

Ecological Assessment Water Lane, Angmering



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Ecology | Green Space | Community | GIS

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EXECUTIVE SUMMARY

Introduction	- The site is located at Land North of Water Lane, Angmering, West Sussex and is subject to plans for the construction of 525 residential dwellings, 3ha of employment land, public open space, play areas, access, associated infrastructure and landscaping. - This Ecological Assessment updates the previous ecological surveys undertaken between 2015 and 2018, in order to inform the assessment.
Surveys undertaken	- This Ecological Assessment was completed following a UK Habitat Classification survey at the site in March 2020, which was extended to include an assessment for protected species. - Targeted surveys for bats, badger, hazel dormouse, great crested newt, otter and water vole and birds were also undertaken throughout the 2020 survey season.
Key Results	- A 7-hectare Ancient Semi Natural Woodland was located on the eastern boundary of the site. - The key habitats were assessed to be the hedgerows, mixed scrub and woodland belt located within the centre of the site. - A main badger sett was identified within the strip of woodland to the south of the racetrack, with signs of foraging nearby. - Hazel dormouse nests and individuals were identified in the majority of the hedgerows and scrub within the northern section of the site. Dormice were assumed present throughout most of the arboreal habitats on site. - Low levels of bat activity were recorded on site, with the woodland edge habitat being the key habitat on site for bats. Two trees were assessed to have potential to support roosting bats. - There was a section of riparian habitat adjacent to Water Lane which was assessed to hold potential for water vole and otter. - Common species of farmland bird were recorded with only common species confirmed as breeding on site. The site was assessed to contain abundant potential nesting habitat. - The site has the potential to be used by hedgehog and polecat. - The site was considered to contain low potential habitat for common species of amphibians.
Recommendations	- Clearance of the site must be undertaken in an ecologically sensitive manner, including working methods and timing of works. - Ecological compensation and enhancement features have been recommended for the site. - A dormouse licence must be sought for the removal of mixed scrub and hedgerow habitat; a working method statement has been provided within this report. - Full habitat recommendations have been provided regarding the establishment and management of created and existing habitats and the restoration of features such as hedgerows on site. - A lighting plan has been produced for the site, which ensures boundary hedgerows and the green infrastructure network throughout the site is not subject to increased lighting levels, in order to protect foraging and commuting bats and other nocturnal species.

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1.0 INTRODUCTION

Ethos Environmental Planning (Ethos) have undertaken this Ecological Assessment (EA) of Land North of Water Lane, Angmering, West Sussex, hereafter known as the 'site' and shown in Figure 1.

The total area surveyed was 32.75 hectares and included several modified grassland fields and arable land with hedgerows, areas of mixed scrub, woodland and other neutral grassland, with a racetrack containing areas of hard standing, bare ground and amenity grassland.

This Ecological Assessment has been provided to support the outline application (Planning Reference: A/40/18/OUT).

Previous surveys were undertaken by The Ecology Partnership on site between 2015 and 2019. This included a Preliminary Ecological Appraisal, a Site Review Report, and several targeted species reports included reports for badger, dormouse, reptiles and bats. These were collated within the Ecological Impact Assessment produced in 2018. The findings from the surveys are summarised in the background section of this report (Section 4.1).

1.1 Aims and Objectives

The overall assessment has been informed by guidelines provided in the '*CIEEM guidelines for ecological report writing 2nd Edition, 2017*'. Further guidance in relation to surveys for protected species is detailed in the relevant sections within this report. The primary aims of the EA is to provide a robust evaluation of the potential impacts of the proposed scheme on ecological features that may be affected; with due regard to relevant local planning policy and legislation.

The EA has the following objectives:

- to identify the existing habitats on site;
- to identify the potential for protected species;
- to establish baseline ecological conditions and determine the importance of ecological features present within the specified area;
- to identify if any further surveys are required with regards to protected habitats or species;
- to identify key ecological constraints to the project and make recommendations for design options to avoid significant effects on important ecological features/resources;
- to identify the mitigation and compensation measures to ensure there is no negative impact on habitats and protected species during construction and in operation;
- to establish any requirements for protected species licensing; and
- to identify ecological enhancement opportunities to seek a net gain in biodiversity.

1.2 Site Location

The site was located at Land North of Water Lane, Angmering, West Sussex (Central Grid Reference TQ 07639 05254), as shown in Figure 1. The site consisted of several modified grassland fields, arable land and a racetrack, with an access track and double hedgerow in the centre of the site.

An area of ancient woodland is located adjacent to the east of the site, with the A27 Arundel Road to the north, Water Lane to the south and areas of residential and commercial land to the west. The site is located northwest of Worthing and north east of Littlehampton.

Figure 1 Site location



1.3 Development Proposals

The proposals comprise the development of up to 525 residential dwellings (Class C3) 3 ha (gross) of employment land (Class B1), public open space, play areas, access, associated infrastructure, and landscaping. The concept masterplan is shown in Figure 2.

Figure 2 Development Masterplan (Drawing Number 19271/ C01C November 2021)



1.4 Structure of the Report

The following sections are included within this report:

- Legislative and planning context;
- Methodology;
- Background data review;
- UK Habitat Classification survey;
- Protected species assessment;
- Discussion;
- Recommendations; and
- Conclusions.

2.0 LEGISLATIVE AND POLICY CONTEXT

This section provides a summary of the legislative and planning context which has been used to inform the ecological assessment and subsequent recommendations made in this report. Appendix 1 sets out further details in relation to the most relevant legislation and policy.

2.1 Summary of Legislation

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

Since the UK has left the EU, these regulations have been amended (in operation terms) to retain the legal powers of the regulations to the UK. Natural England has reiterated that as the UK leaves the EU:

- The UK government is committed to maintaining environmental standards, and will continue to uphold international obligations;
- All European protected sites and species retain the same level of protection once the UK leaves the European Union;
- The environmental assessment regimes that inform planning decisions (SEA/EIA/HRA) continue to apply post EU exit;
- All permits and licences issued by UK regulatory bodies continue to apply;
- The legal framework for enforcing environmental regulations through regulatory bodies and the courts is unaffected by leaving the EU and continues to apply.

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Badgers and their setts are protected under the **Protection of Badgers Act 1992** as amended by the Hunting Act 2004.

The **Natural Environment and Rural Communities Act 2006** (the NERC act) places a duty on all public authorities, including local planning authorities, to consider biodiversity in their work. Local planning authorities are to ensure that there is no net loss of biodiversity on a site, no net loss in habitat connectivity and aims to enhance biodiversity.

The **Hedgerows Regulations 1997** protect ‘important hedgerows’ from being removed (uprooted or destroyed). Hedgerows are protected if they are at least 30 years old and meet at least one of the criteria listed in part II of schedule 1.

Specific legislation related to different species such as bats, birds and reptiles is outlined in Appendix I.

The **Environment Act 2021** includes provision for biodiversity net gain to be applied to every planning permission.

Schedule 14 of the draft Environment Bill sets out amendments to the Town and Country Planning Act 1990 for the inclusion of biodiversity net gain as follows:

“Biodiversity gain objective

(1) The biodiversity gain objective is met in relation to development for which planning permission is granted if the biodiversity value attributable to the development exceeds the pre-development biodiversity value of the onsite habitat by at least the relevant percentage.

(2) The biodiversity value attributable to the development is the total of—

(a) the post-development biodiversity value of the onsite habitat,

(b) the biodiversity value, in relation to the development, of any registered offsite biodiversity gain allocated to the development, and

(c) the biodiversity value of any biodiversity credits purchased for the development.

(3) The relevant percentage is 10%.”

The Environmental Act received Royal Assent in November 2021, meaning that by November 2023 the expectation for all planning permissions to include a biodiversity net gain of at least 10% will become a legal requirement.

2.2 Policy

The **National Planning Policy Framework (NPPF)** aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, including the establishment of coherent ecological networks more resilient to current and future pressures.

The historic UK Biodiversity Action Plan (UK BAP) set out a programme for conserving the UK’s biodiversity. It led to the production of 436 action plans between 1995 and 1999 to help many of the UK’s most threatened species and habitats to recover. A review of the UK BAP Priority list in 2007 identified 1,150 species and 65 habitats that met the UK BAP criteria. Since, as a result of new drivers and requirements the **UK Post-2010 Biodiversity Frameworks (2012)** has replaced the UK BAP Action Plan. The BAP process has been devolved to local level with each county deciding its own way forward.

2.2.1 National Planning Policy Framework 2021

The **National Planning Policy Framework (NPPF)** aims to minimise impacts on biodiversity and deliver net gains in biodiversity contributing to the Government's commitment to halt the overall decline in biodiversity, including the establishment of coherent ecological networks more resilient to current and future pressures.

NPPF 2021 sets out principles for conserving and enhancing the local environment. Key policies are that local plans should allocate land with least environmental or amenity value and take a strategic approach to maintaining and strengthening networks of habitats and green infrastructure as set out under paragraph 174.

'Planning polices and decisions should contribute to and enhance the natural and local environment by:

- a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- b) Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and more versatile agricultural land, and of trees and woodland;*
- c) Maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans, and*
- f) Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

The approach to dealing with biodiversity in the context of planning applications is set out under paragraph 180:

- 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 Site of Special Scientific Interest, 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 Sites of Special Scientific Interest;*

- 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; and*
- d) *development whose primary objective is to conserve or enhance biodiversity should*
- e) *be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

The above approach encapsulates the ‘mitigation hierarchy’ described in British Standard BS 42020:2013, which involves the following step-wise process:

- **Avoidance** – avoiding *adverse* effects through good design;
- **Mitigation** – where it is *unavoidable*, mitigation measures should be employed to minimise adverse effects;
- **Compensation** – where residual effects remain after mitigation it may be necessary to provide *compensation* to offset any harm; and
- **Enhancement** – planning decisions often present the opportunity to deliver benefits for *biodiversity*, which can also be explored alongside the above measures to resolve potential adverse effects.

The measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development (BS 42020:2013, Section 5.5)

2.2.2 Local Policy

The site is located within the Arun district and so falls under the jurisdiction of Arun District Council. The following policies from the Arun Local Plan (2018) relate to development and nature conservation:

Policy ENV SP1 Natural Environment

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 sites listed in Tables 17.1-17.7 that are recognised for the species and habitats contained within them.

Policy ENV DM1 Designated Sites of Biodiversity or Geological Importance

- a) Proposed development likely to have an adverse effect on land with the designated features of any Site of Biodiversity or Geological Importance as listed in Tables 17.1 – 17.7 or any subsequently designated sites (either individually or in combination with other developments), will not normally be permitted. Consideration will be given to the exact designated features present on the site, their scarcity/ rarity and recognition of the protection offered by their existing status. Development on wildlife sites with the highest value will only be permitted exceptionally where the following can be demonstrated:

- i) There is no alternative solution (which shall be adequately demonstrated by the developer).
 - ii) There are reasons of public health and safety or
 - iii) There are benefits of primary importance to the environment or
 - iv) There are imperative reasons of overriding public interest.
- b) 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;
- i) The European, National or Local status and designation of the site;
 - ii) The nature and quality of the site's features, including its rarity value;
 - iii) The extent of any adverse impacts on the notified features of interest;
 - iv) The need for compensatory measures in order to re-create remaining features of habitats on or off the site.
- c) 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 DM3 Biodiversity Opportunity Areas

Development shall:

- a) Retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and steppingstones
- b) Be designed in order to minimise disturbance to habitats

Development proposals that do not reasonably address opportunities for enhancing these through their design, layout and landscaping or access/management shall not be permitted. 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 on the Policies Maps 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.

Policy ENV DM4 Protection of Trees

Development will be permitted where it can be demonstrated that trees protected by a Tree Preservation Order(s), (TPO) identified as Ancient Woodland, in a Conservation Area or contributing to local amenity, will not be damaged or destroyed now and as they reach maturity, unless development:

- a) Would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837 (2012). Details of any advice received having regard to BS 5837 (2012) shall be submitted, in writing, as part of a planning application; or

- b) Would enhance the survival and growth prospects of other protected trees;
- c) The benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland.

Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature without causing future nuisance or damage shall be provided. The planting of new trees shall form an integral part of the design of any development scheme.

Proper provision must be made for the protection and management of trees or areas of woodland on-site when undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 (2012) in order to ensure that trees are adequately protected during development and appropriately maintained in the future. Conditions for the continued protection of trees on sites shall be included in any planning permission given.

Where there are existing trees on or adjacent to a development site, developers shall be required to provide:

- d) Land and tree surveys
- e) A tree constraints plan
- f) An arboricultural impact assessment to include a tree protection plan and arboricultural method statement.

These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.

Policy ENV DM5 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 Background Data Search

A background data search was received from Sussex Biodiversity Records Centre (SxBRC) in July 2021. The search area included records of non-statutory designated sites and protected and notable species within 2km of the proposed development site.

An additional search for statutory designated sites within 2km of the development site and granted European Protected Species (EPS) licences within 1km of the site boundary was undertaken using publicly available information (DEFRA Magic map).

3.2 UK Habitat Classification Survey

A UKHab survey was undertaken on 3rd March 2020. The survey incorporated detailed assessment of the land within the development boundary, including a description and mapping of all key features and habitat types. The survey was carried out to identify the range of habitats within the site and the predominant and notable species of flora.

3.3 Biodiversity Net Gains Assessment

An assessment of the site baseline and proposed ecological value in habitat units was undertaken using mapping software ARC Pro to calculate habitat areas. The Net Gains calculator used within this report was the DEFRA Biodiversity Metric 3.0 Calculation Tool Beta Test.

Areas occupied by proposed street trees were calculated using the Metric 3.0 Calculation Tool Street Tree Helper (STH). The STH requires information on the number and size of street trees of the proposals. Based on standard root protection areas, the STH generates an estimated area the street trees will occupy in target condition, within expected time frame of 27 years. The size input for the STH is divided into three categories: small, medium, and large. The measurements for these three categories are provided in the Metric 3.0 Technical Supplement 15. Size categories were assigned to tree species in the tree planting strategy for the proposals where available.

3.4 Protected Species Surveys

3.4.1 NERC S. 41 Mammals

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

3.4.2 Badger

The survey for badgers included a search of the development site for any evidence of badgers, including setts, foraging signs (snuffle holes), runs and latrines. Habitats on site were systematically surveyed for evidence of badgers in the form of:

- faeces (dung pits): badgers usually deposit faeces in characteristic excavated pits, concentrations of which (latrine sites) are typically found at home-range boundaries.
- setts: comprising either single isolated holes or a series of holes likely to be interconnected underground.
- paths between setts or leading to feeding areas.
- scratching posts at the base of tree trunks.
- hair traces.
- snuffle holes (foraging), formed during foraging and comprising characteristically disturbed ground vegetation; and,
- footprints.

Where setts were found, activity levels were scored using the following criteria:

- number of well-used holes (with one or more of the features: well-worn entrance; freshly excavated soil; bedding material);
- number of partially used holes (leaves or twigs in entrance and/or mosses and other plants growing in or around entrance);
- number of disused holes (partially or completely blocked, with considerable amount of excavation required for reoccupation).

The field survey methods described above are consistent with those advocated by (Harris et al. 1989). All field survey work was undertaken between March and October 2020, embracing the period when territorial marking is taking place and badgers are mobile and foraging.

Camera Trap Surveys

To aid in the classification and scoring of the potential sett, camera trap surveys were undertaken. Three camera traps were set up during the 2020 survey season. Deployment and collection dates are detailed in Table 1, with the locations of camera traps shown in Figure 3.

Data was analysed for any evidence of badger to aid assessment and classification of the sett. The date, times and type of behavior was noted.

As a guide to classifying each sett the following criteria is followed:

- **Main** – normally the focal sett for a badger social group. Generally always occupied, main setts usually have several well used holes with radiating tracks, latrines and other signs of activity. The actual number of holes can vary greatly, depending on social group

size and soil conditions. Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.

- **Annex** – a secondary sett, close to the main sett. Will normally be connected to the sett with very obvious tracks. Annexes may not be occupied constantly, even when the main sett is very active. Normally less than 150m from main sett, comprising several holes.
- **Subsidiary** – occurring at a greater distance from the main sett, and not as clearly linked to it as an annex. These setts will clearly fall within the territory of a social group and may be seasonally used by badgers; and
- **Outlier** – less frequently used, these setts may be colonised by other species when not in use by badgers. Outliers may represent a temporary sett, or a habitation for migrating individuals, or those excluded from a social group.

