The Ecology Co-op
ENVIRONMENTAL CONSULTANTS
Unit 4, Langham Stables, Langham Lane, Lodsworth, Petworth, West Sussex, GU28 9BU.

Tel: 01798 861 800 - E-Mail: info@ecologyco-op.co.uk - Web: www.ecologyco-op.co.uk

Biodiversity Enhancement Strategy

Site Name

High Barn, Crays Lane

Client

Jolliff Developments Ltd

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Author

Meerabai Kings

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The Ecology Co-operation Ltd
Registered Office: Unit 4, Langham Stables, Langham Lane, Lodsworth, West Sussex, GU28 9BU
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About the Author

This report has been prepared by Meerabai Kings, an Assistant Ecologist at The Ecology Co-op, with over one year's experience. As a Qualifying member of the Chartered Institute for Ecology and Environmental Management (CIEEM) she is bound by their code of professional conduct.

About the Reviewers

This report has been reviewed by Rozel Hopkins, a Senior Ecologist at The Ecology Co-op, with 4 years' experience. She has a Level 1 bat survey licence and a Level 1 great crested newt survey licence and as a Qualifying member of the Chartered Institute for Ecology and Environmental Management (CIEEM) is bound by their code of professional conduct.

This report has been reviewed by Kate Priestman, who is a Principal Ecologist with over twenty years' experience. Kate has undertaken extensive survey work and reporting, encompassing a breadth of deliverables, and prepared European Protected Species licences for numerous schemes. As a Full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and a Chartered Environmentalist (CEnv), she is bound by CIEEM's code of professional conduct.

Report Summary

Purpose	The Ecology Co-operation was commissioned by Jolliff Development Ltd to provide a Biodiversity Enhancement Strategy (BES) with regards to a proposed development at High Barn, Cray's Farm. This document outlines targeted enhancement measures for habitats and protected species. It also includes management objectives, responsibilities and maintenance schedules including remedial responsibilities, should they be necessary. It will be submitted to Horsham District Council in regard to planning application, DC/23/0383.
Context	No previous ecology surveys have been carried out at the site. A walkover of the site was undertaken in December 2024 by The Ecology Co-op in order to prescribe appropriate biodiversity enhancement measures. No Phase 2 surveys were recommended.
Biodiversity Enhancements	Section 3 of this report details sets out the location and type of proposed habitat enhancement measures for the site, involving implementing the following: • new native species-rich hedgerow planting; • planting of native tree species; • bat boxes; • bird boxes.
Post-construction management	Post construction management for the proposed biodiversity enhancement features is detailed in full in section 4 and a work schedule is provided in section 5. Section 6 outlines management responsibilities and remedial actions should they be necessary.

CONTENTS PAGE

1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-operation was commissioned by Jolliff Developments Ltd to produce a Biodiversity Enhancement Strategy for a proposed development at High Barn, Cray's Farm, Goose Green.

This document outlines targeted enhancement measures for habitats and protected species. It also includes the locations of the proposed measures, details of initial and long-term maintenance and persons responsible for implementing the enhancement measures. It will be submitted to Horsham District Council with regards to planning application, DC/23/0383.

The prescribed mitigation 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 at High Barn is located at Cray's Farm, Crays Lane, Goose Green, RH20 2LR. The central grid reference for the site is TQ 11350 18046. The location of the site is shown in Figure 1.

The site comprises a large agricultural barn with a smaller, adjacent, breezeblock outbuilding. There are no trees or hedgerows within the site. The agricultural buildings are surrounded by hard standing to the north and south, and modified grassland to the east and west. The site is situated within Cray's Farm which is comprised of farmland, agricultural and residential buildings, access tracks and a small woodland.

The proposed development comprises demolition of the two existing agricultural buildings followed by the construction of three detached dwellings (see Figure 2). The largest of the dwellings, situated on plot 1 to the south of the site, will also have an associated shed and outhouse.

Figure 1. An aerial image showing the location of the application site. The approximate boundary of the proposed construction zone is outlined in red. Images produced courtesy of Google maps (map data ©2024 Google).

