



Ecological Impact Assessment

Land East of Westergate

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Report	Ecological Impact Assessment
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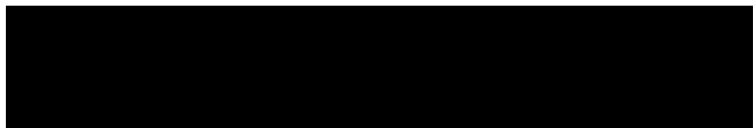


Table of Contents

EXECUTIVE SUMMARY	5
1.0 INTRODUCTION	6
1.1 BRIEF	6
1.2 SITE DESCRIPTION & LOCATION	6
1.3 PROPOSED DEVELOPMENT	7
2.0 RELEVANT LEGISLATION AND POLICY.....	8
2.1 LEGISLATION.....	8
2.2.1 <i>The Environment Act (2021)</i>	8
2.2.2 <i>The Conservation of Habitats and Species Regulations 2017 (as amended)</i>	8
2.2.3 <i>The Wildlife and Countryside Act (1981) (as amended)</i>	9
2.2.4 <i>The Countryside and Rights of Way Act (2000)</i>	9
2.2.5 <i>Natural Environment and Rural Communities Act (2006)</i>	9
2.2.6 <i>Protection of Badgers Act</i>	9
2.1.7 <i>The Environment Act (2021)</i>	9
2.2 POLICY	10
2.2.1 <i>National</i>	10
3.0 METHODOLOGY	14
3.1 IMPACT ASSESSMENT.....	14
3.2 DESK STUDY	15
3.2.1 <i>Data Request</i>	15
3.2.2 <i>Waterbodies</i>	15
3.3 FIELD SURVEY	15
3.3.1 <i>Habitats</i>	15
3.3.2 <i>Badger</i>	15
3.3.3 <i>Bats</i>	16
3.3.4 <i>Assessment of Pond</i>	20
3.3.5 <i>Phase II Reptile Surveys</i>	21
3.3.6 <i>Phase II Dormouse Surveys</i>	21
3.3.7 <i>Breeding Bird Surveys</i>	22
3.3.8 <i>Riparian Mammal Survey</i>	23
3.4 ASSESSMENT METHODOLOGY	23
3.4.1 <i>Introduction</i>	23
3.4.2 <i>Valuation</i>	23
3.4.3 <i>Limitations</i>	24
4.0 ECOLOGICAL BASELINE	25
4.1 DESIGNATED SITES.....	25
4.1.1 <i>Internationally / Nationally Designated</i>	25
4.1.2 <i>Locally Designated / Non-Statutory</i>	26
4.1.3 <i>Ownership & Management</i>	27
4.2 VEGETATION SURVEY RESULTS	28
4.2.1 <i>Modified Grassland (g4)</i>	28
4.2.2 <i>Other Neutral Grassland (g3c) with scattered scrub (11)</i>	29
4.2.3 <i>Wet Woodland (w1d) (PRIORITY HABITAT)</i>	30
4.2.4 <i>Bramble Scrub (h3d)</i>	31
4.2.5 <i>Winter Stubble (c1c5)</i>	31
4.2.6 <i>Hedgerow (h2a) (PRIORITY HABITAT) and Hedgerow with trees (190)</i>	31
4.2.7 <i>Other Rivers and Streams (r2b)</i>	32
4.2.8 <i>Developed Land; Sealed Surface (u1b)</i>	32
4.3 BAT SURVEY RESULTS	32

4.3.1 Pre-existing Data	32
4.3.2 Preliminary Roost Assessment (trees)	33
4.3.3 Phase II Emergence Surveys	34
4.3.4 Walked Transects	36
4.3.5 Static Monitoring.....	40
4.4 BADGERS.....	46
4.4.1 Pre-existing Information	46
4.4.2 On site Habitat Assessment.....	46
4.5 REPTILES.....	46
4.5.1 Pre-existing Information	46
4.5.2 On site Habitat Assessment.....	46
4.5.3 Phase II Survey Results	47
4.6 GREAT CRESTED NEWTS	49
4.6.1 Pre-existing Information	49
4.6.2 Water Bodies Within 500 m	51
4.6.3 On site Habitat Assessment.....	52
4.7 HAZEL DORMOUSE	52
4.7.1 Pre-existing Information	52
4.7.2 On site Habitat Assessment.....	53
4.7.3 Phase II Surveys	53
4.8 NOTABLE AND BIRDS OF CONSERVATION CONCERN (BoCC)	55
4.8.1 Pre-existing Information	55
4.8.2 On site Habitat Assessment.....	55
4.8.3 Phase II Breeding Bird Surveys	55
4.9 HEDGEHOGS.....	57
4.9.1 Pre-existing Information	57
4.9.2 On site Habitat Assessment.....	57
4.10 RIPARIAN MAMMALS	57
5.0 ZONE OF INFLUENCE	60
5.1 CONSTRUCTION PHASE.....	60
5.1.1 Change in Land Use	60
5.1.2 Noise Pollution.....	60
5.1.3 Air Pollution	60
5.1.4 Water Pollution	61
5.2 OPERATIONAL PHASE.....	61
5.2.1 Human Disturbance.....	61
5.2.2 Pollution.....	61
6.0 VALUATION.....	62
6.1 HABITATS ON SITE	63
6.2 BATS	63
6.2.1 Roosting Bats.....	63
6.2.2 Foraging and Commuting Bats.....	63
6.3 REPTILES.....	64
6.4 BIRDS.....	64
6.5 WATER VOLES/ STREAM	65
7.0 LIKELY ECOLOGICAL IMPACTS IN ABSENCE OF MITIGATION.....	66
7.1 INTRODUCTION	66
7.2 SITE PREPARATION AND CONSTRUCTION	66
7.2.1 Impacts to Habitats	66
7.2.2 Bats	66
7.2.4 BoCC / breeding and Nesting Birds.....	67

7.2.5 Water Voles/Stream	67
7.3 SITE OPERATION	67
7.3.1 Human Disturbance.....	67
7.3.2 Dog Walking	67
7.3.3 Pollution.....	67
8.0 MITIGATION	69
8.1 CONSTRUCTIONAL PHASE	69
8.1.1 Change in Land use and Habitat Clearance.....	69
8.1.2 Protecting Retained Trees / Hedgerows.....	69
8.1.3 Badgers.....	69
8.1.4 Reptiles	69
8.1.5 Bats.....	74
8.1.6 Tree Protection.....	75
8.1.7 Water Vole Mitigation Strategy.....	75
8.1.8 Biodiversity Net Gain	77
9.0 MATERIAL ENHANCEMENTS.....	78
9.2 BAT ROOST FEATURES.....	78
9.2.1 Integrated Bricks	78
9.2.2 Bat Boxes on Trees	78
9.3 BIRD NESTING FEATURES.....	79
9.3.1 Integrated Features	79
9.4 HEDGEHOGS.....	80
9.4.1 Hedgehog Homes	80
9.4.2 Hedgehog Highways.....	80
10.0 REFERENCES.....	81

Executive Summary

Ecosupport Ltd was instructed by Cala Homes to undertake an updated Preliminary Ecological Appraisal (PEA) of land east of Westergate, Chichester, PO20 3QR. This was required in order to identify any potentially important ecological features that may be affected by the proposed development. As part of this assessment, the following surveys were undertaken:

- Data request submitted to the Sussex Biodiversity Records Centre (SxBRC)
- Habitat survey assigning UK Hab types
- Preliminary Roost Assessment (PRA) of trees on site
- Reptile surveys (April & May 2023)
- Bat surveys (April-October 2023)
- Dormouse surveys (April-October 2023)
- Breeding bird surveys (March-June 2023)
- Water Vole Survey (May 2023)

The following important ecological features were identified on site following the conclusion of the above survey work and may be subject to adverse impacts in the absence of suitable mitigation / compensation:

- Confirmed presence of foraging and commuting bats (including Barbastelles (*Barbastella barbastellus*) and Bechstein's Bat (*Myotis bechsteinii*))
- A Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) summer day roost within one retained tree
- Confirmed low populations of Slow Worms (*Anguis fragilis*) and Common Lizards (*Zootoca vivipara*)
- High potential for foraging and commuting Badgers
- Confirmed presence of Birds of Conservation Concern (BoCC)

In the absence of any mitigation measures, the proposed development is anticipated to result in **certain adverse effects**. Suitable mitigation and enhancement measures are outlined within **sections 7.0 and 8.0** of this report.

1.0 INTRODUCTION

1.1 Brief

Ecosupport Ltd was commissioned by Cala Homes to conduct an updated Preliminary Ecological Appraisal (PEA) of land east of Westergate, Chichester, PO20 3QR (here after referred to as 'the site'). The purpose of this survey was to assess any ecological impacts that may arise as a result of a proposed residential development. The objectives of the survey were as follows:

- Identify and classify any priority habitats;
- Assess the ecological value of the site;
- Identify any signs of protected species and potential features that may support them
- Make recommendations for further survey work as necessary;
- Make recommendations for any necessary ecological avoidance and mitigation where possible at PEA stage.

Various previous survey work has been undertaken on site, the initial PEA was undertaken in 2011 by ECOSA Ltd (updated in 2015 by WYG and 2016 by ECOSA Ltd.). Based on the PEAs, subsequent Phase 2 survey work was undertaken between 2011 – 2012 as well as March – November 2016. These reports were in support of hybrid application AL/15/17/PL for a full planning application for 101 dwellings and an outline planning application for 249 dwellings. The hybrid application was refused, in regards to ecology this was on the basis that there was insufficient information in relation to ecology and trees, as well as survey data being over 3 years old. This report therefore provides an update to the existing work undertaken and to support a new outline hybrid application for 400 dwellings.

NB: If the works do not take place within 18 months of this report¹ then the findings of this survey will no longer be considered valid and may require updating.

1.2 Site Description & Location

The site comprises of approximately 19.35ha of grassland, arable, woodland, scrub and hedgerows/treelines located to the east of Westergate, Chichester, PO20 3QR (**Fig 1**) (centered on OS grid reference SU 941 048). The north of the site is bound by a secondary school and residential units, the majority of the east is bound by residential units except for the south-east of site which is largely bound by an adjacent field. Meanwhile the west of site is bound by agricultural land and finally, the south is bound by a railway line. The immediate surrounding wider environ is largely comprised of agricultural fields with the village of Westergate just to the east and twin village Eastergate to the north-east.

¹ <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

Figure 1. Google satellite aerial image of the site with approximate redline boundary.



1.3 Proposed Development

A hybrid application for the development of 400 dwellings and associated access, landscaping and drainage.

2.0 RELEVANT LEGISLATION AND POLICY

2.1 Legislation

2.2.1 The Environment Act (2021)

The Environment Act 2021 is the UK's new legislation for environmental protection in the UK, which includes protection of water quality, clean air, and biodiversity among other key protections. This Act provides the government power to set targets to reach long-term aims relating to the environment, which will be periodically reviewed and updated. This legislation also establishes a new environmental watchdog organisation, the Office for Environmental Protection (OEP), which will hold the government accountable on environmental issues.

Part 6 of The Environment Act relates to nature and biodiversity. This section makes provision for biodiversity net gain to be a condition of planning permission in England and a requirement for nationally significant infrastructure projects. Biodiversity net gain will require maintenance for a period of at least 30 years after the completion of enhancement works to be achieved.

The legislation also includes updates to existing environmental legislation, such as the NERC Act 2006, to strengthen biodiversity enhancement rather than just conservation and includes a requirement for local, or relevant, authorities to publish biodiversity reports. Further, The Environment Act places a requirement on responsible authorities to prepare local nature recovery strategies, which will outline nature conservation sites and priorities and opportunities for recovering or enhancing biodiversity within the local area. Within England, the legislation also provides Natural England with the power to publish 'species conservation strategies' and 'protected site strategies' to identify activities that may affect a species or site's status and outline their opinions on measures that would be appropriate to avoid, mitigate or compensate any adverse impacts.

2.2.2 The Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 transposes the EU Habitats Directive (Council Directive 92/43/EEC) into UK domestic law. It provides protection for sites and species deemed to be of conservation importance across Europe. It is an offence to deliberately capture, kill or injure species listed in Schedule 2 or to damage or destroy their breeding sites or shelter. It is also illegal to deliberately disturb these species in such a way that is likely to significantly impact on the local distribution or abundance or affect their ability to survive, breed and rear or nurture their young.

The Conservation of Habitats and Species Regulations 2019 (EU Exit) makes changes to the three existing instruments which transpose the Habitats and Wild Birds Directives so that they continue to work (are operable) upon the UK's exit from the European Union (EU). These include The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017. This instrument also amends section 27 of the Wildlife and Countryside Act 1981 to ensure existing protections continue. The intention is to ensure habitat and species protection and standards as set out under the Nature Directives are implemented in the same way or an equivalent way when the UK exits the EU.

In order for activities that would be likely to result in a breach of species protection under the regulations to legally take place, a European Protected Species (EPS) licence must first be obtained from Natural England.

2.2.3 The Wildlife and Countryside Act (1981) (as amended)

This is the primary piece of legislation by which biodiversity is protected within the UK. Protected fauna and flora are listed under Schedules 1, 5 and 8 of the Act. They include all species of bats, making it an offence to intentionally or recklessly disturb any bat whilst it is occupying a roost or to intentionally or recklessly obstruct access to a bat roost. Similarly, this Act makes it an offence to kill or injure any species of British reptiles and also makes it an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy their eggs and nests (whilst in use or being built).

The Wildlife & Countryside Act (1981) states that it is an offence to 'plant or otherwise cause to grow in the wild' any plant listed in Schedule 9 part II of the Act. This list over 30 plants including Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Parrot's Feather (*Myriophyllum aquaticum*).

2.2.4 The Countryside and Rights of Way Act (2000)

This Act strengthens the Wildlife & Countryside Act by the addition of "reckless" offences in certain circumstances, such as where there is the likelihood of protected species being present. The Act places a duty on Government Ministers and Departments to conserve biological diversity and provides police with stronger powers relating to wildlife crimes.

2.2.5 Natural Environment and Rural Communities Act (2006)

The Natural Environment and Rural Communities (NERC) Act 2006 requires that public bodies have due regard to the conservation of biodiversity. This means that Planning authorities must consider biodiversity when planning or undertaking activities. Section 41 of the Act lists species found in England which were identified as requiring action under the UK Biodiversity Action Plan and which continue to be regarded as conservation priorities under the *UK Post – 2010 Biodiversity Framework*.

2.2.6 Protection of Badgers Act

The Protection of Badgers Act (1992) relates to the welfare of Badgers (*Meles meles*) as opposed to nature conservation considerations. The Act prevents:

- The wilful killing, injury, ill treatment or taking of Badgers and / or
- Interference with a Badger sett
- Damaging or destroying all or part of a sett
- Causing a dog to enter a set and
- Disturbing a Badger while it is occupying a sett

Provisions are included within the Act to allow for the lawful licensing of certain activities that would otherwise constitute an offence under the Act.

2.1.7 The Environment Act (2021)

The Environment Act 2021 is the UK's new legislation for environmental protection in the UK, which includes protection of water quality, clean air, and biodiversity among other key protections. This

Act provides the government power to set targets to reach long-term aims relating to the environment, which will be periodically reviewed and updated. This legislation also establishes a new environmental watchdog organisation, the Office for Environmental Protection (OEP), which will hold the government accountable on environmental issues.

Part 6 of The Environment Act relates to nature and biodiversity. This section makes provision for biodiversity net gain to be a condition of planning permission in England and a requirement for nationally significant infrastructure projects. Biodiversity net gain will require maintenance for a period of at least 30 years after the completion of enhancement works to be achieved.

The legislation also includes updates to existing environmental legislation, such as the NERC Act 2006, to strengthen biodiversity enhancement rather than just conservation and includes a requirement for local, or relevant, authorities to publish biodiversity reports. Further, The Environment Act places a requirement on responsible authorities to prepare local nature recovery strategies, which will outline nature conservation sites and priorities and opportunities for recovering or enhancing biodiversity within the local area. Within England, the legislation also provides Natural England with the power to publish 'species conservation strategies' and 'protected site strategies' to identify activities that may affect a species or site's status and outline their opinions on measures that would be appropriate to avoid, mitigate or compensate any adverse impacts.

2.2 Policy

2.2.1 National

The National Planning Policy Framework (NPPF) (2023) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

Chapter 15 'Conserving and enhancing the natural environment' states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing sites of biodiversity, the wider benefits from natural capital and ecosystem services, minimising impacts on and providing net gains for biodiversity.

The NPPF states that plans should distinguish between the hierarchy of international, national and locally designated sites and that the scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

To protect and enhance biodiversity plans should:

identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;

and 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.

The NPPF states determining planning applications, local planning authorities should apply the following principles:

- a) 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;
- b) development on land within or outside a SSSI, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed 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 SSSI;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists;
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

2.2.2 Local – Arun Local Plan 2011–2031 (Adopted July 2018)

Arun District Council will encourage and promote the preservation, restoration and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects these sites and the species and habitats contained within them.