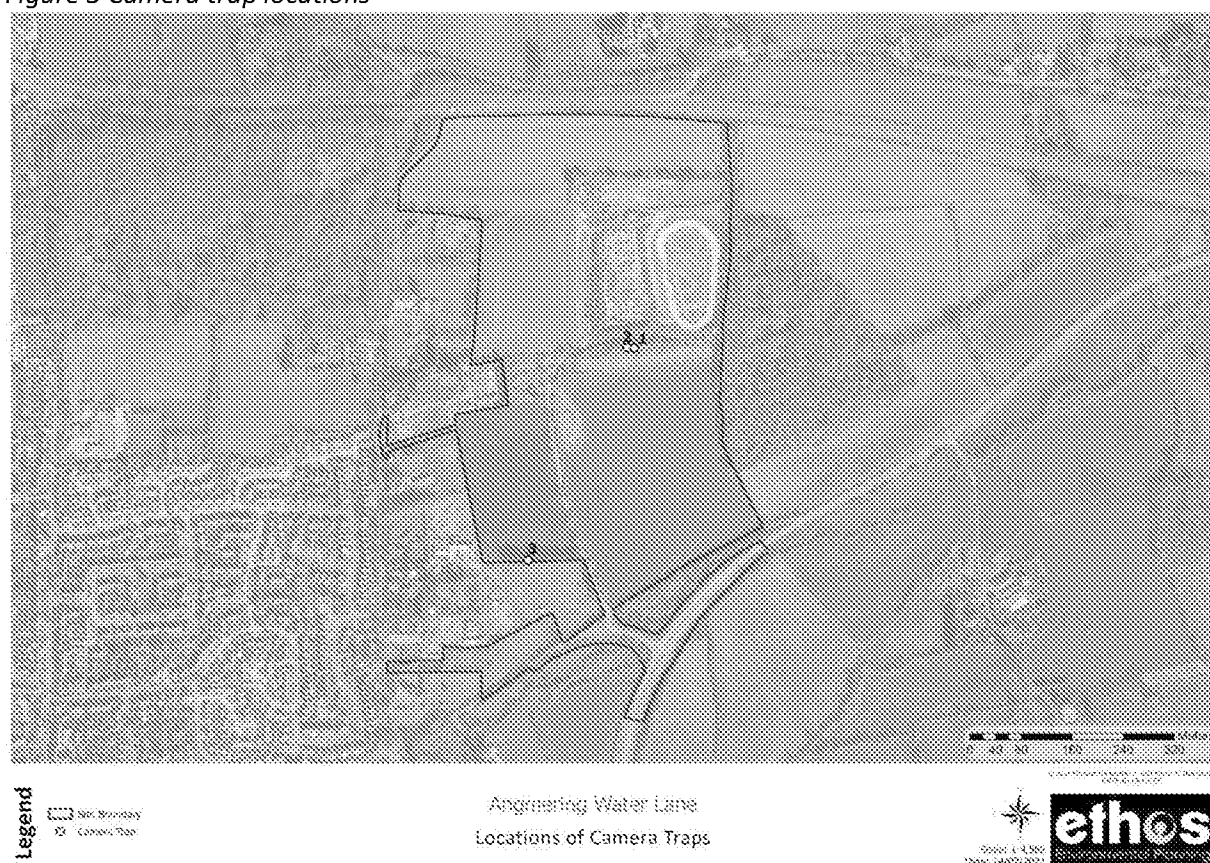
It is important to classify each sett and determine its use by the social group. This involves counting the number of entrances per sett and assessing sett use based on the following criteria:

- **Well-used:** being clear of any debris or vegetation, obviously in regular use and may or may not have been excavated recently.
- **Partially used:** not in regular use and have debris such as leaves and twigs in the entrance or have moss and/or other plants growing in or around the entrance. Partially used holes could be in regular use after a minimal amount of clearance
- **Disused:** not been in use for some time, are partially or completely blocked and could not be used without considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Table 1 Camera trap deployment/ collection dates and locations

Camera Number	Deployment Date	Collection Date	Location
1	19/05/2020	29/07/2020	Main sett, facing large hole.
2	19/05/2020	21/10/2020	Main sett, facing most western hole.
3	22/04/2020	19/05/2020	On boundary fence line facing several offsite mammal holes in southwest of site.

Figure 3 Camera trap locations



3.4.3 Hazel Dormouse

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

Ninety dormouse tubes were deployed in suitable habitat across the site on 22nd April 2020 at roughly 20 metre intervals, as shown in Figure 4. The tubes were checked once a month between May and October 2020.

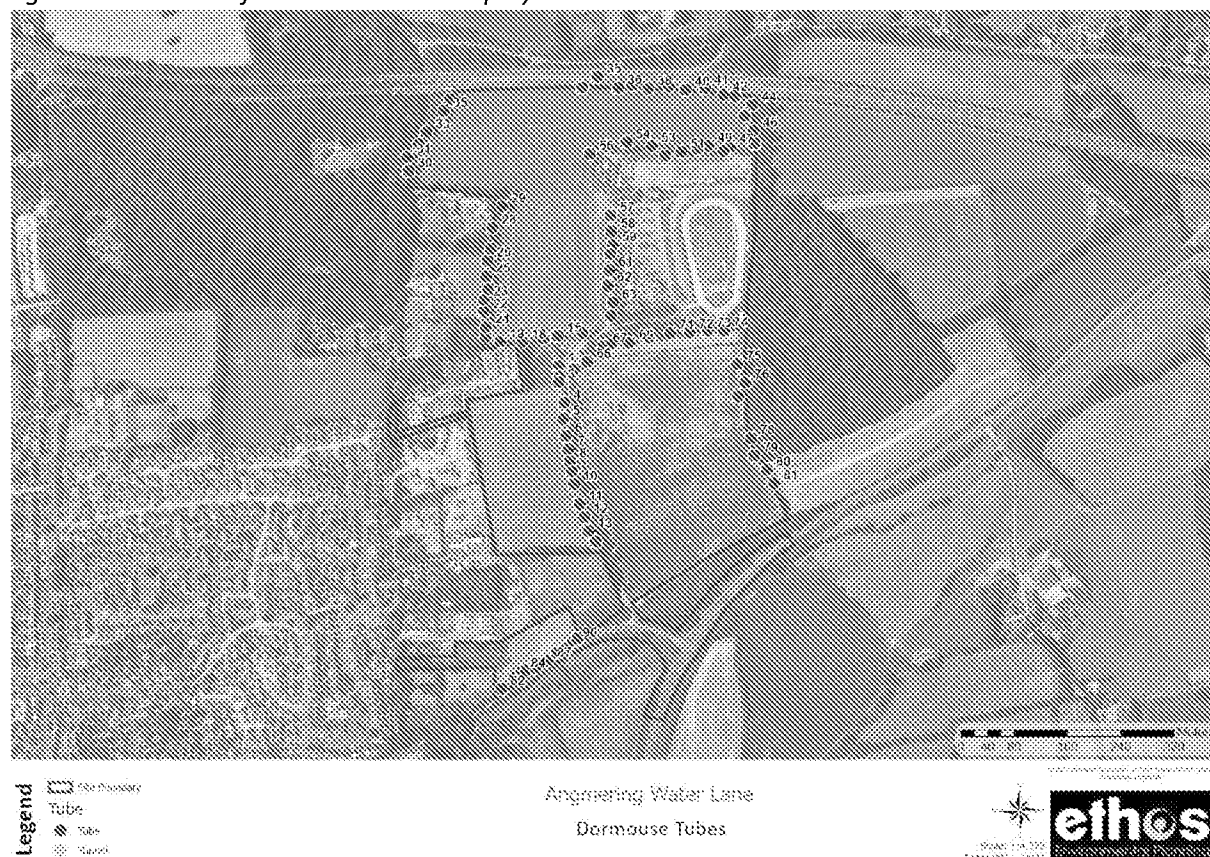
Table 2 below (taken from Table 5 of the *Dormouse Conservation Handbook*) shows the index of probability of finding evidence of dormouse in nest tubes. The score is based on 50 tubes deployed (doubled for 100 tubes and halved for 25 tubes) and a minimum score of 20 must be reached to determine presence/likely absence. The scores highlighted in red show the months checks of the 90 tubes on site were undertaken, and therefore the corresponding points that could be tallied for an overall total score for the survey.

Table 2 Index of probability

Month	Score
April	1
May	4
June	2
July	2
August	5
September	7

Month	Score
October	2
November	2
Total =countx2	44

Figure 4 Locations of dormouse tubes deployed on site



3.4.4 Riparian Mammals

The survey included an assessment of the potential of the site to support riparian mammals such as otter (*Lutra lutra*) and water vole (*Arvicola amphibius*). The principal survey technique employed was a search for field signs including holts/burrows, couches, feeding sites, spraints/latrines, and tracks.

3.4.5 Bats

The methodology for the bat survey has been informed by the Bat Conservation Trust *Bat Surveys Good Practice Guidelines 2016*.

Habitat Assessment

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

Preliminary roost inspection

There were several outbuildings and sheds located on site (Figure 5). A search of these structures in regard to their suitability to support bats was undertaken on 3rd March 2020.

The physical search includes a search for live animals and a search for other signs that give an indication of past or present occupancy as outlined below. In the case of bats, typical indicators include droppings (which are characteristic and can often be speciated or at least be indicative of species type), signs of staining, urine splashing, characteristic odours, and accumulations of discarded prey remains.

The search included an endoscope search of features highlighted within the previous report. Equipment included a Rigid micro-CA-350 Inspection Camera with micro 6mm extension, camera, laser measure and binoculars.

Figure 5 Structures on site



Tree ground level assessment

All trees proposed for removal, or which could be impacted by tree works and/or artificial lighting were subject to a ground- level roost assessment on 24th April 2020 to assess their roosting potential for bats. Surveyors used close-focusing binoculars and a high-powered torch to view areas inaccessible from the ground. The methodology draws upon guidance within Collins (2016) and the Bat Tree Habitat Key (2018).

Potential roosting features on trees were identified as any feature within a tree that could provide shelter for a roosting bat. These features result from the following three mechanisms.

- Disease and Decay;
- Damage; and,
- Associations.

Tree with no potential roost features were assessed as having 'negligible' potential for roosting bats. Trees with features suitable for roosting bats were assessed as having 'low', 'moderate' or 'high' potential for bats.

The definitions of 'negligible, low, moderate and high' used in this assessment are in accordance with those in BCT Survey Guidelines 2016:

- **Negligible:** Negligible habitat features on site likely to be used by roosting bats.
- **Low:** A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential
- **Moderate:** A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only)
- **High:** A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Activity transect surveys

Activity transect surveys were undertaken on site, monthly between May and September. The surveys involved surveyors walking a transect around the site from sunset to approximately two hours after sunset. The dates of the activity transect surveys are shown in Table 3. Echo Meter Touch (EMT) bat detectors were used for all the surveys. All calls recorded were analysed using the Echo Meter Touch app software. All calls recorded were cross referenced to a call reference collection library of known bat species to confirm species presence.

Table 3 Activity transect survey dates

Month	Survey Date
May	19/05/2021
June	16/06/2021
July	15/07/2021
August	12/08/2021
September	17/09/2021

Static Detector Surveys

Four static positions on site which is higher than the recommended within the Bat Survey Guidelines (Collins, 2016) for habitats assessed of providing moderate potential for foraging bats. The static detectors were located on the north-eastern boundary of the site to assess the

composition of the bat's species on site and to assess the levels of activity along the arboreal border, as shown in Figure 6.

Full Spectrum Wildlife Acoustic bat detectors were used on the surveys. The calls were processed and analysed using the British Trust for Ornithology (BTO) Pipeline. This software provides a confidence score for each species returned and highlights rare species which are unlikely to be detected in the survey area. Results with a low confidence <50% probability were excluded from the analysis. This data was then input into the ECOBAT online database which compares the bat activity onsite to all bat results within a 100km radius of the site. This ensures that the bat results are comparable and bat activity can be assessed against a national database.

Figure 6 Static detector locations



3.4.6 Birds

Habitat assessment

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

Sampling point count survey methodology

This sampling point count methodology has been informed by the survey design, methodology, and data collection criteria as the BTO Breeding Bird Survey methodology.

Three separate point-count surveys were undertaken on 12th May 2020, 5th June 2020 and 10th July 2020, which is the peak breeding season for the majority birds in the UK. The survey was undertaken in the early morning (sunrise) to record high levels of bird activity but to avoid the peak period of concentrated singing at dawn.

The locations of the points were mapped before the survey following a systematic methodology to enable the sample points to cover the entirety of the suitable habitat identified within the initial habitat assessment. The locations of the sampling points are shown in Figure 7. The sampling points were focused on the northern boundary which were assessed to provide the most suitable bird habitat for species of conservation concern.

This sampling survey was targeted at species associated with ancient woodland scrub habitats such as nightingale (*Luscinia megarhynchos*), bullfinch (*Pyrrhula pyrrhula*), firecrest (*Regulus ignicapilla*), house sparrow (*Passer domesticus*), and marsh tit (*Poecile palustris*) and farmland birds such as linnet (*Carduelis cannabina*), yellowhammer (*Emberiza citrinella*), and skylark (*Alauda arvensis*). An additional search was undertaken for roosting red kites within the site and wider environment.

A ten-minute survey was conducted from the centre of each of the static sampling points. The data collected included start/end time, weather conditions, species (BTO codes), their activity: calling, singing, flying, none, and the bird's distance from the central point <100m, <50m, and < 25m.

Figure 7 Bird sample survey areas



3.4.7 Reptiles

The potential presence of reptiles on site was assessed considering the habitats present (availability of refugia and basking areas) and suitability of surrounding environment. Where possible, attempts to confirm reptile presence on site were made following *Froglife Advice Sheet 10 – Surveying for Reptiles* through direct observation in reptile “hotspots” and checking of any existing refugia.

3.4.8 Amphibians

The habitats on site were assessed for their potential to support amphibian species, including great crested newt (*Triturus cristatus*) (GCN). Surveys for GCN were informed by the *Great Crested Newt Conservation Handbook*, Froglife 2001. The site was examined for suitable waterbodies which could provide breeding habitat for amphibians and for terrestrial habitats providing sufficiently structured vegetation in which amphibians may forage or hibernate over winter were also surveyed for.

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

Targeted GCN survey were carried out in accordance with the guidelines set out in the *Herpetofauna Worker’s Manual* (Gent & Gibson, 2003) and *Great Crested Newt Mitigation Guidelines* (English Nature, 2001). All surveys were carried out by an appropriately licensed surveyor.

HSI scoring

Ponds 1, 2 and 3 were subject to an HSI assessment on 3rd March 2020, the locations of which are shown in Figure 17.

Habitat suitability indices (HSI) were calculated for ponds within the site boundary. The HSI was developed by Oldham et al. (2000) as a means of evaluating habitat quality and quantity. Ten suitability indices are assessed visually for each pond resulting in a numerical index between 0 (unsuitable) and 1 (highly suitable). As stated in ARG UK Advice Note 5, “In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any pond with a high score will support newts, or that any pond with a low score will not do so.”

eDNA surveys

- Pond 1 was found to be dry at the time of the survey and so was not subject to an eDNA survey.
- Pond 2 was subject to an eDNA survey on 22nd April 2020.
- Pond 3 was surveyed previously by The Ecology Partnership (2016).

The survey comprised the collection of 40ml samples from 20 locations around the edge of the pond. Samples are mixed together in a bag and six 15ml samples are extracted and stored within preserving fluid. These samples were then sent to ADAS, who analyse the samples for GCN DNA. This technique has been tested by DEFRA and found to have a reliability of 99.3%. Sampling methodology followed best practice guidance within Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt (Freshwater Habitats Trust, 2014).

3.4.9 Invertebrates

Due to the many invertebrate taxonomic groups that exist, the often-large differences in invertebrate diversity between habitats and the many survey techniques available, invertebrate surveys are highly specific to individual sites. Therefore, an assessment of the potential site for invertebrates was undertaken, including the need for targeted surveys.

3.5 Personnel

The surveyors on site are included within Table 4. Ethos undertook the UK Habitat Classification survey, conditions assessment, the eDNA and HSI surveys, badger, and tree ground level assessment surveys for bats.

The targeted bird, dormouse and bat activity/static surveys were undertaken by Urban Edge Environmental Consulting. The surveys were planned and data was analysed by Ethos.

Table 4 Surveyors on site

Ecologist	Position	Qualifications/ Licences	Experience
Steph Green	Senior Ecologist	MSc BSc (Hons), MCIEEM Class 1 GCN Licence Class 1 Hazel Dormouse Licence	Has over seven years' experience in ecological field survey and consultancy. Steph is responsible for undertaking comprehensive habitat assessments, protected species surveys and is a licenced GCN and dormouse worker.
Martin Smith	Ecologist	BSc (Hons), Grad CIEEM Class 2 Bat Licence (NE) Class 1 dormouse licence (NE) Class 1 GCN Licence	Martin is a qualified tree climber, bat worker, and also holds licences for dormouse and GCN. Martin leads on designing the bird surveys for the Ethos team. Martin manages several projects for ethos and is experienced at providing suitable mitigation for various projects
Kane Burchill	Ecologist	Level 2 Certificate and Diploma in Work-based Environmental Conservation Class 1 Bat Licence (NE) 2019-39784-CLS-CLS Class 1 Hazel Dormouse Licence (NE) 2019-43735-CLS-CLS	Kane has over six years' experience in ecological field survey and consultancy. As an Ecologist with Ethos; Kane is responsible for undertaking comprehensive habitat assessments and protected species surveys.
George Clutterbuck	Environmental Consultant		George has over five years' experience in ecological field survey and consultancy. George is responsible for undertaking

Ecologist	Position	Qualifications/ Licences	Experience
		Level 2 Certificate and Diploma in Work-based Environmental Conservation Working towards a certificate of higher learning: Field Ecology - currently Level 2 Certificate and Diploma in Work-based Environmental Conservation	comprehensive habitats and protected species assessments. He also assists in interpreting this data using GIS software to achieve Biodiversity Net Gain.
Joel Sellors-Moore	Ecologist	BA (Hons) Working towards Master's in Applied Ecology at the University of Gloucestershire	Has over three years' experience in ecological field survey and consultancy and assists with habitat assessments, protected species surveys and data analysis.

