ethos
Environmental Planning

# Ecological Impact Assessment

## Land at Rebecca Road, Pershore

**October 2024**

Ecology | Green Space | Community | GIS
Unit 1, Brassmill Lane Enterprise Centre | Bath | BA1 3JN
01225444114 | info@ethosep.co.uk
www.ethosep.co.uk

**Report Produced for:**

**Lioncourt Homes & Touch Developments Ltd**

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| **Written by:** | **Katie Munday, Ecologist** |
| **Checked by:** | **Jim Phillips, Managing Director** |
| **Issue:** | **V2** |
| **Date:** | **October 2024** |
| **Project:** | **ETH24-162** |

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# SUMMARY

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| Purpose of the report | This report has been produced by Ethos Environmental Planning on behalf of Lioncourt Homes. It provides an assessment of the likely ecological effects associated with the proposed residential development of 'Land at Rebecca Road, Pershore'. |
| Description of the scheme | The development proposals are in outline for up to 115 dwellings with associated access, infrastructure and green space. |
| Methodology | A desk study and UK Habitat Classification survey were undertaken for the site in July 2024. Detailed surveys for bats, badger and dormice were undertaken in 2024. |
| Baseline ecological conditions | The site comprises an agricultural field, with native hedgerows and a line of trees along the northern, southern and western boundaries. There are minimal arable field margins present.<br><br>The site is located within 500m of Tiddesley Wood SSSI.<br><br>The bat survey identified activity was dominated by common pipistrelle bats, with the focus of activity along the western boundary. The mature and veteran oak trees along this boundary support a variety of potential roosting features for bats, and a confirmed roost of approximately 5 common pipistrelle bats.<br><br>In total, thirteen species of bat were recorded on site, aside from common pipistrelle this activity was low and sporadic indicating occasional commuting along boundary hedgerows. The site is not an important foraging resource for bats, however, the boundary hedgerows are used for commuting.<br><br>The site offers opportunities for hedgehogs, brown hares and polecats.<br><br>An inactive badger sett was identified along the western boundary, however, evidence of badger activity (latrines) was observed on site.<br><br>A single Hazel Dormouse nest was recorded on the north west boundary of the site.<br><br>The hedgerows and line of trees offer nesting opportunities for birds. |
| Key impacts and mitigation | The development layout has been designed to retain, protect and enhance the most valuable ecological features, namely the boundary hedgerows and mature/veteran trees.<br><br>Mitigation measures are described to ensure compliance with protected species legislation for dormouse, hedgehogs, brown hares, polecats, birds, and badgers, details of which will be provided within a CEMP. |
| Conclusion | The scheme has been informed by the baseline ecology surveys, and has sought to avoid impacts on important ecological features through the provision of significant buffers to the boundary hedgerows. |

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|---|---|
| | Mitigation measures for protected species present on site will ensure there are no adverse effects and the scheme delivers a net gain habitats suitable for protected species, all of which can be secured through suitably worded planning conditions.<br><br>The design and mitigation measures therefore fully comply with the mitigation hierarchy and the scheme is considered to be in line with relevant national and local policy and legislation. |

# 1 INTRODUCTION

1.1 This Ecological Impact Assessment (EcIA) report has been prepared by Ethos Environmental Planning (Ethos) on behalf of Lioncourt Homes and Touch Developments Ltd. The EcIA was written by Katie Munday MSc BSc (Hons), Ecologist, and reviewed by Jim Phillips, Managing Director at Ethos. The details and experience of the authors and field survey team are provided in Section 3.16.

1.2 The report provides the results of an EcIA in relation to the proposed development of Land at Rebecca Road, Pershore (Central Grid Reference SO 93655 46336), hereafter referred to as 'the site' and shown in Figure 1.

1.3 The site is 4.96 hectares in size and comprises an agricultural field, with native hedgerows/trees along the northern, southern and western boundaries. There are minimal arable field margins present.


*Figure 1 Site location*

1.4 This EcIA will be used to inform an outline application for the erection of up to 115 dwellings with all matters reserved with the exception of access, including open space, landscaping, drainage and associated works.

1.5 The aims of this EcIA report are to:

- provide an assessment of the likely effects of the proposed development on ecological features on site;
- provide an assessment of the likely effects of the proposed development on nearby designated nature conservation sites;
- identify the measures required to mitigate impacts on site biodiversity;
- identify opportunities to deliver ecological enhancements and measurable gains for biodiversity as part of the development proposals; and
- to enable the Local Planning Authority to assess whether the proposals comply with relevant planning policy or legislation.

1.6 This report has been produced following the approach set out in 'Guidelines for Ecological Report Writing' (CIEEM, 2017).

# 2 POLICY AND LEGISLATION

## 2.1 National Policy

2.1.1 The **National Planning Policy Framework (NPPF)** sets out national planning policy, including policies of relevance to conserving and enhancing the natural environment. Policies of relevance to the proposed development (parts of paragraphs 180, 185, 186 and 191) have been summarised below:

Para 180: When determining planning applications, local planning authorities should apply the following principles, notably:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan).
d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Para 185: To protect and enhance biodiversity and geodiversity, plans should:

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Para 186: if significant harm to biodiversity 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.

Para 191: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

## 2.2 Local Policy

2.2.1 South Worcestershire is the area covered by the administrative areas of Malvern Hills District Council, Wychavon District Council and Worcester City Council. The South Worcestershire Development Plan (SWDP) sets out a vision for the area for the period of 2006 to 2030. Policies relating to biodiversity are provided below.

<u>Policy SWDP 22: Biodiversity and Geodiversity</u>

A) Development which would compromise the favourable condition of a Special Area of Conservation (SAC) or other international designations or the favourable conservation status of European or nationally protected species or habitats will not be permitted.

B) Development likely to have an adverse effect on a Site of Special Scientific Interest (SSSI) will not be permitted, except where the benefits of the development at that site clearly outweigh both its likely impact on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs.

C) Development which would result in the loss or deterioration of an Ancient Woodland (AW), a Veteran Tree (VT), or a nationally protected species will not be permitted unless the need for and the benefits of the proposed development in that location clearly outweigh the loss or deterioration.

D) Development which would compromise the favourable condition or the favourable conservation status of a Grassland Inventory Site (GIS), a Local Wildlife Site (LWS), a Local Geological Site (LGS), an important individual tree or woodland and species or habitats of principal importance recognised in the Biodiversity Action Plan, or listed under Section 41 of the Natural Environment and Rural Communities Act 2006, will only be permitted if the need for and the benefits of the proposed development outweigh the loss.

E) Where the policy requirements of B, C or D have been met, full compensatory provision, to include establishment (secured through a legal agreement where appropriate), commensurate with the ecological/geological value of the site will be required. In the first instance this should be through on-site mitigation, the details of which should be agreed with the Local Planning Authority. Off-site mitigation will only be acceptable where on-site mitigation is shown not to be possible

F) Development should, wherever practicable, be designed to enhance biodiversity and geodiversity (including soils) conservation interests as well as conserve on-site biodiversity corridors/networks. Developments should also take opportunities, where practicable, to enhance biodiversity corridors/networks beyond the site boundary.

## 2.3 Relevant Legislation

2.3.1 The following pieces of legislation have been considered within this assessment with an explanation of their relevance provided in Table 1.

*Table 1 Relevant legislation*

| Legislation | Relevance |
|---|---|
| **The Habitats Directive** (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all, the Directive protects over 1,000 animals and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and parts of the Birds Directive are transposed into legislation by **The Conservation of Species and Habitat Regulations 2017 (as amended).** | Presence of commuting/ foraging bats on site, utilising hedgerows and trees. |

| Legislation | Relevance |
|---|---|
| **Wildlife and Countryside Act 1981** (as amended, including by the Countryside and Rights of Way Act 2000), which provides legislative protection for certain species. The Act also prohibits the spread of invasive plant species, as well as providing the mechanism for the designation and protection of Sites of Special Scientific Interest; | Presence of Tiddesley Wood SSSI approximately 430m south-west of the site.<br><br>Potential for nesting birds in hedgerows and trees. |
| Badgers and their setts are protected under the **Protection of Badgers Act 1992** as amended by the Hunting Act 2004. | Potential presence of foraging/commuting badgers. |
| The **Natural Environment and Rural Communities Act 2006** (the NERC act) places a duty on all public authorities, including local planning authorities, to consider biodiversity in their work. Local planning authorities are to ensure that there is no net loss of biodiversity on a site, no net loss in habitat connectivity and aims to enhance biodiversity. | Enhancements for biodiversity.<br><br>Potential presence of foraging/commuting NERC S.41 mammals (hedgehog, brown hare, polecat). |
| The **Hedgerows Regulations 1997** protect 'important hedgerows' from being removed (uprooted or destroyed). Hedgerows are protected if they are at least 30 years old and meet at least one of the criteria listed in part II of schedule 1. | Potential presence of 'important' hedgerows. |

# 3 METHODOLOGY

## 3.1 Scope of Assessment

3.1.1 This assessment has been undertaken following the approach set out in the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018). The assessment has considered 'Important Ecological Features' that are present within the 'Zone of Influence' of the project. Important Ecological Features for this project comprise[1]:

- Designated nature conservation sites;
- Habitats and Species of Principal Importance for the Conservation of Biodiversity in England;
- Legally protected species; and
- Red Listed or rare species (based on Red Data Book lists, Birds of Conservation Concern and species considered to be nationally rare/scarce).

3.1.2 The Zone of Influence (ZoI) is the area over which the project could have an influence on ecological features. The ZoI is likely to vary for different features. However, in general terms the ZoI for this development proposal is considered to comprise the land within the red line boundary as well as immediate adjacent habitat features. It also includes designated nature conservation sites in the surrounding area.

3.1.3 The scope of the assessment was informed by a Preliminary Ecological Appraisal (PEA) undertaken by Betts Ecology in May 2024. A further ecological walkover was undertaken by Ethos in June 2024. This information was used to assess the s cope of the surveys required for the EcIA.

3.1.4 The overall assessment has been informed by guidelines provided in CIEEM (2017) Guidelines for Ecological Report Writing.

## 3.2 Background Data Search

3.2.1 A background data search was received from Worcestershire Biological Records Centre in July 2024. The search area included records of non-statutory designated sites and protected and notable species within 2km of the proposed development site.

3.2.2 An additional search for statutory designated sites and granted European Protected Species (EPS) licences within 2km of the site boundary was undertaken using publicly available information (DEFRA Magic map).

[1] Box 14 in CIEEM's ECiA Guidelines (2018)

## 3.3 UK Habitat Classification Survey

3.3.1 A UKHab survey was undertaken on 24th July 2024. The survey incorporated detailed assessment of the land within the development boundary, including a description and mapping of all key features and habitat types. The survey was carried out to identify the range of habitats within the site and the predominant and notable species of flora. This survey was informed by the UKHab Classification Version 2 (UKHab Ltd., 2023).

## 3.4 Hedgerow Regulations

3.4.1 A hedgerow assessment was undertaken on the southern boundary hedgerow as approximately 10m of it will require removal to allow access. The hedgerow was surveyed in line with the Hedgerow Survey Guidelines, as described below.

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

1) The hedgerow marks the boundary of a historic parish or township existing before 1850.
2) The hedgerow incorporates an archaeological feature.
3) The hedgerow is a part of or associated with an archaeological site.
4) The hedgerow marks the boundary of or is associated with a pre-1600 AD estate or manor.
5) The hedgerow forms an integral part of, or is associated with, a field system pre-dating the Enclosures Act.
6) The hedgerow contains a listed species. These have to be listed in the Wildlife and Countryside Act 1981 in Part I of Schedule 1 (birds protected by special penalties), Schedule 5 (other animals) or Schedule 8 (plants). In addition, species listed in certain red data books qualify.
7) The hedgerow includes, on average, in a 30m length one of:
    a) at least 7 woody shrub and tree species listed in the regulations.
    b) at least 6 woody species and has at least three associated features.
    c) at least 6 woody species including a black-poplar tree, large-leaved lime, small-leaved lime or wild service tree.
8) The hedgerow runs alongside a bridleway, footpath, road used as a public path or a byway open to all traffic, and includes at least four woody species, on average, in a 30m length and has at least two associated features:
    a) A bank or wall supporting the hedgerow along at least half of its length.
    b) Less than 10% gaps.
    c) On average, at least one tree per 50 metres of hedge.
    d) At least three species from a list of 57 herbaceous woodland plants, including bluebell, primrose, wild strawberry and assorted ferns and violets.
    e) A ditch along at least a half of the length of the hedge.
    f) A number of connections with other hedgerows, ponds or woodland.
    g) A parallel hedge within 15 metres of the hedgerow.

## 3.5 NERC S. 41 Mammals

3.5.1 The survey included an assessment of the habitats on site for their potential to support NERC Section 41 species such as hedgehog *(Erinaceus europaeus)*, polecat *(Mustela putorius)*, harvest mouse *(Micromys minutus)* and brown hare *(Lepus europaeus)*. This included a search for nests, runs, latrines, paw prints, and live specimens.

## 3.6 Badger

3.6.1 The survey for badger *(Meles meles)* included a search of the development site for any evidence including setts, foraging signs (snuffle holes), runs and latrines.

3.6.2 A camera trap survey was undertaken by Betts Ecology (July 2024), the methodology of which is set out in the Badger Survey Technical Report at Appendix 1.

## 3.7 Hazel Dormouse

3.7.1 The survey included an assessment of the potential of the site for hazel dormouse *(Muscardinus avellanarius)*, focusing on the connectivity and suitability of the habitat on site.

3.7.2 Fifty dormouse tubes were deployed in suitable habitat across, and adjacent to, the site on 20th June 2024 at roughly 20m intervals, as shown in Figure 2. The tubes were checked in July and September 2024 and are due to be checked again in October and November 2024. Table 2 below (taken from Table 5 of the 'Dormouse Conservation Handbook') shows the index of probability of finding evidence of dormouse in nest tubes. The score is based on fifty tubes deployed and a minimum score of 20 must be reached to determine presence/likely absence. The months and scores highlighted in bold show the dates when the dormouse tubes were deployed on site.

