ECOLOGICAL ASSESSMENT

LAND AT THE WARREN, CAVERSHAM, READING

AUGUST 2024

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1.0 INTRODUCTION

1.1 Background

1.1.1 Aluco Ecology Ltd was commissioned to carry out an Ecological Assessment of land at The Warren, Caversham, by the property owner.

1.1.2 An 'Ecological Assessment' is the investigation of the likely ecological and nature conservation issues associated with the site and its potential development. The aim of an assessment is to:

- highlight any features of particular ecological value;
- identify potential impacts to ecology as a result of the proposed works;
- identify any ecological issues that may have legal or planning implications such as the presence of protected species;
- recommend and undertake any further work (such as targeted protected species surveys) required in order to fully assess the value of the site, and therefore the potential ecological impacts of the proposals that may arise;

1.1.3 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework. The Government's objectives for planning include an environmental objective 'to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

1.1.4 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development. Planning Practice Guidance on the Natural Environment provides information on taking biodiversity into account in planning.

1.2 Outline of the Scheme and Site Location

1.2.1 The site is situated along The Warren, Caversham, RG4 7TH and borders the River Thames. See **Figure 1**.

1.2.2 The proposals are to demolish existing sheds and outbuildings on the site and replace with a new dwelling. The proposals are shown on **Figure 2** below.

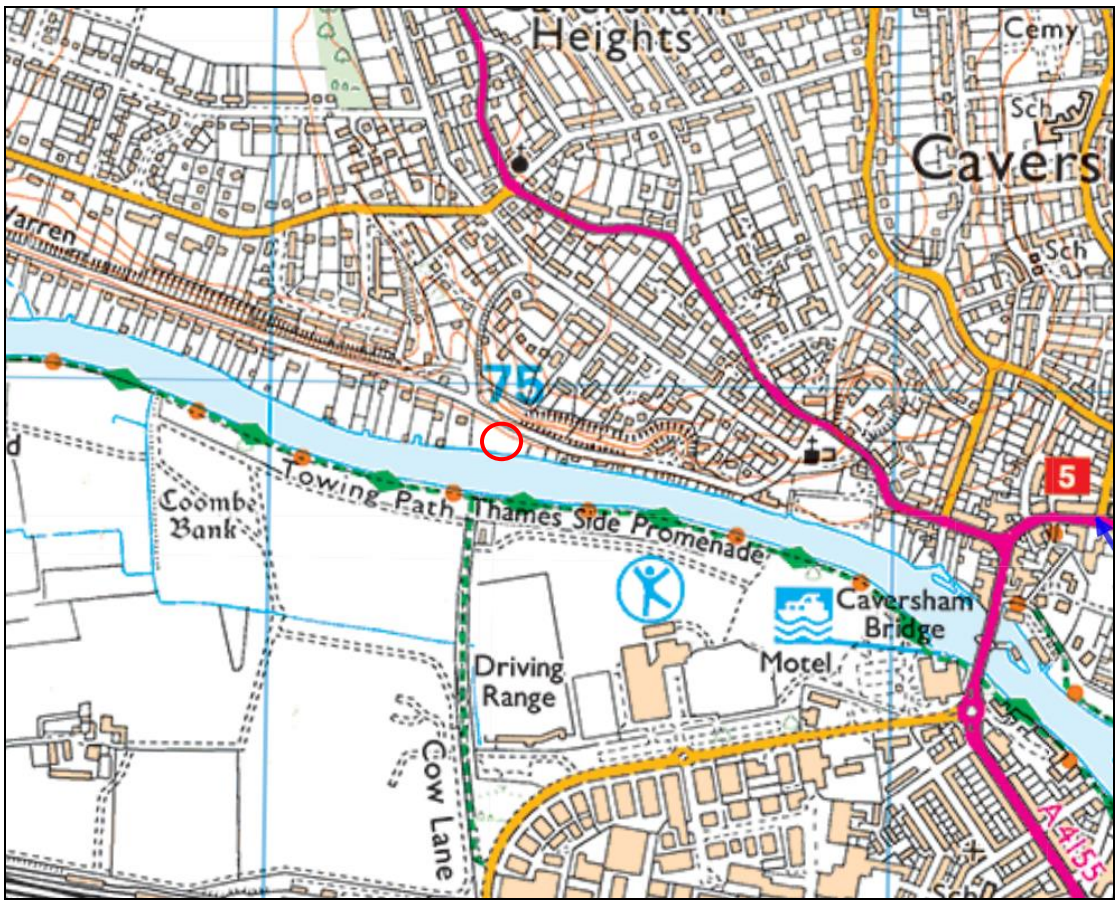

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Figure 1: Location of the Site

1.3 Relevant Legislation and Policy

1.3.1 The outcomes of this Ecological Assessment will be tested against relevant legislation and policy; namely the Conservation of Habitats & Species Regulations 2017 in relation to the protection of European sites (Special Protection Areas SPA, and Special Areas of Conservation SAC) and European protected species (eg bats, dormouse, great crested newts) (see **Technical Appendix 1)** and the Wildlife & Countryside Act 1981 (as amended) and Countryside & Rights of Way Act (CRoW) 2000 for protected species and the designation and protection of SSSIs (see **Technical Appendix 1**). The Protection of Badgers Act 1992 gives protection to Badgers *Meles meles.*

1.3.2 In addition to the planning framework and the legislation outlined above, the local planning policies are the principal policies against which the outcomes of this ecological appraisal will be tested; including the Reading Borough Council Local Plan (see **Technical Appendix 2**).