3.6 Limitations

3.6.1 Background data

Biological data searches rely on data held by the local record centre and cannot be seen as a complete list of every species which may be found within the search radius. As such it is possible that other species are present within the local landscape and are not assessed within the desk study. Despite this limitation, it is unlikely that the possibility of missed species through the desk study process would have any major impacts to the conclusions of this report as the assessment focuses on the suitability of habitat on site to support protected species.

3.6.2 GCN

eDNA surveys have a 95% accuracy rate. Therefore, there is a very low possibility of false negative and false positive results. However, this report also includes the results from the HSI which support the results of the eDNA results. Because of this, it was not considered to be a significant limitation regarding the eDNA surveys.

Pond 3 was surveyed by the Ecology Partnership in 2016. The results indicated that the pond did not contain GCN eDNA at the time of the survey. However, this survey is >4 years old and is out of date. Although this is the case, the nearest pond was confirmed to be negative within during recent eDNA analysis (2020) and because of this they are assumed to be absent from the site and wider area.

4.0 BACKGROUND DATA REVIEW

4.1 Previous Surveys

Previous surveys were undertaken by The Ecology Partnership between 2015 and 2018. A summary of the survey findings are provided within Table 5.

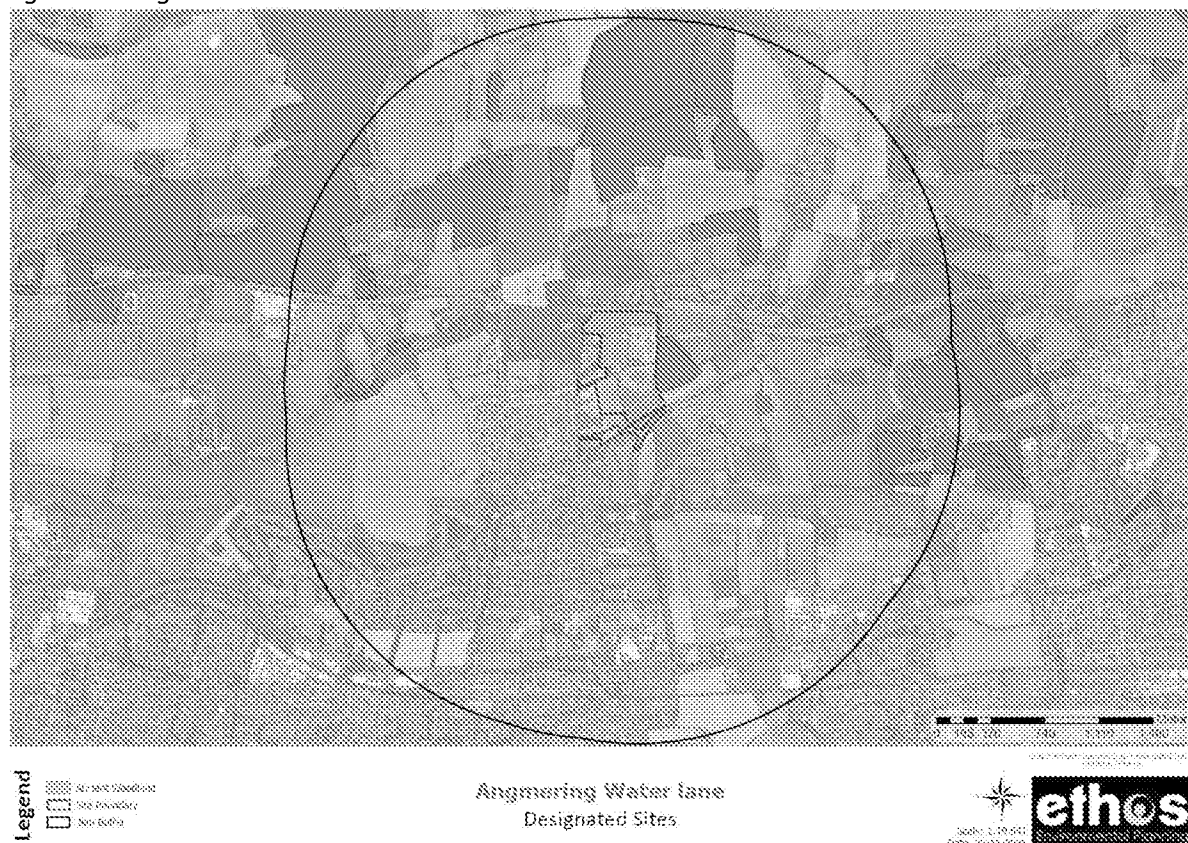
Table 5 Summary of previous surveys 2015 -2018

Species survey	Date undertaken	Description
Bats – roosting	N/A	No bat roosts were identified on site. Trees with potential to support bats were identified. No buildings on site were assessed as suitable to support roosting bats.
Bats – foraging	2015 26 th August and 8 th September 2017 7 th June, 8 th , and 28 th September	Moderate levels of foraging and commuting activity was recorded along the woodland edge and access track. These features provide green links across the site for bats in the local area. The arable, bare earth and grassland habitat were considered to contain negligible interest to bats. The bats recorded were largely dominated by common species, with common and soprano pipistrelle well-represented. Other species included Leisler’s, Myotis and Nathusius’ pipistrelles as well as occasional passes from the rare Annex II listed barbastelle.
Badgers - sett	Updated in January 2018	An active main sett was identified within the wooded area south of the racetrack. The expanse of arable land provides foraging opportunities; hedgerows provide connectivity to adjacent sites.
Badgers – foraging and commuting	Updated in January 2018	There is suitable foraging and commuting for local use by on-site and off-site badger groups.
Reptiles	10 th and 30 th September 2015	No reptiles were identified within the surveyed field boundaries.
Dormice	August 2015 tubes deployed; April 2017 extra tubes deployed. Checks undertaken once a month from August to November 2015 and May to October 2017.	Dormice were found in three locations: the boundary with the offsite woodland in the north-west corner of the site, along the hedgerow to the east of the old raceway access road and within the adjacent Groom’s Copes to the east of the site.
Great Crested Newts	June 2016	Pond 3 tested negative for GCN eDNA and the two other waterbodies (P1 and P2) were determined unsuitable to support GCN.
Birds	2015, 2017	Field margins provide foraging opportunities for bird species. The hedgerows and woodland edge also provide nesting opportunities. Specialist species such as tawny owl are likely to make use of the adjacent woodland habitat.

4.2 Notable Sites

The desk study identified two non-statutory designated sites within 2km of the proposed development site. Additionally, there were multiple parcels of Ancient Semi Natural Woodland (ASNW) within the 2km search radius of the site, with ASNW forming the eastern boundary of the site, as shown in Figure 8. Grooms Copses is located on the eastern boundary of the site.

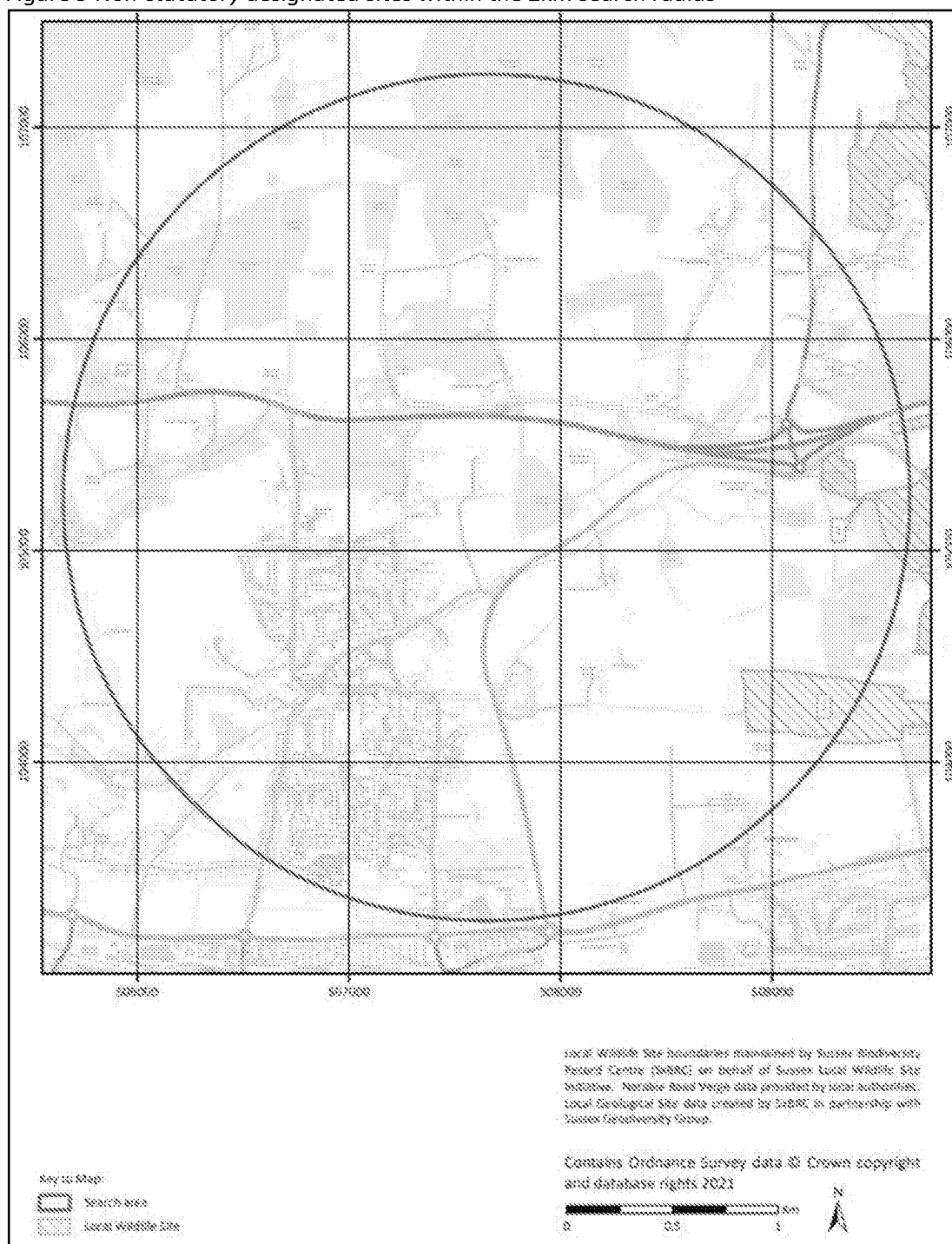
Figure 8 Designated sites within 2km



4.2.1 Non-statutory designated sites

Two Local Wildlife Sites (LWS) were located within the 2km search radius. These included Highdown Hill and the Miller's Tomb, 1.3km east of the site, and Titnore and Goring Woods Complex, 1.4km southeast of the site. These sites are shown in Figure 9.

Figure 9 Non-statutory designated sites within the 2km search radius



4.3 Notable Species

4.3.1 NERC S.41 Mammals

38 records of West European hedgehog (*Erinaceus europaeus*) were recorded within the last 10 years, with the closest being 130m west of the site.

4.3.2 Hazel Dormouse

The background data review returned four records of hazel dormouse within the search radius. Dormouse were recorded within the site in 2015 and 2018.

4.3.3 Riparian Mammals (otter and water vole)

The background data review returned 12 records of Water vole (*Arvicola amphibius*) within the last 10 years. The closest record was on site, in the southern section by the access road, with the most recent record being in 2018. No records of otter were identified.

4.3.4 Bats

The background data review has returned records of common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), Natterer's bat (*Myotis nattereri*), serotine (*Eptesicus serotinus*), unidentified long-eared bat species (*Plecotus spp.*), brown long-eared bat (*Plecotus auritus*) and unidentified bats. The latest records come from 2020.

4.3.5 Birds

A number of common, notable and protected species records were returned from the background data review, including but not limited to: Eurasian stone curlew (*Burhinus oedipnemus*), common ringed plover (*Charadrius hiaticula*), lapwing (*Vanellus vanellus*), Eurasian whimbrel (*Numenius phaeopus*), redshank (*Tringa totanus*), Eurasian bittern (*Botaurus stellaris*), European honey buzzard (*Pernis apivorus*), woodlark (*Lullula arborea*), Cetti's warbler (*Cettia cetti*), tree pipit (*Anthus trivialis*), nightingale (*Luscinia megarhynchos*), black redstart (*Phoenicurus ochruros*), marsh tit (*Poecile palustris*), house sparrow (*Passer domesticus*), wood warbler (*Phylloscopus sibilatrix*), starling (*Sturnus vulgaris*), fieldfare (*Turdus pilaris*), mistle thrush (*Turdus viscivorus*) and tawny owl (*Strix aluco*).

4.3.6 Reptiles

The background data review returned records of slow worm (*Anguis fragilis*), grass snake (*Natrix helvetica*), adder (*Vipera berus*), and common lizard (*Zootoca vivipara*). There were four records of slow worm within the last 10 years, with the closest record being 605m west of the site. There was one record of grass snake within the last 10 years, which was recorded in 2017 and located 1.36km northeast of the site, alongside eleven historic records of grass snake. There were two historic records of adder and one historic record of common lizard within the search radius.

4.3.7 Amphibians

The background data review returned 31 records of amphibians, including six historic records of GCN. There were eight historic records for smooth newt and one record of palmate newt each within the search radius, as well as eight records of common toad and eight records of

common frog, with the most recent records being from 2017. The closest record is from 1.6km northeast of the site.

4.3.8 Invertebrates

A number of common, notable, and protected species record were returned from the background data review. This included: stag beetle (*Lucanus cervus*), purple emperor (*Apatura iris*), small heath (*Coenonympha pamphilus*), adonis blue (*Polyommatus bellargus*), brown hairstreak (*Thecla betulae*), cypress carpet (*Thera cypressata*), cinnabar (*Tyria jacobaeae*) and hornet hoverfly (*Volucella zonaria*).

4.4 Granted EPS Licences and Licence Returns

There were five records of great crested newt licence returns within the data search, all dated 2014. The licence returns were located 430m south of the site.

5.0 UK HABITAT SURVEY

5.1 General Site Description

The site comprised mainly large areas of arable and agricultural grassland intersected by hedgerows. A racetrack with areas of scrub, hard standing and amenity grassland was located in the northeast section of the site. A belt of woodland was located to the south of the racetrack.

There was a parcel of Ancient Semi-natural Woodland (Groom's Copses) immediately adjacent to the east of the site. The A27 was located north of the site boundary, with the A280 and Water Lane adjacent to the south. West of the site boundary comprised areas of residential housing, industrial areas, and a garden centre with allotments.

The wider area comprised a mixture of urban and rural habitats. The village of Angmering was located southwest of the site, with Worthing approximately 3km to the southeast. North of the site there were extensive areas of woodland intersected by fields and hedgerows.

5.2 Habitat Description

Figure 10 shows the key habitats using the UK Habitat classifications. The key features described within this section are:

- Modified grassland
- Other neutral grassland
- Woodland – mixed
- Mixed scrub
- Bramble scrub
- Amenity grassland
- Developed land; sealed surface
- Arable field margins
- Arable cereal crops
- Pond (non-priority habitat)
- Allotment
- Hedgerows (line of trees, hedge with trees, native hedge, hedge ornamental non-native)

Figure 10 UK Habitat survey



- | | | | | |
|---------------|-----------------------------|------------------------------------|--------------------------------|----------------------------------|
| Legend | Hedge Ornamental Non Native | Arable field margins game bird mix | Bramble scrub | Vacant/derelict land/ bareground |
| | Line of Trees | Cereal crops | Mixed scrub | Other woodland; broadleaved |
| | Native Hedgerow | Modified grassland | Allotments | Site Boundary |
| | Native Hedgerow with trees | Other neutral grassland | Amenity grassland | Red Line Boundary |
| | | Tall herb communities | Developed land; sealed surface | |

Water Lane Angmeering Existing Habitats

Scale: 1:3,869
Date: 24/11/2021

ethos
Environmental Planning

5.2.1 Modified grassland

The majority of the site comprised fields of modified grassland (Photo 1 and 2). Species present included perennial ryegrass (*Lolium perenne*), creeping buttercup (*Ranunculus repens*), common dandelion (*Taraxacum officinale*) and ribwort plantain (*Plantago lanceolata*). These grassland sections were species-poor and dominated by perennial rye grass which is synonymous of agriculturally modified grassland. Because of this it was considered that the modified grassland was in a poor ecological condition.



Photo 1 grassland field west

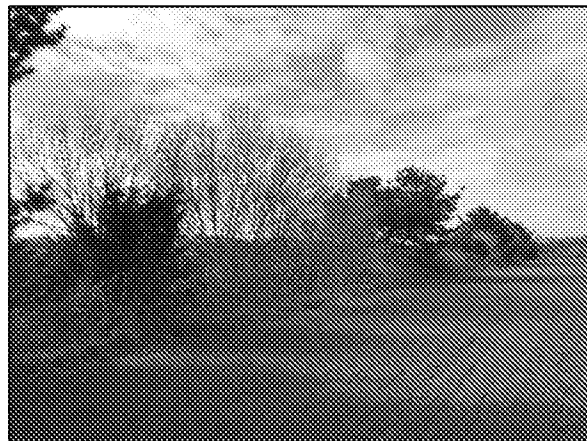


Photo 2 field south-west

5.2.2 Other neutral grassland

There was a section of neutral grassland in the centre of the site which bordered the access road into the racetrack (photo 3). This grassland was short and grazed by rabbits. The grassland was species-poor and contained a high abundance of nettles >10%. Because of this it was assessed to be in a poor ecological condition. Species included perennial rye grass, cocksfoot, Yorkshire fog, meadow-grass (*Poa* sp.), common ragwort (*Jacobaea vulgaris*), teasel (*Dipsacus fullonum*), bristly oxtongue, (*Helminthotheca echioides*) and common knapweed (*Centaurea nigra*).