*Table 2 Index of probability of finding dormice present in nest tubes in any one month*

| Month | Score |
|---|---|
| *April* | *1* |
| *May* | *4* |
| **June** | **2** |
| **July** | **2** |
| **August** | **5** |
| **September** | **7** |
| **October** | **2** |
| **November** | **2** |
| **Total** | **20** |

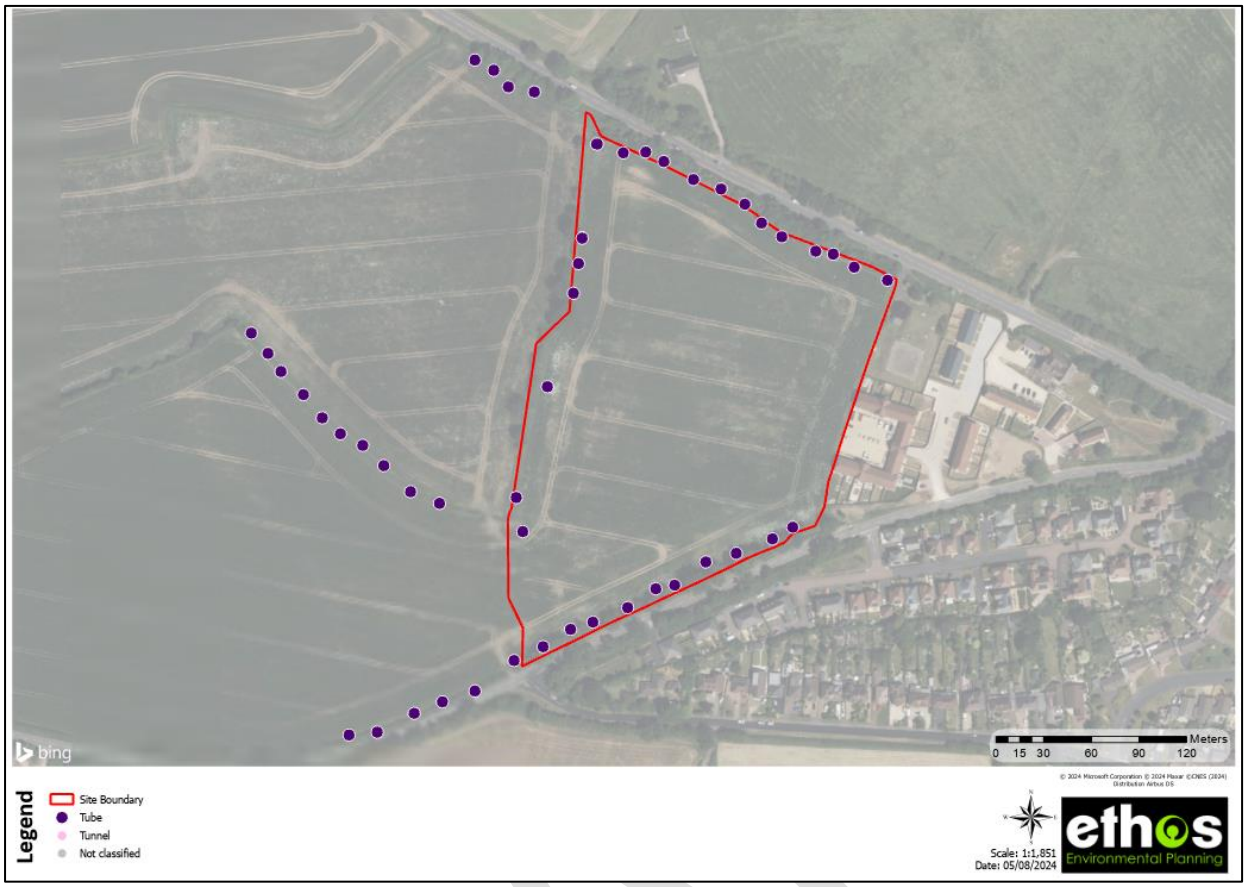


*Figure 2 Dormouse tube locations*

## 3.8 Riparian Mammals

3.8.1 The survey included an assessment of the site to support riparian mammals such as otter *(Lutra lutra)* and water vole *(Arvicola amphibius)*. This included an assessment of the riparian habitats on site or within the wider environment to support these species.

## 3.9 Bats

3.9.1 The methodology for the bat survey has been informed by the 'Bat Surveys for Professional Ecologists Good Practice Guidelines 4th Edition' (Collins, 2023).

3.9.2 The habitats on site were assessed for their suitability to support foraging and commuting bats. This assessment was also contextualised through examination of suitable habitat and features in the wider landscape and possible flight-lines across the proposed site following natural linear features such as hedgerows.

Ground level assessment of trees

3.9.3 The methodology draws upon guidance within 'Bat Surveys for Professional Ecologists' Collins (2023) and the Bat Tree Habitat Key (2018). The surveys were undertaken using binoculars and a high-powered torch to view features from the ground. Details on the

potential roosting features (PRFs) were recorded as well as information to identify the specific trees.

3.9.4 Potential roosting features on trees were identified as any feature within a tree that could provide shelter for a roosting bat. These features result from disease, damage and decay.

3.9.5 Trees were first assessed for their suitability for roosting bats and were classified based on Table 4.2 of the BCT survey guidelines (Collins, 2023), as per the below:

- NONE – either no PRFs in the tree or highly unlikely to be any.
- FAR – further assessment required to establish if PRFs are present in the tree.
- PRF – a tree with at least one PRF present.

3.9.6 If potential roosting features were identified, the surveyor would attempt to classify them as follows:

- PRF-I – PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – PRF is suitable for multiple bats and may therefore by used by a maternity colony.

3.9.7 No trees with suitability for roosting bats are due to be impacted by the project and therefore no further surveys were required.

Emergent Surveys of Trees

3.9.8 Two emergent surveys have been undertaken on the mature trees on the western boundary of the site on the 27th June and 16th August 2024. The surveys used two Flir T540 thermal imaging cameras and videos were recorded as non-radiometric files. This camera has a thermal resolution of 464 × 348 with a 42˚ lens which allows for the detection of bats up to a distance of 51m. The video files were transferred into standard video analysis software for later analysis.

Night-time walkover surveys

3.9.9 A night-time bat walkover survey was undertaken on 27th June and 16th August 2024 to highlight any important commuting or foraging features on site. The surveyor walked a planned transect of the site, shown in Figure 3, for at least two hours after sunset. The route of the transect was chosen to cover the boundary hedgerows, which are likely to be used by commuting and foraging bats, and to investigate if or how bats are utilising the central area of the site, where the construction footprint will be focused.

3.9.10 The survey included identifying species on site, recording areas or features with specific levels of bat activity and identifying key areas for foraging and commuting bats. Echo Meter Touch (EMT) bat detectors were used for the survey. All calls recorded were

analysed using the Echo Meter Touch app software and were cross referenced to a call reference collection library of known bat species to confirm species presence.

3.9.11 An additional survey is planned for late September 2024.


*Figure 3 Night-time bat walkover transect*

Automated/static detector surveys

3.9.12 Passive bat detector surveys were used to identify levels of bat activity on the site. Passive bat detectors can provide a greater understanding of the bat species using the site and identify patterns in bat activity over long periods of time.

3.9.13 Four static bat detectors were deployed on the site for five consecutive nights in June, July and August. The detectors were deployed at the same locations during each of the monitoring periods to enable comparison of bat activity during the different periods. The locations for the survey periods were selected to compare activity levels along the site boundaries, which were considered likely to provide commuting and foraging opportunities for bats, and are shown in Figure 4. The results of this comparison will be used to help determine the likely impacts on bats of the proposed development and to inform the mitigation strategy.

3.9.14 The detectors used were Full Spectrum Wildlife Acoustics Song Meter 4 (SM4) passive bat detectors. Each call was assigned a species using the BTO Acoustic Pipeline. The final data analysis was carried out using Microsoft Excel.

3.9.15 Further static detector surveys will be undertaken in September and October. The survey periods undertaken so far are listed below:

- 20th – 25th June 2024;
- 10th – 15th July 2024;
- 16th – 21st August 2024;
- 10th - 15th September 2024;
- 1st – 6th October 2024.

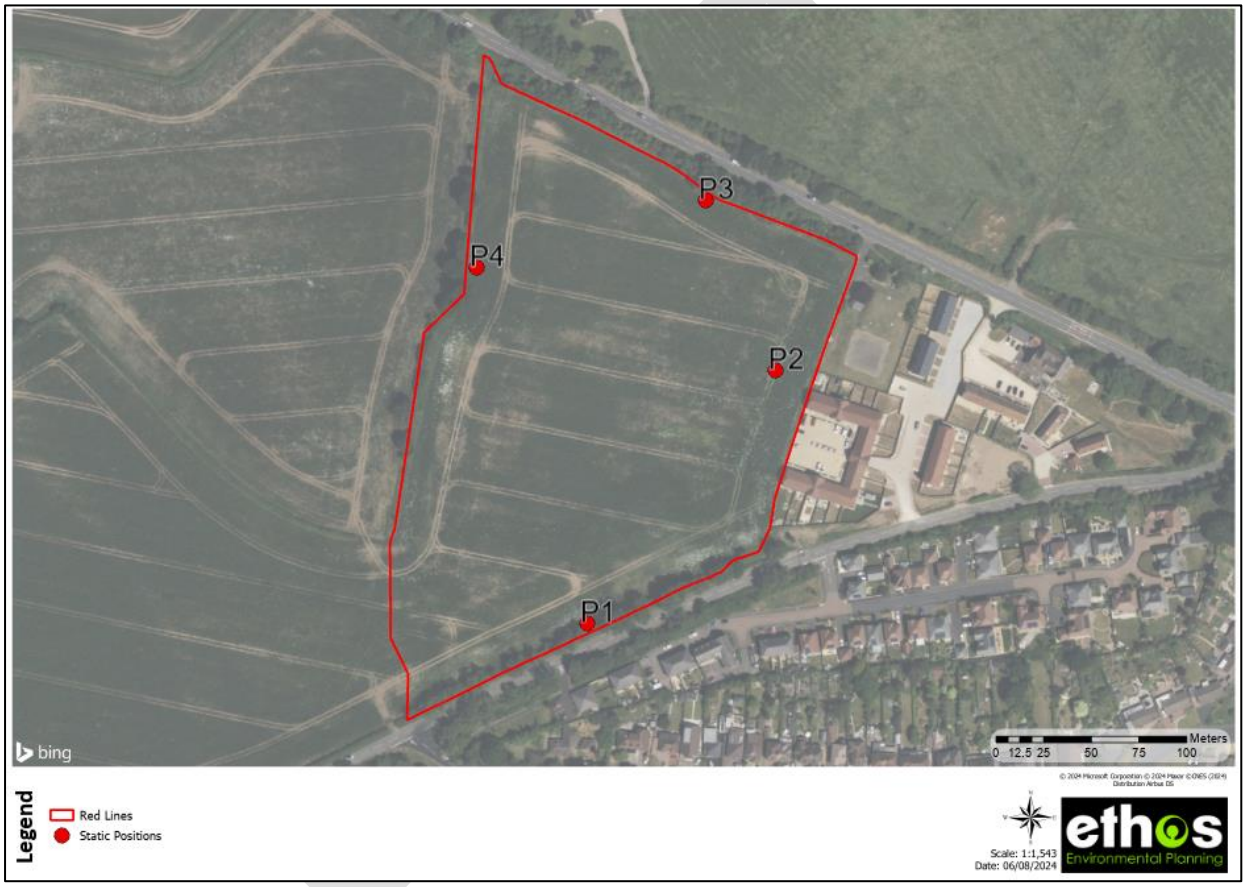


*Figure 4 Static detector locations*

## 3.10 Birds

3.10.1 The bird survey included an assessment of the habitats on site for their potential to support protected and notable species of bird as well as their potential to support breeding birds.

## 3.11 Reptiles

3.11.1 The potential presence of reptiles on site was assessed considering the habitats present (availability of refugia and basking areas) and suitability of surrounding environment. The assessment of habitats was informed by the 'Herpetofauna Workers Manual' (Gent and Gibson, 2003). Where possible, attempts to confirm reptile presence on site were made following 'Froglife Advice Sheet 10 – Surveying for Reptiles' through direct observation in reptile "hotspots" and checking of any existing refugia.

## 3.12 Amphibians

3.12.1 Surveys for GCN were informed by the 'Great Crested Newt Conservation Handbook' (Froglife, 2001).

3.12.2 The site was examined for suitable waterbodies and for breeding terrestrial habitat. Terrestrial habitats providing sufficiently structured vegetation in which amphibians may forage or hibernate over winter were also surveyed for.

3.12.3 In addition to the on-site assessment, 'Great Crested Newt Mitigation Guidelines' (English Nature, 2001) recommend that a desktop analysis of ponds within 500m of the site be undertaken, to identify any potential breeding ponds which may require further survey. Ponds within 500m of the site were mapped on GIS with an OS OpenData base map at 1:10,000 resolution.

## 3.13 Invertebrates

3.13.1 Due to the many invertebrate taxonomic groups that exist, the often-large differences in invertebrate diversity between habitats and the many survey techniques available, invertebrate surveys are highly specific to individual sites. Therefore, an assessment of the site's potential for invertebrates was undertaken, including the need for targeted surveys, as recommended in 'Considering Invertebrates in Preliminary Ecological Appraisals' (Jukes, 2021).

## 3.14 Limitations

3.14.1 Ethos were appointed in June 2024 to review the PEA (*Betts Ecology, May 2024*) and advise on the scope of surveys required to inform an EcIA. As a result of this, Ethos' advice was that surveys for badgers, bats and dormouse would be required to inform the EcIA. The timing of the appointment and application submission has meant there are limitations to the bat surveys undertaken.

3.14.2 The site is assessed as having low potential for bats (see section xx), therefore following the BCT guidance, three surveys (night time walkover and static) would be required in Spring, Summer and Autumn.

3.14.3 As Ethos weren't appointed until June, this has meant the Spring survey window has been missed. To supplement this, static surveys have been extended and undertaken monthly from June to October (5 months). The walkover surveys have been undertaken in June, August and September.