Proposed development likely to have an adverse effect on land with the designated features of any Site of Biodiversity or Geological Importance as designated in the Arun Local Plan or any subsequently designated sites (either individually or in combination with other developments), will not normally be permitted. Development on wildlife sites with the highest value will only be permitted exceptionally where the following can be demonstrated:

- There is no alternative solution (which shall be adequately demonstrated by the developer).
- There are reasons of public health or public safety or
- There are benefits of primary importance to the environment or iv. There are imperative reasons of overriding public interest.

Aside from the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. In determining any planning application affecting Sites of Biodiversity or Geological Importance the Council will ensure that the intrinsic natural features of particular interest are safeguarded or enhanced having regard to;

- The European, National or Local status and designation of the site;

- The nature and quality of the site's features, including its rarity value;
- The extent of any adverse impacts on the notified features of interest;
- The need for compensatory measures in order to re-create remaining features of habitats on or off the site.

Where appropriate the Council will ensure the effective management of designated sites through the imposition of planning conditions or Section 106 agreements as appropriate.

Policy ENV DM2 states the varying level of protection afforded to Pagham Harbour when considering development;

- Within Zone A (0-400m from the boundary) as identified on the Policies Maps, development will only be permitted in exceptional circumstances where the developer is able to demonstrate there will be no detrimental effects on Pagham Harbour, including non-native species and the water environment. Regard shall also be had to tests 1-4 as set out in Policy DM1 (Designated Sites of Biodiversity or Geological Importance).
- Within Zone B (0-5km) for all new residential development and development which is likely to have an impact on Pagham Harbour will be required to:
 - Make developer contributions towards the agreed strategic approach to access management at Pagham Harbour.
 - create easily accessible new green spaces for recreation within or adjacent to the development site. These shall be capable of accommodating the predicted increases in demand for local walking, including dog walking. Good pedestrian links shall be provided between housing areas and new and existing green space in order to discourage car use.

Major developments (as defined in the GDPO 1995 as amended) taking place outside Zone B and close to its boundary will be considered on a case by case basis to determine any potential effects on Pagham Harbour, and the need for any avoidance or mitigation measures.

Policy ENV DM3 states that any development will retain and incorporate important ecological habitats, wildlife corridors and stepping stones as well as be designed to minimise any disturbance to these habitats. Developments that fail to do so will have their proposal rejected. Where a development scheme would result in a habitat loss, mitigation measures will be proposed as part of the proposed scheme and such measures agreed with the Local Planning Authority prior to the determination of any planning application. Within Biodiversity Opportunity Areas (BOAs) identified within the local plan or where likely to have an impact on species or habitats within the BOAs, any application for planning permission shall include a properly conducted survey of the presence of that species and habitat and impact(s) that development may have on the BOA.

Development and biodiversity Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features

minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement. Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species.

3.0 METHODOLOGY

3.1 Impact Assessment

The methodology for the assessment of the likely ecological effects of the proposed development is based on CIEEM's Guidelines for Ecological Assessment in the UK and Ireland (CIEEM, 2018). The guidelines provide a useful framework for assessing ecological impacts at any level.

The following definitions are used for the term's 'impact' and 'effect':

Impact – Actions resulting in changes to an ecological feature.

Effect – Outcome to an ecological feature from an impact.

The approach of the guidelines is to assess potential impacts to all features of ecological interest that could be affected by a scheme. As a scheme may have effects beyond its boundaries, it is important to identify the 'zone of influence' of the scheme and to assess the potential for significant ecological impacts throughout this zone as well as those within the application boundaries, for example impacts upon nearby species, habitats and sites designated for their nature conservation value. Where such features are identified, they are first valued and then assessed as to the likely magnitude and significance of potential impacts that may be exerted upon those features by the proposed scheme. 'Significant' impacts are considered to be where they affect the integrity and/or conservation status of a designated site for a habitat or species. All potential significant impacts are considered in the absence of any avoidance, mitigation or compensation to inform the suitable design of such measures (where necessary), which can then be incorporated into the scheme to reduce such impacts. Finally, an assessment is made to identify any residual impacts upon these features (both positive and negative) that would remain once any impact avoidance, mitigation or compensation measures have been implemented.

All ecological features identified within the site boundaries and the identified zone of influence of the proposals are considered within a defined geographical context, as follows:

- International
- National
- County
- District
- Local
- Site

The guidelines state that ecological features that are valued, under the ecological assessment of a scheme, to be of less than local value are not considered sufficiently valuable for an impact to be considered significant. Therefore, only those features assessed as being of at least local value require avoidance, mitigation and/or compensation. That said, where a feature is of less than local value but where impacts upon this feature hold the potential to result in contravention of relevant wildlife legislation, measures must be implemented to ensure compliance with legislation, regardless of the level of value of the feature.

Potential impacts are considered at all stages of the proposed development. The assessment

should consider all types of impact (both direct and indirect) and whether potential impacts are short, medium, long-term, permanent, temporary, reversible, irreversible, positive and/or negative.

3.2 Desk Study

3.2.1 Data Request

A data request was submitted to the Sussex Biodiversity Records Centre (SxBRC) to ascertain any records held of nature conservation designations and protected species within 2 km of the boundary of the site.

The data search covered:

- Statutory designated sites
- Non-statutory designations such as Local Wildlife Sites (LWS)
- Records of protected and notable species.

3.2.2 Waterbodies

Any ponds located within 500 m of the proposed development were searched for using Ordnance Survey maps and available aerial images.

3.3 Field Survey

3.3.1 Habitats

The updated field survey work which forms the basis of the findings of this report was carried out by Adam Jessop MSc ACIEEM, (10 years post MSc graduation experience) and Lyndsey BSc (Hons) PGCert ACIEEM (6 years post PGCert graduation experience) on the 18th January, 2023.

Habitats on site pre-development were identified in accordance with the categories specified for a UK Habitats survey, using Habitat Definitions Version 2.0 (Butcher et al., 2020). This was chosen as an appropriate habitat categorisation system as it fits within the Biodiversity Metric 4.0 calculation. Where appropriate primary habitat codes were used although for some habitat types, the use of secondary habitat codes was necessary as well (particularly to indicate management practices).

3.3.2 Badger

The site was thoroughly searched for evidence of use by Badgers (*Meles meles*), with the specific aim of identifying the presence and location of any setts. In accordance with the *Badgers and Development: A Guide to Best Practice and Licensing* (Natural England, 2011) guidance, the survey accounted for a 30m from the site's boundary (observed where possible i.e. does not conflict with private dwellings). Evidence of Badgers could include latrines, dung pits, feeding remains and foraging evidence, trails and setts.

3.3.3 Bats

3.3.3.1 Ground-based PRAs of Trees

The assessment of the trees on site was undertaken by Adam Jessop during the updated walkover survey under class level 2 survey licence number (2015-13366-CLS-CLS) and updated by Lewis Lakudzala BSc (Hons) MSc (working under class level 1 survey licence number (2018-38386-CLS-CLS) on 26th May 2023. This followed BCT (Collins (ed) 2016) best practice survey guidelines searching for any PRFs / evidence of bat occupation and assigning a roost potential assessment as outlined in **Table 1** below.

Table 1. Guidelines for assessing the potential suitability of a built structure for roosting bats (reproduced from BCT (Collins (ed) 2016).

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site are likely to be used by roosting bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ² and/or suitable surrounding habitat to be used on a regular basis or by a large number of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

3.3.3.2 Phase II Emergence Surveys

The emergence surveys covering the moderate potential Oak tree were led by Louise Davies (working under NE licence 2015-13366-CLS-CLS) with assistance from Katie Hartman, Jolene Orłowski, and Ashleigh Domblides. Both heterodyne (Bat Box Duet, Peterson D230 and Elkon Batscanner) and time expansion (Elekon Batlogger) detectors were used for identifying species calls / analysis of calls via sonogram (where required). Due to an emergence on the first survey, three surveys including 2 dusks and 1 dawn were completed. The dusk emergence surveys both began approximately 15 minutes prior to sunset and continued until approximately an hour and 30 minutes after with a dawn survey commencing 1 hour 30 minutes before sunrise and continuing until 15 minutes past sunrise. Survey sheets were used to record the following information:

- Time of call registration
- Species (if possible, to identify using heterodyne detector)

- Location / activity
- Direction of flight (if seen)

Surveys were supplemented with the use of one thermal imaging camera on the southern aspect for surveys 2 and 3 to provide a more accurate approximation of the roost locations. The camera used was the Pulsar Merger LRF XL50 Thermal Imaging Binoculars. These binoculars are ideal for the close-range, high specification requirements of roost surveys with a 1024x768, 12µm, <40mK thermal sensor and 50mm f1.0 objective lens (Fawcett Williams & BCT, 2021).

3.3.3.3 Walked Transects

Based on the suitability of the habitat for foraging and commuting bats, walked transects were carried out on site during April – September 2023. It was considered that two transect routes with 8 (north) and 10 (south) listening stations would be appropriate given the scale of the site. Approximately 8-13 minutes was spent at each listening point during which passes of species were noted. Any passes recorded whilst walking between points were also noted. Both a Bat Box duet / Elekon Batscanner heterodyne and Anabat frequency division (for analysis of calls via sonogram) detector was employed during all surveys. The surveys were carried out by Lewis Lakudzala, Amy Johnston, Katalin- Anett Balazs, Rebecca Kent, Nicole Colins and Kelly Clark.

Figure 2. Walked transect (dashed line) route and listening stations used during the bat survey work.



3.3.3.4 Static Detectors

An additional aspect of the recommended bat monitoring within the BCT guidelines is for static detectors to be placed at different locations along the transect route for 5 consecutive nights each month (April – June for this site). 2 Anabat express and or wildlife acoustics mini bats detectors were placed put for each of the months covered by the survey work with the approximate locations of these shown in **Fig 3** below.

Figure 3. The locations of the static detector placed out on site (A(N) = April; B(N) = May; C(N) = June etc.



3.3.3.5 Bat Trapping

The site was assessed during daylight hours by the surveyor to familiarise with the site and identify areas of potential high bat activity and suitable access. Different habitats and features throughout the site were evaluated and assessed for their importance and the potential of different species which could be present to be surveyed for, notably areas likely to be used by Bechstein's bats. Trapping surveys were led by Daniel Whitby (NE class level 4 bat survey licence holder).

The trapping surveys were conducted on the 28th July, and 13th August 2023. Surveys were conducted through the later part of the bat active survey season incorporating birthing and later summer when juveniles will be volant.

Trapping was conducted throughout the site in areas considered suitable, especially areas considered to have the highest potential for Bechstein's bats (*Myotis bechsteinii*) on the site. Traps were spread evenly throughout the site.

The survey involved catching bats using harp traps, with a sonic lure (Autobat/AT100) to attract any bats foraging in or commuting through the area using a range of bat species social calls, this can increase the detection rate of quiet whispering species, such as Long-eared, *Myotis* spp and Barbastelle (*Barbastella barbastellus*), which can be under recorded on detector surveys.

Trapping with an ultrasonic lure is recognised as the only way to accurately identify and confirm the presence of Bechstein's bats (BCT Survey guidelines).

All bats were identified, sexed and reproductive status ascertained. All bats were released at the capture site on same night of capture.

3.3.4 Assessment of Pond

A Habitat Suitability Index (HSI) was carried out on one pond located adjacent to the site on the following the guidance provided with ARG (2010). This considers the following factors when calculating the ponds suitability to support GCN:

- Location of Pond,
- Surface Area,
- Permanence,
- Water Quality,
- Shade,
- Presence of Waterfowl and Fish,
- Number of Ponds within 1km,
- Quality of Terrestrial Habitat,
- Macrophyte Cover.

These criteria are used to calculate a score according to ARC Guidelines (ARC 2010) using the Oldham (2000) calculation formulae. This gives a score between 0 and 1 of the suitability of the pond for GCN with:

0.40 – 0.50: Poor suitability for GCN

0.51 – 0.59: Below average suitability for GCN

0.60 – 0.69: Average suitability for GCN

0.70 – 0.79: Good suitability for GCN

0.80 – 1.00: Excellent suitability for GCN

3.3.5 Phase II Reptile Surveys

Following identification of suitable reptile habitat on site, presence / likely absence surveys were undertaken by Ecosupport Ltd in accordance with best practice guidance (Froglife, 1999). Refugia was spread across the site and allowed two weeks to bed in. The refugia was then checked seven times during suitable weather conditions by experienced reptile workers. No reptiles were recorded on site during these surveys.

Figure 4. The location and number of the artificial refugia used during the 2023 reptile presence/absence surveys. Yellow = reptiles absent, blue = reptiles present.



3.3.6 Phase II Dormouse Surveys

All hedgerows were considered suitable for Dormice (*Muscardinus avellanarius*) on site. As a result,

a dedicated survey took place. Nest tubes were installed at 15-20-meter intervals along stretches of the hedgerows and within pockets of woodland within the site boundary (where these did not conflict with public rights of way). Nest tubes were made from a stiff plastic folded into a tubular square, 25cm in length with a 5 x 5cm cross-section, with a plywood tray sealing one end. 150 tubes were tied to the underside of suitable branches using wire and or cable ties. These were put in place in March 2021 and then were checked monthly between April and August (with a final survey to be completed in September). By carrying out the surveys over these months the survey effort achieves a score of 21 for thoroughness¹. Guidelines state that the score should be no less than 20, therefore the survey effort expended is considered to be more than adequate and will incorporate two of the best months (August and September). The approximate locations of the habitats on site covered by the nest tubes is outlined in Fig 5 below.

Figure 5. Location of Dormouse nest tubes on-site (green triangles) (n=75).



3.3.7 Breeding Bird Surveys

The survey methodology was broadly based upon the British Trust of Ornithology (BTO) Breeding

¹ This is based on the standard 50 tubes and index of probability of finding dormice present in nest tubes as per *Bright et al* 2006.

Bird Survey (BBS) and Common Bird Census methods, including the BTO Standard Recording Codes (BTO, 2004). Surveys were undertaken between early March and June 2023 during favourable weather conditions. Survey visits commenced 30 minutes from dawn, with each survey visit taking between 96-120 minutes each. All surveys were undertaken during suitable weather conditions (with little or no rain, little to no wind and good visibility). Each survey followed a pre-defined linear transect route, including 10-minute observational points from where the surveyor could observe bird activity and listen for birdcalls to establish territories and presence of breeding/nesting birds. Behaviour such as singing male birds, young, nests, feeding behaviour, territorial disputes and defensive behaviour around possible active nests were noted. Observations were marked on a site plan. The transect survey carried out was in a clockwise direction; following the same routes and listening stations as those used in the bat activity surveys (as per Figs 2-4). Surveys were carried out by Katalin-Anett Balazs, Ollie Silvester and Phillip Hemborough, experienced field ecologists of Ecosupport Ltd.

3.3.8 Riparian Mammal Survey

A riparian mammal survey was undertaken by Russell Brewer, Katalin-Anett Balazs and Ollie Silvester in June 2023. The survey involved methodically walking the length of the ditches (Fig 11) (including entering where required) and searching for field signs of presence of protected species, most notably Water Voles (*Arvicola amphibious*). Signs to search for are outlined within the Water Vole Conservation Handbook (Strachan *et al*, 2011) and include:

- Droppings
- Latrines
- Feeding stations
- Burrows
- Lawns
- Footprints; and
- Runways in vegetation;

The entire length of the on-site ditches was surveyed, extending over approximately 1.41km with the survey footprint extended to both banks in accordance to guidance provided by the Water Vole Mitigation Guidance (2016).

3.4 Assessment Methodology

3.4.1 Introduction

The methodology for the assessment of the likely ecological effects of the proposed development is based on CIEEM's *Guidelines for Ecological Assessment in the UK* (CIEEM 2018). Although this assessment does not constitute a formal Ecological/ Environmental Impact Assessment, the CIEEM guidelines provide a useful framework for assessing ecological impacts at any level.

3.4.2 Valuation

Features of ecological interest are valued on a geographic scale. Value is assigned on the basis of legal protection, national and local biodiversity policy and cultural and/or social significance.

3.4.3 Limitations

The updated habitat assessment was complete during January which is outside of the period when vesicular plants are flowering. Notwithstanding this, given the previous survey work undertaken on site, it was not considered that this would have posed a constraint on the assigning of habitat types.

