pipistrelle, *Pipistrellus pipistrellus*	3	Foraging in building 5	
PM	21:55	Common pipistrelle, *Pipistrellus pipistrellus*	1	Emerged from building 7; south gable end	
MC & PM	21:57 – 21:59	Common pipistrelle, *Pipistrellus pipistrellus*	2	Commuting east to west over building 3	
RC	22:00 – 22:15	Common pipistrelle, *Pipistrellus pipistrellus*	5	Emerged from building 7; open barn door on north side	
PM	22:02	Common pipistrelle, *Pipistrellus pipistrellus*	1	Emerged from building 7; vent in western wall	
RC	22:19 – 22:20	Common pipistrelle, *Pipistrellus pipistrellus*	2	Flew into building 7	
SE & MC	22:20	Common pipistrelle, *Pipistrellus pipistrellus*	3	Flying in building 7 & observed re-entering masonry crevice	

Table 13 Observations (Survey 24/05/2018 – B2-12 excluding B5 &11)

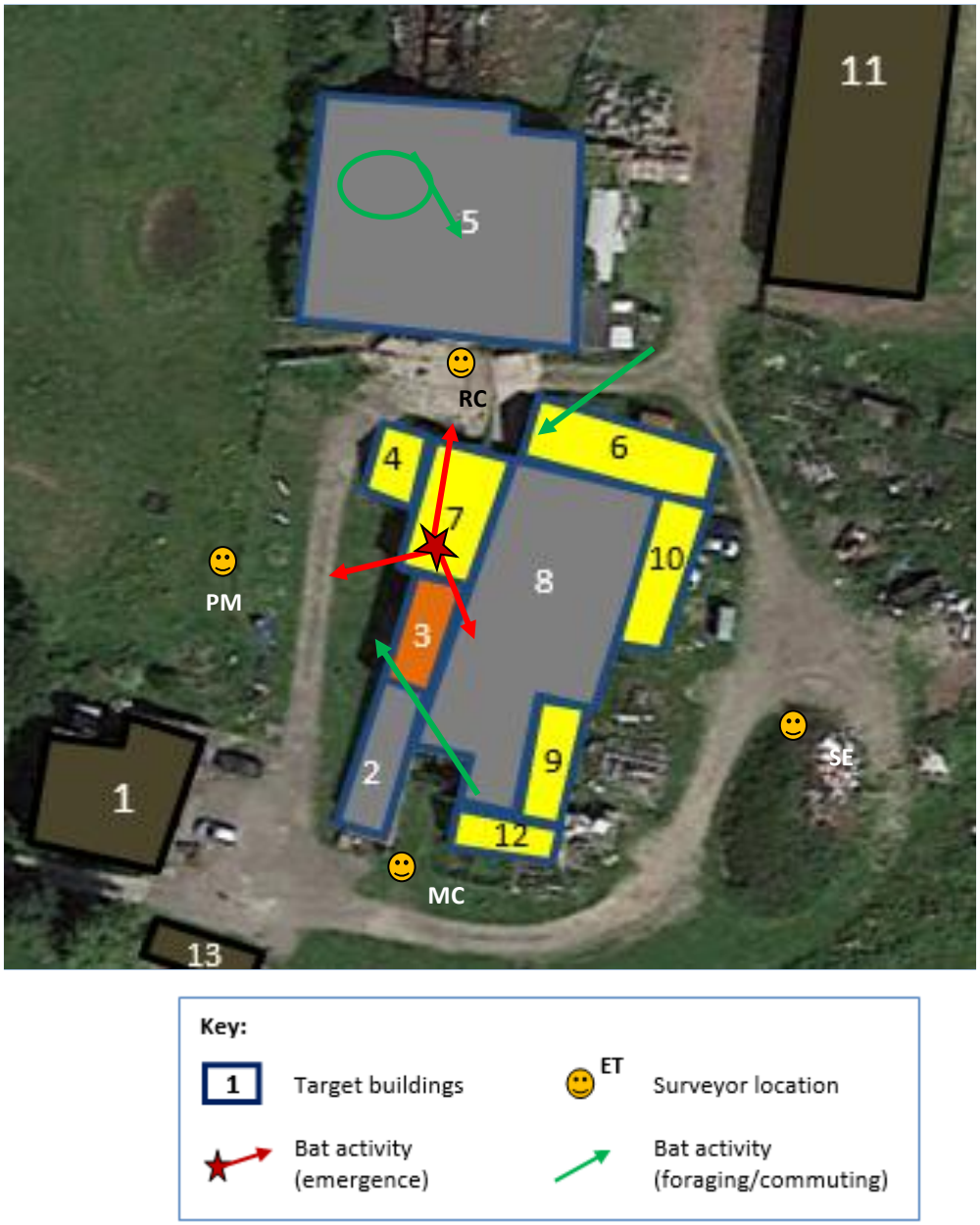


Figure 9 – Surveyor locations and bat activity recorded (Survey 24/05/2018 – B2-12 excluding B5 &11)

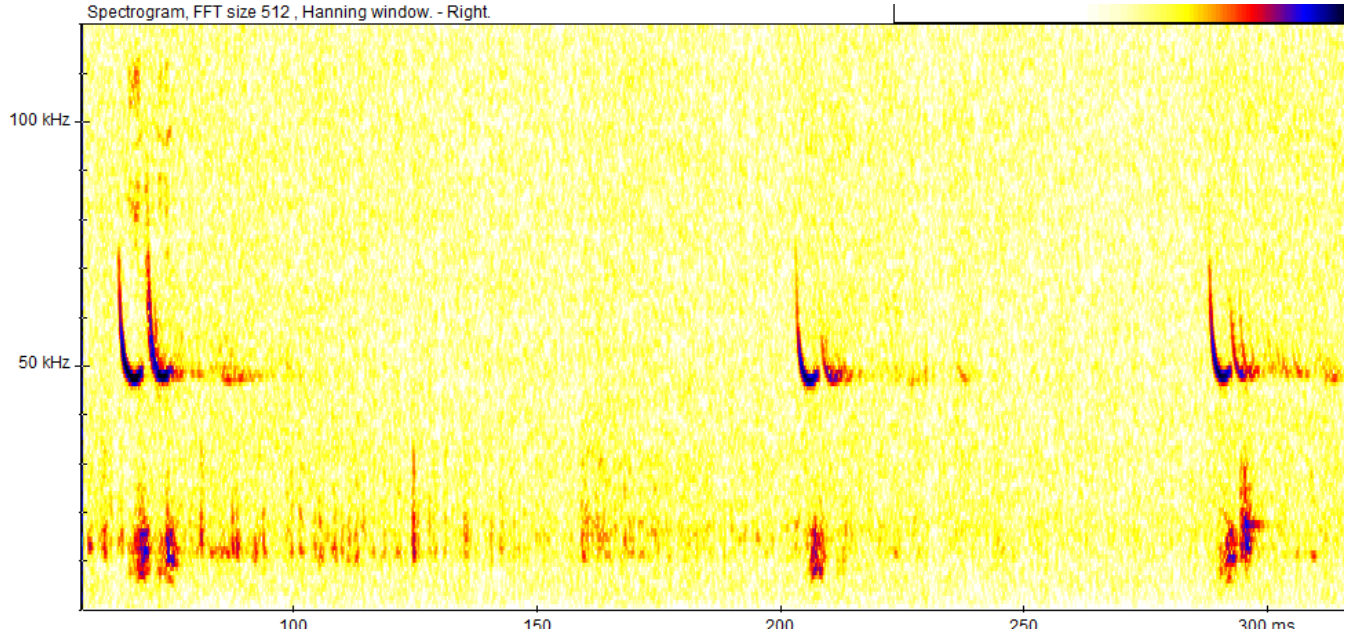
Emergence locations:

Photo 54: Building 7, southern gable end

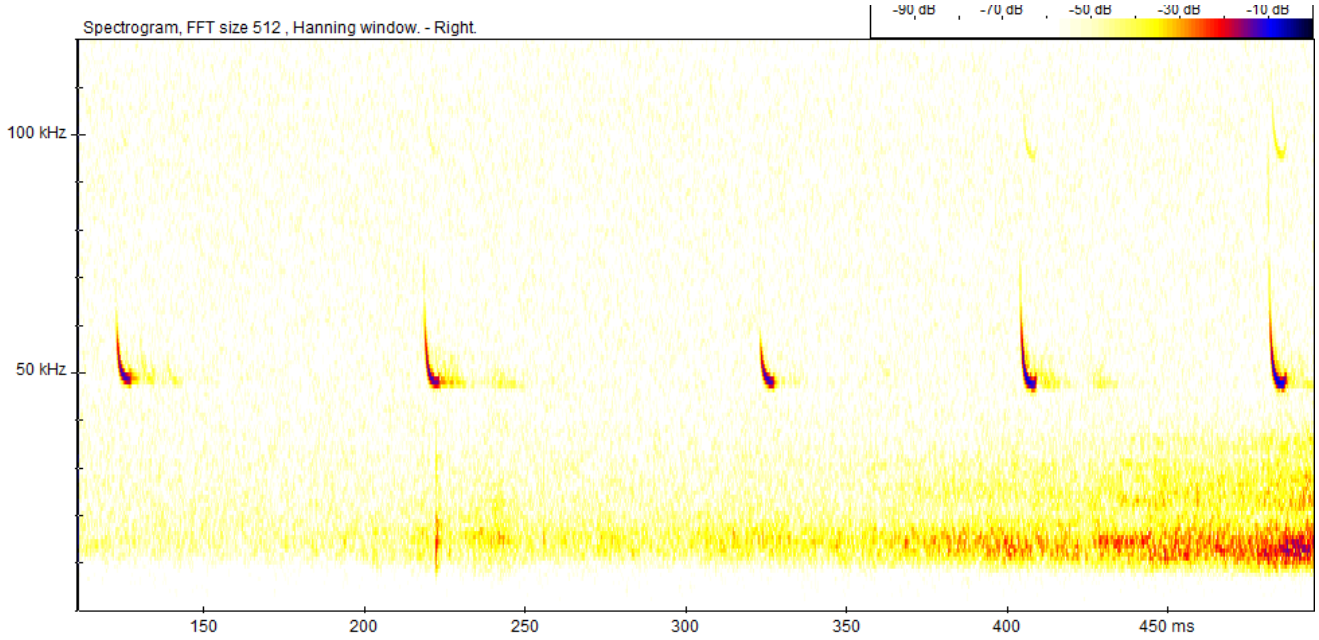
Photo 55: Building 7, northern open barn door

Photo 56: Building 7, vent in western wall

Sound recordings:



Recording 1: common pipistrelle emergence recorded at 21:45 by MC (24/05/2018)



Recording 2: common pipistrelle, flying inside building 7, recorded at 22:20 by SE (24/05/2018)

(Buildings 1 & 13)

Date: 31/05/2018
Start time: 21:15 **End time:** 22:45 **Sunset:** 21:29

Conditions: 15°C start, 11.8°C end. Dry. 0% cloud cover. Slight breeze (BF2).

Surveyors: Matt Cooke (MC); Sarah Emerson (EM); Rosamund Clay (RC)

Equipment used: 2x Pettersson D240x time expansion ultrasound detector with Edirol R09 recorder and 1x BatBox Duet Heterodyne detectors set to 50KHz.

Results summary:
5 common pipistrelle emergences were recorded from building 1. All 5 bats emerged from the east facing wall of the house, from a masonry crevice below the guttering.

A tawny owl was observed flying from behind building 1 towards the modern agricultural buildings on site.

Roosts identified:

Building Ref.	Species	Count	Roost type	Emergence location/access point
1	Common pipistrelle, *Pipistrellus pipistrellus*	5	Day roost	Masonry crevice beneath guttering on east facing wall (photo 1)

Table 14 Roosts identified (31/05/2018 – B1 & 13)

Observations:

Surveyor	Time	Species	Number	Activity	Annotation
SE	21:53	Common pipistrelle, *Pipistrellus pipistrellus*	1	Commuting north to south	
RC	21:56	Common pipistrelle, *Pipistrellus pipistrellus*	1	Foraging in garden west of building 1	
SE	21:58 – 22:22	Common pipistrelle, *Pipistrellus pipistrellus*	2	Commuting west to east	
RC	22:03 – 22:22	Common pipistrelle, *Pipistrellus pipistrellus*	5	Emerged from building 1; under drain on west side	
SE	22:27 – 22:38	Common pipistrelle, *Pipistrellus pipistrellus*	2	Foraging on east side of building 1	

Table 15 Observations (31/05/2018 – B1 & 13)

Figure 10 – Surveyor locations and bat activity recorded (31/05/2018).