## 3.15 Evaluation of Ecological Features

3.15.1 In line with CIEEM's guidelines on EcIA, this assessment has focused on relevant Important Ecological Features. The scale of importance of these features has been determined based on available contextual information and could include:

- **International** – of international importance and protected through international legislation;
- **National** – of importance in England and protected through national legislation;
- **County** – of importance to the county (South Worcestershire) but not sufficiently important to warrant 'National' scale of importance; and
- **Local** – of importance to the local area (Pershore), but not sufficiently important to warrant County scale of importance.

3.15.2 Potential impacts on Important Ecological Features are identified and assessed; likely significant effects are those likely to result in a change to the conservation status of a habitat or species population or undermine/support nature conservation policy. Mitigation measures have been devised following the mitigation hierarchy and appropriate mechanisms for securing mitigation measures have been identified.

## 3.16 Personnel

3.16.1 The site surveyors and report authors have been detailed below in Table 3.

*Table 3 Site surveyors and report authors*

| Ecologist | Position | Qualifications/ licences | Experience | Role in assessment |
|---|---|---|---|---|
| **Jim Philips** | Managing Director | MSc BSc (Hons), MCIEEM<br><br>Class 2 Bat Licence<br><br>Class 1 GCN Licence | Jim's experience in ecology covers a wide range of projects and clients and his focus is on interpreting relevant policy and legislation to ensure projects are delivered efficiently and meet the needs of the client. He holds survey licenses for bats and great crested newts in England and Wales and is a registered consultant on Natural England's Bat Low Impact Class License (BLICL) and holds a level 2 accreditation on the Bat Earned Recognition scheme. | Approved Report, UKHab surveyor, dormouse surveyor, bat surveyor |
| **Rosine Divine** | Ecological Assistant | BSc (Hons) | Over 20 years experience in environmental management, | Assistant bat surveyor |

| Ecologist | Position | Qualifications/ licences | Experience | Role in assessment |
|---|---|---|---|---|
| | | | Several years' experience of occasional role as ecological assistant for field work. | |
| **Katie Munday** | Ecologist | MSc, BSc (Hons), Qualifying CIEEM | Katie has two years' experience in ecological consultancy. She undertakes a variety of surveys, including protected species surveys and habitat assessments, and she assists with bat call data analysis. | Report author. |

# 4 BASELINE ECOLOGICAL CONDITIONS

## 4.1 Previous Surveys

4.1.1 A Preliminary Ecological Appraisal (PEA) was undertaken by Betts Ecology in May 2024 and targeted surveys for bats and badgers were undertaken between June and July 2024. It was identified that the site is dominated by an intensive agricultural crop field which is of limited ecological value. The key features were assessed to be the boundary hedgerows and line of trees along the northern, southern and western boundaries. In particular, three veteran trees were identified along the western boundary which were assessed as potentially suitable for roosting bats. One of the trees along the western boundary was found to support a little owl nest (*Athene noctua*).

4.1.2 A single preliminary bat activity transect survey was undertaken in June 2024. The activity recorded was concentrated in the south-west corner of the site. Three species were recorded, namely common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and noctule (*Nyctalus noctula*). No bats were observed emerging from the mature and veteran trees along the site boundaries. However, targeted emergence surveys were not undertaken following the best practice methodology (Collins, 2023) and this is therefore insufficient to determine an absence of roosting bats.

4.1.3 Several potential mammal holes were observed along the western boundary. The sizes of the holes resembled badger holes, but no evidence of badger presence was identified on site. Three camera traps were deployed around the holes to detect potential badger activity between 19th June and 3rd July 2024. During that period, no badger activity was recorded and it was assessed that the site does not support an active sett. A Badger Technical Report is provided at Appendix 1.

## 4.2 Designated Sites

Statutory designated sites

4.2.1 There are two statutory designated sites and one parcel of ancient woodland within 2km of the site, as shown in Figure 5. Descriptions of the statutory designated sites are provided below.

*Tiddesley Wood SSSI*

4.2.2 Tiddesley Wood is located approximately 430m to the south-west of the site and is designated as a Site of Special Scientific Interest (SSSI) and a Worcestershire Wildlife Trust Reserve. Due to the importance of the Woodland, the following section provides a detailed description of the site for consideration within the assessment.

4.2.3 Tiddesley Wood occupies a ridge of Lias Limestone and clays between the Bow Brook and the River Avon, to the west of Pershore. Historical documents show there has been

woodland on the site since before the preparation of the Domesday Book in 1086 and it is therefore classified as ancient woodland.

4.2.4 The site has been selected as an example of ash-maple woodland which has developed on heavy basic soils. This type of woodland is unusual in the county, especially in the eastern part. Most of the site is broadleaved woodland dominated by ash (*Fraxinus excelsior*) and pedunculate oak (*Quercus robur*), with field maple (*Acer campestre*) and coppiced hazel (*Corylus avellana*) in the shrub layer. In some areas the canopy also contains small-leaved lime (*Tilia cordata*) and silver birch (*Betula pendula*), and in places there are stands of invasive suckering English elm (*Ulmus procera*). Wild service-tree (*Sorbus torminalis*), spindle (*Euonymus europaeus*) and wayfaring-tree (*Viburnum lantana*) are also present.

4.2.5 The ground flora is rich and dominated by bramble (*Rubus fruticosus*), dog's mercury (*Mercurialis perennis*) or bluebell (*Hyacinthoides non-scripta*). Wood anemone (*Anemone nemorosa*) and primrose (*Primula vulgaris*) are abundant in places, and a number of locally uncommon species occur, such as meadow saffron (*Colchicum autumnale*), bird's-nest orchid (*Neottia nidus-avis*), herb-Paris (*Paris quadrifolia*), broad-leaved helleborine (*Epipactis helleborine*) and violet helleborine (*E. purpurata*).

4.2.6 Along the western edge of the wood bordering the Bow Brook is a strip of tall fen and marsh vegetation with scattered scrub, part of which has been planted with grey poplar (*Populus canescens*). This is a breeding site of the nationally rare marsh warbler (*Acrocephalus palustris*). The wood itself supports a wide range of breeding birds and is an important county site for breeding nightingales (*Luscinia megarhynchos*). The invertebrate interest of the site is considerably enhanced by a long central ride which bisects the wood in a north-south direction. Twenty-seven species of butterfly have been recorded recently including white admiral (*Ladoga camilla*), purple hair-streak (*Quercusia quercus*) marbled white (*Melanargia galathea*) and the notable white-letter hairstreak (*Strymonidia w-album*). The proximity of the wood to the river and brook make it an attractive feeding area for dragonflies. Twelve species have been recorded recently, including the rare club-tailed dragonfly (*Gomphus vulgatissimus*). A rare beetle (*Gnorimus nobilis*), considered to be an indicator of ancient woodland has been found on the site.

4.2.7 Tiddesley Wood SSSI is assessed to be of **National importance** for nature conservation, in line with its highest designation. Potential impacts on Tiddesley Woods SSSI are discussed further in Section 6.1.

*Avon Meadows LNR*

4.2.8 Avon Meadows Local Nature Reserve (LNR) is located approximately 1.2km east of the site. In summer, Avon Meadows supports wildflowers that thrive in both grassland and wetland environments, including tubular water-dropwort (*Oenanthe fistulosa*), marsh bedstraw (*Galium palustre*), yellow rattle (*Rhinanthus minor*) and increasingly, knapweed (*Centaurea nigra*) and ox-eye daisy (*Leucanthemum vulgare*). Dragonflies and butterflies abound, as do smooth newts (*Lissotriton vulgaris*) and grass snakes

(*Natrix natrix*). Birdlife is abundant all year round with the reed beds alive with sedge warblers (*Acrocephalus schoenobaenus*) and reed warblers (*Acrocephalus scirpaceus*), even the occasional Cetti's warbler (*Cettia cetti*) joins the cuckoos (*Cuculus canorus*) and reed buntings (*Emberiza schoeniclus*) through the summer. Over winter, waders like snipe (*Gallinago gallinago*) and little ringed plover (*Charadrius dubius*) can be spotted dabbling around the edges of the shallow ponds along with the more common sight of mallard (*Anas platyrhynchos*), teal (*Anas crecca*), mute swan (*Cygnus olor*) and heron (*Ardea cinerea*).

4.2.9 Avon Meadows LNR is assessed to be of **County importance** for nature conservation, in line with its designation. Due to its distance from the site, it is expected that impacts during the construction phase will be avoided. Whilst the proposed development will result in an increase in residents in the area, and therefore potentially an increase in footfall at Avon Meadows LNR, the LNR is actively managed by Friends of Avon Meadows for both biodiversity and recreation. The use of the site for recreational purposes is promoted and it is therefore assessed that any potential effects associated with an increase in recreational pressure will be mitigated by the ongoing management. As such, Avon Meadows LNR is scoped out for further assessment.

*Lodge Wood*

4.2.10 Lodge Wood is a parcel of ancient woodland located approximately 1.6km north-west of the site. It is assessed to be of **County importance** for nature conservation. Due to its distance from the site, it is expected that impacts during the construction phase will be avoided. Lodge Wood is a relatively small parcel of woodland relative to the nearby Tiddesley Wood SSSI. It is therefore assessed that Lodge Wood is unlikely to experience a significant increase in footfall and associated recreational pressure. Potential effects during the operational phase are therefore not assessed to be significant and Lodge Woods is scoped out for further assessment.

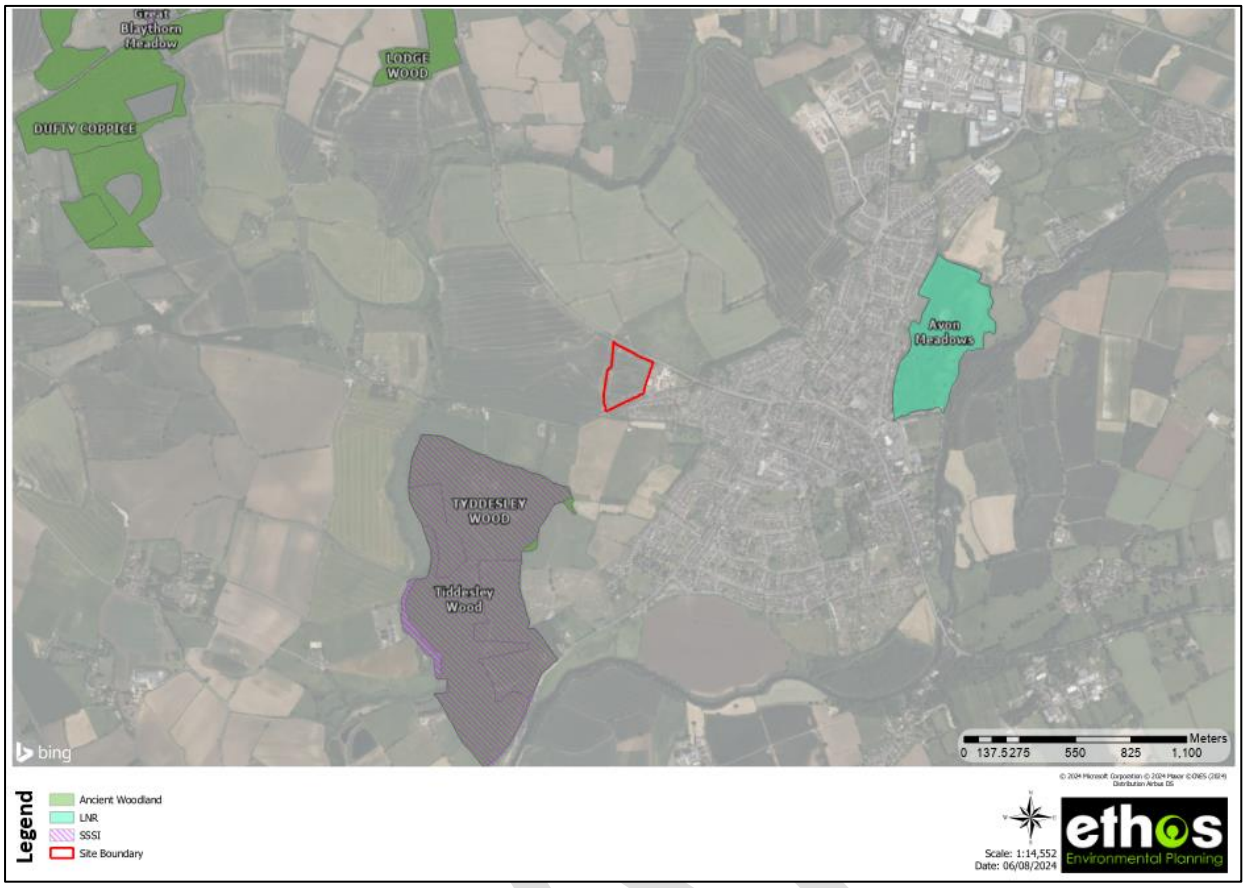


*Figure 5 Statutory designated sites within 2km*

Non-statutory designated sites

4.2.11 There are five Local Wildlife Sites (LWS) within 2km, which are shown in Figure 6 and described in Table 4 below. The LWSs are assessed to be of **Local importance** for nature conservation, in line with their designation.

4.2.12 Tiddesley Wood is designated as a SSSI and a small part of it is also designated as a LWS, as described in Table 4. Potential impacts and mitigation measures relating to Tiddesley Woods SSSI are discussed in Section 6.1 and also cover Tiddesley Wood LWS.

4.2.13 Stocken and Tiddesley Wood Orchards LWS is located to the north of Tiddesley Wood SSSI, approximately 200m from the site. Given the proximity to the proposed development, potential impacts on Stocken and Tiddesley Wood Orchards LWS are discussed in Section 6.2.

4.2.14 The remaining LWSs are assessed to be at a sufficient distance from the site that impacts during the construction phase will be avoided. They comprise watercourse networks and the small sections within 2km of the site are not expected to experience a significant increase in recreational pressure as a result of the proposed development. They are therefore scoped out for further assessment.

4.2.15 In addition, there are four Worcestershire Grassland Inventory records within 2km of the site, as shown in Figure 6. These comprise small parcels which are assessed as unlikely to experience a significant increase in recreational pressure as a result of the proposed development. Given their distance from the site, it is assessed that impacts during the construction phase will be avoided. As such, the Worcestershire Grassland Inventory records within 2km are scoped out for further assessment.