Photo 3 Grassland along the access track

5.2.3 Woodland – Mixed Deciduous

There were several sections of woodland on site. This included a woodland strip present to the south of the racecourse, a woodland belt adjacent to the western access road, and woodland bordering the A280 road to the south. Each section is described below

Woodland Belt to the south of the Racetrack

There was a belt of woodland to the south of the racetrack, which was on a south-facing steep slope. Species present included English oak (*Quercus robur*), hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*), hazel (*Corylus avellana*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), ash (*Fraxinus excelsior*), and Wych elm (*Ulmus glabra*).

Woodland West (access road)

This section was comprised of young trees which included holly (*Ilex aquifolium*), elder (*Sambucus nigra*), English elm (*Ulmus procera*), and willow (*Salix sp*). This woodland section was bordered by two ditches and there were patches of common nettle (*Urtica dioica*) and bramble (*Rubus fruticosus*) bordering the road.

Woodland (bordering the A280, south)

These sections were dominated by goat willow (*Salix caprea*) with scattered hawthorn (*Crataegus monogyna*), maple (*Acer sp*), hazel (*Corylus avellana*), and blackthorn (*Prunus spinosa*).



Photo 5 Mixed woodland



Photo 6 Tree belt, west

5.2.4 Mixed scrub

There were several areas of mixed scrub around the site, the largest of which ran along the western edge of the racetrack. Another section was located in the north-western field corner of the western field and bordered the bare ground within the centre of the site.

The section adjacent to the racecourse (photo 6-7) included elder (*Sambucus nigra*), dogwood (*Cornus sanguinea*), wild privet (*Ligustrum vulgare*), honeysuckle (*Lonicera periclymenum*), blackthorn (*Prunus spinosa*), English oak (*Quercus robur*), rose (*Rosa* sp.), hawthorn (*Crataegus monogyna*) elm (*Ulmus* sp.), bramble (*Rubus fruticosus* agg), ivy (*Hedera helix*), occasional gorse (*Ulex europaeus*) and field maple (*Acer campestre*).



Photo 6 mixed scrub west of racetrack



Photo 7 mixed scrub

5.2.5 Bramble scrub

There were several stands of stands of bramble (*Rubus fruticosus*) scrub on site. This included sections to the north of the racecourse, encroached areas within the bare ground section within the centre of the site, and in the derelict nursery within the south-west of the site.

Field corner

The section within the field corner included a mature oak (*Quercus* spp.) tree which was bordered by scrub which included bramble (*Rubus fruticosus*), hawthorn (*Crataegus monogyna*), and blackthorn (*Prunus spinosa*).

Scrub adjacent to H6

The scrub section to the north of the bare ground had encroached from hedgerow 6. Species included bramble (*Rubus fruticosus*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), ash (*Fraxinus excelsior*), and wych elm (*Ulmus glabra*).

Scrub south-west

The south-western section of the site contained a disused green house. This has resulted in the succession of bramble (*Rubus fruticosus*) scrub. Bramble was the dominant species within this section with some scattered elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*).



Photo 8 Field corner with mature oak



Photo 9 Bramble (*Rubus fruticosus*) scrub south-west

5.2.6 Amenity grassland

There were small areas of amenity grassland present around the racetrack (Photo 10-11), with species included perennial ryegrass, birds-foot trefoil (*Lotus sp*), dandelion (*Taraxacum agg*), ribwort plantain (*Plantago lanceolata*), creeping thistle, wall barley (*Hordeum murinum*), bristly oxtongue (*Helminthotheca echinoides*) and creeping bent (*Agrostis stolonifera*).

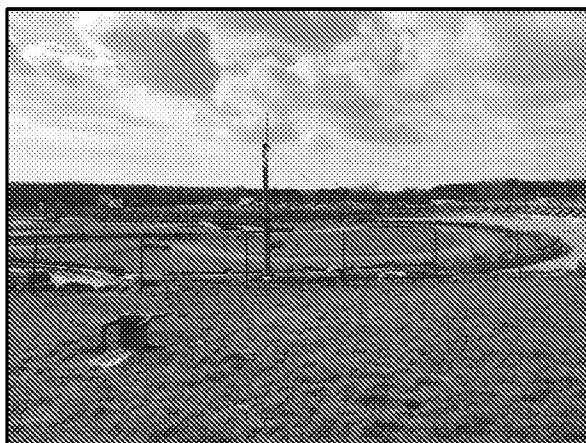


Photo 10 Amenity grassland



Photo 11 Amenity grassland

5.2.7 Developed land; sealed surface

There were areas of hardstanding and buildings located within the racetrack area of the site, with a hardstanding track located through the centre of the site. The access road into the site and the racecourse were metaled roads (Photo 12) whereas the hardstanding within the racecourse comprised crushed stone (Photo 13).

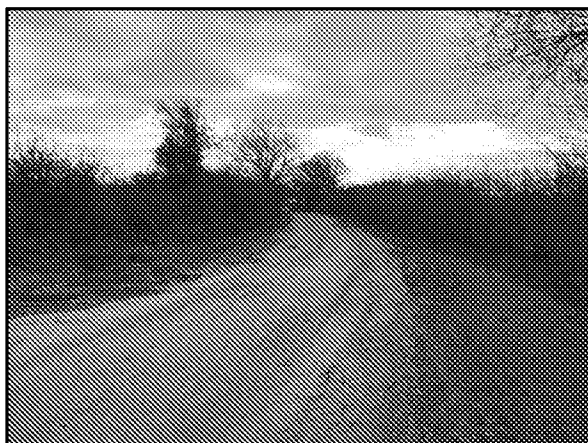


Photo 12 developed land sealed surface



Photo 13 Hardstanding

5.2.8 Arable field margins game bird mix

There was an area of arable field margin – cultivated annually located south of the woodland belt. This section comprised maize (*Zea mays*) which has been sown and left standing to provide cover for game birds.



Photo 14 cover crop

5.2.9 Pond (Non-priority habitat)

There were three ponds present on site. The ponds were located on the northern boundary, within the centre strip of woodland, and on the southern boundary of the site. The ponds are described in more detail in Section 6.8 in relation to amphibians.

5.2.10 Allotment

There was a small section of allotment which falls within the red line boundary of the site, located in the garden centre adjacent to the west of the site.

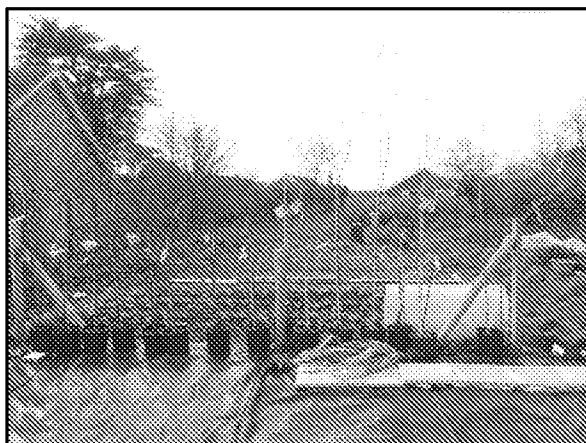


Photo 15 garden centre

5.2.11 Bare ground, Vacant, Derelict.

There were two sections on site where manure was stored on site. These areas were comprised of bare ground with patches of common nettle (*Urtica dioica*), broad-leaved dock (*Rumex obtusifolius*), and willowherb (*Epilobium spp.*). Large sections of this area comprised bare earth from the tracks of continuous use by tractors which disturbed the ground flora. The majority of the vegetation was perennial and as such sections were bare for the majority of the year. There were also areas of standing water within the western section. However, these were heavily polluted from the liquids leaching from manure.

There were extensive areas of bare ground to the north of the site (Photo 17). This included a track and areas of crushed stone. The track was formed on a bank; several sections of the bank included stands of *Brassica sp.*.

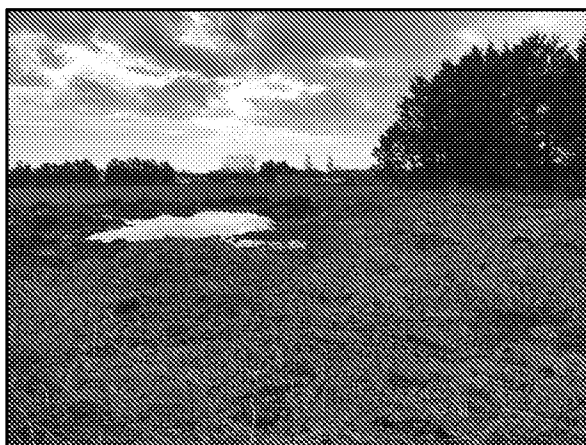


Photo 16 area used to store manure



Photo 17 bare ground with sparse vegetation

5.2.12 Tall herb communities

There were several sections of riparian habitat located to the south of the site. These comprised reed bed (*Phragmites sp.*) which were bordered by scrub habitat comprised of guelder rose (*Viburnum opulus*), bramble (*Rubus fruticosus*), hawthorn (*Crataegus monogyna*), willow (*Salix spp.*) and oak (*Quercus spp.*).



Photo 18 Riparian habitat with tall herb communities present

5.2.13 Buildings

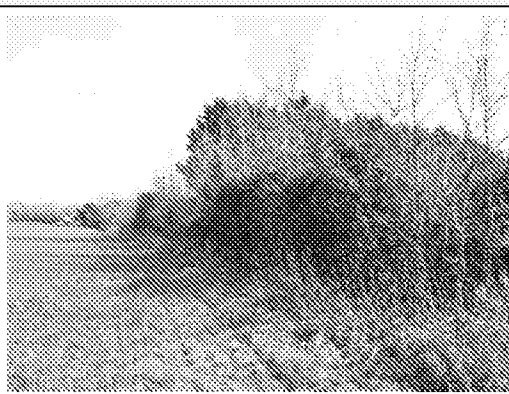
There were several structures on site. This included office buildings and outbuildings within the racetrack section of the site and two stables within the horse paddocks within the south-west of the site. These are described in detail within the bat structures assessment (Section 6.5.2).

5.2.14 Hedgerows

There were several hedgerows throughout the site, which varied from native species-rich with trees to ornamental non-native. Hedgerows are described in more detail in Table 6.

Table 6 Hedgerows on site

Hedgerow Number	Species and Description	Photograph
H1	Row of cypress of the hedgerows and then dominated by hawthorn (<i>Crataegus monogyna</i>) to the north. The hedgerow had multiple gaps and as such the canopy was not continuous. There were several mature oaks within the hedgerow effectively forming a hedgerow with trees. This hedgerow was bordered by permanent pastures to the west and hardstanding to the east.	

Hedgerow Number	Species and Description	Photograph
H2	H2 was dominated by hawthorn (<i>Crataegus monogyna</i>). Other species included blackthorn, bramble (<i>Rubus fruticosus</i>), and hazel (<i>Corylus avellana</i>). There were several mature oak (<i>Quercus spp.</i>) trees within the hedgerow, especially to the south of the hedgerow. The hedgerow was bordered by the road to the west and a <1m field margin to the east.	
H3	H3 was located on the southern boundary of the site. The hedgerow was located to the north of the bridle way and formed a double hedgerow with the hedgerow to the south of the bridleway (offsite). The hedgerow is dominated by hawthorn (<i>Crataegus monogyna</i>). This hedgerow was overmanaged resulting in the hedgerow growing out at the base.	
H4	H4 was a defunct with large gaps along its length. Species included bramble (<i>Rubus fruticosus</i>) with scattered goat willow (<i>Salix</i>), hawthorn (<i>Crataegus monogyna</i>), ash (<i>Fraxinus excelsior</i>), and hazel (<i>Corylus avellana</i>). There was a small grassland margin to the south and the game cover to the north. The hedgerow was assessed to be damaged from excessive management and was in a poor ecological condition.	
H5	This hedgerow was defunct and gappy and bordered by common nettle along most of its length. There was a wet ditch present at the base of the hedgerow and the hedgerow was bordered by grassland, scrub, and structures to the south-west. Species included elm, hawthorn (<i>Crataegus monogyna</i>), and abundant ivy (<i>Hedera helix</i>).	

Hedgerow Number	Species and Description	Photograph
H6	This hedgerow was located on the western boundary of the site. The hedgerow contained oak (<i>Quercus spp.</i>), hawthorn (<i>Crataegus monogyna</i>), hazel (<i>Corylus avellana</i>), and goat willow (<i>Salix</i>). There was abundant honeysuckle (<i>Lonicera periclymenum</i>) within the hedgerow and bramble (<i>Rubus fruticosus</i>) at the base and adjacent to the hedgerow. Several butcher brooms plants were recorded within the hedgerow. The hedgerow was unmanaged and was bordered by grassland to the east and an orchard to the west.	
H7	H7 formed the northern boundary of the site. The hedgerow was dominated by hawthorn (<i>Crataegus monogyna</i>) and contained hawthorn (<i>Crataegus monogyna</i>), dogwood (<i>Cornus sanguinea</i>), elm, cherry (<i>Prunus spp</i>), hazel (<i>Corylus avellana</i>), and blackthorn. The hedgerow was defunct, not continuous, and was thin <15m in width. It was considered that the hedgerow was cut regularly resulting in poor structure and overall ecological condition.	
H8	H8 was located to the north of the racetrack. The hedge was dominated by Corsican pine (<i>Pinus nigra subsp. laricio</i>) with few willow (<i>Salix</i>), alder (<i>Alnus glutinosa</i>), and few yew (<i>Taxus baccata</i>). The hedgerow was gappy, grown out, and there were abundant nettles within the base of the hedge. There was an associated ditch within the hedgerow which was dry at the time of the survey.	

Hedgerow Number	Species and Description	Photograph
H9	H9 was located on the southern boundary of the western field. The hedgerow was comprised of mature cypress. The hedgerow was defunct with no understorey.	
H10	H10 was comprised of a row of cypress trees on the western boundary of the central area of bare ground	
H11	H11 formed the southern boundary of the horse paddocks in the south-west of the site. This hedgerow was dominated by hawthorn (<i>Crataegus monogyna</i>) with scattered blackthorn, and elder (<i>Sambucus nigra</i>). The hedgerows were bordered by the road to the south and grassland to the north. There were abundant nettles at the base of the hedgerow and the hedge was defunct resulting in a non-continuous canopy	

6.0 PROTECTED SPECIES RESULTS AND ASSESSMENT

6.1 NERC S. 41 Mammals

Hedgehog

The wider environment comprised the village of Angmering (south-west) which contains residential housing with gardens, open spaces, and small sections of woodland which provide suitable habitat for hedgehog. The site contained areas of mixed scrub, woodland, and extensive areas of bramble scrub which could provide shelter and a food source in terms of the invertebrates provided by the habitat. It was considered that the wider environment was well-linked to the site, with woodland and scrub bordering the site in several section which would aid hedgehog dispersal on site. Although the scrub and woodland was assessed to provide suitable habitat for hedgehog it was considered that the agricultural fields of arable and modified grassland provided poor habitat potential for the species.

Polecat

The wider environment provides habitat for polecat in the form of the ASNW, mixed farmland with farm buildings, and riparian habitat to the south of the site. The site contains mixed scrub and woodland which could provide habitat for polecat. Although no evidence of polecat was recorded during the extended habitat survey, it was considered that the site could provide habitat for polecat.

Brown Hare

The site was comprised of arable land and extensive areas of agricultural grassland. However, no evidence of brown hare was recorded on site during the extended habitat assessment for protected species. This, alongside the lack of records suggests that brown hares are absent from the site and are not considered further within this report.

Harvest Mouse

It was considered that the field margins within the arable and modified grassland fields were not developed enough to support harvest mouse. The key habitats for harvest mouse were considered to be the reed bed adjacent to the south of the site which could provide some low potential habitat for the species. However, there were no records of harvest mouse returned within the data search and no evidence was found during the extended habitat assessment for protected species. Therefore, it was assessed that harvest mice are likely absent from the site and are not considered further within this report.

6.2 Badger

6.2.1 Habitat assessment

The site contained large areas of modified grassland which were assessed to hold low potential for foraging and commuting badger. The hedgerows, woodland and scrub habitats were assessed to be high value habitats for badger to foraging, commuting and sett-build. The ASNW adjacent to the east of the site and woodland to the west were assessed to provide high value habitat for badger.

6.2.2 Targeted badger survey

The badger survey identified a sett in the centre of the woodland buffer to the south of the racetrack, as shown in Figure 11. Two fresh latrines were also identified within proximity to the main sett.

The sett comprised five holes, one of which one was assessed to be partially used, with the remainder assessed to be disused.