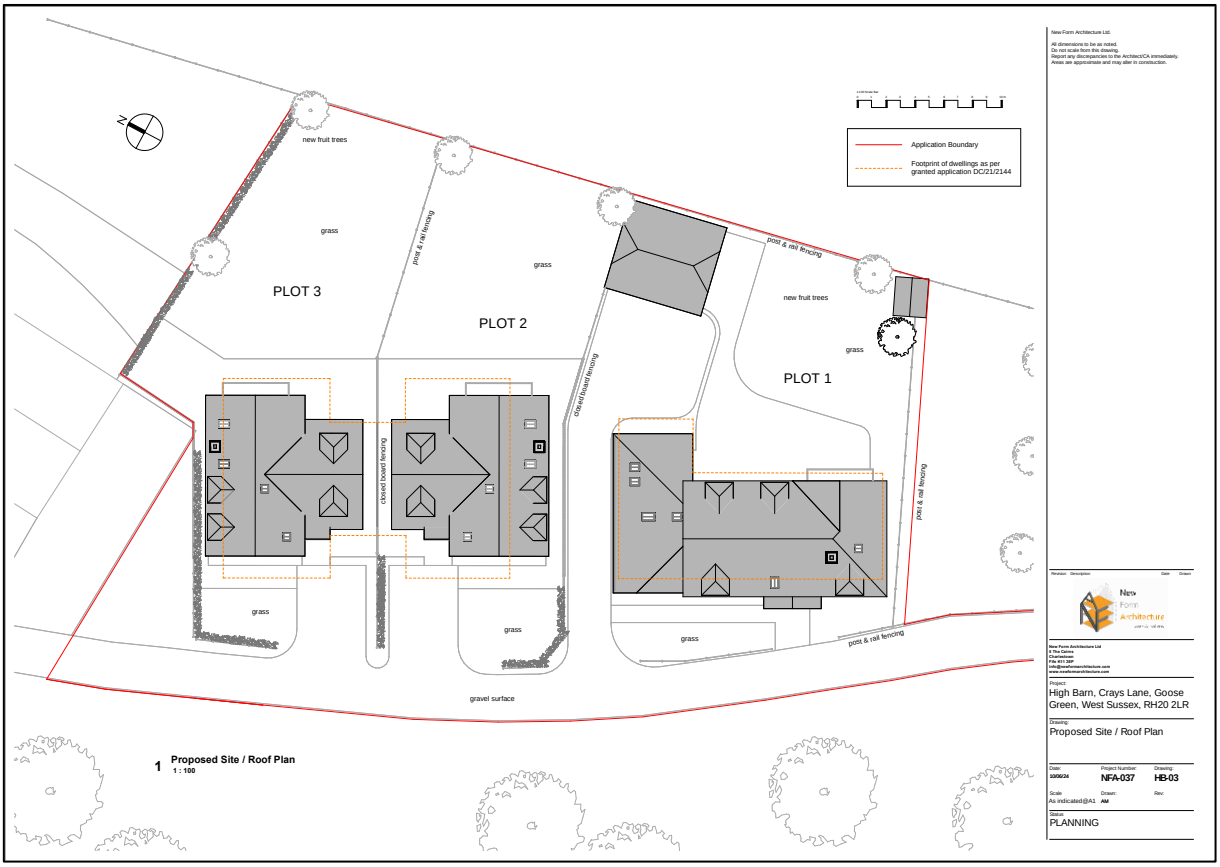

Figure 2. Proposed plans for the development at High Barn. Provided courtesy of New Form Architecture (©2024 New Form Architecture Drawing Number HB-03 10/06/2024).

1.3 Summary of Previous Survey Work

A walkover survey was completed by The Ecology Co-op on the 4th December 2024, in order to prescribe appropriate biodiversity enhancements for the proposed development. No ecological constraints were identified, and no Phase 2 surveys were recommended.

This report should be read in conjunction with the Biodiversity Impact Calculation (BIC)[1] for the scheme. The scheme meets the 10% mandatory net gain value set out within the Environment Act 2021 and achieves the no net loss through development goals detailed by Horsham District Council.

1.4 Management Plan Strategic Vision

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

- creation of new green assets including native hedgerows and scattered native trees;
- provision of targeted and appropriate habitat enhancement features for bats and birds.

The green assets proposed in this report (native hedgerows and native trees) are not included in the BIC as such features within gardens cannot contribute to biodiversity net gain (BNG). The hedgerows and trees proposed in this report are therefore additional recommended enhancements outside of the BIC.