² For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

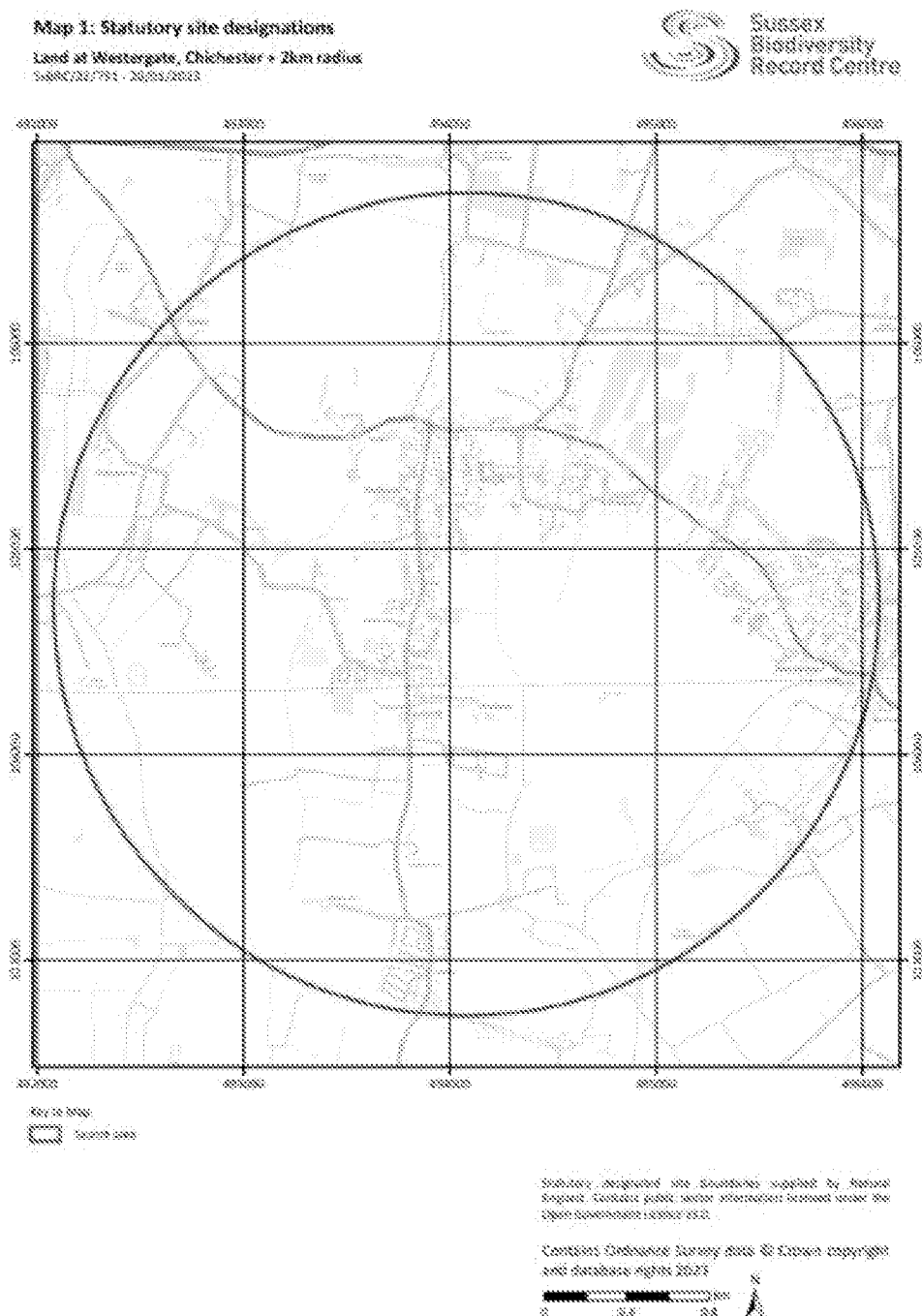
4.0 ECOLOGICAL BASELINE

4.1 Designated Sites

4.1.1 Internationally / Nationally Designated

As per Fig 6 below, no internationally / designated sites are present within 2 km.

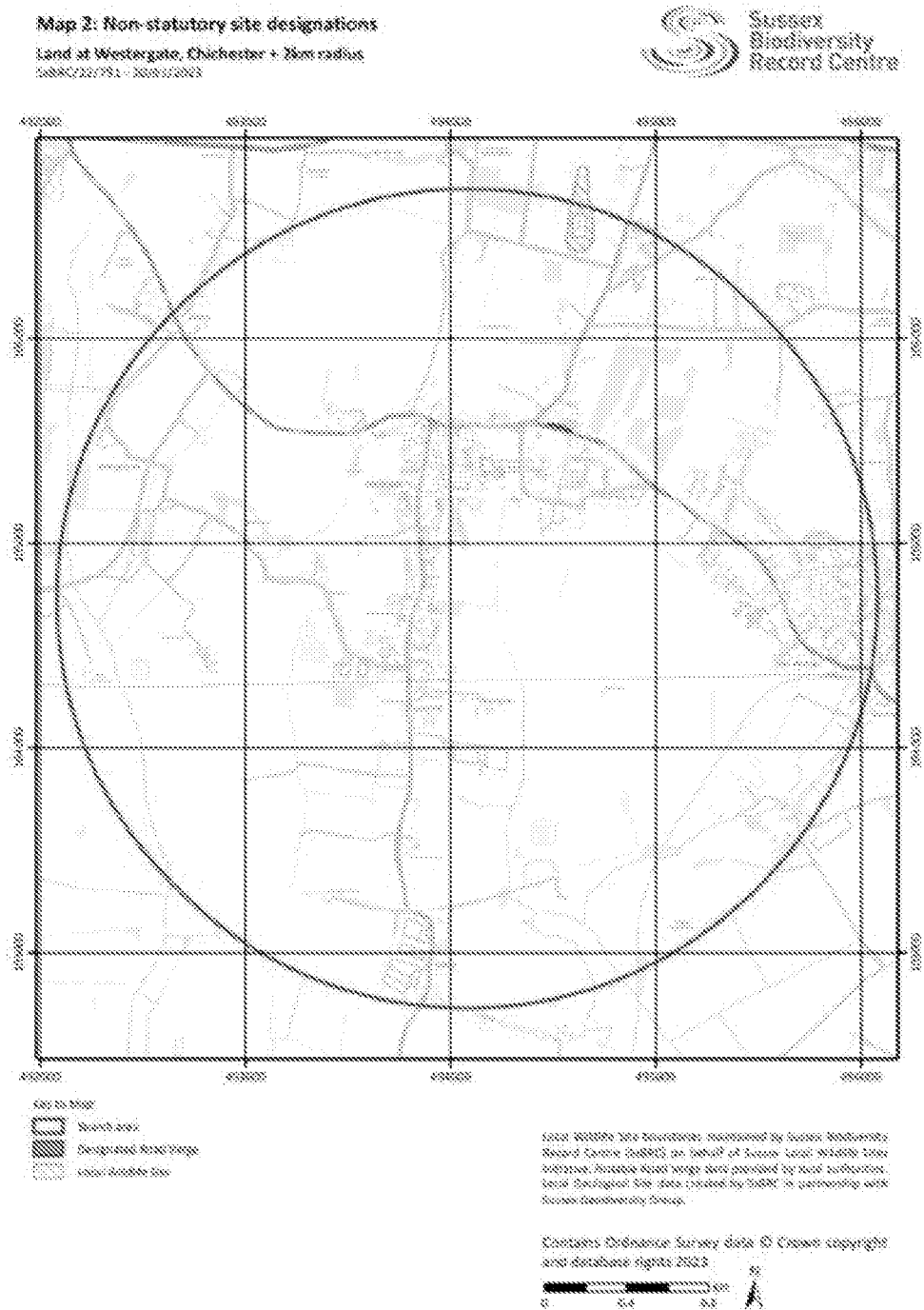
Figure 6. The internationally / nationally designated sites located within 2 km as provided by SxBRC.



4.1.2 Locally Designated / Non-Statutory

As per **Fig 7** below, two locally designated / non-statutory sites are present within 2 km, Fontwell Park Racecourse LWS is located approximately 1.21km to the north and Barnham Road Designated Road Verge is located approximately 0.38km to the north-east of site.

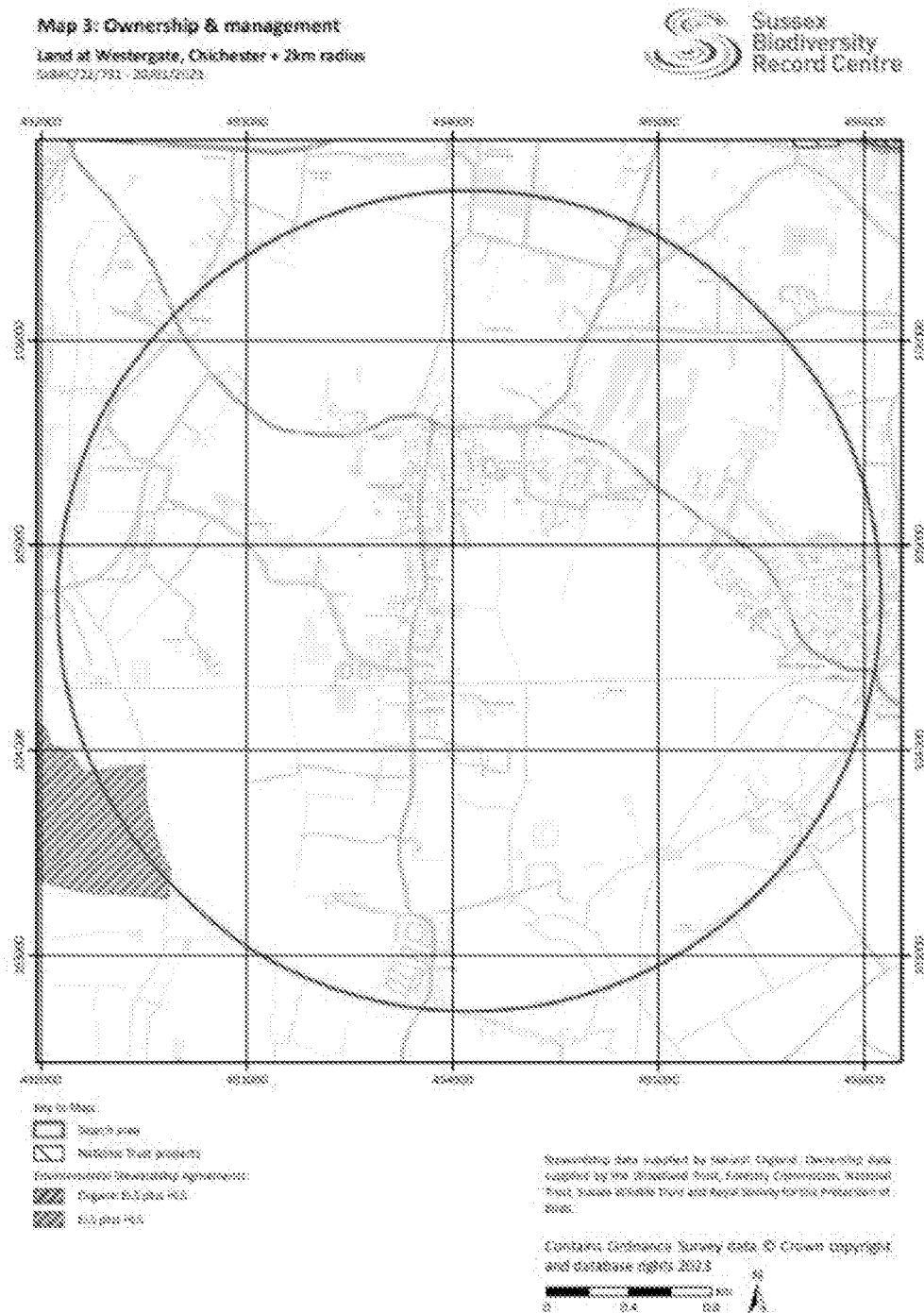
Figure 7. Locally designated / non-statutory designated sites located within 2 km of the site as provided by SxBRC.



4.1.3 Ownership & Management

The final mapping provided by SxBRC relates to ownership and management and as per **Fig 8** below, this indicates a parcel of land to the west of the site is part of an Environmental Stewardship Agreement.

Figure 8. Ownership and management map indicating the land parcel to the west under an Environmental Stewardship Agreement as provided by SxBRC



4.2 Vegetation Survey Results

The vegetation within the site has been described below using the broad Phase I habitat classification terminology as described with UK Habs, (Butcher et al., 2020). The below species noted should not be considered an exhaustive list and instead refer to dominant, characteristic and other noteworthy species associated with each community within the survey area. The habitat types on site comprise (***NB please refer to the UK habs habitat map appended to this document for the spatial distribution of the habitats on-site***):

- Modified grassland (g4) with secondary codes 80 (managed) and 119 (seasonally wet for the three eastern most fields)
- Other neutral grassland (g3c) with scattered scrub (secondary code: 11)
- Wet woodland (w1d) (***PRIORITY HABITAT***)
- Bramble scrub (h3d)
- Winter stubble (c1c5)
- Hedgerow (h2a) (***PRIORITY HABITAT***) and Hedgerow with trees (190)
- Other rivers and streams (r2b)
- Developed land; sealed surface (u1b)

4.2.1 Modified Grassland (g4)

The dominant habitat type on site is modified grassland, notably the centre and eastern boundary of site (**Fig 9**). This habitat supported the following grass species Perennial Rye grass (*Lolium perenne*), Rough Meadow Grass (*Poa trivialis*), Yorkshire Fog (*Holcus lanatus*), Meadow Foxtail (*Alopecurus pratensis*), Cock's-foot (*Dactylis glomerata*) and Timothy (*Phleum pratense*). There were few herbaceous species in the sward as a result of previous weed control, the herb species comprised Creeping Buttercup (*Ranunculus repens*), Hairy Sedge (*Carex lacustris*) with scattered Common Nettle (*Urtica dioica*) and Broad-leaved Dock (*Rumex obtusifolius*).

Figure 9. View of the g4 managed grassland located in the centre of site (taken January, 2023).



4.2.2 Other Neutral Grassland (g3c) with scattered scrub (11)

This habitat type was present within a field to the north-west, the very north of site, north-east of site, adjacent to the wet woodland and south of the arable field (**Fig 10**). The northern field is tussocky and has less herbs present within the sward, species comprised Yorkshire Fog (*Holcus lanatus*), False Oat-grass (*Arrhenatherum elatius*), Tall Fescue (*Schedonorus arundinaceus*) and Ragwort (*Senecio jacobaea*). This northernmost field also had scattered scrub (11) present, in the form of Bramble (*Rubus fruticosus* agg.). The north-east field comprised of limited species diversity, including False Oat-grass, Hogweed (*Heracleum sphodylium*), Nettle, Thistles and scattered burnet-saxifrage (*Pimpinella saxifrage*).

Meanwhile north-western field further supported species including Common Bent (*Agrostis capillaris*), Creeping Bent (*Agrostis stolonifera*), Yorkshire Fog, Perennial Rye-grass, False Oat-grass, Cock's-foot, Timothy, Ragwort (*Jacobaea vulgaris*), Creeping Thistle (*Cirsium arvense*), Spear Thistle (*Cirsium vulgare*) and Docks *Rumex* spp. The north-western field was bound by Bramble (*Rubus fruticosus* agg.) and Butterfly-bush (*Buddleja davidii*).

Finally, the field adjacent to the wet woodland supported species including False Oat-grass, Common Bent (*Agrostis capillaris*), Common Knapweed (*Centaurea nigra*), Yarrow (*Achillea millefolium*), Lesser Stitchwort (*Stellaria graminea*), Cat's-tail (*Phleum bertolonii*) and heavily invaded by Nettle and Bramble.

Figure 10. View of the g3c grassland located in the north-west of site, the Bramble boundary is notable in this picture (taken January, 2023).



4.2.3 Wet Woodland (w1d) (PRIORITY HABITAT)

An area of wet woodland is present on site located within the south-west of site; adjacent to the top of the arable field (**Fig 11**). This habitat supported the following species Crack Willow (*Salix fragilis*) with ground flora and understorey comprising of Bramble, Nettle, Soft Rush (*Juncus effusus*) and Hemlock Water-dropwort (*Oenanthe crocata*).

Figure 11. View of the w1d wet woodland located in the south-west of site, the Bramble understorey is notable in this picture (taken January, 2023).



4.2.4 Bramble Scrub (h3d)

This habitat type was predominantly present on edges of the other neutral grassland fields, as described above, in addition to the southern boundary of the arable field and in the northern [part of the site where more extensive areas were noted.

4.2.5 Winter Stubble (c1c5)

This habitat type was present in a field at the south of site, comprising of winter stubble from previous crops (**Fig 12**). The field itself was mostly devoid of significant vegetation, comprising of arable weeds such as Goosefoots (*Chenopodium* spp.), Petty Spurge (*Euphorbia peplus*) and Scentless Mayweed (*Tripleurospermum inodorum*) with scattered species Sharp-leaved Fluellen (*Kickxia elatine*) and Field Pansy (*Viola arvensis*).

The southern boundary of the field had another neutral grassland field margin, comprising of species such as Perennial Rye-grass, Greater Plantain (*Plantago major*), Creeping Cinquefoil (*Potentilla reptans*), Pineappleweed (*Matricaria discoidea*) and Marsh Cudweed (*Gnaphalium uliginosum*).

Figure 12. View of the c1c5 cereal crop land located in the south of site (taken January, 2023).