Figure 11 Badger survey results



6.2.3 Camera trap surveys

The camera trap survey results for the camera focused on the main sett, which was collected in October 2020, identified the following results:

- Single badger seen commuting past sett (05/07/2020 20:52pm)
- Badger commuting past (5.07.21 21:09pm)
- Badger in distance investigating the area (11.07.21 20:42)
- Badger commuting past (21.07.20)
- Badger commuting past (2.08.20)

No badgers were identified near the holes around camera 3, and it was assessed that this area was not a sett and likely used by rabbits. Sett 1 was assessed to be partially used, with infrequent badger passes. No badger were seen entering the sett during the period of camera monitoring.

6.2.4 Summary

The sett located within the centre of the site was assessed to be used by badgers. This alongside the evidence of latrine within the wider area suggest that the site forms a badger territory.

6.3 Hazel Dormouse

6.3.1 Habitat assessment

The site was bordered by ancient woodland to the east and a section on mixed deciduous to the northwest which were both assessed to provide optimal habitat for dormouse. The site itself contained a variety of hedgerows with features which are beneficial for dormouse such as mature trees, high species diversity, and scrubby unmanaged sections. The site also contained abundant scrub including dense sections of mixed scrub which were species rich, providing a diverse food source for dormouse throughout the year. The habitat on site were well-connected to the suitable features within the wider environment providing high ecological connectivity for the species.

6.3.2 Dormouse tube survey (presence/absence)

Results of the dormouse survey are shown in Table 7 and Figure 12 and are summarised below.

Evidence of dormouse including nests and live individuals were recorded within the hedgerows and mixed scrub sections with most of the records being returned from the north of the site. Several. No records were returned from the central tree lines (H1-H2), and none were recorded within the horse grazed paddocks within the south-western section of the site. Overall, it was confirmed that dormouse are present on site.

Several wood mice were also recorded during the tube surveys. No other small mammals were recorded.

Figure 12 Dormouse evidence



Table 7 Dormouse survey results

Tube Number	Date of First Result	First Result Finding
47	21/10/2020 14:35	Two adult dormice. One escaped. The other was a male weighing 32 grams. Nest that filled entirety of cavity section
58	21/10/2020 13:56	Mature female around 38 grams.
71	21/10/2020 13:32	Single adult
75	21/10/2020 13:07	Single adult
81	21/10/2020 13:01	Dormouse nest
38	21/10/2020 11:12	Dormouse nest
35	21/10/2020 10:59	Old dormouse nest
34	21/10/2020 10:59	Three juvenile dormice, all females, weighting 23g
30	21/10/2020 10:36	start dormouse nest
28	21/10/2020 10:26	Dormouse nest with green leaves with little structure.
22	21/10/2020 10:15	Start of a dormouse nest
20	21/10/2020 10:10	single male dormouse, 24g
55	20/05/2020 07:05	Adult dormouse in box with dormouse nest
46	20/05/2020 06:56	Dormouse nest
40	20/05/2020 06:49	Start of dormouse nest
74	20/05/2020 06:32	Start of nest. Woven grasses

6.4 Otter

The habitats on site comprised agricultural land including arable and modified grassland, which provide poor terrestrial habitat suitability for otter. The riparian habitat to the south of the site included a series of ponds connected by a brook to the south of Water Lane. It was considered that this habitat could provide habitat for otter commuting and foraging. However, it was considered that otters were likely restricted to this habitat to the south of the site.

6.5 Water vole

There was no suitable riparian habitat on site to support water vole such as streams or marshy grassland. The habitats to the south comprised ponds and a connecting stream. It was assessed that the habitats provide a wide range of herbaceous vegetation to support water vole and the habitat is well-connected within the wider environment.

6.6 Bats

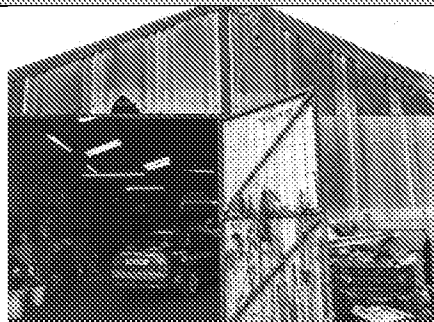
6.6.1 Habitat Assessment

Most of the habitats on site comprised agricultural land which provides poor quality habitat for bats. The key features were assessed to be the hedgerows and mixed scrub onsite as well as the woodland edge habitat on the eastern boundary of the site. The riparian habitats were also assessed to provide insect rich habitats which provide bats with a food source throughout the year. Overall, it was considered that the site provides moderate potential for foraging and commuting bats.

6.6.2 Structures Assessment

Buildings on site are described in Table 8.

Table 8 Structures assessment for bats

Building	Building description	Potential for Bats	Image
B1	Car works shop with skylights, asbestos sheeting, and iron frame structure. Exposed, light and unsuitable for bats.	Negligible	

Building	Building description	Potential for Bats	Image
B2	Two structures, in poor condition structurally, first one comprised of pitched corrugated metal and asbestos which has been refurbished at north. Building to north is comprised of plastic panelling with flat roof of corrugated metal and PVC fittings and features. Could not access internal features. No evidence externally and assessed to be unsuitable for bats	Negligible	
B3	Series of flat roof toilet blocks and caravans. Flat felt roof, wooden barge boards, and breeze block walls. No evidence of bats recorded during the survey	Negligible	
B4	Concrete breeze block with pitched roof with flat clay tiles with no gaps present. PVC gable and windows and doors. Two extensions. 1) PVC panelling 2) breeze block; both with flat felt roofs. No access points for bats and no potential features observed. No evidence of bats was recorded	Negligible	
B5	Stable formed of timber with corrugated metal roof. Freely accessible for bats but exposed. Could provide nesting habitat for breeding birds	Negligible	
B6	Similar construction and results as B5 above	Negligible	

6.6.3 Trees ground level assessment

Two trees were assessed to have the potential to support roosting bats, as shown below in Figure 13. T1 was assessed to hold high potential to support roosting bats whereas T2 was assessed to hold moderate potential for bats.

These trees were identified as having potential to support bats during the initial ecological walkover of the site. The remaining trees on site were assessed to be in a good condition, were young and unsuitable, and did not contain and potential roosting features for bats.

Table 9 Trees with bat potential

Tree Tag	Tree Species	Diameter Breast Height (DBH)	Height of Tree (m)	Number of PRFs	Notes	Potential for Bats
T2	Oak	1.5	18	3	Several pruning cuts with damaged/ lifted bark. One knot hole on main stem. Features look poor for roosting bats, but the knot hole has potential suitability. Visibility into the upper canopy was poor.	Moderate
T1	Oak	1.25	16	2	Knot with high potential on main stem. A couple of pruning cuts and knot holes in canopy.	High

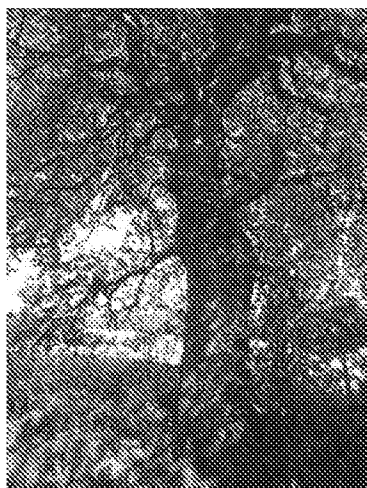


Photo 19 T1 located within H1

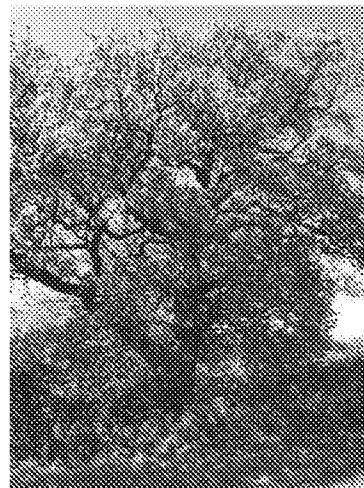


Photo 20 T2 field corner in bramble scrub

Figure 13 Trees with bat roost potential



6.6.4 Activity surveys

The activity surveys undertaken in 2020 are summarised and are compared to the activity within the 2015 and 2017 within this section.

2020 survey results

A total of five species were identified during the activity transect surveys. This included common pipistrelle, soprano pipistrelle, noctule, Daubenton's bat and serotine. Bat activity was low across the site on each survey. Activity was focused on the eastern woodland edge and the woodland belt within the centre of the site. Only noctule were recorded flying over the fields on site. Activity on site was dominated by common pipistrelle bats, which were mainly recorded foraging along the woodland edge habitats on site.

Comparison between 2015/17 and 2020 activity surveys

Activity levels and species composition were similar between the 2020 and 2015-17, with a low to moderate level of bat activity overall. The most frequently recorded species across all surveys was common pipistrelle, with the site considered a key foraging habitat for the species. Soprano pipistrelle was recorded in low numbers and one pass of Nathusius's pipistrelle was recorded during the 2017 survey period.

6.6.5 Static detector surveys

Twelve bat species were recorded through the entire survey period. This included twenty-three passes of Barbastelle bats which are an annex II species and afforded additional protection. Species recorded are provided within Table 11.

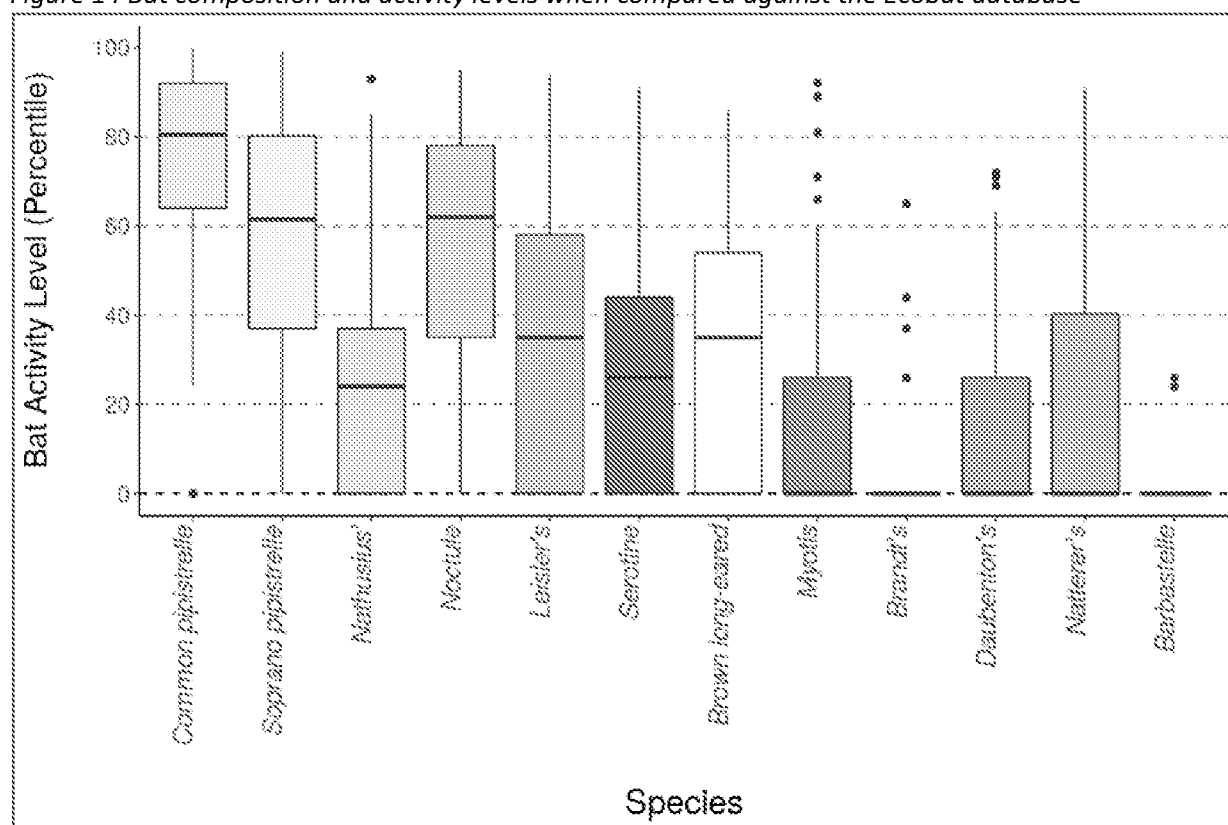
Table 11 Bat species and their percentage when compared to all species

Species	Passes (No.)	Percentage of total (%)
Common pipistrelle	37908	62.3
Soprano pipistrelle	11060	18.2
Nathusius'	491	0.8
Noctule	6830	11.2
Leisler's	1699	2.8
Serotine	1068	1.8
Brown long eared	806	1.3
Myotis	375	0.6
Brandt's	66	0.1
Daubenton's	203	0.3
Natterer's	280	0.5
Barbastelle	23	0.0
Total	60810	99.9

The analysed bat data from the surveys was input into the Ecobat data base which compares the data from the surveys against a national database. This provides comparable information on bat data provided within Figure 14 below.

The results indicate that there were high levels of common pipistrelle activity on site with their activity being within the top 20th percentile. Soprano pipistrelle and noctule were also high with their activity levels being in the top 40th percentile. Nathusius, Leislars, serotine, and brown long eared bats activity were indicative of moderate activity with their activity levels being in the bottom 40th percentile. *Myotis spp.* were generally low across the survey period and barbastelle were within the lowest percentile with only 23 calls through the entire survey period.

Figure 14 Bat composition and activity levels when compared against the Ecobat database



Mean bat calls per hour were calculated for each static location over the entire survey period. The results indicate that location 3 had the highest mean bat registrations per hour with 26.4 records per hour. Location 1 also returned 24.2 mean bat registrations per hour whereas location 2 and 4 returned <20 mean calls recording per hour with 12.7 and 16.3 respectively. Although this is the case, it was considered that there was not a significant difference between the activity levels of the statics on site. Figures 15 and 16 display the activity levels by location.

Figure 15 mean bat recording per hour by static location

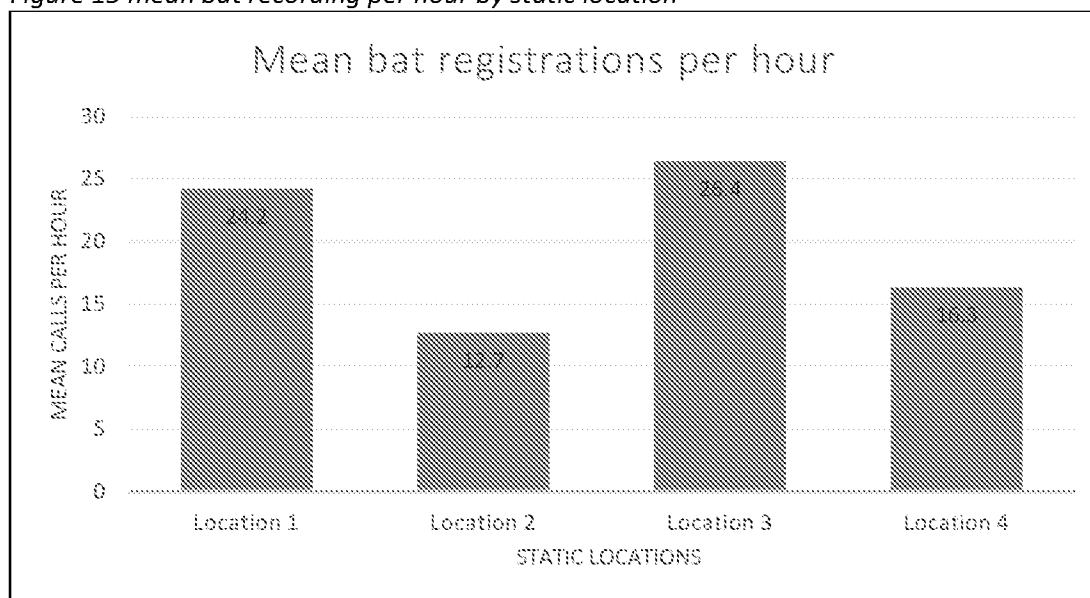


Figure 16 activity levels per static



6.7 Birds

6.7.1 Habitat assessment

The key habitat features on site were assessed to be the habitats within proximity of the racecourse. This included a mosaic of habitats included dense stands of bramble, mixed scrub and trees, bare ground and hedgerows, and was bordered by Ancient Semi Natural Woodland (ASNW) to the east. It was assessed that these habitats could support species returned within the data search including nightingale, bullfinch and firecrest. It was also assessed that this section could support house sparrow, and because of the proximity of the ASNW; marsh tit.

The fields within the main site comprised species-poor modified grassland with largely poor suitability for birds, with low potential habitat for ground nesting birds such as skylark. The fields were bordered by species-rich hedgerows with mature trees which could provide habitat for farmland bird species such as linnet and yellowhammer. The mature trees within the field corners could also provide nesting opportunities for species such as red kite.

The land to the south-west comprised intensively grazed paddocks providing habitat for common and widespread species of bird. Additionally, the site access to the west was a small section of land < 0.4 acres and provide low potential habitats of birds of conservation concern.

