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Biodiversity Enhancement Strategy

Site Name

Roosthole, Mannings Heath

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Client

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This report has been prepared by Emma Baker, who is a Senior ecologist with 9 years' experience. She holds Level 1 great crested newt and hazel dormouse survey licences. As a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM), she is bound by their code of professional conduct.

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Report Summary

Purpose	The Ecology Co-operation was commissioned by Mr and Mrs Ovelgonne to provide a Biodiversity Enhancement Strategy (BES) with regards to a proposed development at Roosthole, Mannings Heath. This document outlines targeted enhancement measures for the site. It also includes management objectives, responsibilities and maintenance schedules including remedial responsibilities, should they be necessary. It will be submitted to Brighton and Horsham District Council to discharge condition five of the approved planning application: DC/25/1832. The proposals include demolition of the existing garage and construction of single-storey side extensions, as well as erection of a garage with studio above.
Context	The site is located to the west of the town of Horsham, West Sussex. It totals approximately 0.5ha and comprises the Roosthole property, garage and a small outbuilding, as well as artificial, unvegetated - unsealed surface, garden space, deciduous woodland and neutral grassland. The site sits within a rural area and is surrounded by similar properties, as well as farms to the north and east, pasture to the south and an extensive plot of ancient woodland to the west. Part of the woodland is owned by the client and is classified as Priority Habitat deciduous woodland, but not ancient woodland. A Preliminary Ecological Appraisal (PEA) was undertaken by David Archer Associates in February 2023. This found that the site had the potential to support roosting bats (main house and garage), foraging bats, nesting birds, herptiles, dormice and hedgehog. Schedule 9 species <i>Rhododendron</i> sp. was also identified on site. Bat emergence surveys were recommended, as well as precautionary mitigation for nesting birds, dormice, herptiles and hedgehogs. It was also detailed that a Construction Environmental Management Plan (CEMP) should be produced to cover mitigation for impacts to the adjacent priority habitat deciduous woodland. The PEA was followed by a bat emergence survey by Fellgrove between July and August 2023. These identified common pipistrelle, soprano pipistrelle and <i>Myotis</i> sp. roosts within the main house. An updated bat scoping survey was undertaken in May 2026 by The Ecology Co-op, which identified a roosting brown long-eared bat within the void of the property.
Biodiversity Enhancements	Section 3 sets out the proposed habitat enhancement measures for the site including native tree planting and targeted features for nesting birds, roosting bats, hedgehogs and invertebrates.
Post-construction management	Post-construction management for the retained ecological features and proposed biodiversity enhancement features is detailed in full in section 4, and a work schedule is provided in section 5 outlining management responsibilities and remedial actions should they be necessary.
Toolbox talk	Site staff must be briefed, prior to the commencement of construction, on the ecological issues related to the project and the importance of contacting an ecologist in the event that any wildlife is identified within the construction zone.



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1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-operation was commissioned by Mr and Mrs Ovelgonne to provide a Biodiversity Enhancement Strategy (BES) with regards to a proposed development at Roosthole, Mannings Heath. This document outlines targeted enhancement measures for the site. It also includes management objectives, responsibilities and maintenance schedules including remedial responsibilities, should they be necessary. It will be submitted to Brighton and Horsham District Council to discharge condition five of the approved planning application, DC/25/1832, which is as follows:

“5. Pre-Commencement (Slab Level) Condition: No development above ground floor slab level shall commence until a Biodiversity Enhancement Layout, providing the finalised details and locations of the enhancement measures contained within the Preliminary Ecological Appraisal (David Archer Associates, February 2023), has been submitted to and approved in writing by the Local Planning Authority. The enhancement measures shall be implemented in accordance with the approved details prior to occupation and all features shall be retained in that manner thereafter.

Reason: As these matters are fundamental to safeguard the ecology and biodiversity of the area in accordance with Policy 31 of the Horsham District Planning Framework (2015), and to enhance Protected and Priority Species/habitats and allow the LPA to discharge its duties under the s40 of the NERC Act 2006 (Priority habitats & species).”

The prescribed enhancement measures described within this document will be issued to relevant works contractors to ensure that they are carried out in full. Implementation of this will be overseen by a suitable ecological consultancy, and the works contractor will be given contact details for an ecologist so that any issues can be resolved promptly.