Emergence locations:

Photo 57: Building 1; masonry crevice under guttering by north west window

Infrared camera footage (building 7)

Date: 31/05/2018
Start time: 21:15 **End time:** 22:45 **Sunset:** 21:29

Equipment used: Sony AX100E with infrared lighting

Results summary: There were 3 emergences from 2 masonry crevices in the internal southern gable end (photo 2), and constant foraging within building 7 throughout the survey.

Photo 58: Emergence location inside building 7

Emergence surveys (Trees)

Survey 1 (Trees 8, 9, 10, 11 and 12)

Date: 16/05/2018
Start time: 20:45 **End time:** 22:30 **Sunset:** 21:02

	Temp (°C)	Wind (mph/BF)	Humidity (%rh)	rain	Cloud cover (%)
Start	7.9	0	-	0	0
Finish	5.4	0	-	0	0
Max	-	7	-	-	-
Min	-	-	-	-	-
Ave	-	-	-	-	-

Table 16 Environmental conditions

Surveyors: Sarah Emerson (SE); Matt Cooke (MC)

Equipment used: 2x Pettersson D240x time expansion ultrasound detector with Edirol R09 recorder

Results summary: No emergences were recorded from any trees being surveyed. There was low bat activity overall, with one Common pipistrelle foraging along the hedgerow on the north of the site.

Observations:

Surveyor	Time	Species	Number	Activity	Annotation
SE & MC	21:47 – 21:56	Common pipistrelle, *Pipistrellus pipistrellus*	1	Foraging up and down northern hedgerow	

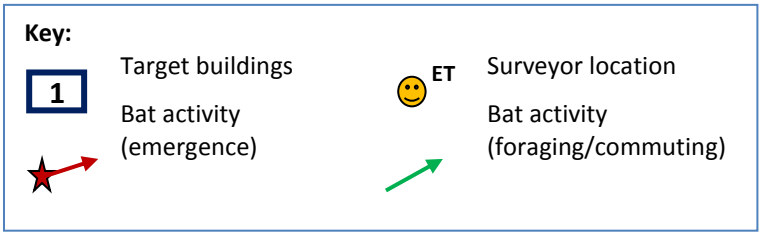


Figure 11 – Surveyor locations and bat activity recorded (16/05/2018).

Survey 1 (Trees 1, 2, 3, 4, 6 and 7)

Date: 07/06/2018
Start time: 21:20 **End time:** 22:45 **Sunset:** 21:31

	Temp (°C)	Wind (mph/BF)	Humidity (%rh)	rain	Cloud cover (%)
Start	16	0	-	0	20
Finish	13	0	-	0	20
Max	-	7	-	-	-
Min	-	-	-	-	-
Ave	-	-	-	-	-

Table 17 Environmental conditions

Surveyors: Sarah Emerson (SE); Anne Heathcote (AH)

Equipment used: 1x Pettersson D240x time expansion ultrasound detector with Edirol R09 recorder, 1x BatBox Duet Heterodyne detectors set to 50KHz.

Results summary: No emergences were recorded from any trees being surveyed. There was low bat activity overall, with one Common pipistrelle and one myotid bat foraging along the treeline on the south of the site.

Trees 2, 3 & 7 Observations:

Surveyor	Time	Species	Number	Activity	Annotation
SE	21:28-22:37	Common pipistrelle, *Pipistrellus pipistrellus*	1	Foraging up and down treeline around trees 1-4	
SE	22:32	Myotid sp.	1	Foraging up and down treeline around trees 1-4	