4.2.6 Hedgerow (h2a) (PRIORITY HABITAT) and Hedgerow with trees (190)

This habitat type was present on site in the form of field boundaries, both present along the redline boundary and bisecting the centre of site across several fields. Species within the hedgerows and hedgerows with trees include Pedunculate Oak (*Quercus robur*), Willow (*Salix* spp.), Hazel (*Corylus avellana*), Field Maple (*Acer campestre*), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Elder (*Sambucus nigra*), Elm (*Ulmus* spp.), Dog Rose (*Rosa canina*), Sycamore (*Acer pseudoplatanus*), Horsechestnut (*Aesculus hippocastanum*), Plum (*Prunus domestica*) Field Rose (*Rosa arvensis*). The understorey species comprised of Bramble, Ivy (*Hedera helix*), Soft Shield-fern (*Polystichum setiferum*), Lords-and-ladies (*Arum maculatum*), Hedge Woundwort (*Stachys*

sylvatica), Dogwood (*Cornus sanguinea*) and Black Bryony (*Tamus communis*)

Some of the hedgerows were adjacent to streams which included ground flora comprising Bramble, Pendulous Sedge (*Carex pendula*), Dog's Mercury (*Mercurialis perennis*), False Brome (*Brachypodium sylvaticum*) and Butcher's-broom (*Ruscus aculeatus*).

4.2.7 Other Rivers and Streams (r2b)

This habitat type was present along the entire eastern boundary of site (**Fig 13**) as well as present along the hedgerow along the west of the arable field.

Figure 13. View of the r2b stream land located along the eastern boundary of site (taken January, 2023).



4.2.8 Developed Land; Sealed Surface (u1b)

This habitat type is only present to the west of site in the form of a tarmac as part of Westergate Street (major road, A29) and Oaks Close.

4.3 Bat Survey Results

4.3.1 Pre-existing Data

The data request from SxBRC returned the following bat records within 2 km of the site (**Table 2**).

Table 2. List of bat records within 2 km of the site provided by SxBRC.

Taxon Name	Species Name	Number of Records	Further Information
<i>Barbastella barbastellus</i>	Western Barbastelle	16	From bat detector and radio tracking
<i>Eptesicus serotinus</i>	Serotine	15	Both from bat surveys and detectors, and roost exits
<i>Myotis spp</i>	Myotis bat	14	From bat surveys and aural detectors
<i>Myotis mystacinus</i>	Whiskered Bat	2	From aural bat detectors
<i>Nyctalus noctula</i>	Noctule	15	From bat surveys / field observations and aural detectors, roost exit records
<i>Pipistrellus nathusii</i>	Nathusius' Pipistrelle	4	From aural bat detectors
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	42	From 4 roost exit records, bat surveys and aural detectors
<i>Pipistrellus spp</i>	Pipistrelle bats	5	From aural bat detectors and roost exit counts
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	24	Majority from bat surveys and aural detectors
<i>Plecotus auritus</i>	Brown Long-eared bat	3	From aural bat detectors
<i>Plecotus spp</i>	Long-eared bat species	11	From aural bat detectors and surveys

A suite of bat activity transect and static detector surveys were also undertaken on site between May - October 2016 (ECOSA, 2017). The species recorded during the bat activity transect surveys comprised of Common Pipistrelle, Soprano Pipistrelle, *Myotis* species, Long-eared species and Serotine. During the static detector surveys, only Noctule and Nathusius' Pipistrelle were the species recorded in addition to those recorded during the transects.

4.3.2 Preliminary Roost Assessment (trees)

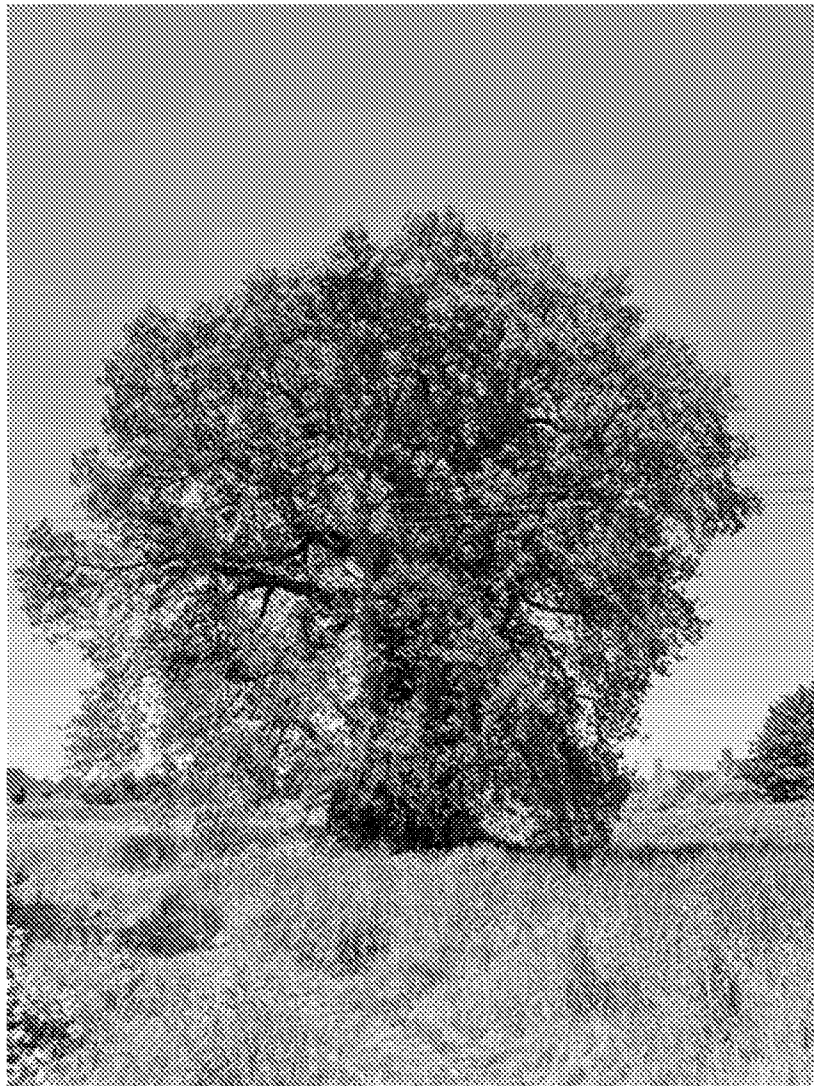
During the updated walkover of site, a non-exhaustive preliminary roost assessment of trees was conducted outlining any trees with PRF's. A number of trees along the western boundary of the arable field were considered to have potential to support roosting bats (however a thorough assessment was not carried out at this stage, it is understood that these trees are currently being retained). The PRF's noted included knot holes and large hollow cavities at the bases of two trees.

Previously, two mature tree were identified as having **Moderate Potential** and nine trees were identified as having **Low Potential** for roosting bats during surveys undertaken in 2011 and updated in 2016. Both Phase 2 emergence surveys and tree climbing surveys were undertaken previously, during which no trees were identified to have bats or evidence of bats present.

An updated PRA of the trees marked for removal were completed on the 26th of May 2023 based on the planning layout (Thrive Architects, July 2023). One tree highlighted for potential removal was found to support moderate potential for roosting bats (**Fig 14**) and, as such, was subject to further Phase II surveys as detailed below. In addition, several trees to be removed have been identified as supporting low roosting potential and will be subject to removal under precautionary measures.

For the tree locations, please refer to the attached UKHabs Map in the Appendix

Figure 14. Oak with moderate bat roosting potential to the north of the site (to be retained).



4.3.3 Phase II Emergence Surveys

The results of the bat emergence surveys and dawn re-entry survey along with other relevant

information of survey conditions are provided in **Tables 3**.

Table 3. Relevant information from the emergence / re-entry surveys carried out on site.

Date	Start Temp (°C)	Finish Temp (°C)	Cloud Cover (%)	Wind (beaufort scale)	Sunset/sunrise	Start time	Finish time
12/07/2023	18	17	15	2	21:13	20:58	22:43
28/07/2023	16	17	100	0	05:23	03:53	05:38
16/08/2023	17	16	25	1	20:22	20:07	21:52

A summary of the results can be found in **Table 4** below.

Table 4. Summary of survey data and bat activity observed during the survey period. HNS = Heard Not Seen and SNH = Seen Not Heard.

Survey Date	Recorded Bat Roost(s)	Bat Activity on Site	
12/07/2023 – Dusk	One Common Pipistrelle Emergence (Fig 16)	First Bat Pass	Last Bat Pass
		Common Pipistrelle emergence at 21:33	Common Pipistrelle commuting southwards at 22:26
		Summary: Bat activity was low during the first survey, with only occasional brief passes of Common Pipistrelles (starting with 1 emergence on the southern side of the tree) and 1 brief pass of a HNS Serotine (<i>Eptesicus serotinus</i>) at 22:05 and a brief pass of a HNS Leisler's at 22:18.	
28/07/2023 – Dawn	One Soprano Pipistrelle re-entry (Fig 16)	First Bat Pass	Last Bat Pass
		Soprano Pipistrelle, heard not seen at 04:14	Soprano Pipistrelle, heard not seen at 04:55
		Summary: Bat activity was low once again during this survey, with only brief HNS calls recorded of Common and Soprano Pipistrelles between 04:14 and 04:55. One Soprano Pipistrelle was seen re-entering the tree on the south-eastern aspect.	
16/08/2023 – Dusk	One Common Pipistrelle emergence (Fig 16)	First Bat Pass	Last Bat Pass
		Common Pipistrelle emerging at 20:47	Serotine heard not seen at 21:37
		Summary: Bat activity was low-moderate during the final survey, with commuting and foraging activity mostly HNS but with a total of five different bat species recorded on site. Common Pipistrelles were the most frequently recorded bat species during this survey, with a total of 9 passes. The second most recorded bat during this survey was Soprano Pipistrelle, with three HNS recordings.	

		Furthermore, two Serotines were recorded heard not seen towards the end of the survey at 21:33 and 21:37. As with the first survey, one Leisler's bat was recorded HNS at 21:18.
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Figure 15. Approximate location of the Soprano Pipistrelle and Common Pipistrelle roosts (red circle).



4.3.4 Walked Transects

Phase II Bat Activity Transects and Static Monitoring are still currently taking place and scheduled to finish October 2023. The interim findings are presented below.

Table 5 below indicates the dates and other relevant information recorded during the transect surveys with the results presented below in **Fig 16** and **Fig 17**.

Table 5. Relevant information recorded during the transect surveys. Wind speed is approximated in the Beaufort Scale. CW = Clockwise and CCW = Counter Clockwise (refer to **Fig 2** for route).

Route	Date	Temp (°C)	Cloud Cover (%)	Precipitation	Wind (Beaufort scale)	Start Time	Finish Time	Starting Point / Direction of Travel
North	26/04/2023	11	10	Dry	3	20:15	22:15	1 - CW
South								1 - CW
North	19/05/2023	12	63	Dry	2	20:45	22:45	8 - CCW
South								9 - CCW
North	19/06/2023	17	75	Dry	1	21:19	23:19	3 - CW
South								3- CCW
North	12/07/2023	16	15	Dry	2	21:13	23:13	7 - CW
South								10- CW
North	13/07/2023	13	13	Dry	0	03:05	05:05	7 - CCW
South								10- CCW
North	14/08/2023	18	60	Dry	1	20:26	22:26	8- CCW
South								5- CCW
North	18/09/23	17	20	Dry	2	19:11	21:11	9- CW
South								6- CCW

Figure 16. The number and species composition of bat recordings noted during the walked transects (n = 7) of the northern section of the site at the different listening points from all the surveys conducted to date (April – September 2023).

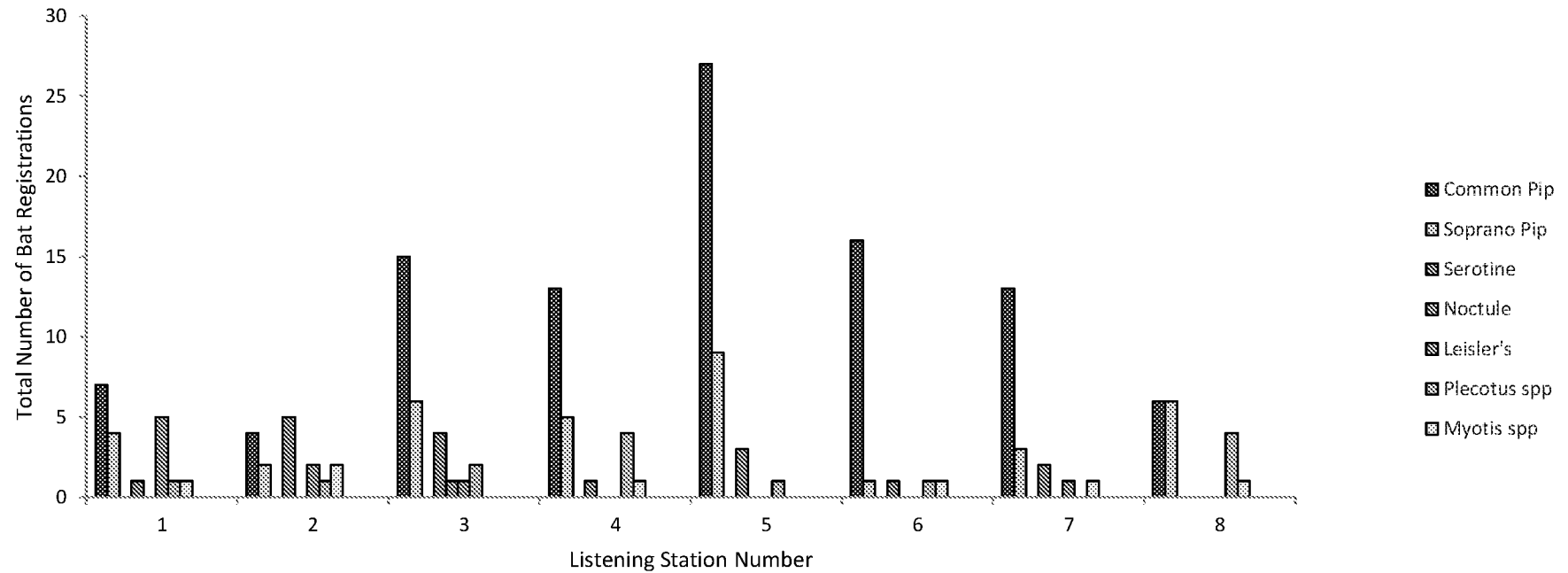
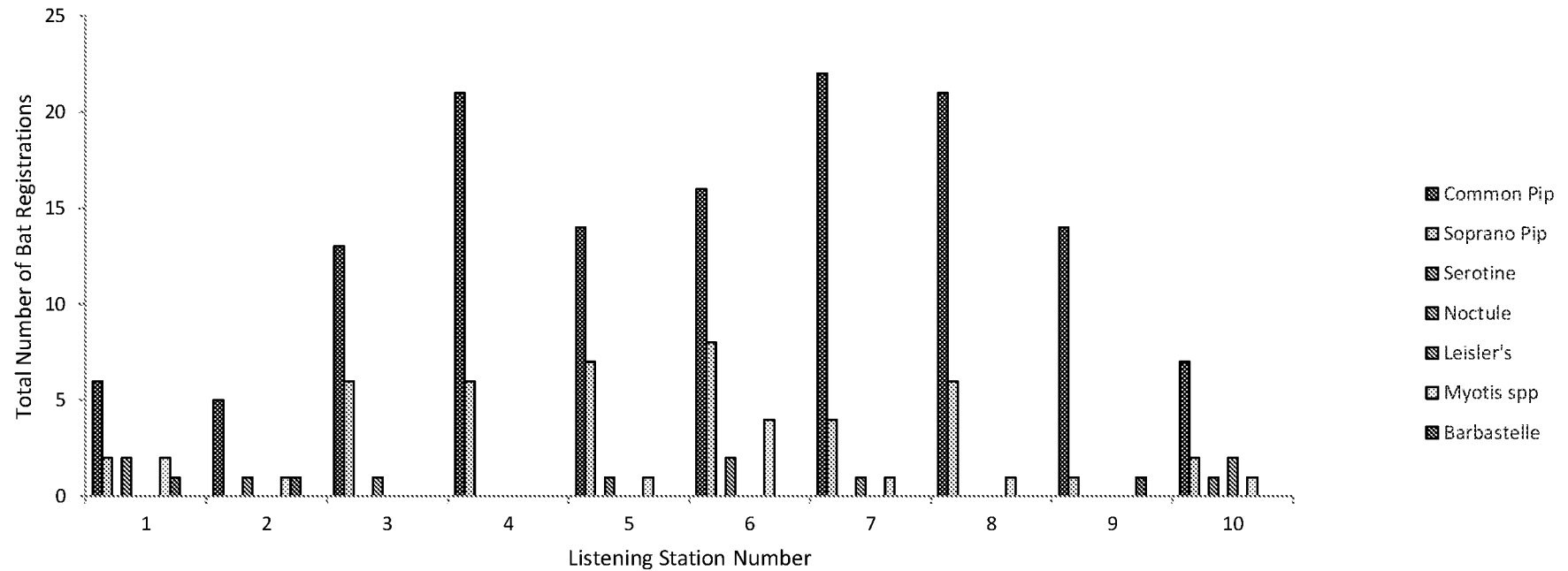


Figure 17. The number and species composition of bat recordings noted during the walked transects (n = 7) of the northern section of the site at the different listening points from all the surveys conducted to date (April – September 2023).