1.2 Background

The site is located to the west of the town of Horsham, West Sussex RH13 6PG. The central grid reference for the site is TQ 20917 29609. Figure 1 shows the boundary of the site.

The site totals approximately 0.5ha and comprises the Roosthole property, garage and a small outbuilding, as well as artificial, unvegetated - unsealed surface, garden space, deciduous woodland and neutral grassland. The site sits within a rural area and is surrounded by similar properties, as well as farms to the north and east, pasture to the south and an extensive plot of ancient woodland to the west. Part of the woodland is owned by the client, and is classified as Priority Habitat deciduous woodland, but not ancient woodland.

The proposals include demolition of the existing garage and construction of single-storey side extensions, as well as erection of a garage with studio above (see Figure 2).

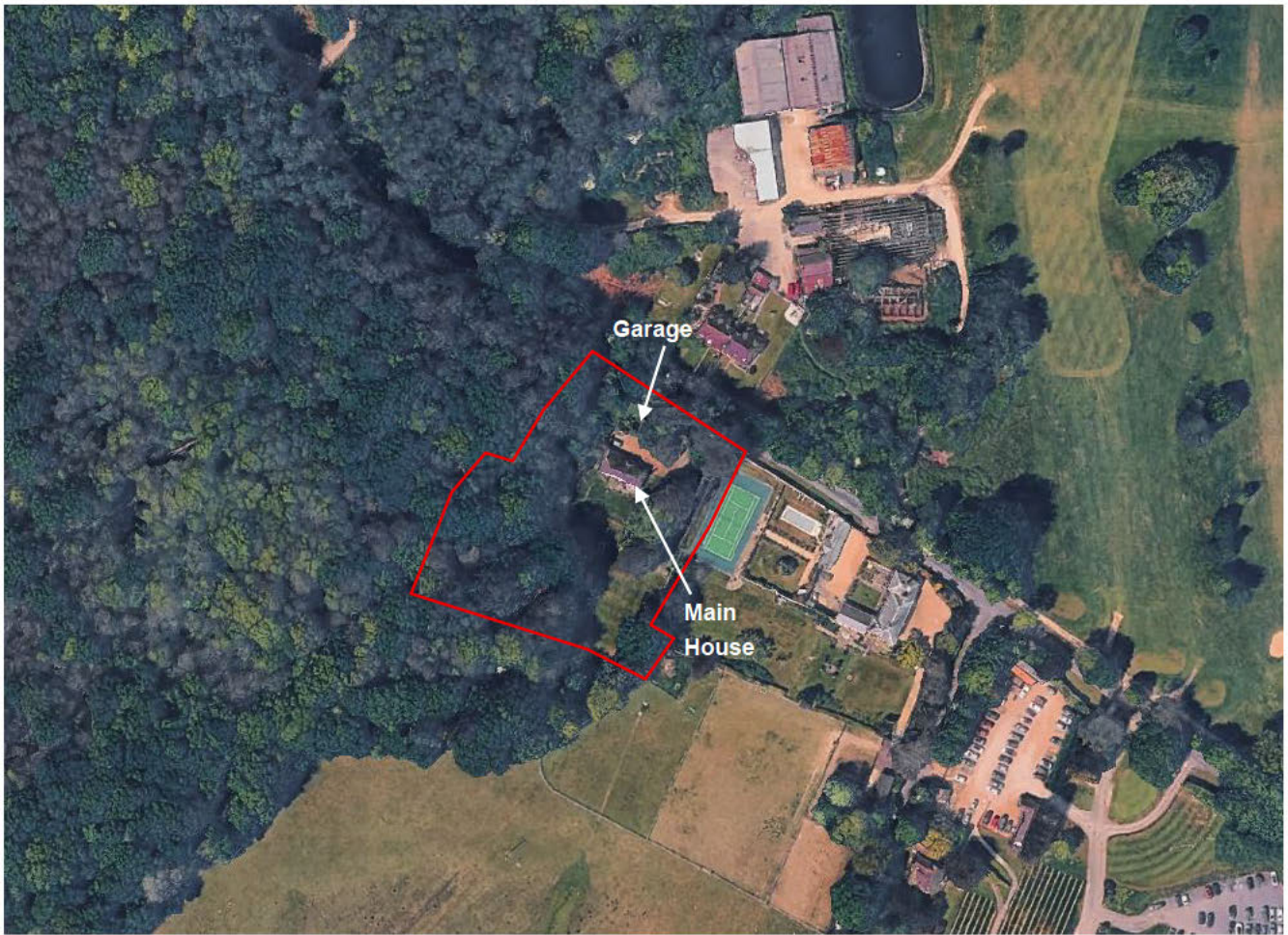


Figure 1. Aerial image showing the location of the application site, with the site boundary indicated in red. Images produced courtesy of Google maps (map data ©2025 Google).