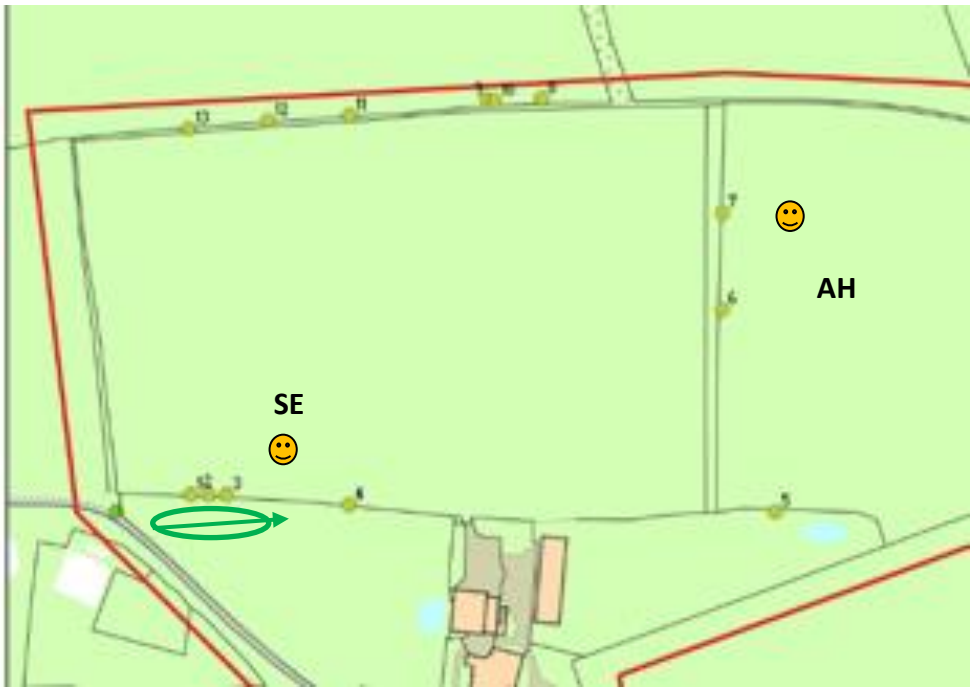


Figure 12– Surveyor locations and bat activity recorded (07/06/2018).

Appendix 5: eDNA results

SureScreen Scientifics

Folio No: E2847
Report No: 1
Order No: 2018-423b
Client: MAB ECOLOGY
Contact: Ione Bareau
Contact Details: ione@mab-ecology.co.uk
Date: 18/05/2018

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

Date sample received at Laboratory: 11/05/2018
Date Reported: 18/05/2018
Matters Affecting Results: None

RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
0543	Langwith Duck	SE 657479	Pass	Pass	Pass	Negative	0

SUMMARY

When Great Crested Newts (GCN); Triturus cristatus inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

The water samples detailed below were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Latest Amendments). Details on the sample submission form were used as the unique sample identity.

RESULTS INTERPRETATION

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

Lab Sample No.- When a kit is made it is given a unique sample number. When the pond samples have been taken and the kit has been received back in to the laboratory, this sample number is tracked throughout the laboratory.

Site Name- Information on the pond.

O/S Reference – Location/co-ordinates of pond.

SIC- Sample Integrity Check. Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.

DC- Degradation Check. Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.

IC- Inhibition Check- PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

Result- NEGATIVE means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence. POSITIVE means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed. Positive or Negative.

Positive Replicates- To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.

METHODOLOGY

The laboratory testing adheres to strict guidelines laid down in WC1067 Analytical and Methodological Development for Improved Surveillance of The Great Crested Newt, Version 1.1

The analysis is conducted in two phases. The sample first goes through an extraction process where all six tubes are pooled together to acquire as much eDNA as possible. The pooled sample is then tested via real time PCR (also called q-PCR). This process amplifies select part of DNA allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines PCR amplification and detection into a single step. This eliminates the need to detect products using gel electrophoresis. With qPCR, fluorescent dyes specific to the target sequence are used to label PCR products during thermal cycling. The accumulation of fluorescent signals during the exponential phase of the reaction is measured for fast and objective data analysis. The point at which amplification begins (the Ct value) is an indicator of the quality of the sample. True positive controls, negatives and blanks as well as spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared so they act as additional quality control measures.