1.3.3 Under the Governments duty to conserve Biodiversity, through Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC, 2006) a number of Biodiversity Action Plans (BAPs) have been prepared for habitats and species of conservation concern, including national BAPs and a Biodiversity Action Plan for Reading Borough (RBC, 2021) is considered in the general ecological site assessment.

1.3.4 Consideration is also given to Environment Act 2021. A core element of this is Biodiversity Net gain through planned development. Local Planning Authorities are now adopting the principals of demonstrated 'net gain' in planning decisions (see **Technical Appendix 1**).

2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

2.1.1 The methodology for this Assessment has regard to the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

2.2 Site Survey Methodology

Desktop Survey & Appraisal

2.2.1 The first stage is a desk study of the site and associated Zone of Influence. This provides background information on the site and local environment in order to effectively target field survey and further desk research. The aims of the field survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the potential ecological value of the habitats and vegetation communities' present along with their potential to support protected species, species of principal importance, and any other notable species. Further details of the methodology used can be found in **Technical Appendix 3**. The site was initially assessed by a walkover survey on 19 April 2023 and further survey undertaken on 19 June 2024.

Bat Survey

2.2.2 The aim of this bat survey is to evaluate the potential suitability of the proposed development site in relation to bat use and bat roosts using the Bat Survey Guidelines (Collins ed. 2016, and Collins ed, 2023), which provide guidance on assessing and evaluating development sites and features for bat roost potential. The potential for structures to support roosting or breeding bats is evaluated under the protocol for the visual internal and external inspection (with the categories; Negligible, Low, Moderate, High or Confirmed Roost).

2.2.3 Survey to assess the site for bats and bat roosts was carried out in May-July 2024. This involved a survey for any roosting bats or signs that could indicate the use of the building by

bats and for potential roost sites and roost access points. GarethKnass LLB (hons) MSc MCIEEM, with David Endacott 2015-13561-CLS, Kathy Warden 2015-12571-CLS assisting with emergence survey for building coverage conducted the survey work, having regard to the best practice guidelines (Collins ed. 2023) and to provide building coverage.

2.2.4 As part of the survey guidelines, use of night-time visual aids (NVAs) was undertaken having regard to guidance from the Bat Conservation Trust (Fawcett Williams, 2021; BCT, 2022). The survey used HIKMicro Xtherm Thermal imaging devices on building aspects of survey in addition to the two survey positions. Screengrabs of the survey are provided in **Technical Appendix 4**.

Limitations

2.2.5 The survey was carried out during a window of time in April 2023 and June 2024 and therefore the survey has provided a window of time of the sites use. Since bats regularly move between different roost sites, particularly to satisfy their varying requirements at different times of the year and weather conditions.

3.0 BIOPHYSICAL CHANGES AND THE ZONE OF INFLUENCE

3.1 Introduction

3.1.1 In order to be able to target relevant ecological survey and assess the impacts of a proposed development, it is necessary to identify the activities that may result in biophysical changes from the development and the area these cover (i.e. the zone of influence). There are three stages of this development scheme that include activities that may have an impact on features of ecological value; namely site preparation, construction and operation / use.

3.1.2 **Figures 2 & 3** below shows the extent of the site.

3.2 Biophysical Changes associated with the Development Scheme – Determination of the Zone of Influence

3.2.1 It is not anticipated that the use of the site would result in the physical structure of the present site being altered. The potential zone of influence of the proposal is determined from the predicted biophysical changes brought about by activities associated with construction and post-construction phases. Therefore, the zone is predicted to extend across the development footprint and nearby areas. Consequently, survey has been carried out within this zone.

3.3 Site Preparation / Construction Activities and Biophysical Changes

3.3.1 During the construction phase, it is predicted that site preparation activities will include local earthworks and earth stripping associated with the small areas of new building footprint and dismantling of existing structures. This phase may affect habitat suitable for wildlife. Without appropriate mitigation, site clearance work may result in death or injury to protected species (if they are present), or damage to other features of ecological value. Construction could result in the loss of features of ecological value and/or the loss of habitat of protected species resulting in a net decrease in biodiversity.

3.3.2 The construction on the site has the potential to affect local adjacent habitats, where present, through noise, air and run off pollution.

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

3.4.1 The operational phase will need to consider how protected species and species of conservation concern may use the site and zone of influence, and what effect the proposals may have on their conservation status locally.