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 badgers, bats, dormice, reptiles, and breeding birds.

3 PROPOSED LANDSCAPE AND BIODIVERSITY ASSEST

3.1 Enhancements Overview

The proposed development represents an opportunity for habitat enhancement to benefit bats and breeding birds in line with the recommendations of the National Planning Policy Framework (NPPF). The methods proposed for the creation of each habitat type are described in detail within this section and their locations for implementation are shown in Figure 11.

3.2 Species-rich Hedgerows

A new native species-rich hedgerow will be planted along most of the site's northern boundary. Three

[1] The Ecology Co-op (2025) High Barn, Crays Lane, Biodiversity Impact Calculation.

smaller hedgerows will also be planted on the western boundary, running east to west to separate the three plots (as seen in Figure 2).

All hedgerows will be planted with a species-rich native mixture to provide valuable shelter and foraging habitat for birds and bats.

The hedgerow will include at least five hedge trees per linear metre and comprise of at least 50% hawthorn *Crategous monogyna* or blackthorn *Prunus spinosa.* In addition, a mixture of at least five or more native woody species selected from the following will be included:

- wayfaring-tree *Viburnum lantana*;
- wild privet *Ligustrum vulgare*;
- dogwood *Cornus sanguinea*;
- purging buckthorn *Rhamnus cathartica*;
- alder buckthorn *Frangula alnus;*
- guelder rose *Viburnum opulus*;
- rowan *Sorbus aucuparia*;
- dog rose *Rosa canina*;
- hazel *Corylus avellana*; and
- field maple *Acer campestre*.

All native species should be sourced from certified nurseries in the UK, to avoid the spread of disease or pests. Given the arrival of Ash Dieback *Hymenoscyphus fraxine*us (previously known by the names *Chalara fraxinea* and *Hymenoschyphus pseudoalbidus*), it is strongly recommended that current advice from DEFRA, The Forestry Commission and the Woodland Trust is followed regarding the planting of ash species[2].

It is best to plant while the trees and shrubs are dormant between November and March in the absence of heavy frost. Guards to protect these hedge trees from rabbits and deer may be necessary for the first 3 years.

3.3 Native Tree Planting

Six native trees sourced from UK stock will be planted along the northern, eastern and southern borders of the site, as shown on Figure 2. This will create greater habitat for a variety of birds and invertebrates. Given the arrival of ash dieback, it is not recommended that ash saplings are planted anywhere on the site. Below is a list of recommended trees species:

- alder *Alnus glutinosa;*
- field maple *Acer campestre;*
- silver birch *Betula pendula;*

[2] Defra, 2013. *Chalara Management Plan*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221051/pb13936-chalara-management-plan-201303.pdf

- downy birch *Betula pubescens;*
- hazel *Corylus avellana;*
- hawthorn *Crataegus monogyna*;
- wild Cherry *Prunus avium;*
- bird Cherry *Prunus padus;*
- pedunculate oak *Quercus robur;*
- sessile oak *Quercus petraea;*
- small leaved lime *Tilia cordata;*
- grey willow *Salix cinereal;*
- white willow *Salix alba;*
- hornbeam *Carpinus betulus;*
- rowan *Sorbus aucuparia; and,*
- crab apple *Malus sylvestris.*

It is best to plant while the trees are dormant between November and March in the absence of heavy frost. Guards to protect these hedge trees from rabbits and deer may be necessary for the first three years.

3.4 Roosting Bats

As a measure to enhance roosting opportunities for bats, roosting features will be incorporated into the new dwellings. It is recommended that *either* two bat boxes are installed on each building, or two bat access tiles are installed on each building. Bat access tiles should be installed on south facing roof pitches where possible, and bat boxes should be installed at least 3.5 metres off the ground, facing south-east and away from new or existing lighting. Where access tiles are used the lining must be bitumen rather than breathable Tyvec type which fray over time and entangle bats.

Suitable bat boxes for use on buildings include:

- 1WI Schwegler Summer and Winter Bat roost. This box can be set into the external wall of a building or incorporated into the masonry;
- 2FE Schwegler Wall-Mounted bat shelters) could be installed upon the external faces of the building close to the eaves of the building;
- 1FQ Schwegler Bat Roost (for external walls). These can be attached directly to the external wall following construction.