The primers used in this process are specific to a part of mitochondrial DNA only found in GCN ensuring no DNA from other species present in the water is amplified. The unique sequence appropriate for GCN analysis is quoted in DEFRA WC 1067 and means there should be no detection of closely related species. We have tested our system exhaustively to ensure this is the case in our laboratory. We can offer eDNA analysis for most other species including other newts.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. Kits are manufactured by SureScreen Scientifics to strict quality procedures in a separate building and with separate staff, adopting best practice from WC1067 and WC1067 Appendix 5. Kits contain a 'spiked' DNA marker used as a quality control tracer (SureScreen patent pending) to ensure any DNA contained in the sampled water has not deteriorated in transit. Stages of the DNA analysis are also conducted in

SureScreen Scientifics

different buildings at our premises for added

SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory checks on accuracy of results as part of our quality procedures.

Reported by: Derry Hickman **Approved by:** Troy Whyte

End Of Report

Forensic Scientists and Consultant Engineers
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Company Registration No. 08950940

SureScreen Scientifics

Folio No: E2851
Report No: 1
Order No: 2018-423a
Client: MAB ECOLOGY
Contact: Ione Bareau
Contact Details: ione@mab-ecology.co.uk
Date: 18/05/2018

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

Date sample received at Laboratory: 11/05/2018
Date Reported: 18/05/2018
Matters Affecting Results: None

RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
0548	Langwith Cattle	SE 655 479	Pass	Pass	Pass	Negative	0

SUMMARY

When Great Crested Newts (GCN); Triturus cristatus inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

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UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

Appendix 5: Hedgerow assessment criteria

Hedges over 100m are surveyed in two 30 metre sections (central section of each side) in accordance with the 1997 Hedgerow Regulations. Each section was surveyed separately. All woody species and any woodland species were noted as listed in the Hedgerow Regulations 1997.

The entire hedge was also surveyed for the following list of features:

- Standard trees
- Rare trees
- Connectivity to other hedges
- Adjacent footpaths, bridleways or BOATs.
- Parallel hedges
- Connectivity to woodlands
- Connectivity to ponds
- Percentage of gaps
- Presence of wall or bank within hedge, if so % of length affected.
- Presence of ditch along hedge, if so % of length affected.

The hedge was then assessed for protected status ('important hedgerow') using the hedgerow assessment criteria as below

Hedgerow assessment criteria:

The hedgerow marks the boundary of a historic parish or township existing before 1850.

• The hedgerow contains or is within an archaeological feature which is on the Sites and Monuments Record, or a pre-1600 manor or estate.

• The hedgerow is a part of or associated with a field system predating the Enclosure Acts.

• The hedgerow contains species in part I of **Schedule 1**; **Schedule 5**; or **Schedule 8** of the **Wildlife and Countryside Act 1981**; or various other defined species including certain Red Data Book species.

• The hedgerow is adjacent to a **public right of way** (not counting an adopted highway) and at least 4 woody species as defined in Schedule 3 of the regulations

plus at least two Associated Features.

• The hedgerow includes one or more of the following:

- At least 7 woody species;

- At least 6 woody species plus at least three Associated Features (see below);

- At least 6 woody species including a black poplar; large-leaved lime, small-leaved lime or wild service tree;

- At least 5 woody species and at least 4 Associated Features.

Note that: Where a hedgerow is situated wholly or partly in the county (as constituted on the first of April 1997) of the City of Kingston Upon Hull, Cumbria, Darlington, Durham, East Riding of Yorkshire, Hartlepool, Lancashire, Middlesbrough, North East Lincolnshire, Northumberland, North Yorkshire, Redcar and Cleveland, Stockton-on-Tees, Tyne and Wear, West Yorkshire or York the number of woody species mention is to be treated as reduced by one"

Associated Features are as follows:

• A bank or wall for at least half the length.

• A ditch for at least half the length.

• Gaps over no more than 10% of the length.

• At least one standard tree per 50m.

• At least 3 ground flora woodland species as defined in Schedule 2 of the Regulations within 1m of the hedgerow.

• Connections scoring 4 or more points, where connection a hedgerow counts as one, a broad-leaved woodland or pond counts as two*.

• A parallel hedge within 15m*.

***These features do not count if a public right of way is being included in the criterion.**

Appendix 6: Breeding bird survey results.