6.7.2 Sampling point count survey

Results of the point count surveys are summarised below:

- No species listed on Schedule 1 of the Wildlife and Countryside Act 1981 were recorded during the point count surveys
- Nine out of nineteen listed farmland bird species were recorded during the survey
- Eleven Red/ Amber listed Birds of Conservation Concern were identified on site
- No breeding was recorded on site, but juveniles of some species recorded e.g., pied wagtail and robin
- Areas of highest activity was located around hedgerow boundaries. Activity was also high within areas of woodland. Foraging swifts and other activity was seen over the northern grassland field and hunting kestrel were seen along the central hedgerow.

Table 12 Birds of conservation concern recorded on site

Common Name	Scientific Name	Conservation Status	NERC S. 41	UK BAP
Song Thrush	<i>Turdus philomelos</i>	red	Global concern	UK BAP
Linnet	<i>Carduelis cannabina</i>	red	European concern	UK BAP
Lapwing	<i>Vanellus vanellus</i>	red	European concern	UK BAP
House Sparrow	<i>Passer domesticus</i>	red	European concern	UK BAP
Dunnock	<i>Prunella modularis</i>	amber	-	-
Swift	<i>Apus apus</i>	amber	-	-
Kestrel	<i>Falco tinnunculus</i>	amber	-	-
Mallard	<i>Anas platyrhynchos</i>	amber	-	-
Reed bunting	<i>Emberiza schoeniclus</i>	amber	European concern	-

6.8 Reptiles

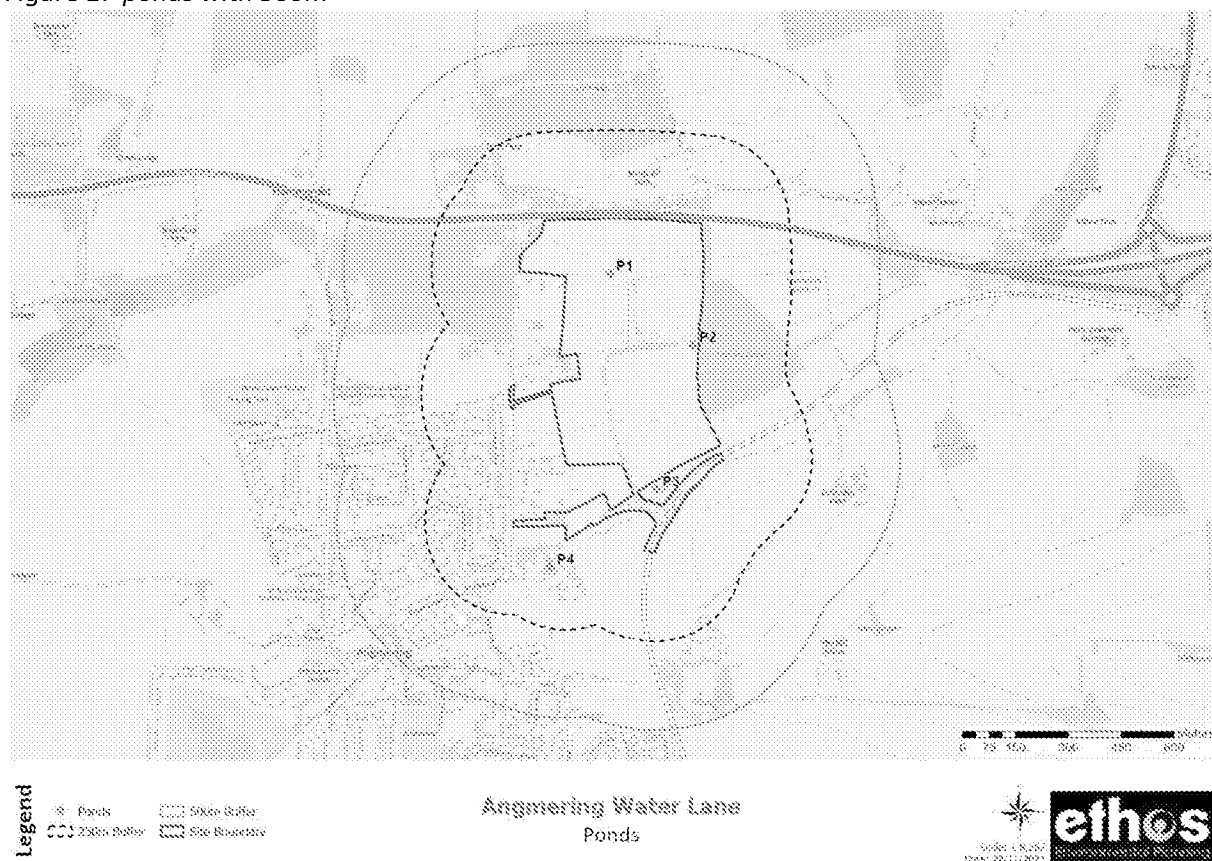
The site comprised large areas of modified grassland maintained to a short sward. This habitat was considered unsuitable for reptiles due to a lack of refugia and structural diversity. It was assessed that reptiles would be constrained to the boundary habitats, namely areas of scrub, hedgerow, and woodland edge. However, the hedgerows and woodland edge contained a limited buffer to the adjacent arable and modified grassland areas. Therefore, it was considered less likely that the site would support reptiles.

6.9 Amphibians

6.9.1 Habitats

The site was dominated by modified grassland and arable land which was managed to a short sward and species poor, providing poor habitat suitability for amphibians. The key features on site were hedgerows, mixed scrub and woodland would provide high quality terrestrial habitat for GCN and other amphibians, as foraging, refugia and hibernating habitat as well as the three ponds located within the site boundary as shown in Figure 17.

Figure 17 ponds with 500m



6.9.2 Habitat Suitability Index Assessments

Ponds 1, 2 and 3 were subject to an HSI Assessment. Pond 4 was excluded from the assessment, as it was in use as a fishing lake and was therefore considered unsuitable for GCN. The results are provided within table 13 below.

Table 13 HSI results of P1-P3

Number	Location	Area m ²	Pond Drying	Water Quality	Shade	Fowl	Fish	Habitat	Macrophytes	Results
P1	Optimal	50	Annually	Moderate	0	Absent	Absent	Moderate	40	Below average
P2	Optimal	50	Sometimes	Poor	90	Absent	Absent	Moderate	0	Poor
P3	Optimal	2000	Sometimes	Moderate	10	Minor	Possible	Good	80	Good

6.9.3 eDNA Assessment

- Pond 1 was dry at the time of survey and as such an eDNA survey was not undertaken.
- Pond 2 was confirmed to not contain GCN DNA (Appendix I).
- Pond 3 was surveyed in 2018 and was confirmed to not contain GCN DNA (section 4.1).

Pond 1

Pond 1 (Photo 21) was located in the northern section of the site and was bordered by ruderal vegetation. The pond was small <10m² and was assessed to ephemeral, seasonally wet. This pond was assessed to hold below average stability regarding GCN and was dry at the time of the eDNA survey. It was considered that this pond provided suitable habitat for common species of amphibians such as frogs and toads. However, it was assessed that GCN are likely absent from the pond.

Pond 2

Pond 2 (photo 22) was comprised of standing water within a ditch to the east of the site and adjacent to the ASNW. The water body was heavily polluted and contained waste materials. The waterbody was <50m² and was heavily shaded. The HSI assessment result indicates that P2 was poor regarding GCN habitat suitability and the eDNA confirmed that GCN were absent from the pond at the time of the survey.

Pond 3

Pond 3 (photo 23) was located to the south of the of the main site redline boundary but north of Water Lane. The pond was approximately 2000m² and contained abundant herbaceous vegetation such as reeds. The pond was connected to the hedgerows at the south of the site (H3) and was also connected to the riparian habitats adjacent to Water Lane. The habitat suitability Index result indicates that the pond provides good habitat suitability for GCN. However, the previous eDNA survey in 2016 confirmed that GCN eDNA was not present at the time of the survey.

Pond 4

Pond 4 was not surveyed within this assessment. However, this pond was confirmed to be a fishing lake which provides negligible potential for GCN. Because of this, pond 4 was excluded from this assessment.



Photo 21 Pond 1



Photo 22 Pond 2



Photo 23 Pond 3

6.9.4 Summary

- Pond 1 was dry at the time of the survey and as such an eDNA survey was not undertaken. Additionally, as Pond 1 was assessed as likely to dry out annually, it was assessed to be unsuitable for GCN as a breeding pond.
- Pond 2 was assessed to be unsuitable for GCN and the eDNA survey result confirmed that no GCN eDNA was present within the waterbody at the time of the survey.
- Pond 3 has been previously surveyed (see Section 4.1 for details) for GCN DNA and was also identified as negative.
- Pond 4 was scoped out of the assessment due to its use as a fishing lake.

Considering the assessment above, GCN are likely absent from the site and are not considered further in this assessment. However, it was considered that the site holds potential habitat for NERC S.41 amphibian's species such as common toad and common frog. Therefore, recommendations are provided within this report to avoid impacting these species of principle importance.

6.10 Invertebrates

The majority of the site contained modified grassland and arable land which provide poor habitat for invertebrates. The key features were assessed to be the woodland edge habitat, the mixed scrub, and the native hedgerows, and riparian habitats such as the ponds on site. It was considered that these habitats could provide habitat potential for a range of invertebrate species include saproxylic species and insects associated within riparian habitat. It was considered that the site provided poor habitat quality for pollinators such as bees and butterflies.

7.0 DISCUSSION

This section includes an assessment of the impact the proposals may have on the habitats on site, protected sites, species, and biodiversity.

7.1 Habitats

7.1.1 Existing Habitats

The internal habitats on site such as the grassland and arable land were species poor and were assessed to provide poor habitat suitability for wildlife because of this the layout of the development has been designed to utilise these areas to minimise the overall impact on biodiversity. The key habitat features on site were assessed to be the mixed scrub, hedgerows, and woodland belt located within the centre of the site. These provide habitat for a range of species such as dormouse, badger, and foraging bats. These features are being retained where possible to avoid impacts on wildlife. However, certain sections must be removed to enable the development. The impacts of these works are provided below.

7.1.2 Impacts on Key Habitat Features

Works on the key habitat features identified on site include minor trees works within the central hedgerow (H1-H2) to enable access into the site and the removal of the mixed scrub to the west of the racetrack. It was assessed that the minor trees works would not have a significant impact on the double hedgerow and recommendations to mitigate the impacts of these works are provided within the following sections. The mixed scrub belt to the west of the racecourse is being removed because there are scrap cars, tyres, and other detritus within the mixed scrub/bund feature. Although, this will see the removal of a key habitat feature on site, proposals include replanting another scrub belt. This new planting will be longer than the previous belt and will connect to a new woodland belt to the north which will improve the ecological connectivity for a range of species including dormouse.

7.1.3 Habitat Creation and Enhancement

There were a mix of hedgerows on the site, from non-native single species hedgerows to double hedgerows with mature oaks and a high species richness. However, all of the hedgerows were degraded by previous intensive management and were defunct, grown out, or species poor. Most were in a low - moderate condition regarding the condition assessment and as such there is scope to restore and enhance the hedgerows within the project. These works will include gapping up the hedgerows, coppicing, thinning, and laying, and the implementation of a long-term management to improve these features for wildlife.

A new woodland belt will be planted on the northern boundary of the development (south of the Arundel Road). This will effectively screen the road to the north of the site and will link the Grooms Copses ASNW in the east of the site to the woodland in the northwest. This will provide an increase in terms of arboreal habitats on site and will improve the ecological connectivity of the site for a range of species.

The proposals also include the creation and enhancement of sections of grassland and attenuation basins which will provide habitat for a range of species including invertebrates and amphibians. The creation and management of these habitat types are provided within the recommendations section of this report.

7.2 Ancient Semi-Natural Woodland (Grooms Copses)

Grooms Copses is located to the east of the boundary of the development site. The woodland is comprised of lowland deciduous trees and is 7.4 hectares in area. To avoid impacting the trees on the woodland edge it is recommended to create a 15m buffer from the edge of the woodland, which is in line with guidance from Natural England (Gov, 2014). The woodland edge will be fenced with stock fencing to prevent access from the residents of the development into the woodland and a thick mixed scrub buffer will be created to improve the ecological corridor, to buffer impacts on the woodland, and to provide good quality edge habitat adjacent to the woodland. There will be no permanent paths within the buffer and measures will be in place to avoid impacts on the woodland throughout the construction phase i.e., fencing and pollution control.

7.3 Protected Species

7.3.1 NERC S. 41 Mammals

It was considered that the site provides suitable habitat for hedgehog and potential habitat for polecat. Provisions to protect these species throughout the construction phase and to ensure the permeability of the site once the development is complete are provided within the recommendations section of this report.

It was considered that the retention/replanting of scrub and the restoration of the hedgerows will provide suitable habitat for the species post development. The enhancement of sections of grassland and attenuation basins will likely increase the foraging opportunities for both species. The woodland belt to the north will also increase the connectivity for both species as they utilise woodland and use linear features to disperse within the landscape. The creation of residential gardens will also provide hedgehog with suitable habitat. Recommendations within this report includes measure to ensure that hedgehogs can access the gardens within the development on site as well as the other habitats within the development.

7.3.2 Badger

A badger sett was identified within the central woodland belt on site. The sett was assessed to be partially used. The proposals will include the retention of the woodland belt so the badgers can remain on site. This habitat feature is connected to the ASNW to the east of the site and because of this it was considered that they can still access suitable habitat during and post construction phase.

Recommendations within this report will include measures to avoid impacting badgers which may use the habitats on site throughout the construction phase and to buffer and protect the active sett within the woodland.

7.3.3 Hazel Dormouse

Dormouse presence was confirmed on site with live dormouse and their nests recorded within the northern section of the development area. It was assessed that most of the site is well connected with dormouse likely to be present within all of the hedgerows and arboreal habitat with the exception of the land within the southwestern parcel (H11). H11 was fragmented from the rest of the development was species poor and gappy providing poor habitat suitability for dormouse. No dormouse were recorded within this section during the targeted surveys.

The key habitats on site were assessed to be the mixed scrub belt to the west of the racetrack, the hedgerows, and Grooms Copses ASNW which is >7 hectares, which was considered to provide suitable and the amount of habitat to sustain a dormouse population.

Habitat Impacts

The proposed works will see the removal of the mixed scrub to the west of the racecourse as it is contaminated with waste and as such these works cannot be avoided and the removal of trees within H1 and H2 to provide access into the site. These works will see the removal of dormouse nesting, foraging, and resting habitat. Therefore, a Natural England licence will need to be sought once planning has been granted regarding the removal of their habitat. Mitigation regarding the removal of habitat, the planting of compensatory habitats, and enhancing existing features for dormouse on site are provided within the recommendations section

Other Potential impacts on Dormice

Anthropomorphic impacts on dormouse regarding the development have the potential to impact the dormouse population. This was assessed to be in the form of domestic cats and the impacts of additional lighting.

To mitigate the impacts of domestic cats on dormice it is recommended to plant a high density of thorny plants within the mixed scrub and ASNW buffer to prevent cats accessing these area

A lighting plan will be required to ensure that lighting on the woodland edge is <0.5lux and that the mixed scrub and northern buffer are not impacted by lighting. It is also recommended that no security lighting be installed and that all lighting within the development should be installed with cowls to prevent light spill.

7.3.4 Otter

The habitats on site were dominated agricultural land and modified grassland which provides poor habitat suitability for otters. The habitat to the south of the site includes P3 and its associated habitats which are linked to a series of ponds and riparian habitat to the north of Water Lane. It was considered that otters are likely restricted to these habitats and are unlikely

to be impacted by the proposals. Measures to avoid impacting otter within the construction phase are provided within the recommendation's sections of this report.

The creation of an attenuation pond in the south of the site (adjacent to pond 3) will provide suitable habitat for otter and will provide a buffer to the riparian habitats to the south.

7.3.5 Water Vole

Similarly, to otter the riparian habitats to the south of the site were assessed to provide suitable habitat for the species. The impacts of the operational phase of the development were considered to not have a significant impact on the potential water vole population. Measure to avoid polluting the riparian habitat to the south and limiting light spill are provided within the recommendations section of this report.

7.3.6 Bats

The habitats were dominated by agricultural habitats which provide poor habitats for bats. The key features were assessed to be the hedgerows, the mixed scrub, and the mature trees. The activity levels for bats were low across the activity surveys and only common pipistrelle were in the top 20th percentile of bats calls when compared to the national database (Ecobat). Bat activity on the statics did not indicate a significant difference between the static locations on site. However, there were greater mean bat registrations per hour on the western boundary of the site than on the eastern boundary. This is contrary to the results of the activity surveys which highlighted the eastern boundary, specifically the woodland edge habitat to be the most important feature on site for bats.

Two trees were identified as having potential to support bats. This included T1 which was located within H1 and T2 which was located within the bramble scrub, within a field corner, of the western field. Both of these trees are being retained in the proposals. To achieve this, a lighting plan must be provided which ensures that light does not exceed 0.5lux within a 15m radius of both trees.

The woodland edge habitat was assessed to be a key foraging feature for bats. The woodland edge habitat on the ASNW will be buffered within the proposals (>15m) and additional planting will improve the density and diversity of the woodland edge which in turn will provide a greater insect abundance for bats. This project also includes creating a woodland along the northern boundary of the site which will provide additional habitat and ecological connectivity on site for bats.