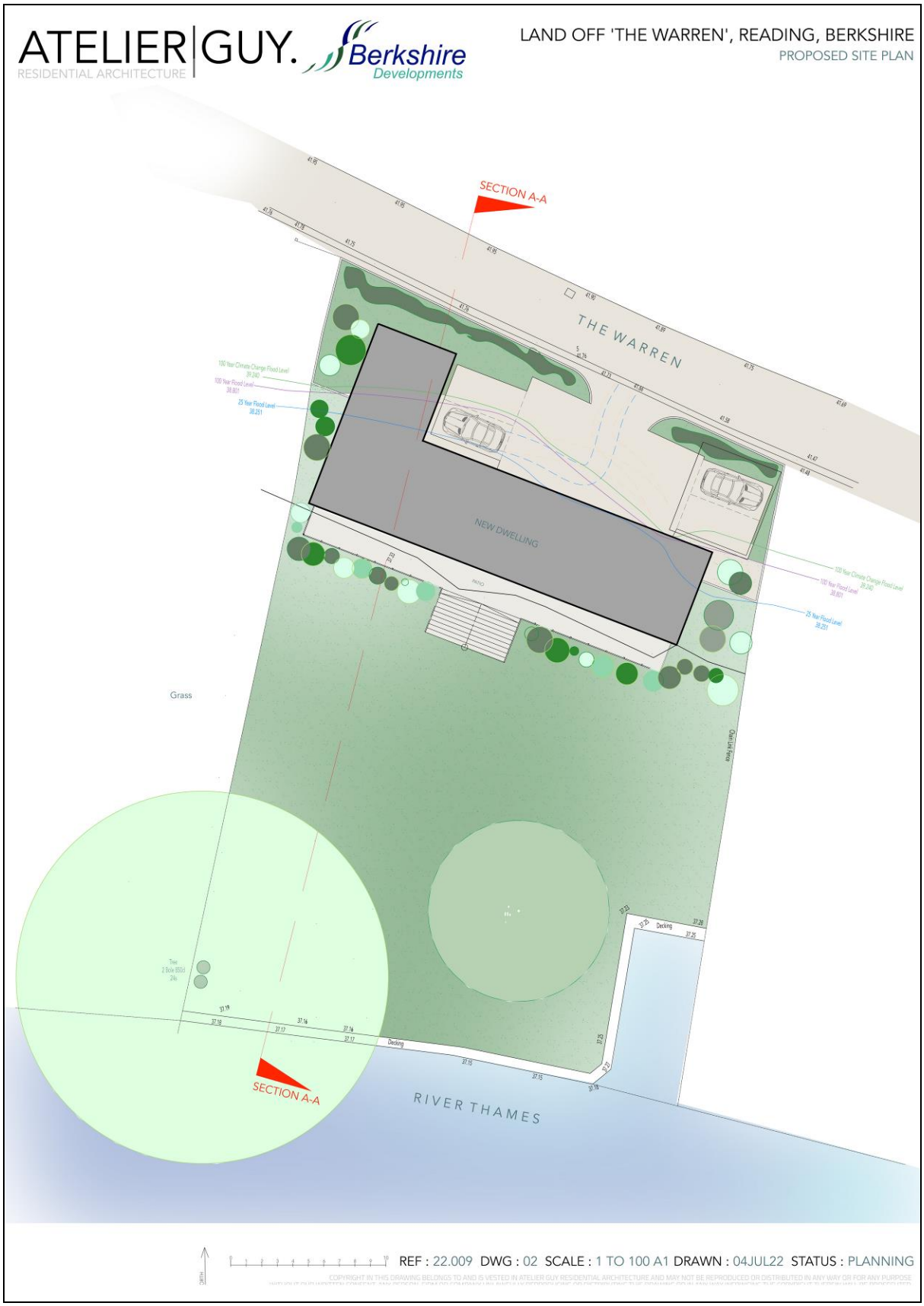

Figure 2: Proposed New Dwelling

4.0 BASELINE CONDITIONS WITHIN THE ZONE OF INFLUENCE

4.1 Introduction

4.1.1 The ecological baseline describes the site in the context of the characteristic habitats of the area, and includes descriptions of designated sites and ecological features present within the potential zone of influence of the proposed development.

4.2 Designated Sites

Statutory Sites

4.2.1 There are no Sites of Special Scientific Interest (SSSI) within 2km of the site. The closest is Sulham and Tidmarsh Woods and Meadows SSSI, which is over 5km to the west.

4.2.2 Internationally designated sites are present within 10km of the site. The closest is Hartslock Special Area of Conservation (SAC), which is designated for its chalk grasslands and Yew *Taxus baccata* woodlands. It is c8.4km to the north west. The Thames Basin Heaths SPA is c12.5km to the south east of the site.

Non Statutory Designated Sites & Habitats

4.2.3 The Warren Woodland Complex Local Wildlife Site is located to the north of the development on the other side of the Warren Road. It is an area of mature woodland on chalk soils.

4.3 Habitats and Vegetation

Introduction

4.3.1 The site comprises a number of sheds / out buildings of various construction, lawns and a bank covered in Ivy *Hedera helix*. The site is further illustrated in **Photos 1-15** and **Figure 3**

Hardstanding & Buildings

4.3.2 A number of linked sheds and greenhouses are present on the northern boundary of the site. These are in various states of upkeep, and are generally single skin wooden clad buildings, with plastic or chipboard on the internal walls. The roofing is either corrugated metal or wood with roofing felt. Some areas of metal have been used to patch up holes in the walls. Greenhouses are attached to the south of a couple of the sheds, and the central shed has some clad tiles to its southern edge (see **Photos 1-3**). Paving slabs, decking and other hardstanding with formal flower beds in a low state of upkeep are present around the sheds.

Grassland

4.3.3 The grassland on site is managed as a lawn. It is likely to have been modified as a grassland, but contains very limited evidence of a semi-natural grassland subject to winter inundation by the River Thames. It is dominated by a small number of grass species, including Perennial Rye Grass *Lolium perenne* with other common grasses likely in smaller quantity. Herb diversity is low, but with locally abundant White Clover *Trifolium repens* and Creeping Buttercup *Ranunculus repens*, as well as occasional to locally frequent Lesser Celandine

Ficaria verna, Daisy *Bellis perennis* and Dandelion *Taraxacum agg.* The grassland is winter inundated by flooding from the Thames, and a small element of the grassland contains species that are likely to benefit from winter wet grassland habitat, including occasional Silverweed *Potentilla anserina*, localised Greater Pond Sedge *Carex riparia*, and a single plant of Cuckoo-flower *Cardamine pratensis* by the river bank.

4.3.4 The grassland has been maintained regularly in the recent past. A small section of grassland is taken over by a vegetable plot, which was covered in plastic during the site visit. The grassland is shown at **Photos 4-5 & 12** below.

Trees

4.3.5 Two mature trees are present on the site, a Weeping Willow *Salix babylonica* and a Plane *Platanus × acerifolia*. These are shown at **Photo 6 & 7** below.