Figure 3. 1WI Schwegler Summer and Winter Bat roost

Figure 4. FE Schwegler Wall-Mounted bat shelter

Figure 5. 1FQ Schwegler Bat Roost

Figure 6. Example of bat access tile.

3.5 Breeding Birds

As a measure to enhance nesting opportunities for birds, 'built in' nesting features will be incorporated into the new buildings. Such nesting opportunities associated with buildings can be targeted for house sparrow *Passer domesticus* and swift *Apus apus*, both 'Red Listed' Birds of Conservation Concern (BOCC).

New nesting opportunities for house sparrows will be provided on one of the dwellings. Two recommended boxes include the Sparrow Box or 1SP Schwegler Sparrow Terrace, although other suitable boxes are available. If individual sparrow boxes are used, groups of five individual boxes would be recommended per building. If 1SP Schwegler sparrow terrace are used, two should be installed per building. Both examples can be incorporated into the fabric of the building. These boxes must be positioned at a minimum of 2m above the ground, facing north or east.

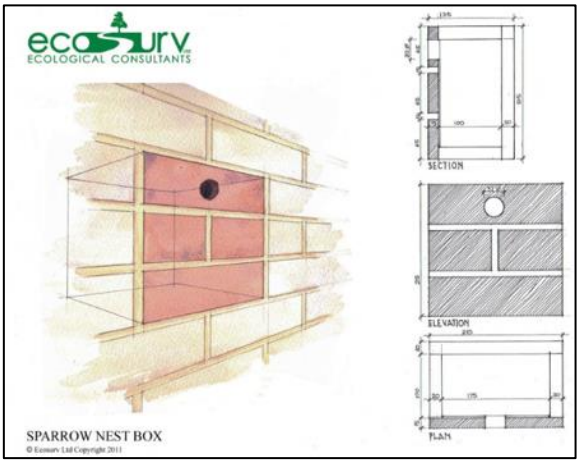

Figure 7. Sparrow Box – smooth brick

Figure 8. 1SP Schwegler Sparrow Terrace

Swifts are colony breeders, therefore, it is recommended that four nesting opportunities are provided together on one of the new dwellings. Example boxes include the Swift Box or Schwegler Lightweight Swift Box Type 1A, although there are other suitable options. These boxes can be incorporated into the fabric of a building as it is built. They should be positioned at a minimum of 5m above the ground with clear unobstructed access to the entrance and at least 40cm between entrance holes. They should be located within shaded area out of direct sunlight on a non-south facing wall.