The proposals on site will see the mixed scrub. However, the majority of the scrub is being replaced to compensate for its loss within the scheme. This will ensure that foraging habitat is provided on site post construction. As well as this, the hedgerows on site will be restored, the ancient trees buffers, and the proposals will include the creation of attenuation basins and a pond which will provide good habitats for bats.

A lighting plan will be required to limit the impacts of lighting on key features which were identified as being suitable for bats. This will include ensuring that the ASNW edge, the new planting in the north, and the 15m radius of the trees with bat potential will have estimated light levels <0.5luxs. this should include the impacts of internal and external lighting. The lighting plan should also include measure to limit the impact of street lighting throughout the development.

The structures on site were all assessed to provide negligible potential for roosting bats. Therefore, these structures can be demolished within the requirement of a Natural England mitigation licence.

Ecological provisions are provided within the corresponding schedule or works (Ethos, 2021). This will include integrated bat bricks, access tiles, and bat boxes.

7.3.7 Birds

The targeted bird surveys returned several species of conservation concern. This included species synonymous with woodland including song thrush, several farmland birds including kestrel, lapwing, and linnet, and species associated with riparian habitat including mallard and reed bunting. Nine out of nineteen farmland birds were recorded on site. However, the species were common and widespread with the exception of linnet and no ground nesting birds were recorded during the surveys.

No schedule 1 species were recorded within the surveys and as such were considered likely absent from the site.

To avoid impacting breeding birds within the proposals the works to the scrub will be undertaken outside of the main breeding season. It was considered that the creation of scrub in the same area as the removed scrub will compensate for the loss of breeding and foraging habitat for birds such as the song thrush. The creation of woodland belt to the north will also provide a significant enhancement regarding the suitability of the site for bats. The attenuation, restoration of woodland, and grassland management will also provide an increase in terms of bird habitat. Nesting provisions will include nesting bricks for swifts which were recorded on site, the provisions for house sparrows to nest in colonies, and the installation of bird boxes around the attenuation ponds for a range of birds.

Structures 4 and 5 were assessed to hold potential for breeding birds. Therefore, these buildings should be demolished outside of the breeding bird season. Otherwise, a or a pre-work check must be undertaken by an ecologist.

7.3.8 Invertebrates

It was assessed that the key features for birds were the mixed scrub, woodland edge habitat, and mature trees. The majority of these features are being retained or replanted within the scheme. the proposals also include the creation of attenuation ponds, woodland planting, and grassland restoration which provides habitat for a range of invertebrates. Ecological provisions

for invertebrates will include the installation of an insect hotel, bee bricks, and the retention of wood on site for saproxylic insects.

8.0 RECOMMENDATIONS

A schedule of works report is provided alongside this report. This includes measures regarding condition 11 of the outline conditions regarding this planning application. This includes the timing of works to mitigate the impacts on protected species, measure to protect wildlife during the construction phase, species monitoring, ecological provisions, and remedial measures if required.

Figure 18 proposed habitats



8.1 Habitats

The recommendations within this section include the habitat creation, enhancement, and their management. The habitats provided within this section correspond to the landscape plan by Hisskinson Brown Ltd, Figure 17.

8.1.1 Neutral Grassland (Enhancement)

Sections of neutral grassland will be restored and enhanced within the proposals as set out below:

Establishment

Areas of existing grassland to the north of the site, to the west of the access road, and within the southern field will be enhanced to provide neutral grassland.

All sections will be sown with an Emorsgate Seed mix EM1 for meadows and will be restored as follows:

- Scarifying existing grassland to 50% bare soil prior to seeding
- Sow with a wild pollen and nectar mix ESF2 (spring or autumn during suitable conditions)
- Top all plant growth at least three times within the first year to aid establishment

Management

The following management will be put in place in line with the Emorsgate specification:

- Each spring, if plant growth is more than 15cm in height, cut (and remove cuttings if dense) to achieve a plant height of between 5cm and 10cm tall
- Cut and remove arisings after the main flowering period August – September
- Any arisings will be baled and removed or composted within a designated area on site
- Cut up to 31 October aiming to leave a plant height of between 10cm and 20cm
- Leave 10% of each grassland section uncut to provide over-winter nesting and safe refuges for insects and other wildlife.

8.1.2 Woodland Northern Boundary (Creation)

A section of woodland will be created within the modified grassland field on the northern boundary of the site. The establishment and ongoing management are set out below.

Stock fencing will be installed along the southern edge of the woodland to prevent residents accessing the woodland. It is recommended to provide acoustic fencing or similar to prevent animals entering the Arundel Road to the north of the site.

Establishment

- The woodland will be created with a native species-rich mix of bareroot trees including 50% oak, 25% hazel, 10% field maple, 2% privet, 5% hawthorn, 5% silver birch, and 3% crab apple.
- Larger tree species will be planted to the north of the woodland block to avoid screen the Arundel Road to the north
- Trees will be planted at 2.0m spacing at a density of 1,600 per hectare
- The ground will be prepared before planting. This should include; removing vegetation by mowing or ploughing and breaking up compact soils by scarifying the ground
- Tree planting will be undertaken between October – December
- Tree tubes will be used where necessary to protect against grazing stock, deer, rabbits etc.
- Replant trees if any have failed within the first two years
- Water regularly in dry periods.

Management

Management prescriptions are focused on the conservation of dormouse and recommendations were informed by the PTES, 2014 woodland management for dormouse guidance.

The management options below are based on four main principles: open up the canopy, encourage a diverse understorey, retain dead and decaying wood, and keep areas of woodland well-linked.

It is expected that the woodland will need to be thinned within the first 10-20 years to allow light to penetrate the woodland floor and to enable the shrub layer to establish. The management options below generally relate to when the woodland is established >20 years

It is recommended to hire an experienced tree worker or arboriculturist to oversee the management of woodland in regard to the management objectives set out below.

- Aim for holes in the canopy of between 10m x 10m and 20m x 20m. Smaller gaps will not provide enough light for regeneration (except at the wood edge or ride-side) and larger ones may encourage deer or affect the connectivity within a small site

- Rides and glades provide increased edge habitat within your wood and ensure light reaches the woodland floor. This can be further enhanced by cutting scallop edges into the wood along the rides.
- Try to maintain a continuous connection between shrubs and trees throughout your wood to enable dormice, which are largely arboreal and reluctant to come to the ground, access to areas of suitable habitat even on neighbouring land. You can also retain brash, bramble and bracken across felling areas
- Protect new tree growth in your woodland from deer, rabbits or domestic stock. For small areas, using tree guards or piling brash over cut stumps and coppice stools may be sufficient protection.
- Climbing plants like ivy, honeysuckle and wild clematis can provide good links between the shrub and canopy layer as well as providing additional habitat and autumn food for dormice, birds, and invertebrates. Generally, ivy should not be removed from trees unless it has developed to the point where it shades the understorey.
- Bramble is a very useful plant that provides food and shelter for many species over a long period. It can develop as part of the felling cycle, growing when light reaches the woodland floor and becoming shaded out as the canopy grows
- Non-native, invasive plants are considered to be one of the greatest threats to biodiversity. In woodlands, rhododendron (which is of very little value to wildlife) may become invasive, shading out other shrubs and ground flora and restricting their regeneration, this should be removed where necessary
- Leave some cut timber in the wood to rot down individually or use logs to create habitat piles. If possible, bury the lower layers and build a compact stack away from coppice stools
- Standing dead wood is very important for invertebrates, birds, bats, and dormice. Retain some dead or damaged trees (as long as they are not unsafe) especially those with cracks and holes, in which dormice may nest and bats roost.

Coppice Management

- Coppice the woodland between November and March
- It is recommended to start coppicing the woodland section between 8-12 years after planting
- Cut no more than a ¼ha (and no more than 10% of the total area each year) in your wood rather than just cut one large block, so the cutting cycle should be carefully planned. Over time this will give a mosaic of mixed aged coppice in the wood. Ensure that coppice coupes remain linked either with intermediate blocks or along an edge so that no areas become isolated due to coppicing. Cut coppice stools will need protection from deer and rabbits to restrict grazing on new growth
- Brash removed during coppicing can be used within the woods to provide dead hedges which provides habitat for wildlife and deters deer from walking through the coppiced sections
- Aim for a mature tree density of 10-15 per hectare, with another 10-15 younger standards allowed to develop. This will allow light to get through to the shrub layer. Some of these shrubs should provide access for dormice into the tree canopy where possible. If standards require thinning this work should be undertaken in the same season just after the coppice is cut, to minimise damage to the stools.

8.1.3 Woodland Buffer - Adjacent to Grooms Copses (Creation)

A woodland buffer will be created adjacent to the ancient woodland on the eastern boundary of the site. The woodland buffer will be approximately 2-5m in width and will be formed of native shrub species and the base will be sown with a suitable grassland mix.

The area between the scrub buffer will be comprised of grassland and swales and will be established and managed as provided in section 8.1.1 and 8.1.6.

Establishment

Stock fencing will be installed along the woodland edge to prevent residents accessing the ancient woodland.

The woodland buffer will be created as follows:

- Whips and transplants will be sown in this section, species will include 50% hawthorn, 25% blackthorn, 15% field maple, 2% privet, 2% bird cherry, 2% sweet cherry, 2% guelder rose, 1% crab apple, and 1% holly
- The base will be sown with a flowering seed mix such as Emorsgate EH1 Hedgerow Mixture
- Any deadwood cleared during vegetation clearance will be retained on site to create refugia in the soft landscaped areas and beneath the existing hedgerows
- Creation of a graded profile to the woodland with a 'scalloped' edge with mixed habitats to maximise the benefit to wildlife

Management

Management prescriptions for this will comprise:

- Grassland beneath new planting to be strimmed on annual basis to limit perennial weed growth
- Once established as semi mature, selective thinning/coppicing on a five-year rotational basis.
- The woodland edge will be selectively strimmed on an annual basis to provide dense woodland edge habitat.
- Encroaching scrub will be removed from the grassland adjacent to the woodland buffer

8.1.4 Mixed Scrub (Creation)

Mixed scrub is being planted on site to compensate for the loss of scrub habitat within the proposals.

Species will include similar species which were identified within the mixed scrub section within the initial UKHab survey. These include dogwood (*Cornus sanguinea*), wild privet (*Ligustrum vulgare*), honeysuckle (*Lonicera periclymenum*), blackthorn (*Prunus spinosa*), dog rose (*Rosa sp.*), hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*), and field maple (*Acer campestre*).

Establishment

This section will be established following the same methodology as provided within section 8.1.3.

Management

- The scrub will be coppiced on a 12-year rotation with the aim of the management to create thick/dense scrub.
- The scrub will be strimmed annually, and the scrub should be controlled to prevent it encroaching other areas of habitat
- Areas will be gaped up if necessary
- Bramble will be allowed to colonise as it provides a food source for dormouse throughout the year

8.1.5 Attenuation Basin (Creation)

There is a large attenuation basin located on the south-eastern boundary of the site. There are several swales on the eastern and northern boundaries of the site which will be established and managed following a similar methodology.

Creation

- The existing grassland will be scarified to provide a seed bed with 50% grassland to 50% exposed soil
- The meadow mixture will be sown per manufacturers specification
- The mix should be sown on the ground prone to winter flooding either in spring or summer once the land has drained

Management

- The vegetation will be cut regularly within the first year to maintain a short sward and clippings will be removed if dense
- Remove perennial weeds such as docks by digging or spot treating with herbicides

- The grassland will be cut using a traditional meadow management, which will include an annual summer cut in July followed by an autumn and spring cut
- Areas of open water should be left to colonise naturally with aquatic plant species
- If the areas are too boggy to mow, then the grasses will need to be strimmed and raked and the clippings removed by hand
- A composting area should be created onsite to provide an area for the clippings removed during the mowing

8.1.6 Pond and Surrounding Area (creation)

Pond Creation

- The pond should have low levels of shade and should not be created under mature trees
- The pond should be kidney shaped with gradient edges and a sloped area forming a beech for wildlife to escape
- The pond should have varying depths with the deepest section being over 60cm deep
- The pond should also have shelved sections providing basking areas for invertebrates
- The pond will be left to fill naturally with rainwater to avoid contamination
- The spoil from the excavation should be used to vary ground levels and create banks which enhances the structural diversity of habitats on site. This in turn can create habitats for invertebrates, reptiles, and amphibians
- It is recommended that the ponds are left to colonise naturally with native aquatic vegetation as this reduces the chance of introducing non-native species
- The pond edges will be sown with a species-rich seed mixture such as Emorsgate Seeds EP1F – pond edge mixture

Grassland Creation in pond Area

Areas of grassland within the pond area will be planted to provide neutral grassland and wildflowers. These sections will be sown with an Emorsgate Seed mix ESF2 which contains species that have been shown to be particularly important to bumblebees, such as red clover and birds foot trefoil as well as open flowered plants like wild carrot and oxeye daisy which are important for other beneficial insect groups such as hoverflies. With the longer lived genuine wild red clover and other plants it offers a long-lived sustainable alternative to the short-lived pollen and nectar mixtures based on agricultural forage varieties. These areas will be created as follows:

- Scarifying existing grassland to 50% bare soil prior to seeding;
- Sow with a wild pollen and nectar mix ESF2 (spring or autumn during suitable conditions);
- Top all plant growth at least three times within the first year to aid establishment.

Management

The following management will be put in place in line with the Emorsgate specification:

- Each spring, if plant growth is more than 15cm in height, cut (and remove cuttings if dense) to achieve a plant height of between 5cm and 10cm tall
- Cut and remove arisings after the main flowering period August – September
- Any arisings will be baled and removed or composted within a designated area on site
- Cut up to 31 October aiming to leave a plant height of between 10cm and 20cm
- Leave 10% of the area uncut or ungrazed to provide over-winter nesting and safe refuges for insects and other wildlife.

Fruit Trees

Five ornamental cherry trees will be planted within this section.

- Tree guards should be used to ensure that the root avoid excessive shaking before the roots are established.
- Weeds should be controlled to prevent competition until the trees are established.
- Good tree management and aftercare in the first few years after planting is crucial to ensure their survival and long-term health

Other enhancements/provisions

It is recommended to create two hibernacula for invertebrates, reptiles, and amphibians and an insect hotel. These will be detailed within the corresponding Schedule of Works report (Ethos, 2021)

8.1.7 Hedgerow Removal and Replanting

It is recommended to remove both the cypress hedges (H9 and H10) and to replant native species rich hedgerows in their place. This is set out below:

Establishment

- The hedgerows will be planted when the trees are dormant between November and March
- Vegetation at the ground level will be cleared before the hedgerow is planted
- The hedgerow will be planted with bare root stock and will include species of local provenance such as 50% hawthorn, 25% blackthorn, 15% field maple, 2% privet, 2% bird cherry, 2% sweet cherry, 2% guelder rose, 1% crab apple, and 1% holly
- The hedgerow will be planted in zig-zag lines at two-foot intervals between tree whips
- Tree guards will be used where necessary

Management

- The hedgerows will be maintained with high basal density – this will be achieved by allowing bramble and other scrub species to grow at the base of the hedgerows. ‘Neat’ hedgerows will be avoided. This will provide foraging and nesting habitat for birds, hedgehogs, and invertebrates

- Infrequent cutting of hedgerows to allow fruit and nut production which will benefit a wide range of faunal species. Cutting will be undertaken on a three-year rotation;
- The hedgerow will be cut between January – February to avoid impacts on wildlife and to ensure high fruit production

8.1.8 Existing Hedgerows

Table 6 Existing hedgerow recommendations

Hedgerow Number	Assessment	Management	Photograph
H1	This hedgerow was defunct in section and was species poor. The mature oaks were assessed to be the key features regarding the hedgerow	- Gap up hedgerow with native whips (section 8.17) - Sow a 1m margin with Emorsgate EH1 mixture for hedgerows - Coppice sections of species poor hedgerow on rotation to encourage regrowth - Plant additional species once coppiced to increase diversity - Trim regularly in the first five years after coppice works - Established hedgerows will be managed on a rotation basis with the hedgerow trimmed annually (1-side, 2-top, 3- side)	
H2	The hedgerow was assessed to be in a good condition for wildlife with little intervention required	This hedgerow will be cut on a three year rotation basis. This will include: year 1 – cut side, year 2 – cut top, and year 3 – cut other side.	

Hedgerow Number	Assessment	Management	Photograph
H3	This hedgerow was grown out at the base and species poor.	• Grow out the hedgerow for five years and then thin and lay the hedge • Selected species within the hedgerow will be allowed to grow out to form hedgerow trees • Whips will be planted within the hedgerow one laid to increase the botanical diversity of the hedgerow • Planted species will be planted as per section 8.1.7 • It is recommended to split the hedgerow into three sections and lay on section per year to avoid overall impacting dormouse • Once established manage on a rotational basis year 1 – cut side, year 2 – cut top, and year 3 – cut other side.	
H4	This hedgerow was defunct and overmanaged resulting in a hedgerow in a poor condition	• Replant areas as per section 8.1.7 • Once established manage on a rotational basis year 1 – cut side, year 2 – cut top, and year 3 – cut other side.	