Northern Boundary Bank

4.3.6 The northern section of the site slopes from the road down to the Thames floodplain. This bank is dominated by Ivy, with some Cleavers *Galium aparine*, and recently cut woody shrubs and small to medium size trees on the bank that would have provided shade. The bank is now open, sunny and south facing. This is shown at **Photo 8** below.

River Frontage

4.3.7 The river frontage is modified with wooden decking alongside the bank and two moored river barges (see **Photo 9**). There is therefore very limited marginal aquatic vegetation, limited to a few plants of Hemlock Water-dropwort *Oenanthe crocata* and Meadowsweet *Filipendula ulmaria*. The inlet on the eastern boundary has a small 5m section of more natural river edge, with the above species, Greater Pond Sedge, and Purple Loosestrife *Lythrum salicaria*. This is just off site.

Site Boundaries

4.3.8 The northern and eastern boundaries are fenced (See **Photo 10**). A couple of small Silver Birch *Betula pendula* and an Ash *Fraxinus excelsior* are present on the eastern boundary (see **Photo 11**). The southern boundary is the River Thames, and the western boundary does not exist on the ground.

Flora

4.3.9 No rare or scarce species were recorded on site.

Evaluation of Vegetation and Habitats

4.3.10 The grassland and riverside habitats on site are considered to be of **value within the zone of influence** as part of the functioning River Thames floodplain, but are fairly heavily modified. The remainder of the site is of **negligible value**.

Photo 1: Sheds on site – various construction and patched together

Photo 2: Shed on Site – freestanding with wooden clad sides and wood roof with felt

Photo 3: Shed on site with greenhouse attached, and in poor repair in places

Photo 4: Grassland on site

Photo 5 Grassland on Site

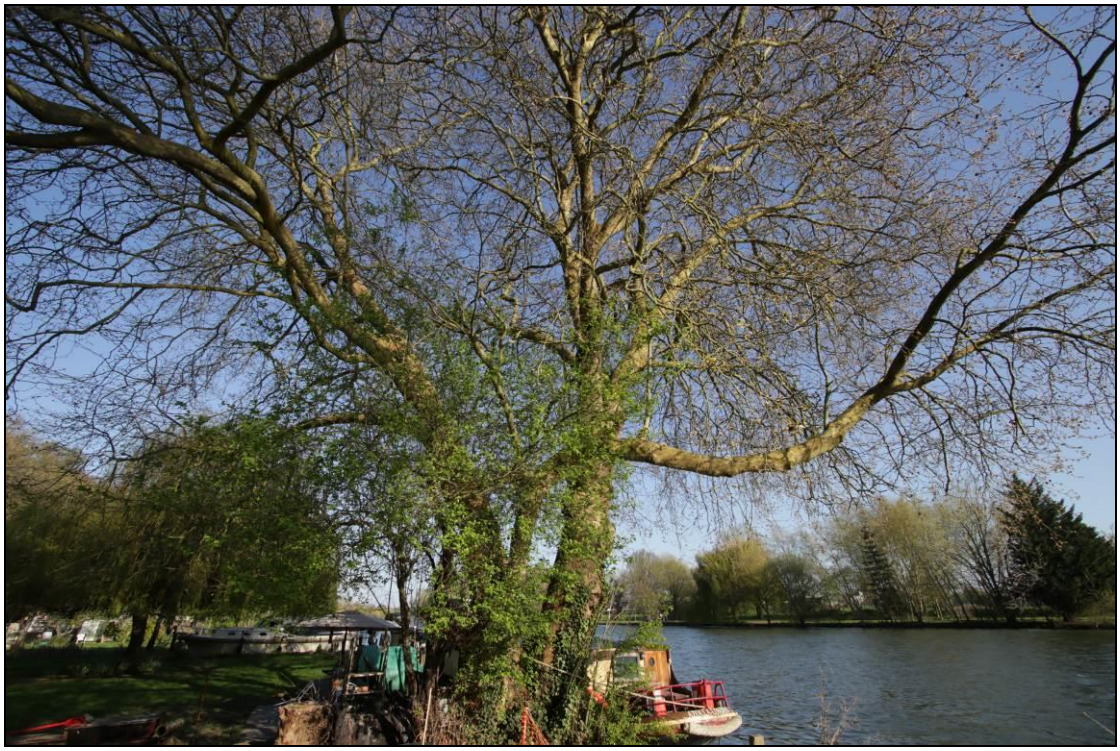

Photo 6: Mature Plane on edge of River Thames

Photo 7: Weeping Willow on site

Photo 8: Northern boundary bank dominated by Ivy, some Cleavers and cut woody shrubs and small/medium size trees.

Photo 9: Bankside of River Thames with wooden decking and moorings

Photo 10: Northern boundary fence

Photo 11: Eastern boundary

Photo 11: Small area used as vegetable plot

5.0 PROTECTED SPECIES & SPECIES OF CONSERVATION CONCERN

5.1 Birds

5.1.1 The habitats on the site mostly comprise a riverside frontage garden, which is also adjacent to woodland habitats at the Warren. The habitats on site are limited, and comprise grassland and river edge. A wooden bird box is present on the Plane tree by the river front.

5.1.2 The site visit recorded a number of birds of conservation concern on site or immediate zone of influence (BOCC5 Stanbury *et al, 2021).* These included the amber listed Mallard *Anas platyrhynchos*, and Black-headed Gull *Chroicocephalus ridibundus*, listed as a result of national population declines of 25-50% during the monitoring period.

5.1.3 The Schedule 1 Wildlife & Countryside Act species Red Kite *Milvus milvus* was noted over the local area during the site visit, and is likely to breed locally.