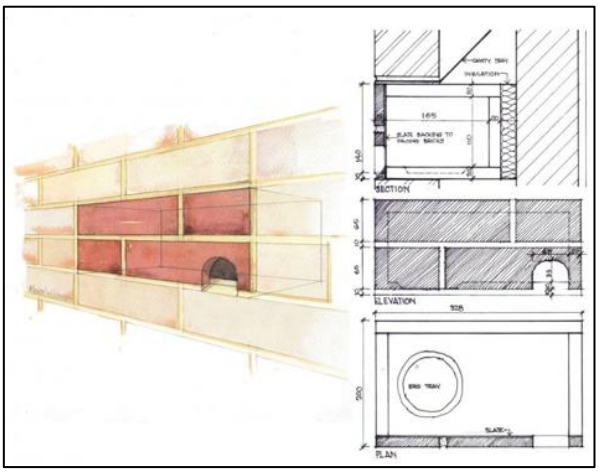

Figure 9. Swift Box – Smooth Brick

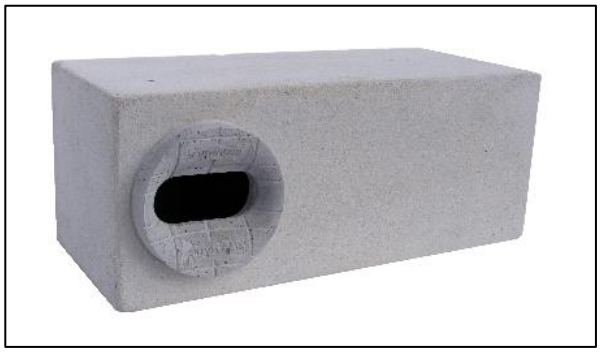

Figure 10. Schwegler Lightweight Swift Box Type 1A

3.6 Proposed Enhancement Plan

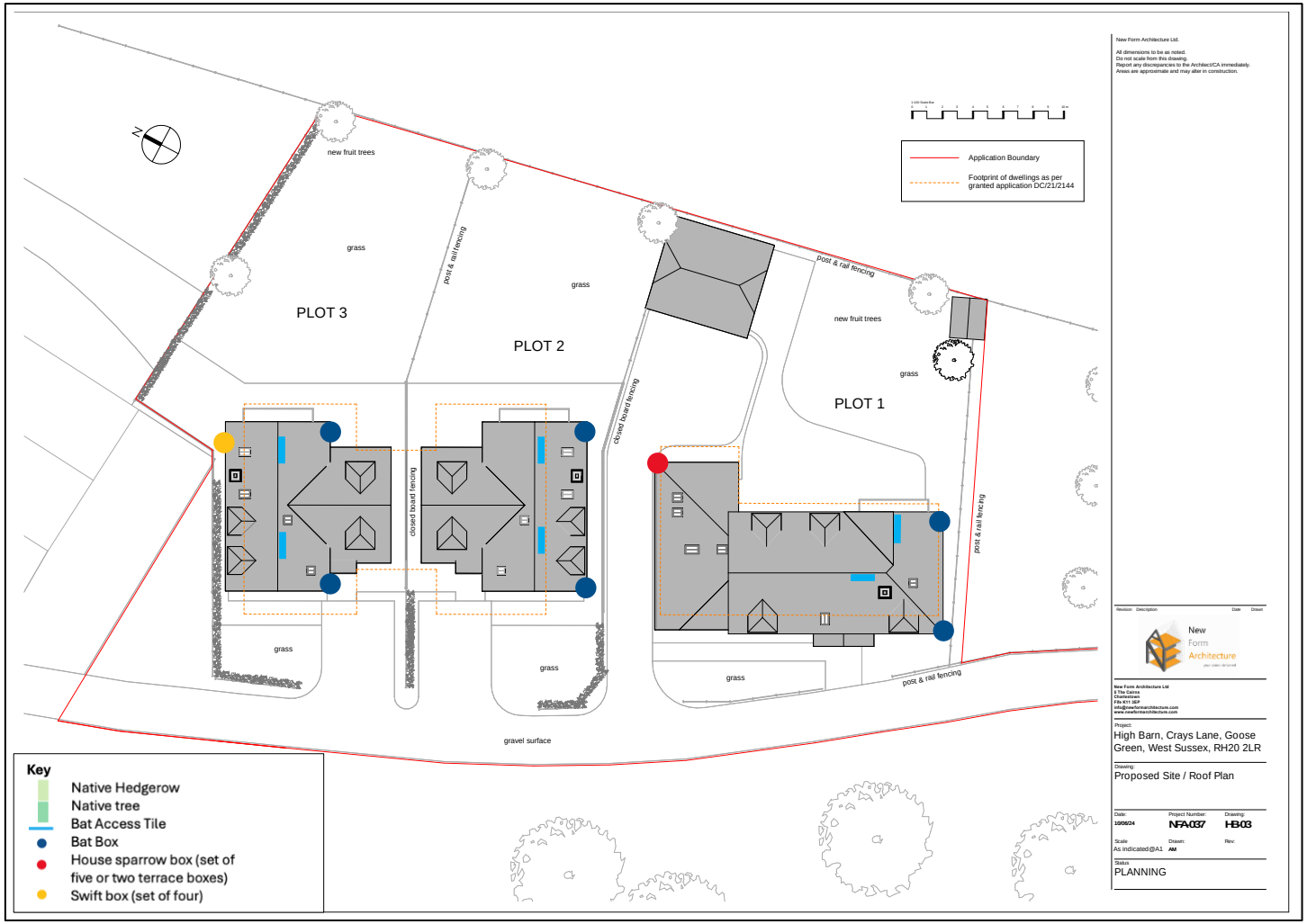

Figure 11. The locations of all compensation and enhancement measures, modified from New Form Architecture *Drawing Number HB-03 10/06/2024*

4 POST CONSTRUCTION MANAGEMENT PLAN

4.1 Hedgerows

Optimal Habitat
A variety of healthy, semi-mature and mature hedgerows, some with trees across the development site.