*Table 4 Non-statutory designated sites within 2km*

| Site name | Description | Distance and direction from site |
|---|---|---|
| Stocken and Tiddesley Wood Orchards | Two orchards located on the edge of Tiddesley Wood Nature Reserve. Stocken Orchard is a more recent high-density grove of apple trees – primarily cider apple varieties, which has previously been managed for commercial cider production. Although a fairly young orchard at less than 25 years old, it has been run along less intensive lines. Trees have not been extensively pruned or sprayed and the understory grass sward is still relatively intact, with fragments of meadow flora. By contrast, Tiddesley Orchard, owned and managed by Worcestershire Wildlife Trust, is a grove of ageing and veteran plum trees. Twenty-two species of epiphytic lichen have been positively identified in Stocken Orchard. The tree cavities can provide good nest sites for hole-nesting birds. The Tiddesley plum orchard has long been renowned for its thriving population of noble chafer beetles (*Gnorimus nobilis*). | 200m south-west |
| Tiddesley Wood | This LWS is a small area of woodland adjacent to Tiddesley Wood SSSI and is part of the larger area that Tiddesley Wood covered in the 1800s. It is a fine example of ash-maple woodland on heavy, basic soils. The ground flora is rich and this extends into this adjacent LWS area of woodland; bluebell is abundant in spring-time together with species such as cuckoo pint. This area also supports a rich invertebrate fauna; twenty-seven species of butterfly have been recorded including white admiral and marbled white. | 430m south-west |
| Bow, Shell, Swan and Seeley Brooks | Rising near Redditch these small watercourses flow south and west before draining via the Bow Brook into the River Avon at Defford. Typically the streams are small, narrow and varied in structure. The stream beds comprise gravels and clays overlying alluvium and lias clays which give rise to a variety of streambed habitats. Flow and depth are variable with a number of deeper pools interspersed with shallow faster-flowing sections, particularly in the upper reaches. Though the brooks vary in quality along their length they are predominantly rich in both aquatic and emergent vegetation. Parts of the corridor are tree lined, particularly with pollarded willows and alders and in places the brooks flow through woodland or associated marshland, augmenting the biodiversity value of the brooks themselves. For the most part though, they flow through open agricultural land and form an important wildlife corridor through this part of the east Worcestershire Plain. The Bow Brook in particular is known for its aquatic and emergent flora and also has an impressive invertebrate fauna including scarce chaser (*Libellula fulva*) and white- | 860m west (at its closest point) |

| Site name | Description | Distance and direction from site |
|---|---|---|
| | legged damselfly (*Platycnemis pennipes*). Kingfishers (*Alcedo atthis*) have bred in several places and otters have been recorded along much of the corridor, though there has not been a comprehensive survey recently. | |
| River Avon | The Avon is a major tributary of the River Severn and drains much of the southern West Midlands. The Worcestershire section has been canalised so that throughout it is a slow-flowing river, often ponded up behind locks and weirs. For the most part the bed is correspondingly silty and due to heavy boat traffic the river is also fairly turbid. As a result the submerged aquatic flora in the main channel is rather limited but in side channels it can often be quite rich. Marginal and emergent vegetation is significantly more diverse and often dominated by reed canary-grass (*Phalaris arundinacea*), true bulrush (*Typha latifolia*) and reed sweet-grass (*Glyceria maxima*). In places the marginal vegetation is augmented by reedbeds and swamps of willowherb (*Epilobium hirsutum*) and nettle (*Urtica dioica*), which provide an important habitat for invertebrates and breeding birds. Elsewhere the river is flanked by scrub and wooded slopes which help to augment the already broad and extremely important wildlife corridor. Generally though the banks are rather open without much shrub cover although pollarded willows are common in several stretches. As well as being an important wildlife corridor through a significant part of the county the Avon provides breeding habitat for a number of priority species. It is of particular note for its dragonflies and holds a number of scarcer species including club-tailed dragonfly (*Gomphus vulgatissimus*), scarce chaser and white-legged damselfly. The River and its accompanying habitats are also important for breeding birds with riverside meadows holding populations of redshank (*Tringa totanus*), lapwing (*Vanellus vanellus*) and curlew (*Numenius arquata*). A number of scrub/swamp habitats are also associated with the Avon and these provide sites for breeding reed and sedge warblers, together with numerous commoner scrub and hedgerow species. Kingfishers breed and the marginal habitats associated with the river still hold breeding turtle dove (*Streptopelia turtur*). Otters (*Lutra lutra*) are known to breed on the Avon and its backwaters, and it provides important commuting and foraging habitats for several bat species. | 1.2km south (at its closest point) |
| Piddle and Whitsun Brooks | The Piddle Brook and its tributary the Whitsun Brook drain most of the eastern part of the east Worcestershire plain and form a valuable wildlife corridor through an otherwise predominantly agricultural landscape. For much of their length both brooks have a natural channel form and exhibit the expected range of features including occasional pools and riffles, debris dams and meanders, often with deeply incised banks. The bed is mainly silt with occasional gravel bars where the flow is faster. Aquatic vegetation is abundant both in terms of number of species and quantity whilst bankside vegetation is often dominated by willow pollards, especially in the downstream stretches. However, the tree line is not continuous and there are also | 1.9km north-east |

| Site name | Description | Distance and direction from site |
|---|---|---|
| | patches of scrub and occasional off-stream wetlands that help to add value to the otherwise usually narrow river corridor. Faunal records for the two brooks are incomplete but they have a good dragonfly fauna and otters are known to occur. Kingfishers have bred in the past and it is likely that they still do. The tree-lined corridor is likely to be of significant value for commuting and foraging bats. | |

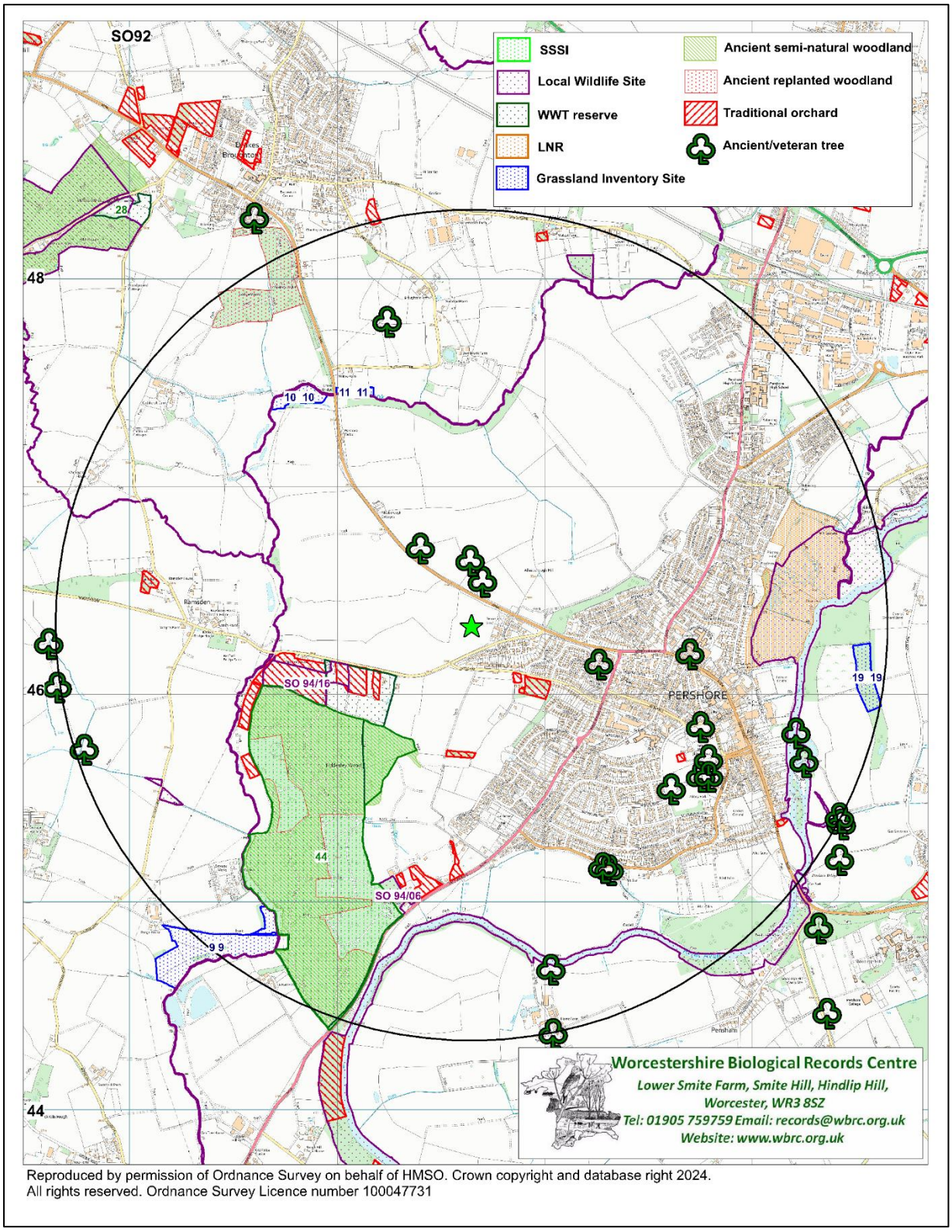


*Figure 6 Non-statutory designated sites within 2km*

## 4.3 Habitats

General site description

4.3.1 The site comprises an agricultural field, with native hedgerows along the northern and southern boundaries, and a line of trees running along a section of the western boundary. There are minimal arable field margins present.

4.3.2 The wider landscape is heavily agricultural, with fields and associated hedgerows to the north, south and west. The town of Pershore is located directly to the east of the site and it is bordered by two roads to the north and south (Worcester Road and Rebecca Road, respectively). There are several watercourses in the wider area, such as the River Avon, approximately 1.2km at its closest point, and Bow Brook, approximately 860m west at its closest point. The large parcel of woodland forming Tiddesley Wood SSSI is located approximately 430m to the south-west of the site.

UKHab survey

4.3.3 Figure 7 shows the key habitats identified during the UKHab survey. The habitats are described in more detail in the following section.


*Figure 7 UKHab survey*

Cereal crops

4.3.4 The site is dominated by an agricultural field supporting cereal crop, as shown in Photos 1 and 2. The field is intensively managed and there are minimal arable field margins present. Due to its lack of structural and species diversity, this habitat is assessed to be of low ecological value and is not assigned any particular importance for nature conservation. Therefore, this habitat is not considered further in this assessment.

*Photo 1 Cereal crop*

*Photo 2 Cereal crop*

Native species rich hedgerow with trees

4.3.5 The northern hedgerow, shown in Photos 3 and 4, supports a mixture of trees and shrubs, including elm (*Ulmus sp*.), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), willow (*Salix sp*.) and ash (*Fraxinus excelsior*). Several of the elm trees are dead and the ash trees show signs of dieback.

4.3.6 The southern hedgerow comprises mature trees dominated by ash, with underlying shrub, as shown in Photos 5 and 6. Other species present include elm, bramble (*Rubus fruticosus*), dog rose (*Rosa canina*), field maple (*Acer campestre*), hawthorn and a mature oak (*Quercus robur*). The hedgerow was assessed under the Hedgerow Regulations and was found to not be important. The full results of the Hedgerow Regulations assessment are provided in Appendix 2.

4.3.7 The northern and southern hedgerows meet the criteria for Priority Habitats in the UK and are assessed to be of **Local importance** for nature conservation.

*Photo 3 Northern hedgerow*

*Photo 4 Northern hedgerow*

*Photo 5 Southern hedgerow*

*Photo 6 Southern hedgerow*

Line of trees

4.3.8 There is a line of mature oak trees in the west of the site which marks the boundary between the site and the adjacent field (Photos 7 and 8). The understorey of the line of trees is dominated by bramble and nettle (*Urtica dioica*). As identified in the PEA (Betts Ecology, 2024) three of the trees are veteran, supporting features such as cracks, fissures, wounds and deadwood. The trees on site are discussed further in Section 4.8 in relation to their potential to support roosting bats.

4.3.9 The line of trees is assessed to be of **Local importance** for nature conservation.

*Photo 7 Western line of trees*

*Photo 8 Western line of trees*

## 4.4 NERC S. 41 Mammals

4.4.1 The data search returned seventeen records of hedgehog within 2km of the site. The records mostly related to residential dwellings and roads within the town of Pershore to the east.

4.4.2 A single polecat record was returned from 2005. It related to Tiddesley Wood located approximately 430m south-west of the site.

4.4.3 The data search returned seventeen brown hare records within 2km, only three of which were from the last decade. Most of the records related to Caddicroft Farm, approximately 1.5km to the north-west.

4.4.4 Two harvest mouse records were identified by the data search. Both records were dated from within the last decade and related to Avon Meadows approximately 1.2km east of the site.

4.4.5 The site is dominated by an agricultural habitat which offers foraging potential for hedgehogs. The hedgerows provide suitable cover for commuting hedgehogs, as well as nesting opportunities. As such, it is considered likely that hedgehogs are present on site. Any hedgehogs utilising the site are considered to be of **Local importance** for nature conservation.

4.4.6 Polecats are found in many habitats including hedgerows and woodlands. They favour land which supports valuable food resources, such as extensive rabbit warrens or ponds for spawning amphibians. The most recent polecat distribution survey found that whilst polecats are present across the West Midlands, relatively few records were received from the Worcester area (Croose, 2016). The hedgerows provide suitable habitat for polecats, but there are no valuable food resources on site. The key feature for polecats in the wider area is considered to be Tiddesley Wood to the south-west. Given the suitability of habitat in the wider area, but the low value of the habitats on site, it is assessed that polecats may occasionally commute across the site, but that the site is not of significant nature conservation importance for them. Precautionary

measures to avoid harm to polecats commuting across the site during the construction phase are provided in Section 6.8.

4.4.7 The site is dominated by a cereal crop field which provides cover and shelter for brown hares. Brown hares are common in agricultural landscapes which support a mosaic of arable fields, grasslands and hedgerows. Given the agricultural setting of the site, it is assessed that brown hare are likely present in the area and utilising the site for commuting and foraging purposes. Any brown hares present on site are considered to be of **Local importance** for nature conservation.