As shown in **Figs 16-17** above, recorded bat activity as a whole was generally considered to be moderate in the northern section of the site and low in the southern section (reflective of the larger area of grassland habitats present in the northern section). Activity was largely dominated by *Pipistrellus* spp, with Common Pipistrelle numbers exceeding Soprano Pipistrelle numbers in the majority of areas. Occasional Noctule, Serotine, *Plecotus* spp, *Myotis* spp, and Leisler's were recorded within all site areas, however *Plecotus* spp activity was higher in the northern section than the southern section (where only 1 individual was recorded). Three Barbastelle passes were recorded immediately adjacent to the wet woodland and towards the centre of the site.

Diversity was highest along the north western area of the site, which is likely as a result of the developed scrub and connection to the linear tree line leading northwards from the site along Church Lane.

4.3.5 Static Monitoring

The results of the static detector monitoring carried out during April to October 2023 are provided in **Tables 6** below.

Table 6. Analysis from Anabat Express and Minibat static deployments from April to October 2023 (see **Fig 4** for approximate locations).

Location	Date	Species	Total passes	Average passes per night	Average passes per hour
A1	27th - 1st April 5 Nights 8.50 hrs p/n	C.pip	1562.00	195.25	19.53
		S.pip	222.00	27.75	2.78
		<i>Myotis</i> spp.	1.00	0.13	0.01
A2	27th - 1st April 5 Nights 8.50 hrs p/n	C.pip	382.00	47.75	4.78
		S.pip	54.00	6.75	0.68
		N.pip	2.00	0.25	0.03
		Noctule	1.00	0.13	0.01
		Serotine	6.00	0.75	0.08
		<i>Plecotus</i> spp.	5.00	0.63	0.06
		<i>Myotis</i> spp.	8.00	1.00	0.10
A3	27th - 1st April 5 Nights 8.50 hrs p/n	Barbastelle	1.00	0.13	0.01
		C.pip	257.00	32.13	3.21
		S.pip	35.00	4.38	0.44
A4	27th - 1st April 5 Nights 8.50 hrs p/n	<i>Plecotus</i> spp.	4.00	0.50	0.05
		C.pip	89.00	11.13	1.11
		S.pip	17.00	2.13	0.21
		N.pip	1.00	0.13	0.01

		Noctule	8.00	1.00	0.10
		Serotine	2.00	0.25	0.03
		Plecotus spp.	5.00	0.63	0.06
		Myotis spp.	7.00	0.88	0.09
		Leislars	1.00	0.13	0.01
		Barbastelle	1.00	0.13	0.01
B1	18th - 22nd May 5 Nights 10.00 hrs p/n	C.pip	280.00	40.00	4.00
		S.pip	3.00	0.43	0.04
		Noctule	1.00	0.14	0.01
		Serotine	3.00	0.43	0.04
		<i>Plecotus</i> spp.	4.00	0.57	0.06
B2	18th - 22nd May 5 Nights 10.00 hrs p/n	C.pip	592.00	84.57	8.46
		S.pip	89.00	12.71	1.27
		Noctule	1.00	0.14	0.01
		Serotine	3.00	0.43	0.04
		<i>Plecotus</i> spp.	8.00	1.14	0.11
		<i>Myotis</i> spp.	66.00	9.43	0.94
		Barbastelle	1.00	0.14	0.01
B3	27th - 1st April 5 Nights 8.50 hrs p/n	C.pip	1396.00	174.50	17.45
		S.pip	32.00	4.00	0.40
		Serotine	25.00	3.13	0.31
		<i>Plecotus</i> spp.	96.00	12.00	1.20
		<i>Myotis</i> spp.	129.00	16.13	1.61
B4	27th - 1st April 5 Nights 8.50 hrs p/n	C.pip	127.00	15.88	1.59
		S.pip	26.00	3.25	0.33
		Serotine	3.00	0.38	0.04
		<i>Plecotus</i> spp.	18.00	2.25	0.23
		<i>Myotis</i> spp.	7.00	0.88	0.09
C1	16th - 21st June 6 Nights 7.50 hrs p/n	C.pip	35.00	5.00	0.67
		S.pip	25.00	3.57	0.48
		Noctule	1.00	0.14	0.02
		Serotine	1.00	0.14	0.02
		<i>Plecotus</i> spp.	11.00	1.57	0.21
		<i>Myotis</i> spp.	6.00	0.86	0.11
C2	14th - 25st June 9 Nights 7.50 hrs p/n	C.pip	206.00	29.43	3.92
		S.pip	65.00	9.29	1.24
		Noctule	2.00	0.29	0.04
		Leislars	8.00	1.14	0.15
		<i>Plecotus</i> spp.	55.00	7.86	1.05
		<i>Myotis</i> spp.	6.00	0.86	0.11
C3	26th - 3rd June/July 7 Nights 7.50 hrs p/n	C.pip	633.00	90.43	12.06
		S.pip	46.00	6.57	0.88
		Serotine	13.00	1.86	0.25
		<i>Myotis</i> spp.	8.00	1.14	0.15
		Leislars	4.00	0.57	0.08

C4	14th - 20st June 7 Nights 7.50 hrs p/n	C.pip	453.00	64.71	8.63
		S.pip	173.00	24.71	3.30
		Noctule	1.00	0.14	0.02
		Leislars	18.00	2.57	0.34
		Serotine	2.00	0.29	0.04
		<i>Plecotus</i> spp.	6.00	0.86	0.11
		<i>Myotis</i> spp.	6.00	0.86	0.11
D1	5th - 11st July 6 Nights 7.75 hrs p/n	C.pip	509.00	72.71	9.38
		S.pip	74.00	10.57	1.41
		Noctule	20.00	2.86	0.38
		Serotine	39.00	5.57	0.74
		<i>Plecotus</i> spp.	48.00	6.86	0.91
		Leislars	23.00	3.29	0.44
		<i>Myotis</i> spp.	4.00	0.57	0.08
D2	5th - 11st July 6 Nights 7.75 hrs p/n	C.pip	4661.00	776.83	100.24
		S.pip	302.00	50.33	6.49
		Noctule	255.00	42.50	5.48
		Serotine	128.00	21.33	2.75
		<i>Plecotus</i> spp.	6.00	1.00	0.13
		Leislars	12.00	2.00	0.26
		Barbastelle	1.00	0.17	0.02
		Parti?	1.00	0.17	0.02
		<i>Myotis</i> spp.	24.00	4.00	0.52
D3	5th - 11st July 6 Nights 7.75 hrs p/n	C.pip	290.00	48.33	6.44
		S.pip	8.00	1.33	0.18
		Serotine	15.00	2.50	0.32
		<i>Myotis</i> spp.	2.00	0.29	0.04
		Noctule	1.00	0.17	0.02
D4	26th - 31st July 6 Nights 8.50 hrs p/n	C.pip	306.00	51.00	6.00
		S.pip	98.00	16.33	1.92
		Noctule	2.00	0.33	0.04
		Serotine	2.00	0.33	0.04
		<i>Plecotus</i> spp.	1.00	0.17	0.02
		<i>Myotis</i> spp.	38.00	6.33	0.75
E1	8th - 14th August 6 Nights 9.25 hrs p/n	C.pip	207.00	34.50	3.73
		S.pip	239.00	39.83	4.31
		Noctule	4.00	0.67	0.07
		Serotine	8.00	1.33	0.14
		<i>Leislars</i>	2.00	0.33	0.04
		<i>Myotis</i> spp.	28.00	4.67	0.50
E2	8th - 14th August 6 Nights 9.25 hrs p/n	C.pip	554.00	92.33	9.98
		S.pip	27.00	4.50	0.49
		Noctule	1.00	0.17	0.02
		Serotine	2.00	0.33	0.04
		<i>Myotis</i> spp.	6.00	1.00	0.11

E3	8th - 14th August 6 Nights 9.25 hrs p/n	C.pip	1312.00	218.67	23.64
		S.pip	1097.00	182.83	19.77
		Serotine	21.00	3.50	0.38
		Noctule	6.00	1.00	0.11
		Barbastelle	3.00	0.50	0.05
		<i>Myotis</i> spp.	62.00	10.33	1.12
		<i>Plecotus</i> spp.	13.00	2.17	0.23
E4	8th - 14th August 6 Nights 9.25 hrs p/n	C.pip	829.00	138.17	14.94
		S.pip	370.00	61.67	6.67
		Serotine	1.00	0.17	0.02
		<i>Plecotus</i> spp.	1.00	0.17	0.02
		<i>Myotis</i> spp.	7.00	1.17	0.13
F1	18th - 22th September 5 Nights 11.75 hrs p/n	C.pip	565.00	113.00	9.62
		S.pip	112.00	22.40	1.91
		Barbastelle	1.00	0.20	0.02
		<i>Myotis</i> spp.	61.00	12.20	1.04
F2	18th - 22th September 5 Nights 11.75 hrs p/n	C.pip	1314.00	262.80	22.37
		S.pip	444.00	88.80	7.56
		Noctule	2.00	0.40	0.03
		Serotine	12.00	2.40	0.20
		<i>Myotis</i> spp.	230.00	46.00	3.91
		<i>Plecotus</i> spp.	5.00	1.00	0.09
		Leislars	5.00	1.00	0.09
		<i>Barbastelle</i>	16.00	3.20	0.27
F3	18th - 22th September 5 Nights 11.75 hrs p/n	C.pip	1248.00	249.60	21.24
		S.pip	195.00	39.00	3.32
		N.pip	4.00	0.80	0.07
		Serotine	2.00	0.40	0.03
		Noctule	1.00	0.20	0.02
		Leislars	1.00	0.20	0.02
		Barbastelle	48.00	9.60	0.82
		<i>Myotis</i> Daub.	8.00	1.60	0.14
		<i>Myotis</i> W/B	3.00	0.60	0.05
		<i>Myotis</i> spp.	6.00	1.20	0.10
		<i>Plecotus</i> spp.	12.00	2.40	0.20
F4	18th - 22th September 7 Nights 11.75 hrs p/n	C.pip	38.00	5.43	0.46
		S.pip	18.00	2.57	0.22
		Serotine	1.00	0.14	0.01
		Noctule	1.00	0.14	0.01
		<i>Myotis</i> spp.	6.00	0.86	0.07
G1	10th - 16th October 7 Nights 13.00 hrs p/n	C.pip	935.00	133.57	10.27
		S.pip	11.00	1.57	0.12
		Noctule	15.00	2.14	0.16
		Serotine	4.00	0.67	0.05

		Nathusius's Pip	8.00	1.14	0.09
		Barbastelle	1.00	0.14	0.01
		<i>Plecotus spp.</i>	7.00	1.17	0.09
		<i>Myotis spp.</i>	58.00	8.29	0.64
G2	10th - 16th October 7 Nights 13.00 hrs p/n	C.pip	22.00	3.67	0.28
		S.pip	15.00	2.14	0.16
		<i>Plecotus spp.</i>	1.00	0.14	0.01
		Serotine	1.00	0.14	0.01
		<i>Myotis spp.</i>	2.00	0.33	0.03
G3	10th - 16th October 7 Nights 13.00 hrs p/n	C.pip	1162.00	166.00	12.77
		S.pip	539.00	77.00	5.92
		Noctule	2.00	0.29	0.02
		Barbastelle	5.00	0.71	0.05
		<i>Myotis spp.</i>	73.00	10.43	0.80
		<i>Plecotus spp.</i>	1.00	0.17	0.01
G4	10th - 16th October 7 Nights 13.00 hrs p/n	No Bats		0.00	0.00

Similarly, to the transects, activity across all areas of the site was largely dominated by *Pipistrellus spp.*, the majority of which were Common Pipistrelle. Occasional Serotine, Noctule, *Plecotus spp.*, *Myotis spp.* and Barbastelle (*Barbastella barbastellus*) were also recorded. It is worth noting that location D2 (Fig 4) had a noticeably larger number of Noctule. The areas of the site considered to be key bat foraging and commuting areas are shown below in **Fig 18 below**.

Figure 18. Key bat commuting routes identified across the site. Red circle==location of Barbastelle bats, blue circle= confirmed location of Bechstein's Bat.



4.3.6 Trapping

Final results from the trapping surveys have yet to be collated, analysed and evaluated, however, the following species were noted:

- **Common Pipistrelle**
- **Soprano Pipistrelle**
- **Serotine**
- **Daubenton's Bat**
- **Bechstein's Bat**
- **Natterers Bat**
- **Barbastelle**

4.3.7 Foraging & Commuting Habitat Assessment

The mature tree lines, linear scrub features, parcels of scrub and wet woodland on site provide a continuous linear corridor for local commuting bats across the entire site and at a regional-level (particularly pertaining to Barbastelles and Bechstein's Bat). For the full, detailed evaluation of the results, please refer to section 5.2.2.

4.4 Badgers

4.4.1 Pre-existing Information

SxBRC do not return any records of Badgers at a request of local Badger groups to have records remain confidential. However, no evidence of Badger presence or activity was recorded on site in 2012 or 2016 during work conducted by ECOSA Ltd.

4.4.2 On site Habitat Assessment

During the walkover survey on site, no evidence of Badgers was noted. Aforementioned, no evidence of Badger presence or activity was noted previously on site, with the exception of several mammal trails present across site particularly along the base of hedgerows and across fields. Taking this into consideration, as well as the habitats on site, there is considered to be **High Potential** for foraging and commuting Badgers on site.

4.5 Reptiles

4.5.1 Pre-existing Information

SxBRC returned 12 records of Slow Worm (*Anguis fragilis*) presence from within 2 km and 5 records of Common Lizard (*Zootoca vivipara*). The majority of the records (7 Slow Worm & 4 Common Lizard) returned by SxBRC are from the May – June 2016 suite of reptile surveys conducted by ECOSA Ltd confirming presence on site.

4.5.2 On site Habitat Assessment

Although some of the modified grassland on site has a shorter sward height for reptiles, there are longer areas developing on site particularly along the fields hedgerow / scrub boundaries. Meanwhile, the other neutral grassland on site supports a longer sward, and the northern modified grassland field supports a scattered scrub mosaic. Therefore, much of the site supports the structure and heterogeneity needed by foraging and sheltering reptiles (Edgar et al., 2010). The

habitat conditions on site are comparable to those observed during the 2016 reptile surveys, which confirmed presence of reptiles on site. Taking all of this into consideration, there is a **High Potential** for common reptile species to still be present on site.

4.5.3 Phase II Survey Results

The results of the reptile presence / likely absence survey are presented below in **Table 7 and Figure 19** where a '**Low**' population of Slow Worms (<50 / ha total adults as per HGBI 1998) was noted on site (max count of 29 adults) and a '**Low**' population of Common Lizards (max count of 11 adults). The individuals found were evenly scattered throughout the site and are likely all part of the same local population. The site is not considered a key reptile site.

Table 7. Results of the reptile surveys undertaken on site in May 2023. Wind speed is measured in the Beaufort scale.

AM – Adult Male, AF – Adult Female, SA – Sub-adult, J – Juvenile

						Slow Worm				
Date	Start Time	Weather Conditions (Temp, Wind, Cloud &, Precipitation)	Common Lizard	Grass Snake	Adder	AM	AF	SA	J	Total ²
18/04/23	11:16	11c, 4, 20%, 0	2 (31, 34)	0	0	6(29, 30,33, 34, 34, 37)	5(30, 31, 33, 34, 35)	2 (7, 36)	3(26, 31, 37)	11 SW 1 CL
20/04/23	13:00	15°C, 4, 10%, 0	4(21, 30, 36, 44)	0	0	4(21, 29, 30)	7(7, 30, 31, 43)	3(26., 34, 45)	2(7, 35)	11 SW 4 CL
24/04/23	13:30	11°C, 2, 90%, 0%	3 (29, 45)	0	0	10 (19, 21, 29, 30, 31, 34, 36, 44)	9 (7, 29, 30, 31, 34, 36)	3 (32, 34, 45)	1 (1)	19 SW 3 CL
27/04/23	12:00	14°C, 2, 80%, 0	7 (21,29,31,35)	0	0	12 (19,21,29,30,31, 33,34,71,68)	7 (7,31,33,34,35,3 6,47)	4 (1,31,36)	9 (26,27,31,36)	19 SW 7 CL
2/05/23	11:30	15c,1,50%,0	11 (29,31,31,31,3 6,36,36,,47,47 ,24,21)	0	0	22 (29,29,30,31,31, 31,33,34,34,34, 36,36,36,36,48,4 6,67,68,70,1,8)	7 (30,30,33,36,65, 73,77)	9 (29,29,30,31,3 2,34,35,35,14)	13(30,31,31, 31,31,32,33, 36,36,36,36, 36,36)	29 SW 11 CL
4/05/23	10:00	15c,2,40%,0	4(29,36,8,17)	0	0	10 (29,31,35,35,49, 63,67,24,17)	9 (34,35,54,54,77, 773,1)	10(34,34,29,2 9,50,50,10,10, 17,17)	13(30,31,31, 31,31,31,31, 35,52,52,1,1 3,17)	19 SW 4 CL
11/05/23	10:00	16, 0, 30%,0	2 (1)	0	0	5(1, 70, 11,)	8 (77, 70, 11, 1, 34)	4(34, 10, 22)	6(28, 34, 72)	13 SW 2 CL

² This only considers adult individuals.