Yearly Management
The hedgerows should be checked annually for signs of disease and more frequently while new hedgerows are establishing. If disease is identified, advice should be sought from an arboriculturist regarding the appropriate method of treatment.

Tree guards must be inspected yearly for the first five years and then removed if planting is well-established, while establishing saplings must be kept well-watered during extended dry periods. Replacement planting, timed in the next planting season, will be required where the hedgerows shrubs fail to establish.

Hedgerows should be allowed to grow to a height of at least 2.5 metres where possible. Hedge cutting is best carried out every 3 years, however it may be necessary to trim back hedgerows and shrubs annually in some circumstances such as where there is a risk to health and safety. Cutting must only be timed outside the bird nesting season (1st March to 31st August). Where possible, hedgerows shouldn't be cut until February, so that valuable winter food associated with fruiting shrubs and trees is retained for over-wintering birds. For management in the longer term, it is advised to lay or coppice the hedgerow once every 40-50 years to rejuvenate the hedge and prevent any gapping.

4.2 Tree Planting

Optimal Habitat
A variety of healthy, semi-mature and mature native tree species across the development site.

Management
Tree saplings must be kept well-watered during establishment. Weeds must be controlled at the base of the trees.

Tree guards, to protect the new saplings from rabbits and deer, to be inspected twice annually to remove weeds and any soil build up inside the tubes for first 3 years and then remove when planting well established. Tree stakes and ties will be checked annually and after string winds.

Check for signs of disease. If disease is identified advice should be sought from an arboriculturalist regarding the appropriate method of treatment.

Cutting of trees as required must only be timed outside the bird nesting season (avoiding 1st March to 31st August). Where possible shrubs shouldn't be cut until February, so that valuable winter food associated with fruiting shrubs/trees is retained for over-wintering birds.

Replacement planting will be required where trees fail to establish.

4.3 Bat and Bird Boxes

The integral bat roosting features in buildings will be largely maintenance-free, and apart from an annual check that they remain in position. Any damaged boxes are to be replaced like for like. However, an important component to these habitat features will be managing the expectations of residents and other users of the development site, including dealing with any fears, questions, or unauthorized interference. It is recommended that prospective buyers of these properties are made aware of the legal protection afforded to bats and birds, and their obligations as owners. Bat boxes should only be maintained by a suitably qualified/licensed ecologist, as they may support roosting bats.

In the event any boxes become damaged or have fallen down, then they must be replaced as soon as possible.

5 WORK SCHEDULE

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

Table 1. Annual Work schedule for the management period.

Action for green assets	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Check hedgerows and trees for signs of any disease							X	X	X			
Cutting of hedgerows and trees	X	X										
Keeping tree sapling(s) well-watered where necessary	X	X	X	X	X	X	X	X	X	X	X	X
Inspection of tree guards and fences	X	X	X	X	X	X	X	X	X	X	X	X
Replacement planting of failed trees or shrubs	X	X	X								X	X
Inspection of bat and bird, features for loss and damage								X	X	X	X	

6 COMPETENCIES AND REVIEW OF WORK

All contractors should have a copy of this report, including Figure 11, when implementing works relating to the biodiversity enhancement measures. A site inspection should also be undertaken by a suitably qualified ecologist post-construction to ensure compliance with this report and that all enhancement measures are correctly implemented.

All relevant works must be carried out by someone suitably qualified as follows:

- all tree works are to be undertaken by a suitably qualified arboriculturist;
- the installation of all wildlife boxes will be overseen by a suitably qualified ecologist;
- initial and monitoring site inspections will be undertaken by a suitably qualified ecologist.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.

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 oibjectives 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 *Satyrium 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, badger, 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.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992), and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a badger sett; or
- to disturb a badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2023)[3] sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its

[3] HM Government (2023). National Planning Policy Framework. Department for Communities and Local Government. Available online at: https://assets.publishing.service.gov.uk/media/64f991c99ee0f2000fb7c001/NPPF_Sept_23.pdf.

biodiversity commitments with regard to the operation of the planning system.

Paragraph 185b, 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) [4]. In accordance with the NPPF, it is 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.

References

Protection of Badgers Act (1992). HMSO London. Available at: http://www.legislation.gov.uk/ukpga/1992/51/contents

[4] 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.

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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 Trust[5] 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 cats 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

[5] Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

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, 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:

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