4.4.8 The site does not support any suitable harvest mouse habitat. They are therefore assessed as likely absent from the site and they are scoped out of this assessment.

## 4.5 Badgers

4.5.1 Thirty-three badger records were returned by the data search. They mostly related to Tiddesley Wood, 430m to the south-west, and the outskirts of Drakes Broughton, 1.5km to the north-west. Several of the most recent records related to roadkill observed along Worcester Road (B4084) which runs along the northern boundary of the site.

4.5.2 The site is dominated by cropland with boundary hedgerows which provide foraging and commuting opportunities for badgers. The PEA undertaken by Betts Ecology (2024) identified a number of potential mammals holes which were of a suitable size for badgers. However, after monitoring the holes using camera traps, it was assessed that the holes were not in active use.

4.5.3 The surveys undertaken by Ethos in 2024 identified the same holes along the western boundary, as well as a number of badger latrines along the western boundary and along hedgerows west of the site.

4.5.4 Whilst it is assessed that the site does not currently support an active sett, the presence of latrines on and off site shows badgers are present, and the status of the currently disused set could change at any point. As badgers are not a species of principal importance, they are not assigned any scale of importance for nature conservation. However, they are legally protected whilst occupying a sett and therefore precautionary mitigation is provided in Section 6 of this report to avoid direct impacts on badgers during the construction phase.

*Photo 9 Mammal hole on W boundary*

## 4.6 Hazel Dormice

4.6.1 No hazel dormice records were returned by the data search.

4.6.2 The site comprises an agricultural field supporting cereal crop, which is of negligible value for hazel dormice. The suitable hazel dormice habitat on site is restricted to the boundary hedgerows and line of trees. The hedgerows support a variety of native species which provide foraging opportunities for dormice.

4.6.3 A single dormouse nest was found in the north west of the site during the survey in September. The location of the nest is along the northern hedgerow which is well connected to hedgerows across the wider landscape. This is in contrast to the western hedgerow which is gappy, and to an extent the southern hedgerow which has an existing field entrance gap. The survey results suggest a small population is present on site, likely limited to the northern boundary which is well connected to other suitable habitat.

4.6.4 Dormouse are a species of Principal Importance and a European Protected Species, and whilst numbers on site are likely to be low and limited to the northern boundary, this would be considered to be of **County importance** for nature conservation.

## 4.7 Riparian Mammals

4.7.1 Fifteen otter records were returned by the data search. Approximately half related to live sightings and the closest records were located along Bow Brook approximately 850m west of the site.

4.7.2 A single water vole record was returned from 2000. The record was located in proximity to the River Avon approximately 1.3km to the east of the site.

4.7.3 There are no watercourses present on site and the terrestrial habitat is assessed to be of poor suitability for riparian mammals. The nearest watercourses, Bow Brook to the west of the site and the River Avon 1.3km to the east, are assessed as likely to support riparian mammals, with several associated records returned by the data search. The site is separated from these watercourses by urban development to the east and further agricultural habitats to the west, both of which are assessed to be poor terrestrial habitats. As such, it is considered that riparian mammals are likely absent from the site and they are scoped out for further assessment.

## 4.8 Bats

4.8.1 The data search identified over one hundred records of bats within 2km. Species recorded include common pipistrelle, soprano pipistrelle, serotine (*Eptesicus serotinus*), Daubenton's bat (*Myotis daubentonii*), Whiskered bat (*Myotis mystacinus*), Natterer's bat (*Myotis nattereri*), Leisler's bat (*Nyctalus leisleri*), noctule, Nathusius' pipistrelle (*Pipistrellus nathusii*), brown long-eared bat (*Plecotus auritus*), lesser horseshoe bat (*Rhinolophus hipposideros*) and barbastelle (*Barbastella barbastellus*).

4.8.2 Several of the records related to roosts within Tiddesley Wood approximately 430m south-west of the site. Species roosting within the woodland included noctule, lesser horseshoe and barbastelle.

4.8.3 Three granted EPS licences relating to bats were identified within 2km. The details of the licences are provided below:

- 2016-25452-EPS-MIT granted in 2016 for brown long-eared bat, common pipistrelle, lesser horseshoe bat, Natterer's bat and soprano pipistrelle. Located approximately 1.4km to the south-east.
- 2016-21540-EPS-MIT-1 granted in 2016 for brown long-eared bat, common pipistrelle, Daubenton's bat and lesser horseshoe bat. Located approximately 1.4km to the south-east.
- 2020-46473-EPS-MIT granted in 2020 for lesser horseshoe. Located approximately 1.9km to the south-west.

<u>Ground level assessment of trees</u>

4.8.4 The tree numbers referred to within this report correspond to the tree numbers in the 'Tree Constraints Plan' (Betts Ecology, 2024). The ground level assessment of trees identified 6 oak trees with potential roosting features (PRFs) for bats, with several trees supporting PRF-Ms. The trees are predominantly located along the western boundary, with one located along the southern boundary. Detailed descriptions of the trees with PRFs are provided in Appendix 3.

<u>Emergent Surveys of Trees</u>

4.8.5 During the emergence surveys in June and August, approximately five common pipistrelle bats were observed emerging from the group of three mature oak trees on

the western boundary of the site. The bats were observed foraging around the trees and western boundary for the majority of the survey.

4.8.6 Each of the trees has multiple potential roosting features, and it was not possible to pinpoint the exact roosting locations due to the presence of dense foliage. The number of bats that are roosting is estimated to be five, as that was the maximum number observed foraging in and around the trees.

4.8.7 Images from the thermal imaging cameras and daytime photos of the trees are shown below.

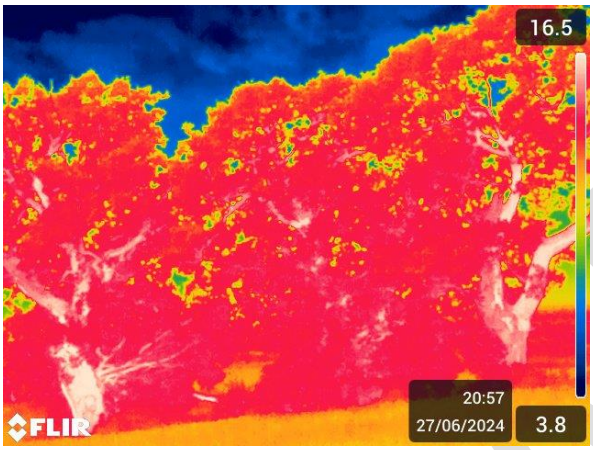


*Photo 10 Group of three trees*

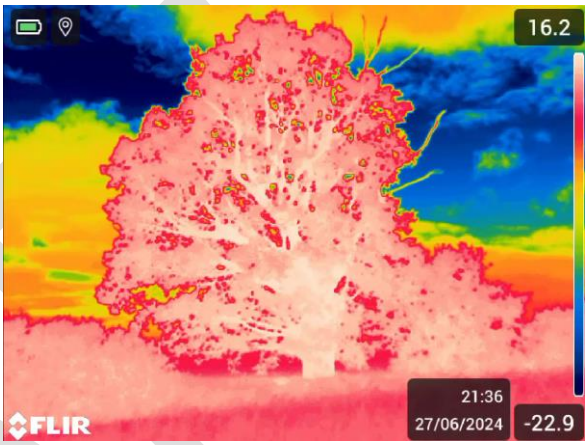


*Photo 11 Single tree*

*Photo 12 Group of three and single tree (daytime)*

Night-time walkover surveys

4.8.8 A night-time walkover survey was undertaken on 27th June and 16th August 2024. During both surveys, only common pipistrelle bats were recorded. Activity was focused around the mature and veteran oaks along the western boundary and consisted predominantly of foraging.

4.8.9 The full results of the night-time walkover survey are provided in Appendix 4. One further survey is planned for September 2024, the results of which will be provided in the Ecological Addendum.

Automated/static detector surveys

*General activity*

4.8.10 Thirteen bat species were recorded on the static detectors, namely common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Brandt's/whiskered bat, noctule, barbastelle, Daubenton's bat, Natterer's bat, Leisler's bat, Bechstein's bat, brown long-eared bat, serotine and lesser horseshoe bat.

4.8.11 Common pipistrelle was the most abundant species recorded comprising 94% of all recordings, followed by Nathusius' pipistrelle (1.18%), soprano pipistrelle (1.1%) and Brandt's/whiskered bat (0.86%), as shown in Figures 8 and 9. A total of 205 barbastelle calls were recorded (0.61% of total calls) and relatively low numbers of Bechstein's bat (0.12%) and lesser horseshoe bat (0.05%) calls were recorded.

4.8.12 Activity levels along the western boundary (P4) were significantly higher than along the other boundaries of the site, as shown in Figure 8.

4.8.13 The full results of the static detector surveys are provided in Appendix 4. Further static detector surveys will be undertaken in September and October 2024.

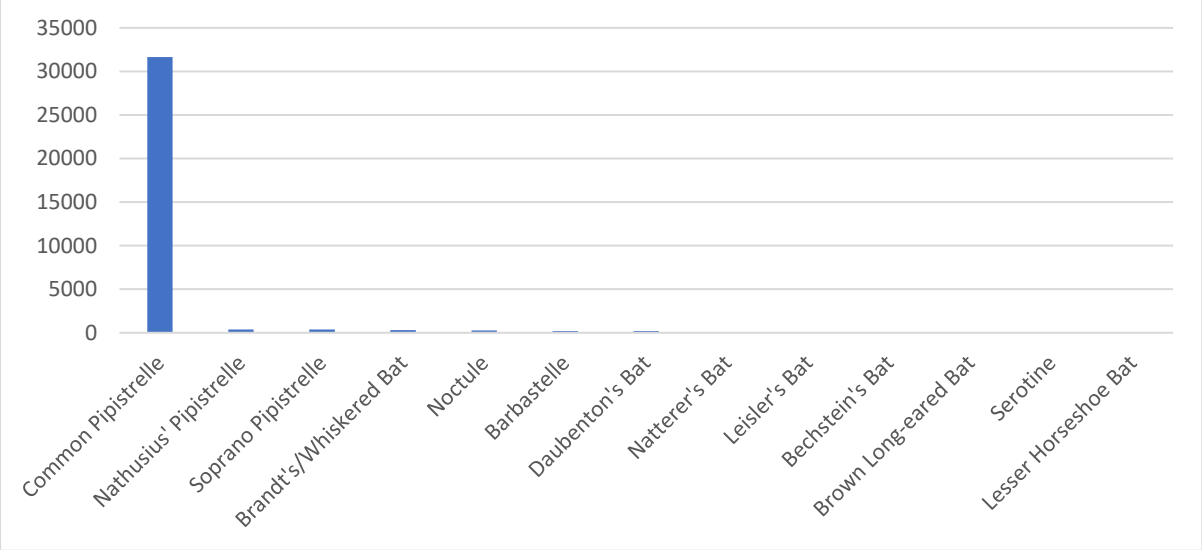


*Figure 8 Total calls per species across the June and July survey periods*

Add in graphs of Annex II – check remining figure numbers

*Summary*

4.8.14 The group of three veteran oak trees on the western boundary of the site are a roost for approximately 5 common pipistrelle bats.

4.8.15 Bat activity at the site is dominated by common pipistrelle bats (92%), of which, the majority (xx%) were recorded on the static detector on the western boundary,

reflecting the findings of the activity and emergent surveys. The presence of the Common Pipistrelle bat roost and associated activity is assessed to be of **Local importance** for nature conservation.

4.8.16 The other boundaries of the site are used infrequently by common pipistrelle bats and are not considered to be of particular importance.

Annex II species

4.8.17 Further analysis of Barb, LHS and Bech required.

## 4.9 Birds

4.9.1 The data search identified over two hundred bird records within 2km. Records included several species listed in Schedule 1 of the Wildlife and Countryside Act 1981, such as redwing (*Turdus iliacus*), fieldfare (*Turdus pilaris*), barn owl (*Tyto alba*) and Cetti's warbler (*Cettia cetti*). Records of species on the RSPB's Birds of Conservation Concern (BoCC) Red list include skylark (*Alauda arvensis*), corn bunting (*Emberiza calandra*), yellowhammer (*Emberiza citrinella*), linnet (*Linaria cannabina*), grasshopper warbler (*Locustella naevia*), spotted flycatcher (*Muscicapa striata*), house sparrow (*Passer domesticus*), marsh tit (*Poecile palustris*), whinchat (*Saxicola rubetra*), starling (*Sturnus vulgaris*), song thrush (*Turdus philomelos*) and mistle thrush (*Turdus viscivorus*). Most of the records related to Avon Meadows LNR 1.2km east of the site.

4.9.2 The site is dominated by an agricultural field which is assessed to be of low value for birds. The boundary hedgerows and line of trees provide foraging and nesting opportunities for common and widespread species of birds, as well as farmland species. Several of the crevices within the mature and veteran oak trees are of a suitable size to support nests for birds of prey. In particular, the PEA carried out by Betts Ecology (2024) identified a little owl nest within one of the trees along the western boundary.

4.9.3 Due to the likely intensive management of the agricultural habitat, and the abundance of trees providing perching opportunities for birds of prey and corvids along the site boundaries, it is assessed that ground nesting birds are likely absent.

4.9.4 Overall, it is assessed that the site is likely to support an assemblage of birds which is not of significant nature conservation importance. Therefore, birds are only considered further within this assessment in relation to precautionary working methods during the construction period, discussed in Section 6.10, and biodiversity enhancements, discussed in Section 7.

## 4.10 Reptiles

4.10.1 Fourteen records of reptiles were identified within 2km of the site. This included eight records of slow worm (*Anguis fragilis*) and six records of grass snake (*Natrix helvetica*).

None of the records were dated from within the last decade and they mostly related to Avon Meadows LNR 1.2km to the east and Tiddesley Orchard 200m south-west.

4.10.2 The site offers suitability for reptiles within the hedgerows. However, there is minimal transitional habitat present between the hedgerows and the cereal crop and there are therefore minimal basking opportunities for reptiles present. The agricultural habitat itself offers negligible foraging opportunities for reptiles. Given the limited suitability of the habitat on site, it is assessed that reptiles are likely absent, and they are not discussed further.