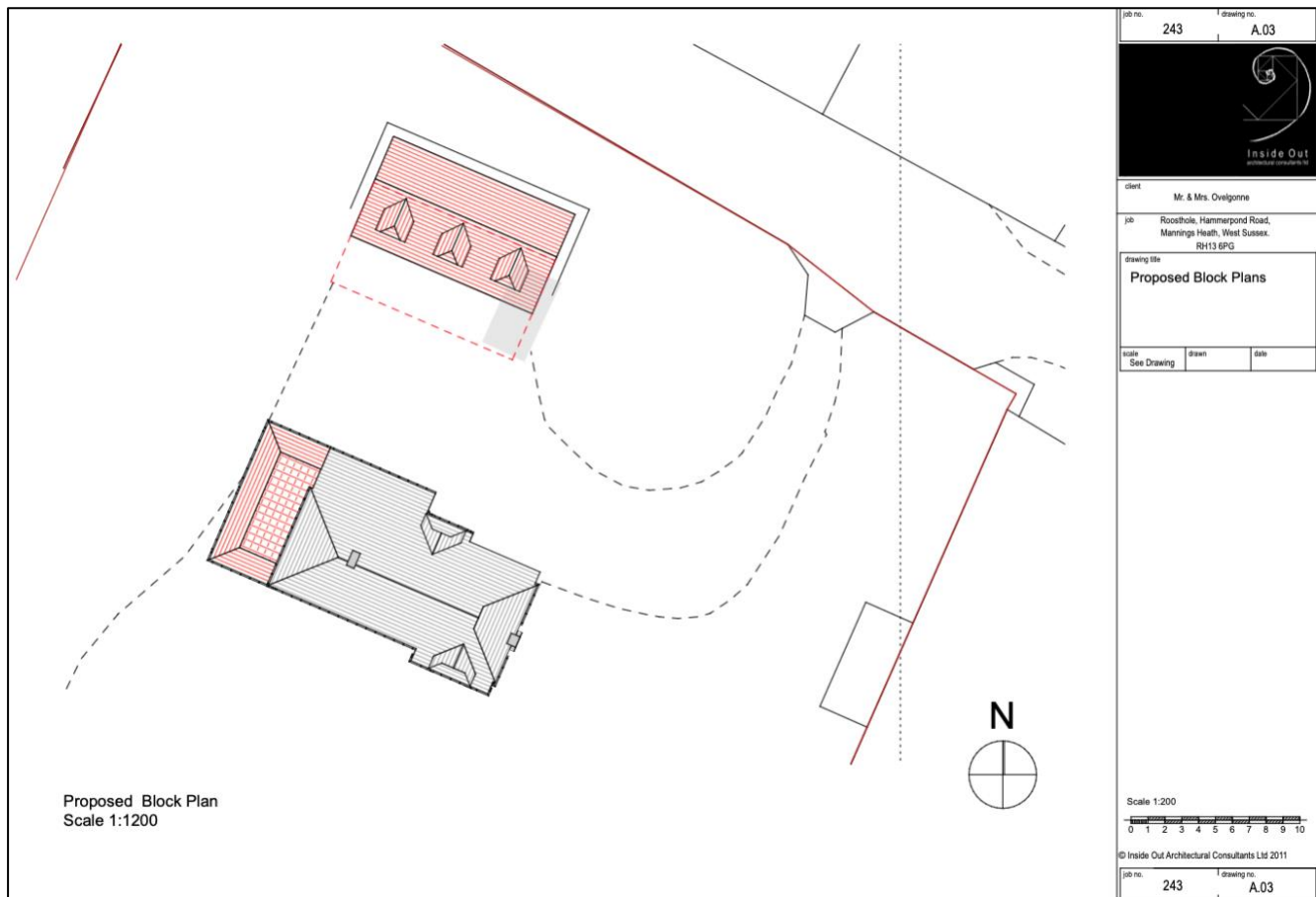


Figure 2. Proposed plans for Roosthole, Mannings Heath. Provided courtesy of inside out architectural consultants ltd, dwg no: A.03.