5.1.4 The structure of the habitats and low to moderate species diversity on site suggests the site is likely to be of **value within the zone of influence** for bird populations.

5.2 Bats

Data Search

5.2.1 All bats and their roosts are protected under law (see **Technical Appendix 1 & 2**).

5.2.2 A search of the MAGIC database indicates a high density of roosts in the Warren area with nearest known roosts are 350m north east with non-breeding Common Pipistrelle *Pipistrellus pipistrellus* and Brown Long-eared Bat *Plecotus auritus* roosts, and 590m north west with non-breeding Common and Soprano Pipistrelle *Pipistrellus pygmaeus* roosts, and another Soprano Pipistrelle breeding roost 600m west of the site.

Building Roost Potential

5.2.3 The buildings are considered to be of low potential to support bats following updated survey in 2024. There are however some small niches for bats to utilise on some buildings, from gaps in cladding and in the apex of roofing, but these only lead to sub-optimal spaces for roosting, and are on low single storey buildings. These niches were all examined for potential bat evidence with none noted. The sheds are all open to bats and there is some limited potential for bats to occur in the main building space. The buildings are illustrated in **Photos 13–21**.

Tree Roost Potential

5.2.4 Two mature trees are present on site. These are a Weeping Willow pollard and a twin stem Plane on the river front. Both trees were healthy with limited, negligible potential roost features for bats.

Habitats on Site for Bats

5.2.5 The habitats on site comprise a garden that is within the Thames floodplain and is dominated by grassland with a couple of mature trees. The wider zone of influence includes extensive

woodland north of The Warren road. The proximity of woodland and the River Thames is likely to provide moderate to high quality bat foraging and commuting in the local area, of which the site is a small part of.

Emergence Survey Work

5.2.6 In accordance with the best practice guidelines (Collins ed, 2023), a single emergence survey was undertaken on site for the low potential sheds. The results of this survey are set out in **Table 1** and **Figure 4** below. No emergence was recorded, however there was regular foraging of the site by Common and Soprano Pipistrelle. Noctule bat *Nyctalus noctula* was also recorded.

Evaluation

5.2.7 The habitats are considered to be of **local value** to bat populations. The roost potential of the buildings on site is considered to be generally low and a single emergence survey of the sheds on 19 June 2024 has not recorded any emergence.

Table 1: Bat Emergence Survey 19 June 2024

Position	Results
Weather	Cloud 1/8; 16.4c-14.2c, Wind SE1, Dry
South	Summary; No recorded emergence 21:32 PP P HxS 21:36 PP P HxS 21:40 PP P south to north 21:42 PP P south to north 21:44 PP P south to north 21:46 PP F near sheds 21:49-54 PP Fx3 under trees by river then PP F on and off for remainder of survey 22:13 NN P 22:15 NN P 22:19-26 NN F locally
North	Summary: No recorded emergence 21:32 NN P 21:39 PP P HxS 21:40 PP P over sheds from river 21:42 PP P 21:45 PP HxS 21:46 PP P river to woodland off site 21:47-52 PP F 21:52 NN P 21:52-22:11 PP & PS F 22:16 NN P 22:16-48 PP + PS ongoing F riverside and open space around site

Key:

PP = Common Pipistrelle, PS = Soprano Pipistrelle, NN – Noctule.

E = Emerge, P = Pass, F = Foraging, C = Commuting, HxS = Heard not seen

Photo 13: Roof of standalone shed. Wood with roofing felt and negligible potential for roosting features.

Photo 14: Externally the wooden cladding had occasional gaps and at the rear apex, however limited space in the gaps for bats

Photo 15: Internal areas of sheds were checked for bat droppings, no bat evidence recorded