Figure 19. Location of the reptiles found on site during the surveys in 2023 (yellow = common lizard, red = slow worm, orange = both).



4.6 Great Crested Newts

4.6.1 Pre-existing Information

SxBRC returned 2 records of Great Crested Newt (*Triturus cristatus*) presence from within 2 km, both approximately 0.85km to the west of site in a waterbody from surveys undertaken by FPCR

Consultancy in 2013 (**Fig 20**).

There is only one waterbody within 500m of site, as described in **Section 4.6.2**. This pond was subject to an eDNA survey by ECOSA Ltd. in May 2016 and was subsequently updated by Ecosupport Ltd in 2023. The results of the eDNA survey returned a negative result for GCN, confirming an absence of the species being present.

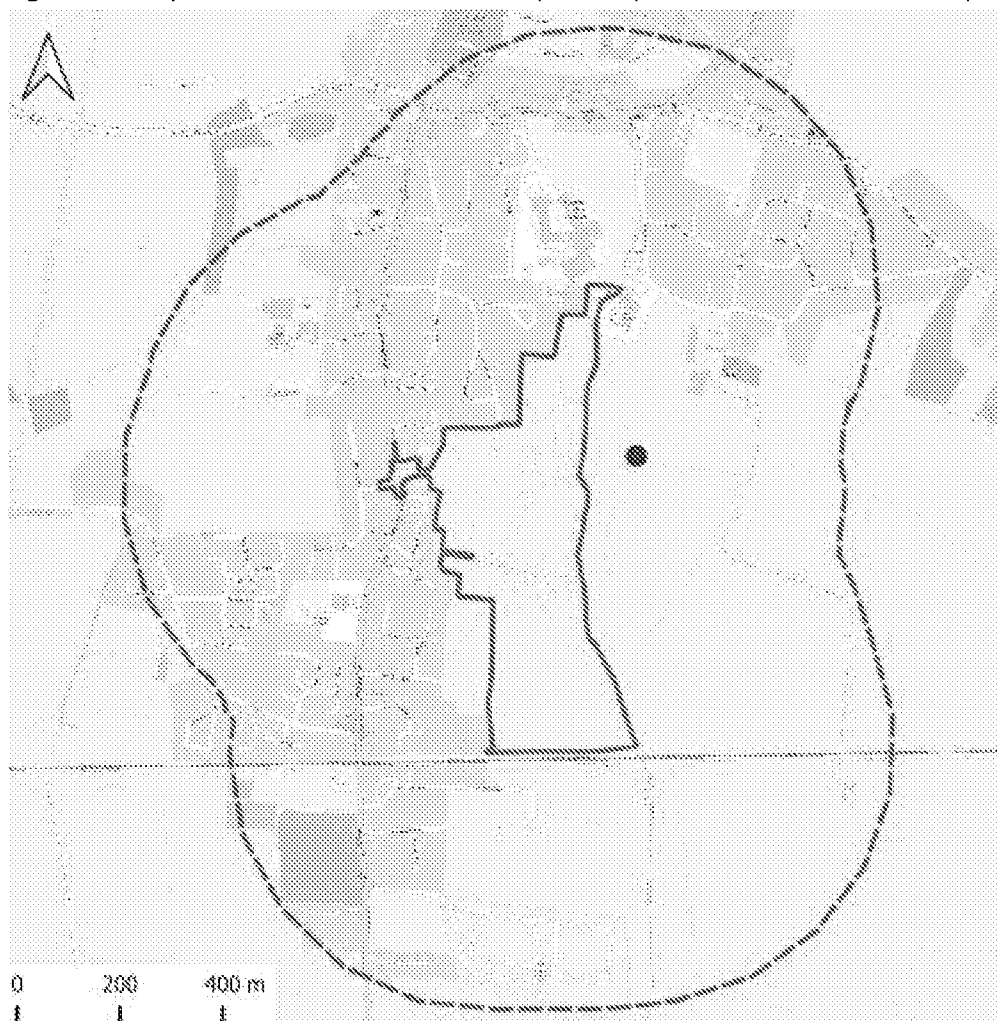
Figure 20. The GCN records provided by SxBRC (yellow star) relative to the site's location (redline).



4.6.2 Water Bodies Within 500 m

As per **Fig 21** below, and aforementioned in the previous section, there is only one pond within 500m of site and that is located approximately 110m to the east of site. The pond is located on the opposite side of the stream which forms the eastern site boundary.

Figure 21. The pond located within 500m of site (blue dot) relative to the site's location (redline).



4.6.3 On site Habitat Assessment

Similar to reptiles, it can be considered that the habitats present within site provide the required structure and heterogeneity required by GCN. The only pond within 500m of site is located approximately 110m to the east of site, which is on the eastern side of the flowing stream present on site. As evaluated by ECOSA Ltd. *"this stream forms a partial barrier to the site from this pond, reducing the likelihood of any newts associated with this pond using the terrestrial habitat on site"* (2016). Similarly, whilst there are 2 records of GCN from within 1km of site (**Fig 12**), these are separated from site by significant barriers to dispersal in the form of a large number of residential dwellings, fences and major roads. Taking all of this into consideration, the site is considered to be of **Low Potential** for GCN.

4.7 Hazel Dormouse

4.7.1 Pre-existing Information

SxBRC did not return any records of Dormouse (*Muscardinus avellanarius*) presence within 2 km of the site. A suite of Dormouse surveys were undertaken on site during June – November 2016 as an update to survey work conducted in 2012. No Dormice or evidence of Dormice presence or activity was recorded on site in 2012 or 2016 during work conducted by ECOSA Ltd.

4.7.2 On site Habitat Assessment

The diverse hedgerows and scrub along both the site boundary and field boundaries along with the wet woodland area on site offer ideal habitat for Dormice, despite no returned records from SxBRC or observed presence during previous survey work. Therefore, it is considered the site holds ***Moderate Potential*** of supporting Dormice.

4.7.3 Phase II Surveys

A total of 6 Dormouse surveys were conducted between May – October 2023. No evidence of Dormice was found across the tubes deployed across the site and therefore, no further mitigation is required. **Table 8** shows the survey results.

Table 8. Results of the Dormouse nest tubes survey work on site carried out between May-October 2023.

Survey No	Date	Other Occupancy	Dormice				Dormice Evidence
			GEC	GEO	Juvenile	Adult	
1	10/04/23	-	-	-	-	-	None identified
2	11/05/23	-	-	-	-	-	None identified
3	08/06/23	-	-	-	-	-	None identified
4	11/07/23	-	-	-	-	-	None identified
5	08/08/23	-	-	-	-	-	None identified
6	12/09/23	Woodmouse nest identified in tubes 11, 25, 26	-	-	-	-	None identified
7	19/10/23	Evidence of woodmice found in tubes; 7, 9, 45, 52, 55, 56, 65, 70, 73, 39, 26, 22	-	-	-	-	None identified

4.8 Notable and Birds of Conservation Concern (BoCC)

4.8.1 Pre-existing Information

SxBRC have returned records for a total of 66 'notable and protected' bird species including a number of NERC S41 listed species, Birds of Conservation Concern (BoCC) or those protected under W&CA Schedule 1 Part 1. A suite of breeding bird surveys were undertaken on site during June – November 2016 as an update to survey work conducted in 2012. A number of species were noted as breeding, including that of Cetti's Warbler (*Cettia cetti*), Linnet (*Linaria cannabina*), Song Thrush (*Turdus philomelos*), Yellowhammer (*Emberiza citrinella*) and Dunnock (*Prunella modularis*).

4.8.2 On site Habitat Assessment

The woodland, hedgerows and scrub boundaries present on site offer a range of suitable habitat for breeding and nesting birds to support a variety of species. Some of the grassland habitat and cropped arable field does offer some potential for ground-nesting birds (although this is limited in other grassland areas due to management). Additionally, it is understood that the wet woodland area majority of hedgerows and several areas of the grassland will be retained as part of the proposed plans. The habitat conditions on site are comparable to those observed during the 2016 breeding bird surveys, which confirmed presence of several species on site. Taking all of this into consideration, there is a **High Potential** for breeding and nesting birds to still be present on site.

4.8.3 Phase II Breeding Bird Surveys

A total of 32 bird species were recorded during the Breeding Bird Surveys within or just beyond the site boundaries with species noted shown in **Tables 9-11** below. A total of 7 red listed birds (of which 5 species are thought to be holding a territories within the site boundary) and 5 amber listed birds (of which 2 species is thought to be holding territories on-site) noted. The Song Thrush, Yellowhammer and Lesser Spotted Woodpecker are also priority species within England.

One active Buzzard (*Buteo buteo*) was located in the centre of the site (please refer to the appended bird results map).

Table 9. Weather conditions during breeding bird survey completed.

Date	Start Temp (°C)	Finish Temp (°C)	Cloud Cover (%)	Wind (Beaufort scale)	Start time	Finish time	General information
16/03/2023	10	10	0	0	06:16	08:02	Dry, broken clouds
						08:16	
13/04/2023	7	12	0	0	06:14	08:00	Sunny, clear, cool
						08:14	

11/05/2023	8	15	100	2	05:10	06:56	Cloudy, humid
						07:10	
14/06/2018	14	24	0	3	04:48	06:34	Sunny, dry, mild
						06:48	

Table 10. Summary of the results of the breeding bird survey completed between March- June 2023 (n=4) for the northern section.

Species	Legal/Conservation Status	Number of Pairs, nest locations, Males holding territory on site
Swift (<i>Apus apus</i>)	BoCC Amber	Commuting over site
Green Woodpecker (<i>Picus viridis</i>)	BoCC Amber	One sighting on a mature tree on-site
Starling (<i>Sturnus vulgaris</i>)	BoCC Red	One individual observed on the far western boundary adjacent to existing gardens. One group observed commuting across the far northern boundary.
Song Thrush (<i>Turdus philomelos</i>)	BoCC Red	A minimum of 4 territories were identified
Mistle Thrush (<i>Turdus viscivorus</i>)	BoCC Red	One individual heard calling to the far north west of the site
Dunnock (<i>Prunella modularis</i>)	BoCC Amber	Minimum of 4 territories
House Sparrow (<i>Passer domesticus</i>)	BoCC Red	Several individuals heard throughout the north section of the site adjacent to backing gardens and hedgerows
Whitethroat (<i>Curruca communis</i>)	BoCC Amber	Three territories heard within the centre of the site
House Martin (<i>Delichon urbicum</i>)	BoCC Amber	One individual observed close to existing dwellings to the west of the site
Yellowhammer (<i>Emberiza citrinella</i>)	BoCC Red	One territory present on the northern section of the site

Table 11. Summary of the results of the breeding bird survey completed between March- June 2023 (n=4) for the southern section.

Species	Legal/Conservation Status	Number of Pairs, nest locations, Males holding territory on site
Swift (<i>Apus apus</i>)	BoCC Amber	Commuting over site

Lesser Spotted Woodpecker (<i>Dryobates minor</i>)	BoCC Red	One individual seen on two occurrences on the same mature tree to the west of the agricultural field
Greenfinch (<i>Chloris chloris</i>)	BoCC Red	One individual was heard in the south east corner close to the railway line
Song Thrush (<i>Turdus philomelos</i>)	BoCC Red	One individual heard calling in the hedgerow bounding the east of the agricultural field and another within the centre of the site.
Yellowhammer (<i>Emberiza citronella</i>)	BoCC Red	One territory present along the hedgerow bounding the eastern side of the agricultural field.

4.9 Hedgehogs

4.9.1 Pre-existing Information

SxBRC returned 16 records for Western European Hedgehog (*Erinaceus europaeus*) presence within 2 km of the site.

4.9.2 On site Habitat Assessment

The hedgerows, scrub and wet woodland on site offer suitable habitat for Hedgehogs as they provide suitable corridors to link the site to the wider landscape providing more opportunities for sheltering and foraging. The habitat onsite is therefore deemed to have **Moderate - High Potential** to support Hedgehogs.

4.10 Riparian Mammals

SxBRC do not return any records of Otters (these records remain confidential however), although it is noted that whilst there are no recent records of Otters, signs of Otter activity have been found within Sussex river catchments. SxBRC returned 2 records of Water Vole (*Arvicola amphibious*) presence from within the 2 km search radius.

A Water Vole survey was undertaken on site during 2016 as an update to survey work conducted in 2012. No Water Voles/Otter or evidence of their presence or activity was recorded on site in 2012 or 2016 during work conducted by ECOSA Ltd.

An updated survey was completed by Ecosupport Ltd in June 2023 which found no evidence of Water Vole burrows or signs (**Fig 22**).

Figure 22. Results of the riparian mammal survey completed in June 2023.



5.0 ZONE OF INFLUENCE

5.1 Construction Phase

5.1.1 Change in Land Use

The change of use of the site will result in the physical structure of the present site being altered by the proposed development. Site preparation activities will include some earthworks and earth stripping associated with a phased construction. Therefore, the zone of influence is predicted to extend across the development footprint and all protected species and habitats within the development footprint have the potential to be disturbed.

5.1.2 Noise Pollution

Noise associated with construction activities is one of the hardest things to quantify. Noise disturbance occurs as a result of plant operation, traffic movements, and movements of site personnel associated with the continued extraction, crushing, screening and tipping within the application area.

When ground cover or normal unpacked earth is present between the source and receptor, the ground becomes absorptive to noise energy and is called a soft site. This can reduce in-air noise over distance. As these conditions are present on site it is considered that the noise from construction will not travel far past the development boundary. This will be aided by the presence of screening vegetation around the boundary of the site. The retention of perimeter vegetation and 'gapping up' existing hedgerows will reduce noise levels outside of the development footprint. It is therefore considered that the zone of influence for noise will be within the development boundary itself and 50 meters outside of the boundary.

5.1.3 Air Pollution

Particulates associated with the construction phase of this development will come from three main sources: the vehicles on site (from exhaust emissions, the contact of tyres on the road surface or dust blowing from materials carried via vehicles), stripping of topsoil/vegetation and excavation of footings for the new properties.

The zone of influence for air pollution, particularly dust, will depend on the time of year/weather condition within which works are carried out. For example, in dry conditions there may be dust generated by activities taking place during the construction phase, whereas in wet weather less dust will be generated. It is also dependent on the wind speed at the time of the activity as this determines how far the air pollution will be transported and indeed the direction.

Fugitive dust from development sites is typically deposited within 100-200m of the source; the greatest proportion of which comprise larger particles (greater than 30 microns) is deposited within 100m (Greater London Authority, 2006). Therefore, the zone of influence for air pollution during construction will be the development footprint itself with a 200m buffer.

It is also important to consider the impact of dust on sensitive sites, such as SACs, SPAs, SSSIs and non-statutory Wildlife Sites in the vicinity of a construction site (Greater London Authority, 2006).

5.1.4 Water Pollution

The zone of influence can be limited to a single river or stream, but can also extend many miles downstream. The impact area is related to releases of pollutants to a water body will depend on the type of water body (e.g. stream, river, sea or lake), the volume and flow of that water body, the nature of the pollutant and the chemical characteristics of the water body (see report from WSP which outlines the measures through which surface water treatment ensure pollutants are appropriately dealt with prior to discharge). The stream eventually flows to the coastline, however, does not flow directly into a statutory designated site.

5.2 Operational Phase

The zone of influence associated with the operational phase is extended beyond the site boundaries due to the nature of the development resulting in an increase in human activity and disturbance in the direct vicinity and further afield.

5.2.1 Human Disturbance

5.2.1.1 Recreational Pressure

The results of the nearby Solent Disturbance Mitigation Project (SDMP) forms the basis of the zone of influence for recreational pressure associated with human disturbance aided by the use of transportation. Evidence shows that 75% of coastal visitors live within 5.6km therefore, the zone of influence for people visiting designated and/or protected sites outside of the development boundary will be defined at 5.6km (with the Solent & Southampton Water SPA located approximately 360m away).

5.2.1.2 Walking

A study in 2002 found that 38% of walking trips were for personal errands, 28% were for exercise, 21% were for recreation or leisure and 5% for work. The average trip length was 2.1km (National Highway Traffic and Safety Administration and the Bureau of Transportation Statistics, 2002). With this in mind the zone of influence for disturbance in the form of people on foot will be assumed to be 2.1km.