1.3 Summary of Previous Survey Work

A Preliminary Ecological Appraisal (PEA) was undertaken by David Archer Associates in February 2023¹. This found that the site had the potential to support roosting bats (main house and garage), foraging bats, nesting birds, herptiles, dormice *Muscardinus avellanarius* and hedgehog *Erinaceus europeus*. Schedule 9 species *Rhododendron* sp. was also identified on site. Bat emergence surveys were recommended, as well as precautionary mitigation for nesting birds, dormice, herptiles and hedgehogs. It was also detailed that a Construction Environmental Management Plan (CEMP) should be produced to cover mitigation for impacts to the adjacent priority habitat deciduous woodland. The PEA was followed by a bat emergence survey by Fellgrove between July and August 2023². These identified common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and *Myotis* sp. roosts within the main house. An updated bat scoping survey was undertaken in May 2026 by The Ecology Co-op³, which identified a roosting brown long-eared *Plecotus auritus* bat within the void of the property.

¹ David Archer Associates (2023). Preliminary Ecological Appraisal – Roosthole, Hammerpond Road, West Sussex.

² Fellgrove (2023). Bat Activity Assessment Report – Emergence and Re-entry Surveys.

³ The Ecology Co-op (2026). Bat Scoping Assessment – Roosthole Mannings Heath.



2 LEGAL PROTECTION

Legal protection applying to relevant bird, mammal and herpetofauna species is detailed in Appendix 1 of this report. This includes both national and European legislation that protects [REDACTED], bats, dormice, reptiles and breeding birds.

2.1 Management Plan Strategic Vision

The aims and objectives for the landscape and biodiversity elements of this development project are as follows:

- creation/enhancement of green assets including native tree planting; and
- provision of targeted and appropriate habitat enhancement features for bats, nesting birds, hedgehogs and invertebrates.

2.2 Persons Responsible for Implementing the Works

The installation of the prescribed enhancement measures will be the responsibility of Mr and Mrs Ovelgonne, and elements of the work should be overseen by a suitably qualified ecologist.

3 BIODIVERSITY ENHANCEMENT MEASURES

The enhancements below are in line with a number of recommendations made within the PEA report¹.

There will be native tree planting along the eastern and western boundaries. Features for roosting bats, nesting birds, hedgehogs and invertebrates will also be incorporated into the development. Figure 3 below indicates suitable locations for these enhancements within the application site. Note that log piles can be placed wherever there are sheltered spots within the woodland parcel.