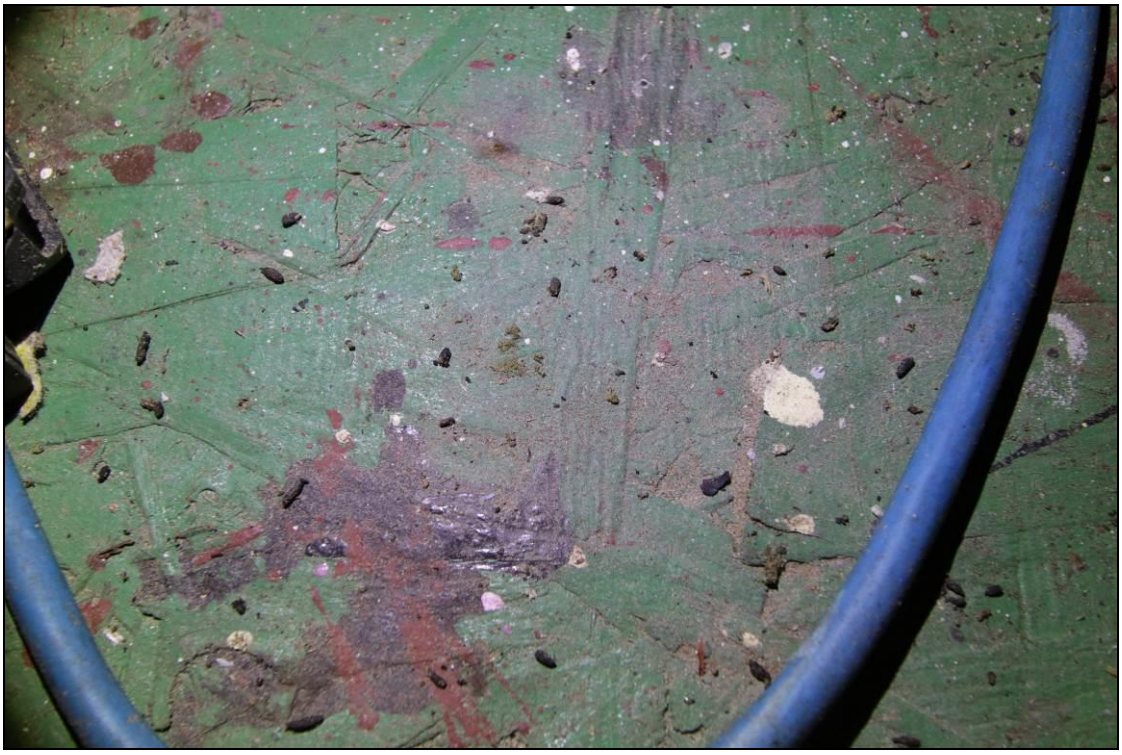

Photo 16: Mouse dropping evidence was noted

Photo 17: Extensive cobwebs in some of open space of the sheds suggests no recent use internally in the main shed space

Photo 18: Hole in internal cladding showing small gap, which has been patched up by corrugated metal

Photo 19: Access to all internal areas was not possible due to amount of materials stored in the sheds. A small amount of roofing was collapsed on a lean-to to one of the shed sections

Photo 20: Cladding on sheds contained some potential gaps from warped wood, but no evidence noted.

Photo 21: Gap in cladding leading to small void space with some roosting potential but no evidence noted.

5.3 Other Mammals

5.3.1 Signs of use of the site by Badger *Meles meles* were searched for during the site visit. Mammal runs were noted on the site, running through the permanent pasture and also the western and northern boundaries. No evidence of active Setts was noted on site or directly adjacent where access was possible.

5.3.2 The site contains no suitable woody habitat for Dormouse *Muscardinus avellanarius*. The riverbank is of limited value to Otter *Lutra lutra* and Water Vole *Arvicola amphibius* as it contains virtually no semi-natural vegetation.

5.4 Reptiles & Amphibians

Reptiles

5.4.1 Commoner reptile species are protected from harm under UK Legislation (see **Technical Appendix 1**). The grassland habitats on site are generally of negligible value for potential reptile presence as they are regularly close mown and contain no structure. They are also likely to be occasionally winter inundated. The bank along the northern boundary contains some habitat structure in the extensive Ivy. This is now a sunny south facing bank following removal of woody shrubs. There is potential for small numbers of commoner reptile species to be present on this bank.

Amphibians

5.4.2 Great Crested Newt (GCN) *Triturus cristatus* and their habitats are protected under UK and European Legislation (see **Technical Appendix 1**). No waterbodies are present on site. Mapping and aerial photography was examined for potentially suitable waterbodies within 500m of the site. No potentially suitable waterbodies were noted. Integration of MAGIC data indicates the nearest known populations from 5km west and 6.5km south west. The site appears to be within the green zone for mapping on the district GCN mapping (www.naturespaceuk.com).

5.4.3 The grassland habitats on site are generally of lower quality for amphibians, lawns being relatively open and with limited places for hiding or foraging. The Ivy-covered bank contains some suitable terrestrial habitats for amphibians and reptiles.

5.5 Invertebrates

5.5.1 The site currently contains some limited semi-natural habitats for invertebrates, particularly around the site boundaries and this habitat is considered to be of **value within the zone if influence** for invertebrates. The legally protected species Stag Beetle *Lucanus cervus* has been recorded locally, and suitable dead wood habitat is present in site and boundaries.

Figure 3: Existing Habitats on Site (Imagery Copyright Google Earth)

Figure 4: Bat Survey 19 June 2024 (Imagery Copyright Google Earth)

6.0 ASSESSMENT OF LIKELY IMPACTS WITHOUT MITIGATION

6.1 Introduction

6.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Section 3, this section identifies potential ecological impacts within the predicted zone of influence, those considered likely to arise in the absence of mitigation.

6.2. Potential Impacts on Designated Sites

6.2.1 The distance of Statutory designated sites from the site and scale of the proposed development is such that no significant impacts are predicted on these features.

6.2.2 The development is adjacent to The Warren Wooded Complex LWS a non-statutory designated site. The woodland is on the other side of The Warren road and not directly connected to the site. Without mitigation, however, there is potential for indirect impacts from the development proposals.

6.3 Potential Impacts on Habitats and Protected Species

Potential Impacts on Habitats

6.3.1 The new dwellings and gardens will mostly be located on lower quality habitats on site. Mature trees are proposed to be retained in situ. No significant impacts are predicted on habitats.

Potential Impacts on Birds

6.3.2 There is some habitat for nesting bird species within woody vegetation and buildings on site. Without mitigation there is the potential for a development to affect the nests of birds, which would be contrary to Section 1 of the Wildlife & Countryside Act 1981 (as amended).

Potential Impacts on Bats

6.3.3 Use of the site for roosting has not been recorded on survey work to date, and three species have been recorded foraging around or over the site, with a single emergence survey undertaken on low potential buildings.

6.3.4 Foraging routes along the river corridor will be retained.

Potential Impacts on Other Mammals

6.3.5 No significant impacts are predicted on other mammal species.

Potential Impacts on Reptiles & Amphibians

6.3.6 The proposals will impact the Ivy covered bank on the northern edge of the site. This contains habitat that could be used by small numbers of reptiles (such as Slow Worm *Anguis fragilis*). Without mitigation there is potential for a significant impact on individual reptiles from construction of the site.

Potential Impacts of Invertebrates

6.3.7 The impacts on invertebrates from the proposals is not considered significant, as habitats impacted are of lower importance to local invertebrate populations.