## 4.11 Amphibians

4.11.1 The data search returned over one hundred amphibian records within 2km of the site. This included five great crested newt (GCN) records, thirty-six common frog (*Rana temporaria*) records, sixteen smooth newt (*Lissotriton vulgaris*) records and fourty-six common toad (*Bufo bufo*) records.

4.11.2 All but one of the GCN records were dated from before 2001 and they related to Tiddesley Wood approximately 430m south-west of the site and Caddicroft Farm approximately 1.5km to the north-west. The most recent GCN record was located approximately 760m south of the site and appeared to relate to a garden pond.

4.11.3 Three granted EPS licences relating to GCN were identified within 2km. The details of the licences are provided below:

- 2018-35410-EPS-MIT-2 granted in 2019 located approximately 670m south.
- EPSM2011-3169 granted in 2011 located approximately 670m south.

4.11.4 In addition, GCN class survey licence returns demonstrated that GCN were confirmed to be present at three locations, all approximately 605m south of the site, between 2014 and 2017.

4.11.5 The desk study did not identify any ponds within 500m of the site, as shown in Figure 8. There are no waterbodies present on site, and therefore no breeding opportunities for amphibians. The terrestrial habitats are dominated by a cereal crop field which is of poor suitability for GCN and other amphibians. The key features on site are assessed to be the boundary hedgerows which provide cover for commuting amphibians. However, there are roads directly to the north and south of the site which act as significant barriers to amphibian dispersal. The habitats to the east and west, namely the further agricultural habitat and urban development, are also of poor suitability for reptiles, reducing the overall connectivity of the site.

4.11.6 Given the lack of suitable habitats on, and in proximity to the site, it is assessed that GCN and other amphibians are likely absent and they are not considered further in this assessment.

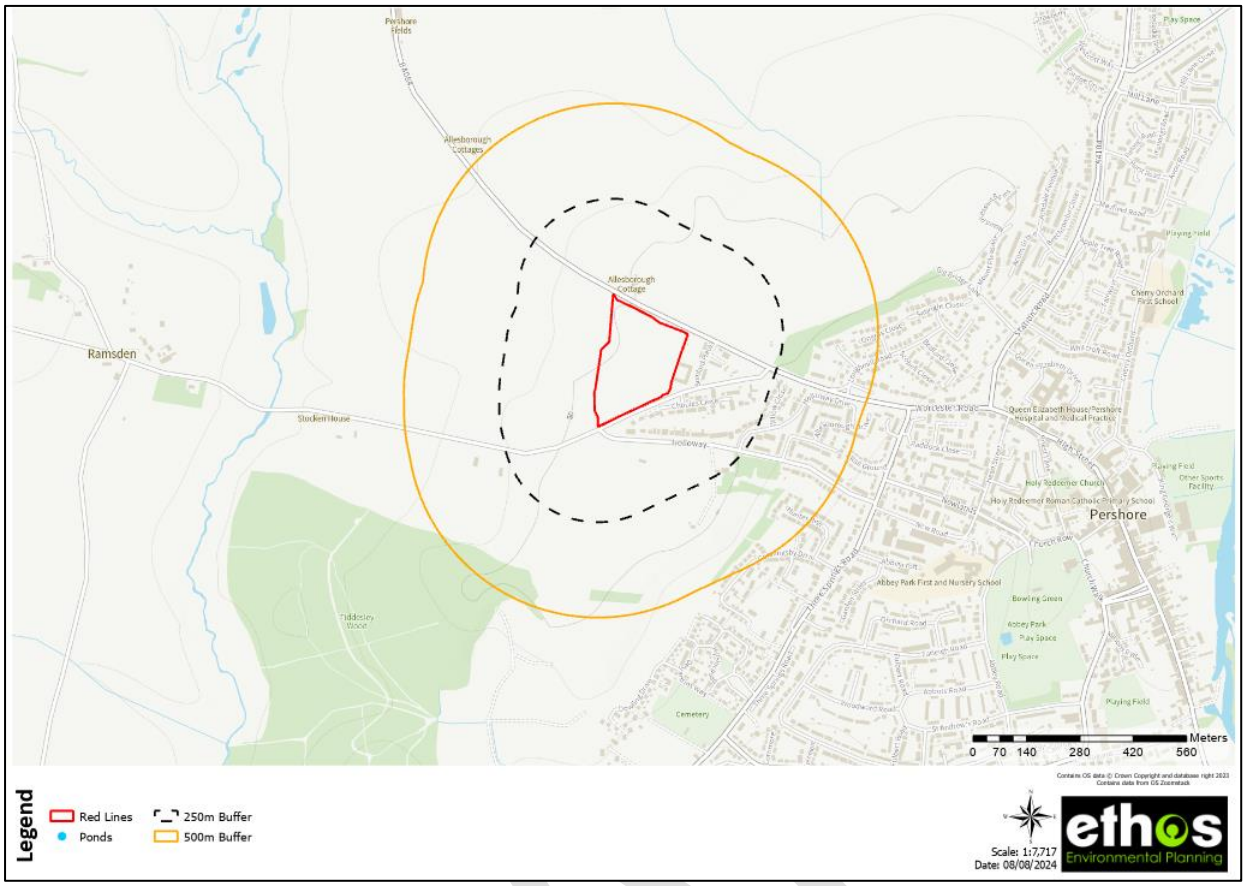


*Figure 9 Ponds within 500m*

## 4.12 Invertebrates

4.12.1 Over five hundred invertebrate records were returned by the data search. This included several NERC S.41 species, such as noble chafer (*Gnorimus nobilis*), small heath (*Coenonympha pamphilus*), white admiral (*Ladoga camilla*), small blue (*Ladoga camilla*), ghost moth (*Hepialus humuli*) and cinnabar (*Tyria jacobaeae*).

4.12.2 The site is dominated by an agricultural habitat with limited botanical diversity. There are minimal field margins present and the boundary hedgerows support species which are common and widespread across the UK. The key features for invertebrates are assessed to be the mature and veteran trees which support a range of ecological niches. These trees are being retained as part of the proposed development. Overall, it is considered that the site is unlikely to support an assemblage of invertebrates that is of particular nature conservation importance and the key features for invertebrates are being retained. As such, invertebrates are scoped out of this assessment and are only discussed further in relation to enhancements for biodiversity.

## 4.13 Invasive Species

4.13.1 No records of invasive floral species listed in Schedule 9 of the Wildlife and Countryside Act 1981 were returned by the data search.

4.13.2 No invasive species were observed on site. They are therefore considered absent and are not discussed further in this assessment.

## 4.14 Summary

4.14.1 The important ecological features of relevance to this assessment and their importance are summarised in Table 5.

*Table 5 Important ecological features*

| Important ecological features | Scale of importance |
|---|---|
| Tiddesley Wood SSSI | National |
| Stocken and Tiddesley Wood Orchards LWS | Local |
| Hedgerows and line of trees | Local |
| Hedgehogs | Local |
| Brown hares | Local |
| Common Pipistrelle bat roost | Local |
| Hazel dormice | County |
| Polecats | N/A - precautionary |
| Badgers | N/A - precautionary |
| Birds | N/A - precautionary |

# 5 DESCRIPTION OF THE PROPOSED DEVELOPMENT

5.1 The proposals are in outline illustrative form, and comprise a residential development of up to 115 residential dwellings as shown in Figure 9.

5.2 The illustrative layout of the development has been developed to minimise impacts on site ecology as follows:

- Retention of the key ecological features on site, namely the boundary hedgerows and veteran and mature trees.
- Provision of ecological buffers along the site boundaries to maintain ecological corridors and protect the connectivity of the site.
- Citing of the development footprint within a habitat which is of low ecological value.
- Citing of the access gap along the southern hedgerow to avoid the removal of ecologically valuable trees.

5.3 The proposed access to the development is not reserved for later approval, and requires the removal of 20 metres of hedgerow and cutting back of 66 metres of hedgerow on the southern boundary of the site.


*Figure 10 Planting strategy – 240274-RAP-XX-XX-DR-L-4001 (Rappor, Sep 2024)*

# 6 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

## 6.1 Tiddesley Wood SSSI

Construction

6.1.1 The site has no habitat connectivity with Tiddesley Wood SSSI and it is located at a sufficient distance that both direct and indirect impacts on the SSSI during the construction phase will be avoided.

Operational

6.1.2 Tiddesley Wood SSSI supports multiple trails which are open to the public. As the development comprises the construction of 121 new residential properties within 500m of the SSSI, there is potential for an increase in footfall across the SSSI which could lead to recreational impacts. However, Tiddesley Wood is managed by Worcestershire Wildlife Trust for both recreational use and benefits to biodiversity. They promote recreational use by maintaining a car park and footpaths with associated signage to prevent degradation of habitats outside the designated areas of public use. As such, it is considered that there will be no significant adverse effect on Tiddesley Wood SSSI as a result of the proposed development.

## 6.2 Stocken and Tiddesley Wood Orchards LWS

Construction

6.2.1 Stocken and Tiddesley Wood Orchards LWS is located approximately 200m from the site. Potential impacts on the LWS could arise from polluting construction activities, such as creation and deposition of dust and water run off. To avoid impacts on Stocken and Tiddesley Wood Orchards LWS, pollution prevention controls will be required during the construction phase. This will comprise standard control measures which can be detailed within a Construction Environmental Management Plan (CEMP) which can be secured by planning condition.

Operational

6.2.2 Stocken and Tiddesley Wood Orchards supports a public right of way which runs along the western and southern boundaries of the site. Whilst the LWS may experience an increase in footfall as a result of the proposed development, it is assessed that footfall will be restricted to the margins and is unlikely to result in significant adverse effects on the habitats present within the orchard areas. In addition, one of the two orchards is managed by Worcestershire Wildlife Trust as part of the Tiddesley Wood reserve described in Section 6.1.2. As such, it is considered that there will be no significant adverse effect on Stocken and Tiddesley Wood Orchards LWS as a result of the proposed development.

## 6.3 Hedgerows and Line of Trees

Loss

6.3.1 Approximately 20m of the southern boundary hedgerow will be removed to allow access to the site. In addition to this, approximately 66 metres of hedgerow will need to be cut back to facilitate the visibility splay. The southern hedgerow was assessed as unimportant under the Hedgerow Regulations. It is not considered that this loss of hedgerow is sufficient to require bespoke compensation, however, it is noted that the scheme will include approximately 310 metres of new hedgerow planting along the northern and southern boundaries to reinforce the existing vegetation and strengthen the connectivity of the site.

Construction

6.3.2 The remaining hedgerows and line of trees on site will be retained as part of the proposed development. In the absence of mitigation during construction, impacts could include damage to the root protection zones of the trees as well as impacts from construction pollution and unsuitable construction lighting. To avoid impacts, there will be ecological buffers along the northern, western and southern boundaries. These buffers will vary in size but will be a minimum of 15m in width. Sensitive construction lighting will be implemented and pollution prevention controls will also be required. These measures will be set out within the CEMP.

Operational

6.3.3 In the absence of mitigation, impacts to the hedgerows and the line of trees during the operational phase could include damage from excessive residential management. To avoid damage, the hedgerows and line of trees will be located outside of private ownership and will therefore be managed and maintained by a management company, which will be set out within a Habitat Management and Monitoring Plan (HMMP), which can be secured by planning condition.

6.3.4 Overall, with the implementation of precautionary mitigation during construction and suitable management and maintenance of the hedgerows and line of trees, no significant adverse effects are predicted as a result of the proposed development.

6.3.5 Enhancements to the hedgerows and line of trees will include new native planting adjacent to the existing vegetation to reinforce these features and improve their structure to enhance them for a range of species. Therefore, it is expected that the proposed development will result in a **long-term positive effect** on the site's hedgerows and line of trees.

## 6.4 Hazel Dormice

6.1 There is a small population of dormouse present on site, which was assessed to be limited to the northern boundary. Impacts on dormouse could arise during the construction and operational phase.

Construction

6.4.1 The access to the site requires the removal of 20 metres of hedgerow and cutting back of 66 metres of hedgerow on the existing road side. Whilst it has been assessed dormouse are unlikely to be present along this hedgerow, this cannot be fully ruled out. On this basis, whilst it is not considered the works require an EPS license, a non-licensed precautionary working method must be followed. The details of the method statement will be set out within the CEMP, using the following principles:

- Prior to any vegetation clearance, the areas to be removed must be checked by a suitably qualified ecologist for the presence of any dormouse or their nests. Once confirmed to be free of this species, vegetation clearance can take place;
- Removal of above-ground vegetation must take place during the dormouse hibernation season, which runs from November to March inclusive. Once cleared, the scrub must be kept short to prevent it becoming suitable for dormouse;
- Clearance works must be carried out using hand tools;
- Removal of the roots and stumps must be carried out in the dormouse active season (April – October). Again, immediately prior to works being carried out, the area must be checked by a suitably qualified ecologist.

6.4.2 Retained hedgerows will be protected during construction through the provision of tree protection hedgerows, which can be secured by planning condition.

6.4.3 Compensation for the loss of the hedgerow will be delivered by the scheme, and will include the planting of 310 metres of native hedgerow on site.

Operational

6.4.4 Operational impacts could arise during the operational phase from damage to retained hedgerows, human disturbance and potentially increased predation from domestic animals such as cats (although the latter point is not fully evidenced, the Dormouse Conservation Handbook states *"Dormouse are rarely caught in traps or by predators such as cats and owls, so it is easily overlooked even where present").*

6.4.5 The scheme has sought to avoid impacts on hedgerows (and therefore dormouse) through the provision of significant ecology buffers to hedgerows on the south, west and north boundaries. This will serve to reduce potential disturbance and provide an ecology buffer between the built form and hedgerows. The landscape plan also includes the provision of additional suitable dormouse habitat comprising native

broadleaved woodland planting. Further enhancements for dormouse will be delivered for dormouse as set out at section 7 of this report.

6.4.6 Overall, the scheme is considered to result in an overall positive effect for dormouse.

## 6.5 Hedgehogs

Construction

6.5.1 The site has the potential to support hedgehog and in the absence of mitigation, impacts on hedgehog could occur during site clearance, comprising injury or mortality of hedgehog foraging and commuting over site. Good practice measures to avoid impacts on hedgehog comprise appropriate storage of materials to avoid creating refugia, the installation of escape ramps in exposed trenches to ensure hedgehog do not get trapped overnight and a sensitive construction lighting plan. These measures will be set out within the CEMP.