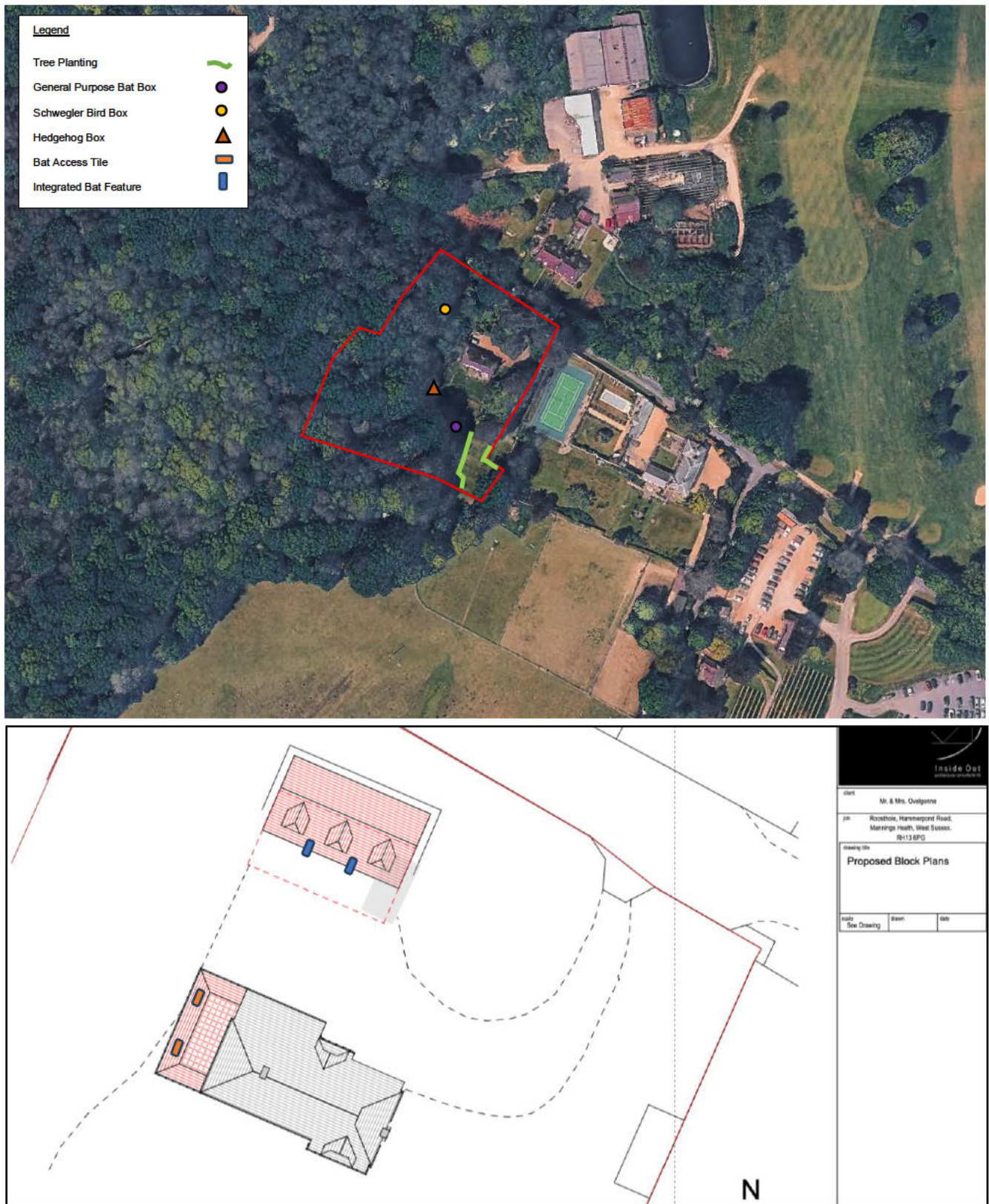


Figure 3. Top: Aerial image showing the location of the application site, with the site boundary indicated in red. Images produced courtesy of Google maps (map data ©2025 Google). Top: diagram to show locations of enhancements for birds, bats and hedgehogs on site. Bottom: plan to show suitable locations for integrated bat features on the new building/extension. Overlaid on plan provided courtesy of Inside Out Architectural Consultants Ltd, dwg no: A.03.



3.1 Native Trees

Native trees should be planted along the western and eastern site boundaries to increase habitat connectivity and to replace trees felled previously along the northern and western boundaries.

A variety of native trees will be planted from November to March before they come into leaf. Planting should be avoided during droughts, hard frosts (most likely in January and February) or particularly cold, windy periods. These will be planted as bare root whips. All grass and weeds will be removed in a 1m diameter circle around each tree station prior to planting, by physical stripping. A mix of a minimum of five species from the list below is recommended:

- hornbeam *Carpinus betulus*;
- sweet chestnut *Castanea sativa*
- beech *Fagus sylvatica*;
- hazel *Corylus avellana*;
- hawthorn *Crataegus monogyna*;
- blackthorn *Prunus spinosa*;
- elder *Sambucus nigra*;
- silver birch *Betula pendula*;
- wild cherry *Prunus avium*;
- bird cherry *Prunus padus*;
- pedunculate oak *Quercus robur*;
- guelder rose *Viburnum opulus*;
- gorse *Ulex europaeus*;
- spindle *Euonymus europaeus*;
- small leaved lime *Tilia cordata*; and
- crab apple *Malus sylvestris*.

Newly planted trees require watering when planted and regularly in the first weeks after, with the ground thoroughly wetted to ensure the water reaches the roots. New trees will be watered appropriately (the Arboricultural Association recommended 50 litres/week) in the summer months for their first three years.