7.0 ASSESSMENT OF LIKELY IMPACTS AND OPPORTUNITIES FOR MITIGATION

7.1 Introduction

7.1.1 Where there a potential for impacts has been identified in the section above, mitigation recommendations are provided below for the proposed development on site.

7.2 Mitigation for Impacts on The Warren LWS, Habitats and Vegetation

7.2.1 The Warren Wooded Complex LWS is separated from the site by the road. During the site's construction, contractors and workers should be made aware that no damage should be made to the woodland off site.

7.2.2 Based on the masterplan for the scheme (reproduced at **Figure 2**), the development could provide additional biodiversity habitats through:

- Provision of new and diverse locally native species woody shrubs and hedgerow along the retained areas of the bank including the northern boundary with the road, and the eastern and western boundaries. This will provide mitigation for recent loss of woody shrubs on the northern bank.
- New native species trees could be planted on site.
- Removal of wooden decking on the riverside frontage and allowing of semi-natural bankside vegetation to develop. This could be left to naturally develop, or measures to soften the bankside could be made through coir rolls, stakes and other features to provide niches for marginal aquatic plants.

7.3 Mitigation for Birds

7.3.1 As part of the construction phase. all woody habitat not to be retained on site should be removed outside the nesting bird season (which is early March-August). Small areas of vegetation may be able to be checked during the nesting season by an experienced ecologist. Building demolition should also have regard to potential nesting birds in buildings, and if undertaken during the nesting season, checks should be made prior to works by an ecologist. Where birds are nesting in a building, demolition will need to wait until the nest has finished.

7.3.2 As part of the mitigation for birds, nest boxes for House Sparrow and House Martin are recommended to be located on site (see **Technical Appendix 6** for examples).

7.3.3 The proposals should aim to provide new semi-natural woody habitats, and bankside habitats as part of the masterplan will provide new habitats for local bird populations.

7.4 Mitigation for Bats

7.4.1 The sheds on site are assessed as being of low potential for bats, with some wooden cladding features being the main point of interest. No evidence of roosts was noted during survey work, including a single emergence survey. In the unlikely event of any bats being found during demolition or construction, all work must stop immediately, and a suitably qualified ecologist and Natural England must be contacted. Additional information is available on the Bat Conservation Trust website at https://www.bats.org.uk/advice/im-working-on-a-building-with-bats/ive-found-a-bat-during-works.

7.4.2 Bat roosting opportunity and dark foraging corridors should be provided within scheme design. Bat roosting opportunities can be incorporated into the scheme designs through external in-built roost units into the new house to replicate current cladding gap opportunity (see **Technical Appendix 6** for suitable examples)..

7.4.3 Any external lighting should consider guidance from Institute of Lighting Professionals, Guidance Note 08/23 Bats and artificial lighting in the UK for further information if any lighting is proposed. Luminaires on site be low level and directional to light essential walkways and doorways etc only and should feature a peak wavelength of >550 nm with red / warm light spectrum to avoid the component of light most disturbing to bats. Lighting should be directional and not impact likely important features on the site boundaries, including the river Thames and woodland to the north of the The Warren road.

7.5 Mitigation for Reptiles & Amphibians

Reptiles

7.5.1 The following method statement should be followed to ensure that reptiles and amphibians are not impacted by the construction of the development. In the unlikely event a GCN is recorded during these works, work will have to stop and Natural England should be contacted:

- In advance of works, vegetation in the construction zone should be managed to reduce suitability for newts and reptiles, in order to discourage newts from impacted areas. This should be by cutting scrub and tall grass no lower than 150mm and carefully removing arisings;
- Cut areas should be left undisturbed for 48 hours;
- Any tree stump clearance and clearance of shrubs should be via a destructive search methodology and only take place during the active herpetofauna season usually between April – early Oct, and in appropriate weather conditions, to avoid killing/injuring reptiles and newts;
- Hand searches, destructive searches (see below) will be undertaken ahead of site works, to reduce the risk of herpetofauna being on the site during construction;
- Hand searches, destructive searches and initial site stripping should be supervised by a suitably qualified ecologist;
- Destructive searches and initial soil stripping should be undertaken using a machine with a 'toothed' bucket. The machine should avoid tracking on potential habitat;

- Working areas should avoid any retained habitat on site, which should be protected by fencing demarcating retained habitat areas;
- Any herpetofauna should be relocated to retained garden habitats at the edge of the garden;
- Pollution protection measures should be implemented to avoid indirect impacts on retained or off-site habitats, such as run-off or accidental encroachment from working vehicles, material or operatives
- Machinery, materials, equipment and any waste should be stored away from potentially suitable herpetofauna habitats;
- Excavations should be backfilled, covered overnight, or ramps placed in to allow any animals to escape;
- Excavations and working areas should be managed so as not to create temporary waterbodies which may attract newts onto site;
- Access for works should use existing roads and tracks and keep habitat disturbance to a minimum, avoiding any areas of sensitive or potentially valuable habitat.

***Hand Searching* -** This is the careful searching and dismantling, by hand, of potential refuges and suitable habitat features. Hand searching may be done throughout the active season where weather conditions are suitable (e.g. not during very hot dry or cold weather). Hand searches are ineffective on large expanses of habitat and are suited to searching distinct habitat features, such as log piles and small areas of debris.

***Destructive searches* -** This is the careful searching and dismantling of features including stumps of hedgerows, any rubbles piles on site, with ongoing supervision to check for animals as works progress. Destructive searching maybe undertaken throughout the active season, where weather conditions are suitable (e.g. not during very hot dry weather or cold weather) and is combined with hand searches.