Operational

6.5.2 Whilst the development proposals will result in the loss of cropland, which is assessed to provide potential foraging habitat for hedgehog, the majority of the more valuable habitats are being retained and enhanced. This includes the boundary hedgerows which provide foraging opportunities as well as suitable cover for commuting and nesting hedgehog.

6.5.3 Given the retention of the more valuable hedgehog habitat on site and the creation of other suitable foraging habitat, namely a network of residential gardens, the proposed development is not expected to have a significant adverse effect on hedgehogs. To ensure the site remains permeable to hedgehog post-construction, non-permeable fencing (e.g. close-boarded fencing between residential gardens) will contain suitable holes at the base to ensure hedgehog can continue to commute and forage across the site.

6.5.4 The proposals for the site include several enhancements (discussed in Section 7) which will increase the value of the site for invertebrates and the species which feed on them, such as hedgehogs. It is therefore assessed that there will be a **long-term positive effect** on hedgehogs as a result of the proposed development.

## 6.6 Brown Hare

Construction

6.6.1 It is assessed that brown hare are likely present in the wider area and utilising the site for commuting and foraging purposes. In the absence of mitigation, impacts on brown hare could occur during site clearance, comprising injury or mortality. Good practice measures to avoid impacts on brown hare comprise the installation of escape ramps in

exposed trenches to ensure animals do not get trapped overnight along with a sensitive construction lighting plan. These measures will be set out within the CEMP.

Operational

6.6.2 The proposed development will result in the complete loss of brown hare habitat and the site will therefore no longer be suitable for brown hares during the operational phase. Given the amount of suitable agricultural habitat present in the local area, it is assessed that any adverse effects on brown hare resulting from the loss of habitat will be minor and temporary as they adjust to the change in landscape and locate alternative opportunities.

## 6.7 Bats

6.7.1 The surveys undertaken to date indicate that the assemblage of bats utilising the site is dominated by a common and widespread species, namely common pipistrelle, which are roosting within the mature and veteran trees located along the western boundary.

6.7.2 The scheme provides ecological buffers of at least 15m located along the northern, western and southern boundaries which will reduce light spill onto the key habitats and maintain vegetated corridors for foraging bats. The hedgerows and line of trees will be located outside private ownership to prevent damage to these habitats through excessive management. In addition to these measures, a lighting strategy will be required to demonstrate that the boundary features will not experience light spill above 0.5 Lux.

## 6.8 Polecats

6.8.1 It is assessed that polecats may be present in the wider area and occasionally commute across the site. The method statement for ensuring the protection of polecats during the construction period will include the installation of escape ramps in exposed trenches to ensure individuals do not get trapped overnight and limiting the period of construction lighting. These measures will be detailed within a CEMP.

## 6.9 Badgers

6.9.1 Surveys undertaken in 2024 identified several mammal holes which upon monitoring were found to be inactive. The holes are located along the western boundary which is due to be retained and buffered. To ensure that impacts on badgers are avoided as a result of the proposed development, it is recommended that an updated pre-works check be undertaken by a suitably qualified ecologist. This will be carried out to assess if badger activity on the site has changed and the results of the pre-works check will determine the requirement for further monitoring or licencing.

6.9.2 The general method statement for ensuring the protection of foraging/commuting badgers during the construction phase will be the same as outlined for polecats. In

addition, open pipework with a diameter of more than 120mm should be properly covered or capped at the end of the working day to prevent badgers from entering and becoming trapped.

## 6.10 Birds

6.10.1 Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), so it will be necessary to avoid damage or destruction of nests, or disturbance of nesting birds, during the construction phase. In order to mitigate impacts to breeding birds, removal of any suitable bird nesting habitat, namely the ~10m stretch of the southern boundary hedgerow to allow access, will either be undertaken outside of the nesting season (March-August inclusive) or be subject to a pre-works check by a suitably qualified ecologist. The method statement for ensuring the protection of nesting birds will be detailed within the CEMP, to be secured by a planning condition.

## 6.11 Summary

6.11.1 A summary of the predicted significance of any effects, as well as the proposed mitigation/compensation measures and how these may be secured are outlined in Table 6.

*Table 6 Summary of significance of effects and mitigation*

| Ecological feature | Mitigation | Mechanism for securing delivery | Residual effects |
|---|---|---|---|
| Tiddesley Wood SSSI | • None required. | N/A | No significant effect |
| Stocken and Tiddesley Wood Orchards LWS | • Pollution prevention measures. | CEMP secured by condition | No significant effect |
| Hedgerows and line of trees | • Provision of ecological buffers.<br>• Sensitive lighting.<br>• Pollution prevention measures.<br>• Management of hedgerows post-construction. | CEMP secured by condition<br><br>HMMP secured by condition<br><br>Lighting strategy | Long-term positive effect |
| Hedgehogs | • Precautionary construction measures.<br>• Measures to ensure site remains permeable post-construction. | CEMP secured by condition<br><br>HMMP secured by condition | Long-term positive effect |
| Brown hares | • Precautionary construction measures. | CEMP secured by condition | Minor temporary adverse effect |
| Hazel dormice | • Retention and protection of key habitats.<br>• Provision of ecological buffers. | CEMP secured by condition<br><br>HMMP secured by condition | Long-term positive effect |

| Ecological feature | Mitigation | Mechanism for securing delivery | Residual effects |
|---|---|---|---|
| Bats | • Retention and protection of key habitats.<br>• Provision of ecological buffers.<br>• Sensitive lighting to maintain light levels below 0.5 Lux on key features. | CEMP secured by condition<br><br>HMMP secured by condition<br><br>Lighting strategy | TBC – dependent on remaining survey results |
| Polecats | • Precautionary construction measures. | CEMP secured by condition | N/A |
| Badgers | • Precautionary construction measures.<br>• Pre-works check by a suitably qualified ecologist. | CEMP secured by condition | N/A |
| Birds | • Precautionary construction measures during vegetation clearance/timing of works. | CEMP secured by condition | N/A |

## 6.12 Cumulative Effects

6.12.1 To be completed once residual effects have been concluded.

# 7 ENHANCEMENTS

## 7.1 Habitats

7.1.1 Additional native hedgerow and tree planting within the ecological buffers on the northern and southern boundaries will strengthen the connectivity of the site and increase the foraging resource of these features for bats, birds and hazel dormice. In addition, this will provide further nesting opportunities for hedgehogs.

7.1.2 Creation of new woodland, wildflower meadow areas and a SUDS basin within the western boundary buffer will provide a broader range of habitats on site which in turn will result in the presence of a greater variety of ecological niches.

7.1.3 The creation of a SUDS basin and associated wetland habitats will provide new opportunities for amphibians and aquatic invertebrates.

## 7.2 Protected Species

7.2.1 The enhancement of the ecological buffers and planting of new native hedgerows and trees as described in Section 7.1 will benefit a wide range of species including birds, bats, hazel dormice, amphibians, hedgehogs and invertebrates.

7.2.2 There is additional scope to enhance the site for a range of protected species with the following measures:

- Installation of twenty integrated bird boxes suitable for species such as house sparrow, starling and swift across the residential development;
- Installation of five hanging bird boxes suitable for species such as tits and wrens on the trees along the northern, western and southern boundaries;
- Installation of two owl boxes on the mature trees along the western boundary;
- Installation of twenty integrated bat boxes suitable for crevice-dwelling species such as pipistrelle bats and some *Myotis* species across the residential development;
- Installation of five hanging bat boxes suitable for barbastelle bats on trees along the western and southern boundaries;
- Installation of three bug hotels within the ecological buffers on the northern, western and southern boundaries; and
- Installation of two hedgehog houses within the ecological buffer on the western boundary.

<u>Dormouse</u>

7.2.3 Fifteen dormouse boxes will be installed in suitable locations within retained hedgerows to provide safe nest sites for dormice.

7.2.4 Existing hedgerows will be planted with honeysuckle (*Lonicera periclymenum*) as this provides an early food source for dormice as well as nesting material.

7.2.5 The strengthening of the existing hedgerows with thorny plants will also enhance them for foraging and commuting dormice. Blackthorn (Prunus spinosa), hawthorn (Crataegus monogyna) and bramble (Rubus fruticosus) are favoured food sources for dormice and would provide enhanced foraging opportunities. The planting will also increase the width of the hedges and research has shown that wider hedgerows are more valuable to this species

# 8 MONITORING

8.1 The mitigation measures set out in Section 6 which will be supervised by a suitability qualified ecologist, or 'Ecological Clerk of Works' (ECoW) will be recorded as a 'site note' by the ECoW, and if required made available to the LPA.

8.2 The provision of the ecological enhancements as set out in Section 7 will be subject to an ecological compliance report undertaken by the ECoW.

8.3 The habitat on site provided for biodiversity net gain will be monitored for success for 30 years. This will be the responsibility of the management company who will appoint an ecologist to undertake this. Details of habitat monitoring and remediation measures will be provided in the HMMP.

# 9 CONCLUSIONS

9.1 To be completed once all impacts and residual effects have been concluded.

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# APPENDIX 1 BADGER SURVEY TECHNICAL REPORT

See separate report

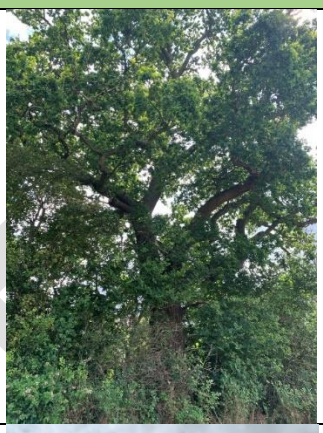
# APPENDIX 2 HEDGEROW REGULATIONS ASSESSMENT – SOUTHERN HEDGEROW

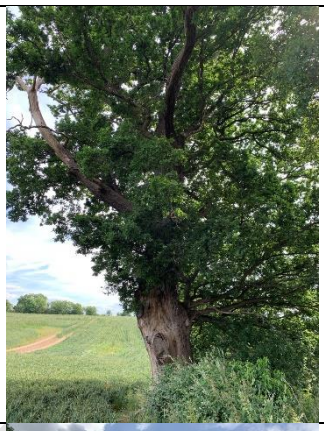
*Table 7 Hedgerow regulations assessment results*

| Criteria | Result |
|---|---|
| Is the hedgerow over 20m long or, if shorter, connected to other hedgerows at both ends or part of a longer hedgerow? | Yes |
| Is the hedgerow in or adjacent to common land, village greens, SSSIs, LNRs, or land used for agriculture, forestry or keeping of horses, ponies or donkeys? | No |
| Is the hedgerow at least 30 years old? | Yes |
| Is the hedgerow defunct? | Yes |
| Does the hedgerow contain standard trees? | Yes |
| What species are present? | Ash, oak, elm, bramble, elm, hawthorn, dog rose |

# APPENDIX 3 GROUND LEVEL ASSESSMENT OF TREES

*Table 8 Trees with potential roosting features*

| Tree number | Description of tree and PRFs | Photo(s) |
|---|---|---|
| T8 | Large oak tree with several PRF-Is present in the form of old pruning wounds. |  |
| T15 | Large oak tree with PRF-Ms in the form of significant amounts of standing deadwood, old pruning wounds and a small cavity near the base. |  |
| T18 | Large oak tree with PRF-Ms in the form of large wounds, flaking/decaying bark, standing deadwood, old pruning wounds and cavities. |  |

| | | | |
|---|---|---|---|
| T19 | Large oak tree with PRF-Is in the form of standing deadwood and small amounts of flaking bark. | |  |
| T20 | Large oak tree with PRF-Ms in the forms of a large crack with associated cavities. | |  |
| T21 | Large oak tree with PRF-Ms in the form of a large cavity near the base some standing deadwood. | |  |

# APPENDIX 4 BAT SURVEY DATA

The following section details the results of the bat surveys at the site. Codes used in the description of bat species are as follows:

| | |
|---|---|
| CP | Common pipistrelle (*Pipistrellus pipitrellus*) |
| SP | Soprano pipistrelle (*Pipistrellus pygmaeus*) |
| NP | Nathusius's pipistrelle (*Pipistrellus nathusii*) |
| NOC | Noctule bat (*Nyctalus noctula*) |
| LEI | Leisler's bat (*Nyctalus leisleri*) |
| SER | Serotine bat (*Eptesicus serotinus*) |
| MYOBECH | Bechstein's Bat (*Myotis bechsteinii*) |
| MYODAU | Daubenton's bat (*Myotis daubentonii*) |
| MYONATT | Natterer's bat (*Myotis nattereri*) |
| WHI/BRA | Whiskered/Brandt's bat (*Myotis mystacinus/brandti*) |
| BLE | Brown long-eared bat (*Plecotus auritus*) |
| BARB | Barbastelle bat (*Barbastella barbastellus*) |
| LHS | Lesser horseshoe bat (*Rhinolophus hipposideros*) |

Night-time bat walkover surveys

A summary of the night-time bat walkover surveys is included below, and the environmental variables recorded during the surveys are shown in Table 9.

*Table 9 Night-time walkover surveys environmental variables*

| **Date** | **27/06/2024** | | **16/06/24** | | **19/09/24** | |
|---|---|---|---|---|---|---|
| **Sunset/sunrise** | 21:29 | | | | | |
| Start/end time | 21:29 | 23:30 | | | | |
| Temperature (°C) | 15 | 13 | | | | |
| Humidity (%) | 68 | 72 | | | | |
| Cloud cover (oktas) | 7 | 7 | | | | |
| Avg. wind speed (m/s) | 1.9 | 2 | | | | |
| Rain | None | | | | | |

*Survey 1 – 27th June 2024*

- 22:03 CP foraging around the veteran oaks along the western boundary. This activity was continuous for the remainder of the survey.
- 22:07 CP brief pass along southern boundary.
- 22:09 CP brief pass along southern boundary.
- 22:40 CP x 2 foraging around the mature oak along the southern boundary.