3.2 Enhancements for Bats

As a measure to enhance roosting opportunities for bats on the site, two 'built in' roosting features will be incorporated into the extension on the main house and two on the new garage. The house will include two sets of bat access tiles and the garage, two of any of the features shown below. The boxes should be installed on the southern or eastern elevations approximately 5m in height. Figure 3 shows proposed locations of these bat roosting features.

Additionally, one general purpose bat box can be installed upon a mature tree within the adjacent woodland. This could include one of the boxes indicated below. Bat boxes should be placed facing away from prevailing winds and box entrances should be clear of obstructions to flying bats such as foliage. This will need to be installed at least 5m above ground level and face in a southerly direction, so that it receives sun for part of the day.

Importantly, artificial light sources must be positioned facing away from the box and any natural habitat features on the site that may be used by commuting and foraging bats such as the woodland. More detail around an



ecologically sensitive lighting scheme is provided in in Appendix 2 of this report. Suitable locations for these boxes are indicated in Figure 3.



Bat Access Tile



2FR Schwegler Bat Tube



Habibat Bat Box



1WI Schwegler Summer and



2F Schwegler Bat Box (General Purpose)



General Purpose Bat Box

Winter Bat roost

3.3 Enhancements for Nesting Birds

A minimum of one Schwegler 1B Nest Box with either a 'round hole' or an 'oval hole' will also be affixed to a mature tree within the wider site (see Figure 3). This box will support a range of small garden birds. This should be placed facing southeast, at least 3m above the ground and facing away from prevailing winds, with a clear flight path to and from the box.



Schwegler 1B Nest Box (round hole)



Schwegler 1B Nest Box (oval hole).

3.4 Hedgehog Homes

In order to enhance the proposed development site for hedgehogs, one hedgehog box/home will be installed on site. The HH7 Hogilo Hedgehog House is made from durable FSC timber with a predator resistant entrance. The Hogilo Hedgehog House will need to be placed in a quiet corner covered with leaves and brash for extra camouflage. A suitable location is shown in Figure 3.



HH7 Hogilo Hedgehog House

3.5 Log Piles

Using fallen/cut wood and any brash within the woodland adjacent to the site, small log piles can be created in sheltered spots. These will create shelter for small mammals, herptiles and invertebrates.

4 POST-CONSTRUCTION MANAGEMENT PLAN

4.1 Native Trees

Tree saplings must be kept well-watered during establishment. Weeds must be controlled at the base of the young trees. Replacement planting will be required where any trees fail to establish.

An annual check for signs of disease should be undertaken. If disease is identified, advice should be sought from an arboriculturalist regarding the appropriate method of treatment. Inspection for the presence of invasives can be completed at the same time. Invasives are more likely to colonise in the first five years after recent ground disturbance and bare ground cover.



Trimming back trees where required (unlikely during establishment) should be carried out for the first five years annually to maintain healthy tree growth. Pruning should ideally take place in January/February to encourage fruiting and avoid the nesting bird season.

4.2 Other

Bats: Bat boxes will be largely maintenance-free, and apart from an annual check it must be ensured that they remain in position. If damaged, the boxes are to be replaced like for like. Bat boxes must only be checked by a bat licenced ecologist.

Birds: Bird nesting boxes should be emptied of nesting material in winter to prevent the build-up of parasites.

Hedgehogs: The box should be cleared of old material in October, before hibernation, but outside of the nesting season.

Log piles: these must be retained in perpetuity.



5 WORK SCHEDULE

Table 1 below provides the timetable to aid correct timing of the annual management at the site.

Table 1. Annual work schedule for the site for maintenance of enhancements.

Action for green assets	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Check trees for signs of any disease							X	X	X			
Cutting of trees		X										
Keeping tree saplings well-watered	X	X	X	X	X	X	X	X	X	X	X	X
Replacement planting of failed trees	X	X	X								X	X
Inspection of bat and bird boxes									X	X	X	
Clearance of old bird nests from bird boxes									X			
Clearance of old nesting material from hedgehog box										X		



6 COMPETENCIES, STANDARD AND SPECIFICATIONS OF WORKS

The following competencies/standards/specifications should be adhered to:

- the installation of the bat boxes is to be undertaken or overseen by a suitably qualified ecologist;
- the installation of the bird boxes is to be undertaken or overseen by a suitably qualified ecologist;
- all tree works are to be undertaken by a suitably qualified arboriculturist or tree surgeon.