5.2.1.3 Dog Walking

The visitor survey supporting the SDMP also found that people participating in dog walking lived within 1.20 km of the location at which they choose to walk their dog. Therefore, the zone of influence for dog walking will be 1.2km.

5.2.2 Pollution

5.2.2.1 Light

The impact of lighting will be confined within the development footprint itself. There is the possibility of light spilling into adjacent land; however, as adjacent land to the west is already urban and the land to the east is proposed for future development, the zone of influence will encompass the development footprint with a one-meter buffer along the outside of the boundary.

5.2.2.2 Air

Pollution will arise from the increased level of traffic and vehicles associated with a housing development of this size. It is outside of the expertise of this report to model the spatial patterns of air dispersion and deposition for various chemicals to allow for close delineation of the area of

influence. Therefore, a general consideration of the impacts on nearby notable ecological features will be considered.

5.2.2.3 Noise

The site is currently screened by vegetation on most boundaries. The retention of this and additional planting will continue to provide screening for wildlife populations. As the noise associated with this development will not be continuous and will not reach high levels, it is considered that the zone of influence for this development in operation will integrate the development site and 10 meters beyond the boundaries.

6.0 VALUATION

6.1 Habitats on site

The majority of the impact area is considered to be of **Site-Local** ecological value, with the site dominated by modified grassland, winter stubble, other neutral grassland with a low number of scattered trees. There are however areas of more mature trees lines, lines of scrub, streams and wet woodland with these habitats considered to be of **Regional** value.

6.2 Bats

6.2.1 Roosting Bats

The type of bat roost on site has been assessed in accordance with Bat Conservation Trust (BCT) Good Practice Guidelines (Collins 2016) and Bat Mitigation Guidelines (Mitchell-Jones 2004).

Based on best practice guidance, the results of the surveys indicate a **day roost for Common and Soprano Pipistrelle bats**. Due to the low numbers of individuals present, the features identified it is considered consistent with the BCT definition of a summer day roost which is “a place where individual bats, or small groups of males, rest or shelter in the day” (BCT, 2016).

Common and Soprano Pipistrelle bats are considered to be amongst the most common and widespread bat species in the UK (BCT, 2016). In accordance with best practice guidance (Mitchell-Jones, 2004; Wray et al., 2010), the identified day roosts within the tree are considered to be of **local conservation value** due to the species and the roost type and of **low conservation significance** using the CIEEM valuation criteria for bat roosts (Wray et al., 2010).

6.2.2 Foraging and Commuting Bats

Varying numbers of *Pipistrellus spp* were recorded foraging on site, with the highest trafficked areas shown in **Fig 19** (the majority of which were Common Pipistrelle). Occasional Serotine, Noctule, *Plecotus spp*, *Myotis spp* and Barbastelle (*Barbastella barbastellus*) were also recorded. It is worth noting that location D2 (**Fig 4**) had a noticeably larger number of Noctule calls. These species are considered common, rarer and rarest in England (Wray et al 2010)). Overall, when considering the results of all the bat survey work undertaken, it was considered there was a high level of Pipistrelle foraging and commuting activity on site, although this was largely restricted to single and low numbers of all other bat species. Guidance on valuing bat foraging and commuting habitat is provided by Wray et al (2010), which uses a points-based system. Using this system, the site scores **34 points** for commuting bats and **30 points** for foraging bats (see **Table 12**) and is correspondingly considered to be of **Regional** value for commuting bats and **County** value for foraging bats.

Table 12. Valuation of habitat for (a) commuting and (b) foraging bats after Wray et al. (2010). The points scored by the site are indicated in bold type.

Species	Number of bats	Roosts nearby	Habitat features
(a) Commuting habitat			
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
		Small number (3)	Un-vegetated fences and large field sizes (2)
Rarer (5)	Small numbers (10)	Moderate number/not known (4)	Walls, gappy or flailed hedges, isolated well grown hedges, moderate field sizes (3)
		Large number of roosts or close to a SSSI for the species (5)	Well grown and well-connected hedges, small field sizes (4)
Rarest (20)	Large numbers (20)	Close or within a SAC for the species (20)	Complex network of well-established hedges, small fields and rivers/ streams (5)
(b) Foraging habitat			
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established legislation (1)
		Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Small numbers (10)	Moderate number/not known (4)	Isolated woodland patches, less intensive arable and/or small towns/villages (3)
		Large number of roosts or close to a SSSI for the species (5)	Larger or connected woodland blocks, mixed agriculture and small villages/hamlets (4)
Rarest (20)	Large numbers (20)	Close or within a SAC for the species (20)	Mosaic of pasture, woodlands and wetland areas (5)

6.3 Reptiles

With a maximum count of 29 adult Slow Worms and 11 adult Common Lizards, the site can be considered to support low populations of both species using the HGBI (1998) guidelines. The reptiles were not widespread throughout the site due to the current mowing regime and were restricted to areas of longer grassland around the field boundaries and unmanaged grassland within the western field parcel. Both species are common and widespread throughout Hampshire (as indicated by the HBIC data) and therefore, the site is considered to be of **Local** value for reptiles. The site is not considered a key reptile site.

6.4 Birds

Despite the fact 7 red listed and 5 amber listed birds were noted to be holding territories on the site, these species, apart from the Lesser Spotted Woodpecker, are all common-numerous within Sussex and are therefore considered to hold value at the **Local-County** value.

6.5 Water Voles/ Stream

Although no evidence of Water Voles was discovered, due to the suitability of the stream to the east of the site and the mobility of Water Vole populations, it is considered that the site has capacity to support dispersal and seasonal use by Water Voles. Therefore, the site is considered to be of *site* value for Water Voles.

7.0 LIKELY ECOLOGICAL IMPACTS IN ABSENCE OF MITIGATION

7.1 Introduction

The CIEEM guidelines (CIEEM 2018) require that the potential impacts of the proposals should be considered in absence of mitigation. In order for a significant adverse effect to occur, the feature being affected must be at least of local value. However, in some cases, features of less than local value may be protected by legislation and/or policy and these are also considered within the assessment. Although significant effects may be identified at this stage of the assessment, it is often possible to provide appropriate mitigation.

7.2 Site Preparation and Construction

7.2.1 Impacts to Habitats

The proposals will predominantly involve the loss of the areas of modified grassland and cropland which is only considered to be of value at the **Site** level of significance. The proposals do however include the loss of areas of other neutral grassland and unmanaged boundaries, areas of scrub and some lengths of hedgerows, which are considered to be of **Local-Regional** level of significance. The wet woodland (priority habitat), streams, some of the hedgerows/tree lines and scattered trees on site are to be retained (please refer to the pre- and post-development habitat maps in the appended Biodiversity Net Gain report), however, the trees within the tree lines and wet woodland on site could be damaged by machinery and particularly by root zone compaction, and degraded through deposition of fine and heavy dust particulates and surface water run-off. Construction activities are associated with the generation of nuisance dust (larger particles) and PM₁₀ emissions. The larger particles tend to fall out quickly and, therefore, the impacts are generally most likely to be felt within 200m of the development (DEFRA, 2016). The loss of habitat and potential indirect effects would have a **moderate adverse impact** to habitats of **Local-Regional** value.

7.2.2 Bats

The boundary habitats on site provide foraging and commuting resources for common, rarer and rarest species of bat, and bats associated with Singleton and Cocking Tunnels SAC. The development will result in the loss of some hedgerows on-site, and, if unmitigated, potential impacts through root compaction and damage to retained trees/tree lines on commuting routes and a retained Common and Soprano Pipistrelle bat roost. Additionally, the development will result in the permanent loss of bat foraging habitat in the form of the grassland. Therefore, it is considered the development will result in a **certain moderate adverse impact** to species of **Regional** value.

Please note, if the plans change and the tree with a bat roost is proposed for removal then a NE mitigation licence will be necessary.

7.2.3 Reptiles

Reptiles were found within the other neutral grassland to the west of the site, along the scrub/grassland interface to the north of the site and along the southern boundary. The western field will become part of the development area, some of the southern grassland strip to a residential road, and some of the northern grassland strip. Without mitigation procedures put in

place, this would result in the direct harm of individuals and a reduction in the local population. This would therefore be contrary to the provisions of the Wildlife & Countryside Act (1981) and would create a significant adverse impact to the local reptile population. This will have a **certain moderate adverse impact** to species of **Local** value.

7.2.4 BoCC / breeding and Nesting Birds

The removal of hedgerows and scrub will result in the loss of breeding bird habitat. Additionally, whilst construction works are completed the removal of scrub/ hedgerows and scattered trees could lead to the disturbance of nesting birds and damage to their nests. In addition, as some of the construction works are proposed to be undertaken immediately adjacent to the woodland and bounding hedgerows, there is the risk of disturbing nesting birds which has the potential to result in adults abandoning their nests. Despite this, the level of noise associated with the construction will only be for a short period and are likely to only result in disturbance to nests within 5m of construction works. Therefore, an **adverse impact is possible** at the **site level** if breeding and nesting birds are present. Therefore, it is considered the development will result in a **certain adverse impact** at the **local level**.

7.2.5 Water Voles/Stream

A bridge will be constructed over the stream to link this application with the adjacent Church application. The crossing will result in a small loss of potential Water Vole habitat and disruption to dispersal. Additionally, construction activities on site can result in the increased risk of pollution incidents that have the potential to directly negatively impact upon the stream habitat itself and indirectly impact upon Water Vole. In combination this will have a **significant adverse impact** at the **local** level.

7.3 Site Operation

7.3.1 Human Disturbance

The development falls outside the 5.6km zone of influence for recreational pressure on the Solent SPAs. Therefore, there will be a neutral impact.

7.3.2 Dog Walking

No local wildlife sites falls within the 1.2km zone of influence for dog walking, therefore there will be a likely neutral impact.

7.3.3 Pollution

7.3.3.1 Air

Air pollution will arise from the introduction of vehicles on site. Although it will result in an increase in local emissions which may result in cumulative levels of air pollution resulting in a negative impact upon on-site retained habitats (i.e. the priority habitat wet woodland), although any detailed assessment of this is outside of the scope of this report (please refer to Air Quality chapter in the ES).

7.3.3.2 Noise

Noise will be generated by the inhabitants themselves and their associated activities. Noise will have implications for all fauna on site resulting in **certain minor negative impacts**.

7.3.3.3 Light

When the development is operational lighting will be introduced on site via the use of both street lamps and security lighting associated with the properties themselves. As currently there is a limited amount of existing lighting in place this will have ***certain major negative impacts*** upon nocturnal species such as bats (notably commuting Barbastelles which are of regional ecological value) and Badgers.

8.0 MITIGATION

Mitigation refers to measures that can be undertaken to avoid or reduce ecological impacts. The below sections outline a number of recommendations to both mitigate and protect the existing features of value from potential impacts.

8.1 Constructional Phase

8.1.1 Change in Land use and Habitat Clearance

To facilitate construction on site differing levels of vegetation clearance will be required. Although it is recommended wherever possible that existing vegetation is retained, removal should take place prior to or after the bird-nesting season (March – September). If this is not possible, the area to be cleared should be thoroughly checked by an ecologist immediately prior to clearance. If any active nests are found, they should be left undisturbed with a suitable buffer of undisturbed vegetation (ca. 5m) until nestlings have fledged.

8.1.2 Protecting Retained Trees / Hedgerows

In all cases, retained trees must be protected from direct impact and from severance or asphyxiation of the roots. An appropriate stand-off zone will be established on site to protect the trees. Fences must be installed at the distance of the branch spread away from the tree trunk (British Standard 5837:2012 trees in relation to construction) at a distance half the height of the tree and be of chestnut paling or of another similarly robust style of fencing. No vehicles should enter the protective ring fencing and no materials should be stored within their circumference. All protective fencing must be in place before any construction machinery arrives on site, and before any site stripping commences.

8.1.3 Badgers

Prior to the commencement of works on site, it is recommended for the following procedures to be in place:

- Trenches in excess of one metre in depth should be covered or secured and a means of escape provided for any animal that does fall in (a suitable escape can be provided by wooden planks placed at a 45-degree angle);
- Any temporarily exposed open pipe system should be capped in such a way as to prevent badgers gaining access;

An updating Badger survey will also be required immediately prior to site clearance / construction to ensure no further setts have been built that may require closure under licence (if they will be directly impacted upon).

8.1.4 Reptiles

Due to the legal protection relating to reptiles, it is necessary to implement mitigation to ensure these animals are not harmed as a result of the impending construction works and to ensure that there is no net reduction in the conservation status of reptiles in the local area. Therefore, this mitigation strategy has been produced in accordance with best practice guidelines relating to reptiles and development, published by English Nature (2004) and the HGBI (1998).

Due to the '**Low**' population size of Slow Worms and '**Low**' population size of Common Lizards identified and the fact the development is proposed to impact areas reptiles were discovered, it is

considered an on-site reptile relocation is necessary.

8.1.4.1 Donor Site Habitat Management & Manipulation

Despite the current condition of the managed modified grassland on site being of negligible potential for reptile species, it is noted that should the site be left unmanaged for a prolonged period, it is considered highly likely that reptiles present within the surrounding habitats will rapidly populate this area. Therefore, it is recommended that the current high intensity mowing management is sustained in order to maintain the existing sward height and keep the habitat unsuitable for reptile species.

Initial habitat manipulation will be implemented across the suitable area of the site. The Bramble and grass level will be cut to reduce the sward height to 10cm (if possible, this should be completed between September- February to avoid nesting bird season). This will increase the reptile's reliance on the artificial refugia to enhance the capture effort. This may need to be repeated if the grass level begins to increase.

8.1.4.2 Fencing

Semi-permanent exclusion fencing will be installed around the perimeter of all fields to both facilitate the reptile capture and prevent reptiles in the field boundaries from colonising the unsuitable habitat (managed grassland and cropland) once this develops into grassland. This provides a division between the areas of retained and protected vegetation and the 'working' areas i.e. those areas where humans and machinery will disturb the ground and also will prevent reptiles from passively passing through the site from surrounding favourable habitat.

The fencing will remain in place until all works are completed (**Fig 23**). Any breaches/damaged fence will be repaired and/or replaced as quickly as possible, at the cost of the contractors responsible.

Figure 23. Proposed approximate reptile fencing plan (orange) and the areas subject to a capture (orange hatched), and the reptile receptor (yellow).



8.1.4.3 Capture

Artificial refugia will be distributed throughout the main body of the site. The refugia used will be a mixture of bitumen roofing felt and corrugated metal. The density will be increased, if necessary, to facilitate the capturing process, in an attempt to reduce the number of capture days required.

Suitably qualified ecologists, with experience in reptile capture will undertake the capture between April-October. Reptiles will be captured by hand from beneath the artificial refugia and placed into a suitable container during suitable conditions (i.e. between 10°C and 20°C with little or no wind or rain). All captured reptiles will be released into the receptor area immediately. By ensuring that all reptiles are translocated by the end of October it will allow sufficient time for reptiles to find suitable hibernation sites within the receptor site.

8.1.4.4 Capture Effort

The HGBI guidelines (1998) suggest that for 'low' populations a minimum of 60 days capture is undertaken (**Table 15**). However, with the use of habitat manipulation and increased density in refugia, it is considered likely the capture may be completed in a much shorter timeframe (30 days) although this can be reviewed during the capture works. Artificial refugia will be distributed across the site at a minimum density of 50/ha. The capture effort will not be deemed completed until five consecutive negative days are recorded.

Table 13. The minimum capture effort for common reptile species based on HGBI (1998). The figures relevant to this scheme are emboldened and italicised.

Species	Population Size (adult density)	Refugia Density / ha	Minimum No of Trapping Days in Good Weather
Slow Worm	High (> 100 / ha)	100	All suitable days between March and September (min 90 suitable days)
	Medium (>50 / ha)	100	All suitable days between March and September (min 70 suitable days)
	<i>Low (< 50 / ha)</i>	50	<i>60 Suitable days</i>
Common Lizard	High (> 100 / ha)	100	All suitable days between March and September (min 90 suitable days)
	Medium (>50 / ha)	100	All suitable days between March and September (min 70 suitable days)
	<i>Low (< 50 / ha)</i>	50	<i>60 Suitable days</i>

8.1.4.5 On-site Reptile Receptor

As most reptiles found on-site were located within field boundaries, these boundaries will be retained to both protect adjacent hedgerows, trees and ditches but to also retain suitable reptile habitat thus minimising the requirement for a reptile capture. A full capture of the other neutral grassland (western field) and a small section of the western boundary of the north of the site (**Fig 15**) will be completed prior to construction works commencing. To contribute towards BNG, the south eastern section of the site (**Fig 24**) will be enhanced into good condition other neutral grassland for the benefit of reptiles and will serve as a suitable site of relocation due to the presence of the adjacent railway line (thus allowing movement of reptiles into and out of the area). The total size of the south eastern area is approximately 1.95ha which will offset the combined area of western field and north western field boundary (1.07ha).