Hedgerow Number	Assessment	Management	Photograph
H5	This hedgerow was defunct in sections and contained a margin of common nettle which suggests that there are high levels of nutrients within the soil.	- Remove the turf within 1.5m of the northern edge of the hedgerow and then reseed with the EH1 hedgerow mix - Remove dead elm tree and allow to rot down at the base of the hedgerow - Gap up hedgerow as in 8.1.7 - manage on a rotational basis year 1 – cut side, year 2 – cut top, and year 3 – cut other side.	
H6	This hedgerow was in a good condition for wildlife and contained abundant grown out trees	No change in management	

Hedgerow Number	Assessment	Management	Photograph
H7	This hedgerow was species poor and defunct	Woodland will be planted to the south of this hedgerow. Hedgerow will form a section of the woodland and will be allowed to grow out	
H8	This line of trees was dominated by non native species.	It is expected that this hedgerow will be removed and will be replanted with mixed scrub	

Hedgerow Number	Assessment	Management	Photograph
H9	Single species cypress with poor value for wildlife	Remove and replant as provided in section 8.1.7	
H10	Single species cypress with poor value for wildlife	Remove and replant as provided in section 8.1.7	

Hedgerow Number	Assessment	Management	Photograph
H11	This hedgerow was species poor, bordered by nettle but in a moderate condition	• Grow out the hedgerow for five years and then thin and lay the hedge • Selected species within the hedgerow will be allowed to grow out to form hedgerow trees • Whips will be planted within the hedgerow one laid to increase the botanical diversity of the hedgerow • Planted species will be planted as per section 8.1.7 • It is recommended to split the hedgerow into three sections and lay on section per year to avoid overall impacting dormouse • Once established manage on a rotational basis year 1 – cut side, year 2 – cut top, and year 3 – cut other side.	

8.2 Protected Species

8.2.1 Nocturnal Mammals

The recommendations below include measures to avoid impacting species such as hedgehog, polecat, dormouse, bats, and badger throughout the construction phase.

- If fencing is required between the dwellings, it should be lifted in areas by approximately 10cm to allow mammals (e.g., hedgehog) to pass under the fence, or fitted with gaps around 13cm/13cm to retain permeability.
- All trenches should be covered at night or contain a ramp to avoid nocturnal mammals becoming trapped in them overnight.
- Any temporary lighting used during construction will be switched off at night to avoid disturbing nocturnal mammals. Any security lighting required overnight will be sensitively placed, directed away from bat habitat.
- Any potential refugia onsite to support hedgehogs will be checked by a suitably qualified ecologist before removal.
- Any necessary piling of materials will be kept on pallets (i.e., off the ground) to avoid creating refugia for species such as reptiles, amphibians, and hedgehog, which could be injured or killed when the materials are moved.

8.2.2 Badger

It is recommended to install Heras fencing around the woodland belt in the centre of the site throughout the construction phase to prevent construction activities disturbing badgers. This will be larger than the 20m buffer zone legally required to avoid impacting badgers in their sett regarding the underground disturbance such as the use of machinery or digging.

A buffer zone to avoid impacting badgers is provided on the Landscape plan, figure 17.

The fencing required to avoid impacting badgers through the construction phase is provided within figure 18.

Figure 19 Badger Exclusion Zone



8.2.3 Dormouse Method Statement

Clearance of Large Sections of Habitat (>100m)

The areas which are being cleared to enable the development include the mixed scrub to the west of the racetrack (section a), the tree line (H8) to the north (Section b), and the woodland to create access to the west of the site (Section c). These works will be undertaken using persuasive clearance of habitat methods to remove dormouse habitat in a staged process. The clearance will be directional to persuade dormouse to move back into existing habitats which are being retained such as the ASNW to the east of the site.

- No more than 100m of hedgerow (dormouse range) can be cleared during a season. This ensures that dormice do not become stranded when their habitat is removed.
- This means that the dormouse clearance of sections A and B will need to be phased over successive years.
- The vegetation within the impacted areas A, B, and C will be removed with hand tools during the main hibernation period for dormouse (November – March)
- Following this, the roost of the trees and the ground vegetation will be removed in the active dormouse season (May – September)
- The clearance of vegetation within sections A and B will be directional starting furthest away from retained habitat and then moving closer to allow dormouse to disperse into the surrounding habitats (Figure 17).

- Boxes (2-5) will be installed within the hedgerow/woodland which the dormouse are being moved towards to make the area more suitable for them
- Planting to provide connectivity between the south of section A and the woodland belt will be undertaken in the first year to provide a gap between the cleared area of section A in the second year and the woodland belt. This will comprise a standard holly, three mature hazel plants, and a young oak tree (6 years approx.)
- Any clearance works will be undertaken under the supervision of a licenced dormouse ecologist

Figure 20 Dormouse mitigation and staged approach



Clearance of small and poor sections of habitat (<10m)

Small areas of habitat which are to be cleared to enable access into the site. Also, habitat which is of poor-quality dormouse habitat (non-native hedgerows) can be cleared within their active season. The mitigation to achieve this is provided below.

- Individual trees, short sections of hedgerow (<10m), or poor-quality habitat such as bramble scrub can be cleared within the dormouse active period.
- The works should be staggered to only remove a small section of the habitat per day to allow the dormouse to react to the works and disperse from the cleared area
- These works will be undertaken under supervision of a licenced ecologist.

Compensation

The mixed scrub sections will be replanted with a similar species mix to what is already present within the mixed scrub section (section a). It was considered that this was optimal habitat for dormouse; being scrubby, dense, and diverse in its species composition. The creation and management of the compensatory habitat is provided within section 8.1 of this report.

Enhancement

The proposals include the creation of a woodland belt which will border the northern perimeter of the site (figure 12). This planting will provide native woodland habitat, will screen the road to the north, and will provide dormouse habitat and improve the connectivity for the species. Although there is a link between the west and east of the site for dormouse through the centre of the site it was considered that the northern woodland would provide a more robust link between the ANSW and the woodland in the north west (offsite), would provide an additional link, and would provide additional habitat on site which will be managed for dormouse. Other enhancements will include hedgerow restoration and the implementation of beneficial management.

8.2.4 Riparian Mammals

Riparian habitats suitable for water vole and otter and located offsite, to the south of the southern boundary of the site. Precautionary and good practice construction methods will be put in place to avoid impacting this section. These are detailed below.

8.3 General Good Practice Mitigation Measures

The following section details general good practice measures which will be adopted during the entire construction process. It will be the responsibility of the site manager to ensure that all staff are inducted and made aware of these recommendations.

8.3.1 Dust generation

Generation of dust will be mitigated by wetting down and/or the use of screening if appropriate. This will avoid dust deposition on sensitive habitats including the ANSW and riparian habitats to the south of the site.

8.3.2 Excavations and trenches

All excavations and trenches will either be covered at night or include an escape ramp to prevent nocturnal species such as badger and hedgehog from becoming trapped. This could be in the form of a roughened plank of wood. The trenches/pits will be inspected each morning to ensure no badgers have been trapped.

8.3.3 Open pipework

Open pipework larger than 150mm outside diameter will be blanked off at the end of each working day to avoid nocturnal mammals entering the pipes and potentially becoming trapped or injured.

8.3.4 Contractors' materials and hazardous waste

All chemicals and hazardous materials and waste will be stored in-line with best practice guidelines, ensuring they are secure and cannot be accessed by roaming animals. No materials will be stored within the biodiversity protection zone.

8.3.5 Sympathetic working practices:

- Avoid creating potential refuges. Amphibians will use stacked materials such as wood, stone, boards, or metal sheets as refugia. Keep the Site tidy and store materials off the ground, for example on pallets where possible;
- Store materials away from areas of retained vegetation which are considered suitable for reptiles and amphibians (e.g., hedgerows);
- Should it be necessary to store materials such as topsoil on site then the stockpile should be smoothed to prevent access by faunal species into potential cavities;
- Staff should simply demonstrate awareness when working and moving materials. Should an animal be found, it should be gently moved, for example in a clean bucket, to a suitable location within habitat well away from the working area.

8.3.6 Bats

A lighting plan will be required to limit the impacts of excessive lighting on key features which were identified as being suitable for bats. This will include ensuring that the ASNW edge, the new planting in the north, and the 15m radius of the trees with bat potential will have estimated light levels <0.5luxs

Provisions such as bat boxes, bat access tiles, and integrated bat bricks will be provided within the corresponding Schedule of Works report (Ethos, 2021).

The structures on site can be demolished within no timing constraints and without the need to obtain a licence. The demolition of the structures must be undertaken within two years of the issue date of this report otherwise updated surveys may be required.

8.3.7 Birds

The proposals will see the removal of extensive areas of mixed scrub and structures 4 and 5 which were assessed to provide suitable habitat for nesting birds. Because of this, it is

recommended to time the works to avoid impacting nesting birds. Provisions for nesting birds are provided within the corresponding schedule of works report (Ethos, 2021).

- Any potential nesting habitat such will be felled in the winter, outside of the main breeding bird season which is between March and September.
- Structures 4 and 5 must be demolished outside of the main breeding season or be checked by an ecologist
- Alternatively, a pre-works check must be undertaken by a suitably qualified ecologist.

8.3.8 Amphibians and Reptiles

The key features for reptiles and amphibians were assessed to be the ponds. This included P1 which is being removed within the proposals. Because amphibians may be impacted it is recommended to drain the pond under supervision of an ecologist. Any amphibians or reptiles encountered will be moved to a safe area, with suitable habitat, where they will not be disturbed again.

Recommendations to ensure that it does not become more suitable for amphibians and reptiles and the provision of refugia to provide overwintering habitat are provided within the schedule of works (Ethos, 2021).

8.3.9 Invertebrates

Provisions include the installation of an insect hotel and hibernacula within the open space area in the centre of the site. Bee bricks will also be incorporated into the dwellings on site. These are detailed within the Schedule of Works report (Ethos, 2021).

9.0 CONCLUSIONS

Ethos Environmental Planning (Ethos) have undertaken this Ecological Assessment (EA) of Land North of Water Lane, Angmering, which is subject to plans to create up to 525 residential dwellings (Class C3) 3 ha (gross) of employment land (Class B1), public open space, play areas, access, associated infrastructure, and landscaping.

The habitats on site were dominated by agricultural grassland and arable land as well as developed land-sealed surface which provides poor habitat value for wildlife. The key features were assessed to be the woodland belt, the hedgerows, and areas of scrub. The site was also bordered by an Ancient Semi Natural Woodland to the east and riparian habitats to the south.

Dormouse were confirmed as being present on site and as such a working method statement has been provided which details the mitigation required to inform a Natural England licence. A badger sett was also identified on site and will be retained within the proposals. The site was confirmed to support common species of bats and birds, and the potential to support badger and polecats.

Overall, the proposals include the provision of good habitat which will provide an increase in terms of habitat suitability for a range of species. This includes multiple attenuation basins and swales, a new woodland on the northern boundary of the site which will significantly improve the ecological connectivity on site for a range of species, a woodland buffer for the ancient woodland, grassland enhancement, and the creation of an open space area within the centre of the site which will include a pond and wildlife meadow.

10.0 REFERENCES

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APPENDIX I EDNA SURVEY RESULTS

Client: Lindsay Sellers-Moore,
Ethos Environmental Planning



ADAS
Spring Lodge
172 Chester Road
Helsby
W86 0AR

Sample ID: 2020-0913 Condition on Receipt: Medium Sediment Volume: Passed
Client Identifier: PZ Angmering Description: pond water samples in preservative
Date of Receipt: 22/04/2020 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control ^a	2 of 2	Real Time PCR	28/04/2020
Degradation Control ^b	Within Limits	Real Time PCR	28/04/2020
Great Crested Newt ^c	0 of 12 (GCN negative)	Real Time PCR	28/04/2020
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) ^d	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 30/04/2020 Date of issue: 30/04/2020

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

^a If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.

^c Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

^b No degradation is expected within time frame of kit preparation, sample collection and analysis.

^d Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

APPENDIX II LEGISLATION AND POLICY DETAILS

Legislation - Species

This section outlines the key legislation related to the habitats and species considered within this survey report.

Bats

All British bats are fully protected under Section 9 Schedule 5 of the Wildlife and Countryside Act 1981 and amendments. Agreement, and are fully protected under The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. In addition, they are protected under the Berne Convention; they are given migratory species protection within the Bonn Convention.

Regulation 43 (1) of The Conservation of Habitats and Species Regulation 2017 makes it an offence to:

- deliberately capture, injure or kill any species of bat;
- deliberately disturb any species of bat;
- damage or destroy a breeding site or resting place of any species of bat.

It is an offence to disturb any bat roosting site, whether the bats are there or not. Under Regulations 43 (2) disturbance includes in particular any disturbance which is likely:

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

Presence of bats does not necessarily mean that development cannot go ahead, but that with suitable, approved mitigation, exemptions can be granted from the protection afforded to bats under regulation 43 by means of a licence. Natural England (NE) is the appropriate authority for determining licence applications for works associated with developments affecting bats, including demolition of their roost sites. In cases where licences are required, certain conditions have to be met to satisfy Natural England. Before the Statutory Nature Conservation Organisation (SNCO), in this case NE, can issue a licence to permit otherwise prohibited acts three tests have to be satisfied under the requirement of Regulation 55. These are:

1. Imperative Reasons of Overriding Public Interest [Reg 55(2)(e)];
2. No Satisfactory Alternative [Reg 55(9)(a)];
3. Maintenance of Favourable Conservation Status [Reg 55(9)(b)].

In order to meet the tests, SNCO usually expects the planning position to be fully resolved as this is necessary to satisfy tests 1 and 2. Full planning permission, if applicable, will need to have been granted and any conditions relating to bats fully discharged. ahead of any licence application to the SNCO. The LPA have a legal duty under The Conservation of Habitats and Species Regulations 2017, to assess whether the application is likely to meet the Three Tests

and therefore the requirements for Natural England licensing, prior to determination of an application The Licence application process may take two months before a licence is issued. Planning Permission and granting of a bat licence are separate legal functions. Therefore receiving planning permission from the Local Authority is no guarantee that the SNCO will issue a derogation licence.

Badger

The Protection of Badgers Act 1992 is based primarily on the need to protect badgers from baiting and deliberate harm or injury. It also contains restrictions that apply more widely and it is important for developers to know how this may affect their work. All the following are criminal offences:

- to wilfully kill, injure, take, possess or cruelly ill-treat a badger;
- to attempt to do so; or
- to intentionally or recklessly interfere with a sett.

Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed.

Development should not be permitted unless it is possible to take steps to ensure the survival of the badgers in their existing range and at the same population status, with provision of adequate alternative habitats if setts and foraging areas are destroyed. Natural England will normally only issue a licence after detailed planning permission has been granted, where applicable, so that there is no conflict with the planning process.

Before the planning application is determined, the local planning authority should request a detailed ecological survey/report and developers should be prepared to provide the following information:

- The numbers and status of badger setts and foraging areas that are affected by the proposal;
- the impact that the proposal is likely to have on badgers and what can be done by way of mitigation;
- judgment on whether the impact is necessary or acceptable; and
- a recommendation on whether a licence will be required.

A badger survey usually requires assessment of the site and a 30-50m buffer area as tunnels can extend up to 20m from sett entrances. As badgers are not a European Protected species the Three Test do not need to be applied, however Planning Permission and badger licensing are separate legal functions. Thus receiving planning permission from the Local Authority is no guarantee that development operations will not breach the Protection of Badgers Act 1992. Similarly planning permission does not guarantee that a badger licence will be granted.

Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended) and cannot be killed or taken, their nests and eggs taken, damaged or destroyed while their nest is in use or being built. It also prohibits or controls certain methods of killing or taking except under licence. Other activities that are prohibited include possession and sale. Activities such as killing or taking birds (including relocating) which would otherwise be illegal can be carried out under licence where there is suitable justification and the issue cannot be resolved by alternative means.

Specially protected or Schedule 1 birds receive full protection under the Wildlife and Countryside Act 1981 (as amended). Part I birds are protected at all times, Part II during the close season only. In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

Hazel dormouse

They are protected under both The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and the Wildlife and Countryside Act 1981 (as amended). Dormice and their breeding sites and resting places are fully protected. Without a licence it is an offence for anyone to deliberately disturb, capture, injure or kill them. It is also an offence to damage or destroy their breeding or resting places, to disturb or obstruct access to any place used by them for shelter. It is also an offence to possess or sell a wild dormouse.

If it is not possible to avoid harming dormice or damaging or blocking access to their habitats, a derogation licence will be required. Planning permission is required to be in place before a licence application.

Planning Permission and granting of a mitigation licence are separate legal functions. Therefore receiving planning permission from the Local Authority is no guarantee that the SNCO will issue a derogation licence.

1.5 Otter

The European Otter is fully protected under UK and European law by the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitat and Species Regulations 2017 (as amended). Otters and their breeding sites and resting places are fully protected. It is an offence for anyone to deliberately disturb, capture, injure or kill them; to deliberately damage or destroy their breeding or resting places; to disturb or obstruct access to any place used by them for shelter. It is also an offence to possess or sell an otter.

Under Regulation 43(2) of The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 the disturbance of otter includes in particular any disturbance which is likely to impair their ability to survive, breed or reproduce, or to rear or nurture their young; or to affect significantly the local distribution or abundance of the species to which they belong.

If it is not possible to avoid harming otter or damaging or blocking access to their habitats, a derogation licence will be required. Planning permission is required to be in place before a licence application.

Planning Permission and granting of a mitigation licence are separate legal functions. Therefore, receiving planning permission from the Local Authority is no guarantee that the SNCO will issue a derogation licence.