APPENDIX 1 – Wildlife Legislation and National Planning Policy

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the Directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain the favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the Directive (for example Bechstein’s bat *Myotis bechsteinii*, Barbastelle bat *Barbastella barbastellus* and white-clawed crayfish *Austropotamobius pallipes*). Together with ‘Special Areas of Conservation’ (SACs), SPAs form a network across Europe of protected areas known as the ‘Natura 2000 sites’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2017, as amended (the “Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites, now known as National Site Network sites under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, receive the highest level of protection under the Regulations which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects’ to the conservation objectives are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to:

- deliberately capture, injure or kill any such animal;
- deliberately disturb wild animals of such species;
- deliberately take or destroy their eggs (where relevant);
- damage or destroy a *breeding or resting place* of such an animal;
- possess, control, sell or exchange any live or dead animal or plant, of such species;
- deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority and, in order to grant a license,



ensures that three statutory conditions (sometimes referred to as the ‘three derogation tests’) are met:

- a licence can be granted for the purposes of “preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53 (2) (e);
- a licence can be granted if “there are no satisfactory alternatives” to the proposed action;
- a licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended.

This remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- take, damage or destroy the nest of any wild bird while it is in use or being built
- take or destroy the egg of any wild bird
- disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example, Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, [REDACTED] otter, polecat, dormice, hedgehog and red squirrel).

Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006) created the statutory nature conservation body Natural England, and places a statutory duty on all public bodies, including planning authorities, under Section 40, to take, or promote the taking by others, steps to further the conservation of *habitats and species of principal importance for the conservation of biodiversity* in England (commonly referred to as the ‘Biodiversity Duty’). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on



Government and Ministers. Section 41 of the NERC Act lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Environment Act (2021)

The Environment Act sets a target of halting the decline in species through the inclusion of a legally binding 2030 species abundance target. Aiming to restore natural habitats and enhance biodiversity, the Act requires new developments to improve or create habitats for nature (through mechanisms such as mandatory Biodiversity Net Gain), and tackle deforestation. Going forwards, UK businesses will need to look closely at their supply chains as amongst other measures they will be prohibited from using commodities associated with wide-scale deforestation. Woodland protection measures are also strengthened through the Act.

The Act enables the reform of the Habitats Regulations and further improves protection for nature through the establishment of Local Nature Recovery Strategies that support national Nature Recovery Networks. In addition, the Act provides for the production of Protected Site Strategies and Species Conservation Strategies, aimed at supporting the design and delivery of strategic approaches to deliver better outcomes for nature.

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2024)⁴ sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

Paragraph 192, states that council plans should “*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*”

The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, 2005)⁵. In accordance with the NPPF, it is

⁴ HM Government (2024). National Planning Policy Framework. Department for Communities and Local Government. Available online at: <https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf>.

⁵ HM Government (2005) ODPM Circular 06/05 Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf.

important that developments should contribute to and enhance the natural and local environment by:

- minimising impacts on existing biodiversity and habitats;
- providing net gains in biodiversity and habitats, wherever possible;
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), first published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992) until 2010, when the UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011), and a progress update was provided in July 2013 (Defra 2013).

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade.

Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas and species because the Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their local area or situation.

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations listed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every five years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2021 (Stanbury et al, 2021), which provides an up to date assessment of the conservation status of birds in the UK.

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APPENDIX 2 – Reducing Impacts of Artificial Light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust⁶ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;
- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features;
- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths,

⁶ Bat Conservation Trust and Institute for Lighting Professionals (2023) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development;

- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- lighting spectra: peak wavelength >550nm
- colour temperature: <2700k (warm)
- reduction in light intensity
- minimal UV emitted
- upward light ratio of 0% and good optical control.

Further reading:

Buglife (2011) A review of the impact of artificial light on invertebrates.

Royal Commission on Environmental Pollution (2009) Artificial light in the environment. HMSO, London. Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

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CPRE (2014) Shedding Light: A survey of local authority approaches to lighting in England. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.



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https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATSGuidelines8_lightpollution.pdf?v=1542109376