*Survey 2 – 16th August 2024*

*Survey 3 – 19th August 2024*

Static bat detector surveys

*Table 10 Total calls per species across June and July survey periods*

| Species | Sum of calls | % of total calls |
|---|---|---|
| Common Pipistrelle | 31635 | 94.19 |
| Nathusius' Pipistrelle | 395 | 1.18 |
| Soprano Pipistrelle | 369 | 1.1 |
| Brandt's/Whiskered Bat | 287 | 0.86 |
| Noctule | 251 | 0.75 |
| Barbastelle | 205 | 0.61 |
| Daubenton's Bat | 182 | 0.54 |
| Natterer's Bat | 76 | 0.23 |
| Leisler's Bat | 70 | 0.21 |
| Bechstein's Bat | 40 | 0.12 |
| Brown Long-eared Bat | 36 | 0.11 |
| Serotine | 23 | 0.07 |
| Lesser Horseshoe Bat | 16 | 0.05 |
| **Grand total** | **33585** | |

*Table 11 Static detector survey results summary for June and July survey periods*

| Static location | Location deployed | Average calls/night (across all species) | Species recorded | Comments |
|---|---|---|---|---|
| P1 | Southern boundary hedgerow | 386 | 13 species: CP, SP, NP, NOC, LEI, SER, WHI/BRA, MYODAU, MYONATT, BLE, BARB, MYOBECH, LHS | CP accounted for 83% of records |
| P2 | Eastern boundary | 79 | 13 species: CP, SP, NP, NOC, LEI, SER, WHI/BRA, MYODAU, MYONATT, BLE, BARB, MYOBECH, LHS | CP accounted for 77% of records |
| P3 | Northern boundary hedgerow | 33 | 10 species: CP, SP, NOC, LEI, SER, WHI/BRA, MYODAU, MYONATT, BLE, BARB | CP accounted for 74% of records |
| P4 | Western boundary line of trees | 2861 | 13 species: CP, SP, NP, NOC, LEI, SER, | CP accounted for 95% of records |

| Static location | Location deployed | Average calls/night (across all species) | Species recorded | Comments |
|---|---|---|---|---|
| | | | WHI/BRA, MYODAU, MYONATT, BLE, BARB, MYOBECH, LHS | |

**NB: The term 'Activity' has been used during the analysis of the static bat detectors. Whilst static bat detectors cannot give an accurate indication of the number of bats foraging/commuting on site, they provide valuable information relating to species composition and comparisons from the number of records across the site. In this instance, the term 'activity' is based off the mean average records per night in order to prevent a period of intensive foraging over a short period of time skewing the results. It also allows for true comparison when detectors are deployed for different periods of time.*

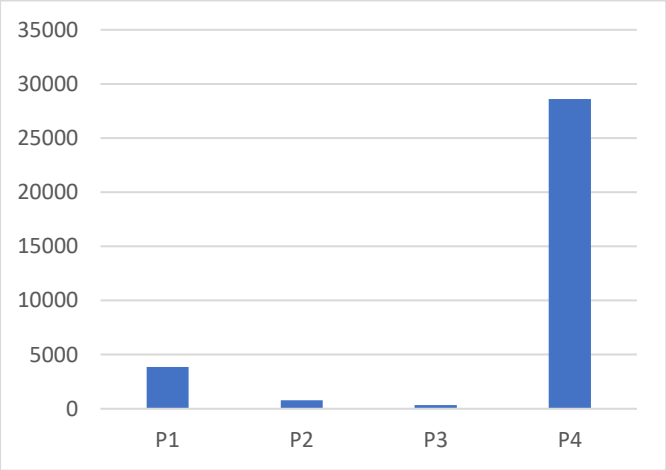



*Figure 11 Total calls based on location*

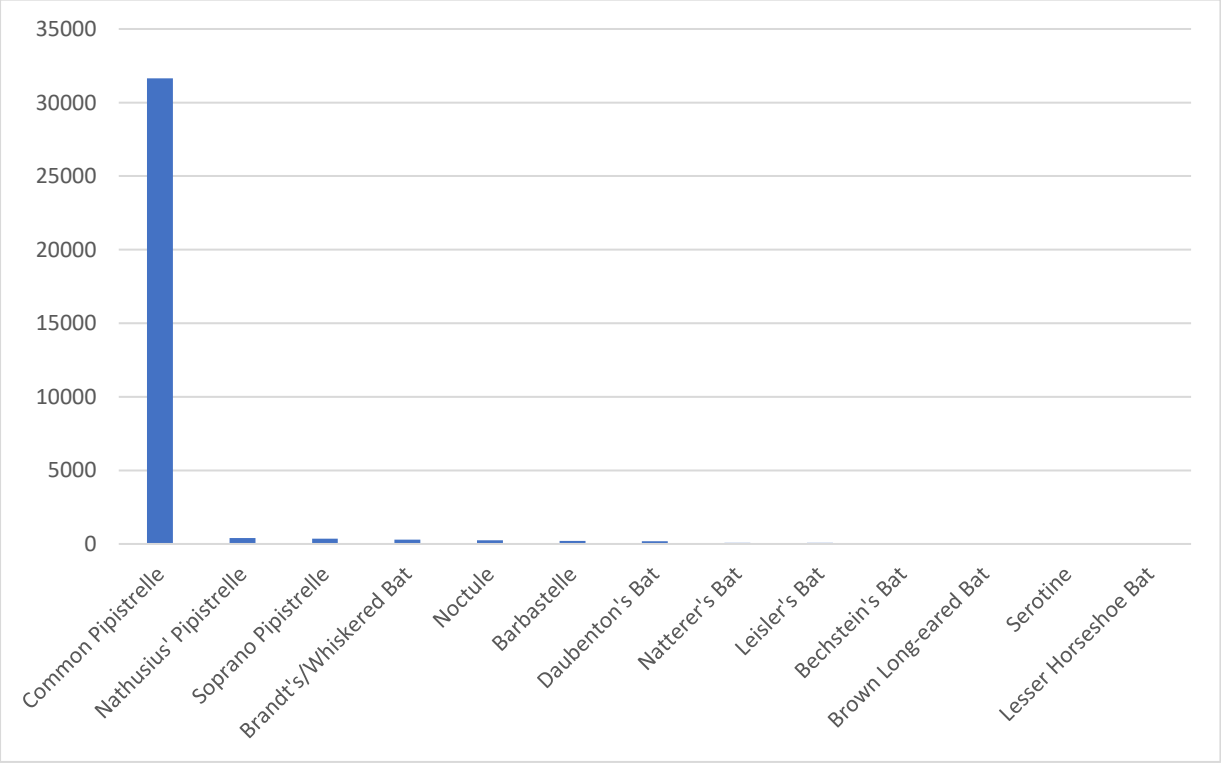



*Figure 12 Total calls per species*

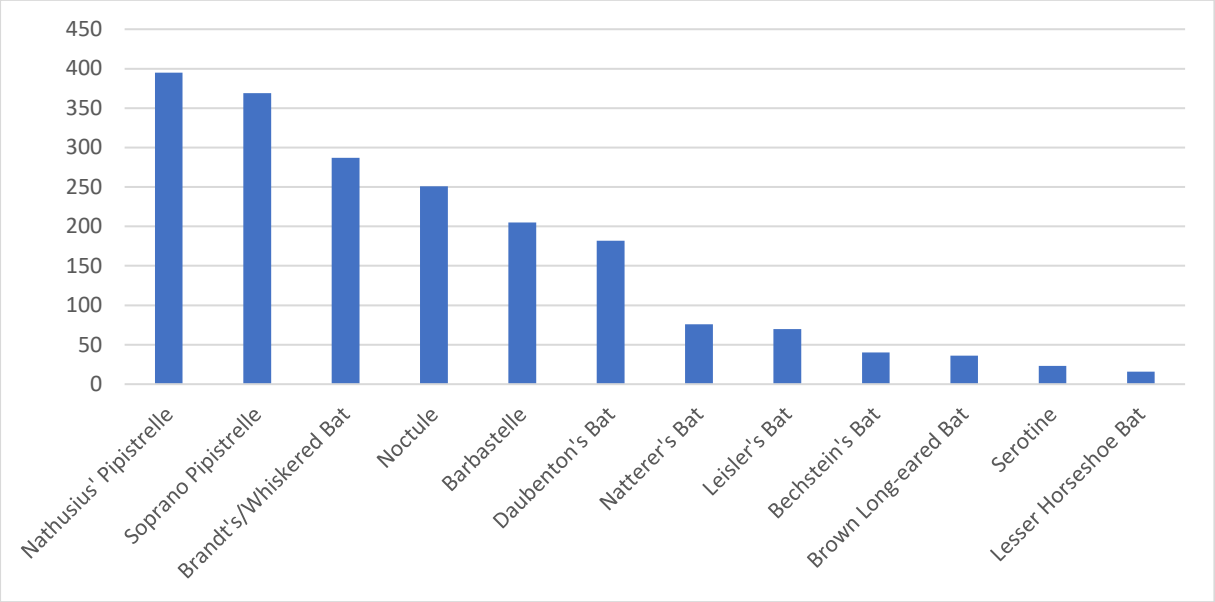



*Figure 13 Total calls per species excluding common pipistrelle*

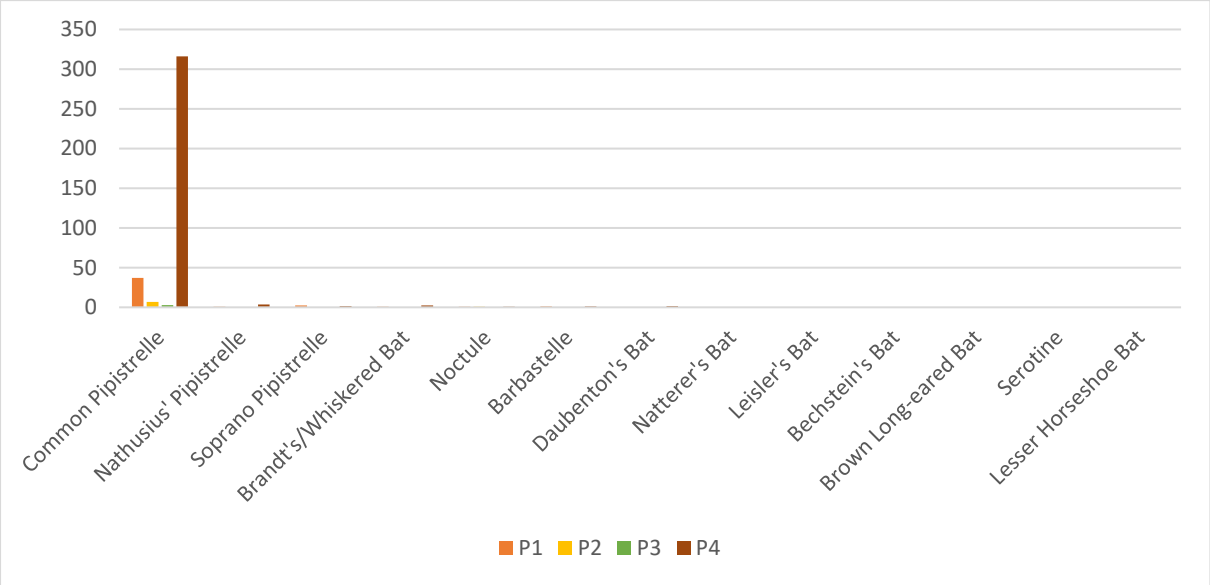



*Figure 14 Average calls per hour per night per location*

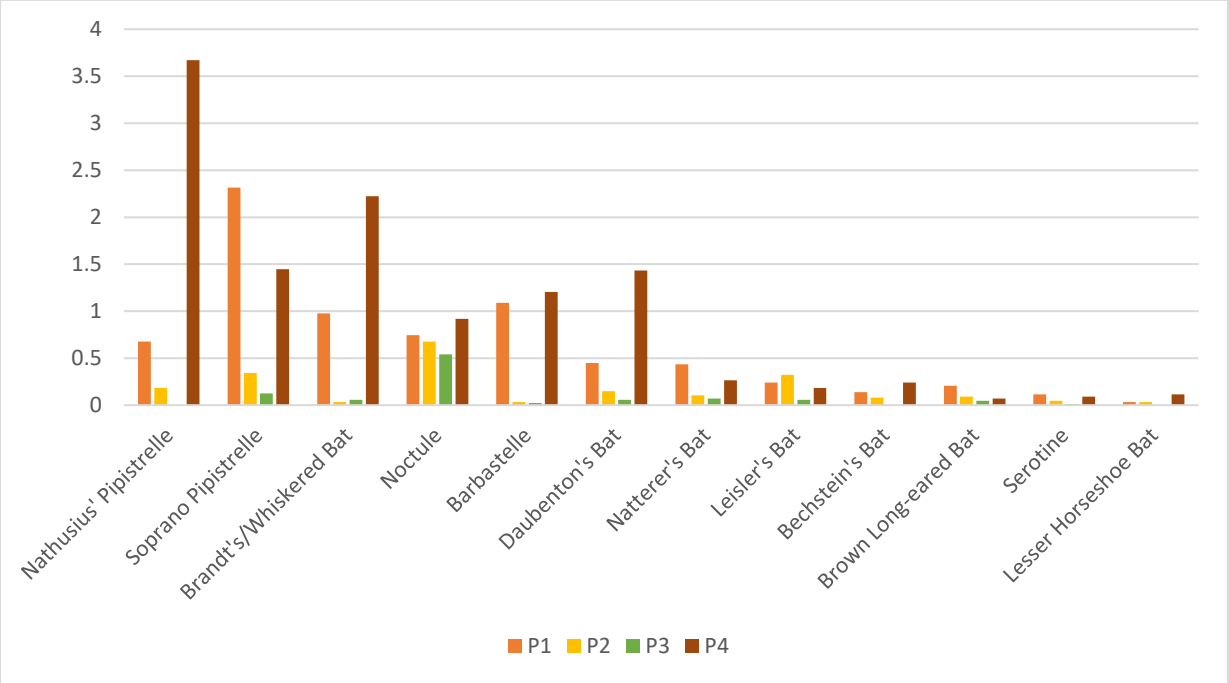



*Figure 15 Average calls per hour per night per location excluding common pipistrelles*