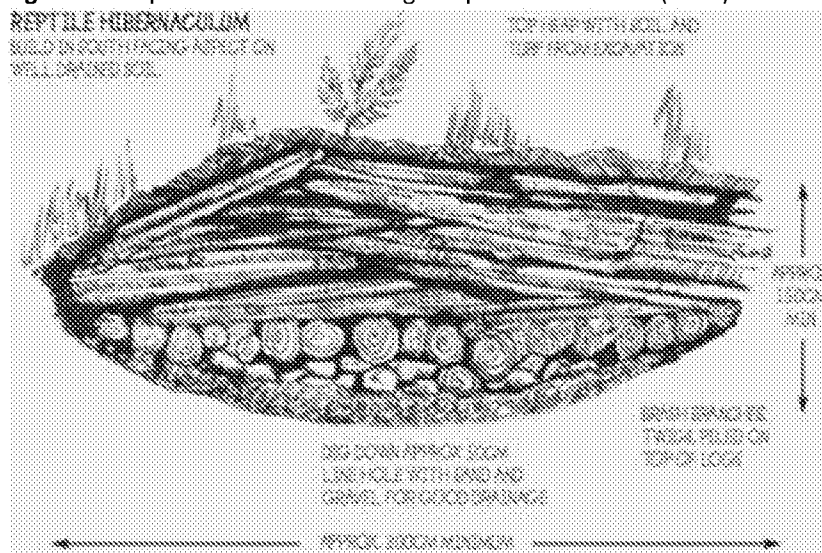
Figure 24. Existing habitats within the proposed reptile receptor (February 2023)..



8.1.4.6 Hibernacula

To provide the relocated reptiles with suitable areas to hibernate, 3 wood-based hibernacula will be created within the receptor (exact location to be determined by ecologists on site so the areas around them can be used as release focal points). This will be created following the specification outlined within *Reptile Habitat Management: Guidelines for Landowners* (HART, 2009) and *Reptile Habitat Management Handbook* (Edgar *et al*, 2010) (**Fig 25**) and each will be a minimum size of 5m².

Figure 25. Reptile hibernaculum design as provided in HART (2009).



8.1.4.7 Destructive Search

Following the conclusion of the relocation, a destructive search of the site will be necessary. The decision as to whether this would need to be more than a targeted destructive search of localised areas would depend on the number and location of reptiles captured during the relocation exercise in the wider site. Destructive search would entail the removal of any remaining natural reptile refugia within areas of the site where particularly high densities of reptiles were captured.

8.1.5 Bats

8.1.5.1 Dark Corridors

Please note, the application does not include the details of house materials or layout, therefore additional ambient artificial lighting from the introduction of the dwellings will be considered at the reserved matters stage.

All artificial lighting will be kept below a maximum of 0.5lux on retained boundary habitats (including the stream, retained woodland, retained scattered trees and retained scrub). These areas will be seeded with wildflowers to improve the quality of boundarygrassland habitats for bats and will also include the installation of log piles and hibernacula to increase the habitat resource for invertebrates (an important food source for bats). This will provide improved foraging habitat on-site post-development. In addition, the habitats will be protected from light spill (**please refer to the accompanying BNG report for full details**).

Ecotones will be utilized adjacent to key commuting and foraging habitats to provide a level of protection for bats from artificial light (**Fig 26**).

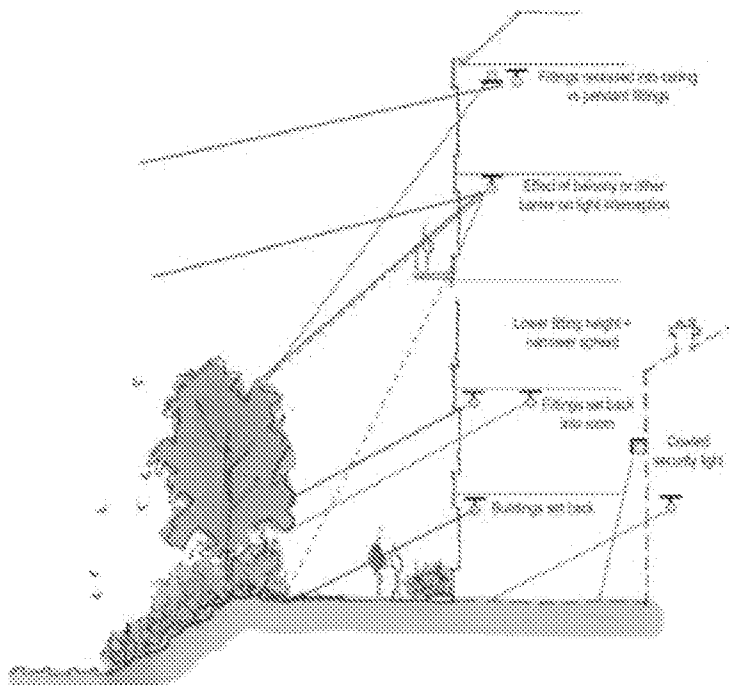
In addition to the lux levels, the wavelength of the street lighting will be kept to below 2700 Kelvin and peak wavelengths higher than 550nm, as bats have been shown to be less impacted by warm, white light sources without LED components.

For site-wide street lighting, directional hoods will be utilized to prevent light spill above the 90° horizontal plane and to direct the light source towards the urbanized areas and away from linear boundary habitats.

Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely' Please see Figure 18 below for a schematic of lighting recommendations that will be followed.

It has been confirmed with the lighting consultant that the LumiStreet luminaire will be used as these are 'equipped with dedicated light recipes that help with: 1) maintaining an optimal ecosystems for bats or 2) preserving a dark night sky and reduce light pollution'.

Figure 26. Internal lighting mitigation options (ILP 2023)



8.1.6 Tree Protection

Tree protective fencing will protect retained trees and shrubs from direct impact and from severance or asphyxiation of the roots. Fences must be installed at the distance of the branch spread away from the tree trunk (British Standard 5837:2012 Trees in relation to construction) at a distance half the height of the tree and be of chestnut paling or of another similarly robust style of fencing. No vehicles will enter the protective ring fencing and no materials will be stored within their circumference. All protective fencing must be in place prior to any construction machinery arriving on site, before any works on site get underway, and will remain in place until all work is completed. This will minimise the level of disturbance within the scattered tree and shrub areas during construction.

In addition, all tree protection will be covered by the CEMP which will detail further protection measures from the impacts of pollution during the construction phase of the development (please refer to the ES).

8.1.7 Water Vole Mitigation Strategy

8.1.7.1 Stream Cross-over

The location of the bridge will be clearly marked by an engineer and/or appropriate personnel. An ecologist will then undertake an updated survey of this area prior to works commencing. If no evidence of Water Voles is found, to discourage future colonisation of the area of impact, under the supervision of a SQE, vegetation will be stripped to bare earth either side of the ditch. All arisings will be raked off and removed from site. If evidence of Water Vole presence is noted during the survey, works may need to take place under a Natural England licence and an updated mitigation strategy should be accordingly compiled. If necessary, this will include the potential temporary displacement of Water Voles and ensuring bankside habitat incorporates plenty of areas

above the predicted water level of the ditch for the creation of burrows post-development.

8.1.7.2 Pollution Incidents

A number of hazardous materials are associated with construction projects. Not only can this lead to contaminated soil, but the site is particularly vulnerable to issues with run off with risk of hazardous substances entering the ditch network. **Table 16** contains a variety of procedures to prevent ecological implications from hazardous substances. These details will be further expanded upon by the completion of a Construction Environment Management Plan (CEMP) which will provide further detailed mitigation measures to minimize the impact of construction-related pollution on the aquatic systems within the development (which in turn will provide protection to local Water Voles from pollution events).

Table 14. Practical measures and sensitive working practices involving hazardous substances.

Issue(s) to Control	Best Practices to be adopted
Containers	• Use containers designed to minimise spills. • Ensure that containers used are appropriate to the substances contained (e.g. do not react with the substance, resistant to corrosion). • Ensure that containers are maintained in good conditions and securely closed. • Locate secondary containment store as far away from environmentally sensitive areas such as watercourses and water discharge points as possible. • Store goods away from heavily trafficked areas to avoid container damage. • In each storage area: • Ensure that only the substance(s) specified are stored. • Provide secondary containment or drip trays, and impermeable floor and bunding. • Prevent unauthorised access by providing locks to the storage areas.
Cleaning up minor spills	• Use sand, saw dust, or spill kit to absorb the spill and prevent it from spreading. • Dispose of the contaminated absorbent material as chemical waste. • Ensure that saw dust, spill kits, etc are readily accessible and of enough quantity.
Inspection and Maintenance	• Periodically inspect, and where necessary test, the condition of storage drums, tanks and pipelines (especially flanges and gaskets) • Inspect and maintain all plant and equipment to prevent leakage of chemicals/fuel.
Major Spills*	• Contain the spill to minimise reduce land contamination and pollution of nearby watercourse. • Inform the Project Manager immediately. • The Project Manager shall arrange for appropriate removal and disposal of the chemicals by authorised organisations, and determine if other parties (e.g. Environment Agency) need to be informed.

* Spills on the worksite are likely to be hydraulic oil or engine oil spilled from plant items. If a

spillage occurs the following procedure is to be followed:

- Immediately identify the spilled material and notify the Site Management Team. The Site Managers are to notify the BHL Project Manager.
- Contain the spill as soon as possible so it doesn't spread. Refer to Material Safety Data Sheets (MSDS) for personal protective clothing needed
- If containment is required, contain using earth mound and/or absorbent socks/spill kit. If you can't do this let your Supervisor know.
- Use the relevant clean up procedure as instructed by the MSDS.
- Once the spill has been contained, your Supervisor will arrange removal and disposal as soon as possible. Dispose of material using a licensed contractor and keep records of disposal on site.
- Complete an Incident Reporting Form (form F03) and forward it to the Project Manager.

8.1.8 Biodiversity Net Gain

In line with the upcoming requirements of delivery a 10% gain as per the Environment Act (2021), a BNG assessment of the scheme has been undertaken. The outcome of this has identified the likely requirement for some additional land in order to deliver a 10% gain and this is being actively looked at to ensure compliance (***NB a stand-alone BNG report is being provided to support the scheme.***)

9.0 MATERIAL ENHANCEMENTS

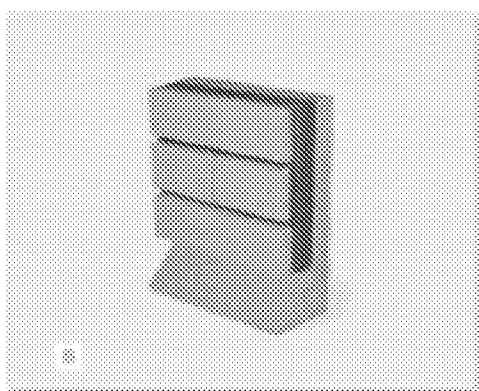
Please note, this section only considers hard landscaping and purpose-built habitat structures for protected and notable species. Details on soft landscaping enhancements will be included within the accompanying BNG report.

9.1 Bat Roost Features

9.1.1 Integrated Bricks

It is recommended that at least 50% of the proposed dwelling should include one bat brick or suitable alternative. The bat bricks used should be the ibstock bat brick B as they are available in a variety of different brick colours and requires no maintenance (**Fig 27**). These should also be positioned as close to the eaves as possible, away from windows and in a position that will receive some direct sunlight.

Figure 27. The Ibstock bat brick 'B' that will be incorporated into the newly built building.



9.1.2 Bat Boxes on Trees

In addition, bat boxes should be erected within trees in the woodland and retained mature trees (exact number to be determined at the RM stage):

Schwegler 2F bat boxes (or similar) – The front panel has a second inner wooden panel fitted to it to create a cavity wall. This provides ideal quarters for bats that inhabit crevices.

Schwegler 1FF bat boxes (or similar) – These are spacious enough for bats to use as a roost or nursery with making it ideal for bat species which inhabit crevices such as Pipistrelle Bats but also larger bats such as Noctule (*Nyctalus noctula*).

Schwegler 1FD bat box (or similar) – The domed roof results in an increased interior height whilst the two grooved internal wooden front panels provide a crevice. Both the cooler woodcrete surface and the warmer wooden panel means bats have a choice of different temperatures in different parts of the box.

Bat boxes to be sited on trees will be done so using the galvanised steel hanger and aluminium nail provided. They should be positioned at a height of between three to six metres from ground level. Bat boxes should ideally be sited in open sunny positions. The arrangement of the bat boxes has

them facing different directions to provide a variety of micro-habitats. To increase the chances of bats roosting in the new features, the bat boxes will be placed adjacent to vegetation features as bats will be more likely to discover the artificial roosts if it is placed close to an existing flight path.

9.2 Bird Nesting Features

9.2.1 Integrated Features

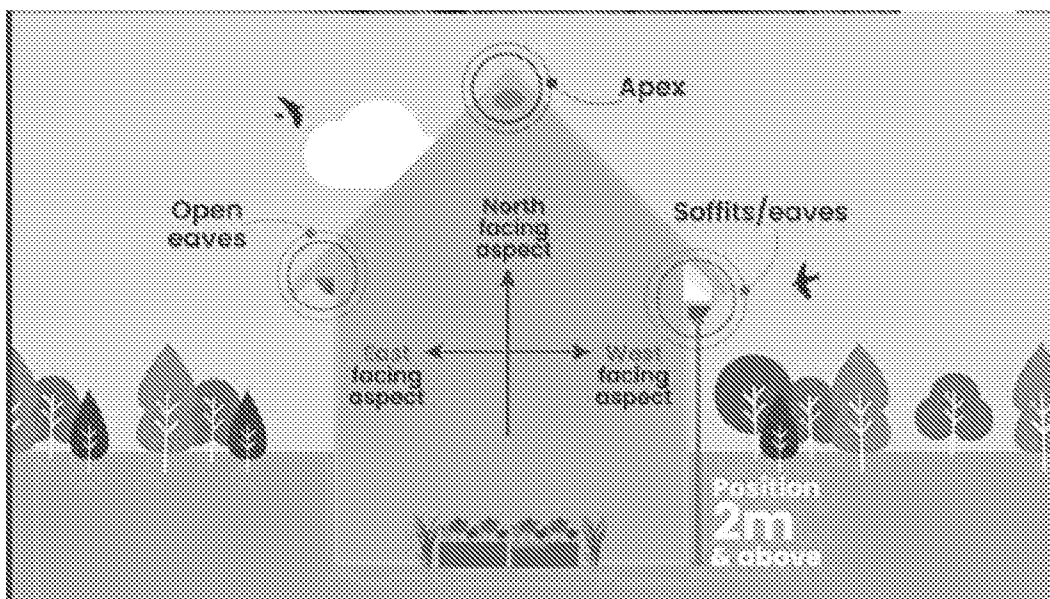
To act as a biodiversity enhancement, 50% of the new dwellings will incorporate two Swift bricks (equivalent to over a 1:1 ratio).

The 'CJ Wildlife swift maxi nesting box' with entrance via a CJ Wildlife 'Cambridge swift fullface brick' is recommended as it provides ideal nesting opportunities for Swifts and the fullface brick is available in different colours and can also be painted if necessary, to blend in with the surrounding brickwork. If this model is not suitable for the building specifications, an alternative swift box with internal floor space exceeding 400cm squared must be used. This feature should be installed at 6-7m above the ground, ensuring that there is unobstructed access for birds entering and leaving. The box should be installed under the eaves in shaded areas out of direct sunlight and away from windows.

Sparrow Terrace features will also be introduced on site. These can be fixed onto the surface of a suitable wall or incorporated into the brickwork. Although designed specifically for Sparrows it may also occasionally attract Tits, Redstarts and Spotted Flycatchers. Thus, it is recommended they be installed on 10% of properties.

In addition, House Martin nest cups will be installed in the eaves of 10% of properties. The nest cups need to be placed at least 2m from ground height with an overhang to protect the nest from the elements (at least a 150mm overhang in total) (**Fig 28**). The cups should be placed on north, east or west elevations, avoiding southern elevations when the nest is exposed to sunlight for too long.

Figure 28. Recommended fitting instructions for House Martin cups (House Martin Conservation UK & Ireland).



9.3 Hedgehogs

9.3.1 Hedgehog Homes

As well as the log piles, Hedgehog homes will also be incorporated into the wider landscaping of the development to enhance sheltering opportunities for local Hedgehogs (such as Igloo Hedgehog home or Hogitat Hedgehog house) (**Fig 29**). This will provide a rapidly declining species with a place to shelter/hibernate.

Figure 29. Igloo Hedgehog House (Amazon, 2020).



9.3.2 Hedgehog Highways

Provision will be made to promote site connectivity and extended foraging ranges and opportunities for European Hedgehog. Holes measuring 10cm x 10cm will be made at the base of boundary fences/gravel boards into and between each garden and the surrounding habitats. Small signage should be installed on the fence above either side of these access points to ensure they remain open upon completion of the development. The People's Trust for Endangered Species provide such signage, the purchase of which also supports conservation efforts.

10.0 REFERENCES

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