7.6 Biodiversity Gain Recommendations

7.6.1 The proposed development will be a self-build development so does not need to undertake a Biodiversity Net Gain assessment. However local policy aims for provision of biodiversity gain in new development and the following measures, based on the impact assessment and mitigation measures outlined above are recommended (see also **Figure 5**):

- Provision of new native species woody boundary hedgerow planting on the northern half of the site, as the southern half is within the floodplain. Hedgerow planting is recommended to be minimum of five native species from the following: Hawthorn, Blackthorn, Field Maple, Hazel, Holly, Dogwood, Wayfaring Tree, Guilder-rose, Wild Privet, Goat & Grey Willow, and Honeysuckle. This should be planted in a double row and allowed to develop into a mature hedge feature. Hedges should be allowed to grow to greater than 1.5m high and wide, and cut in winter, preferably on rotation. The bases should be allowed to develop a semi-natural vegetation where possible in the garden, and a short width buffer to any formal garden allowed for the hedge to be placed in a more semi-natural setting.

- Provision of two in built or woodcrete type bat boxes on the new building (see **Technical Appendix 6**).
- Provision of two in built or woodcrete type bird boxes on the new building (see **Technical Appendix 6**).
- Planting of new native species trees in site landscaping that is proposed. Trees recommended include, Field Maple, Oak, Small-leaved Lime, or other locally native species rather than cultivars or non-native species.
- Allowing the development of a wildflower area in the wider grassland part of the garden through seeding or overseeding, or allowing the existing grassland vegetation to flower annually with cutting restricted between April-August. A hay cut and removal in autumn, followed by further cutting during late autumn and late winter will allow a semi-natural grassland sward to develop over a part of the lawn. Any seeding should be preceded by rotovating the ground and following sowing instructions and rates. Best results are done by sowing native wildflowers in autumn. It is recommended that native wildflower mixes are used, such as those at Emorsgate (https://wildseed.co.uk/) – for neutral to calcareous grassland and either dry or damp conditions.
- Softening of the bankside edge of the site. Where possible without compromising flood risk, removal of existing wooden decking, or part removal, and allowing aquatic marginal species to develop, or planting native species. Advice can be further sought from the Environment Agency. Species to consider are those locally native such as Yellow Flag Iris, Hard and Soft Rush, Water Mint, Gypsywort, Common Reed, Reedmace, Purple Loosestrife.

Figure 5: Proposed New Dwelling – Biodiversity Enhancement Recommendations

8.0 CONCLUSIONS

8.1 An ecological assessment of the site was undertaken in order to provide an indication of the potential for habitats and species of conservation concern to be present on site. The vegetation and habitats of the site are described, with the site being a garden plot on the River Thames frontage. The potential for presence of protected and notable species has also been considered. Options for mitigation and biodiversity gain are presented. No evidence of bat roost was noted on survey to date, and the sheds are generally low potential. Foraging and flight lines will be retained within the proposed new gardens. With implementation of the mitigation recommendations, the scheme should not have an adverse impact on biodiversity features identified in the zone of influence.

9.0 REFERENCES

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Technical Appendix 1
Wildlife & Countryside Act
Habitats Regulations and Schedule 2 Species
Natural Environment & Rural Communities Act 2006
Environment Act 2021

WILDLIFE & COUNTRYSIDE ACT 1981 (AS AMENDED)

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principle legislation in Britain for the protection and conservation of our wildlife and its habitats of national importance. The legislation adopts a habitat and species based approach to nature conservation. Habitats and some species are protected in designated Sites of Special Scientific Interest (SSSI). Other species are afforded some protection from harm or disturbance by way of inclusion in either Section 1 (birds), Schedule 1 (specially protected birds), Schedule 5 (specially protected animals) or Schedule 8 (specially protected plants).

Protection Afforded to SSSIs
The presence of an SSSI on or near to a development is a material consideration, and this is discussed further in planning policy (see National Planning Policy Framework)

Law Relating to Protected Species
The WCA provides protection to such species in Part 1 of the Act. These sections provide protection from intentionally:

- killing, injuring or taking any wild bird or taking, damaging or destroying the nest or eggs of a wild bird

- disturbing any wild bird in Schedule 1 whilst building, on or near a nest, or disturbing dependant young of such birds

- damaging, destroying or obstructing access to any structure or place of shelter or protection of a schedule 5 animal, or disturbs any such animal whilst it is occupying a structure or place it uses for that purpose

- killing, injuring or taking any animal listed in Schedule 5

- Having in procession or control any live or dead wild bird or egg, or any wild animal in Schedule 5, or trading in any animal under Schedule 5.

- Damage to plants listed in Schedule 8 or uprooting of wild plants unless an authorised person.

Exemption and licences for development can be obtained in certain circumstances. Protected species are also a material consideration in planning applications.

Disturbance & Recklessness

The Countryside and Rights of Way Act 2000 (CRoW Act 2000) adds to protected species legislation in the WCA. The lesser test of 'Recklessness' is added to the protection from disturbance in three circumstances. These are:

- disturbance to Schedule 1 birds and their nests, eggs and dependant young,
- disturbance to Schedule 5 animals in their place of shelter/protection, and
- disturbance to the places of shelter/protection of Schedule 5 animals.

This addition means that any person who deliberately takes an unacceptable risk or fails to notice an obvious risk falls under the Section irrespective of intention. The CRoW Act also provides greater protection to SSSIs from operations (and non operations) of owners, occupiers and third party users of the SSSI.

For further information see: https://www.legislation.gov.uk/ukpga/1981/69

HABITAT REGULATIONS 2017

General

The Conservation of Habitats and Species Regulations 2017 ('The Habitat Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

European Protected Species

Species listed under Annex II of the Habitats Directive were formally afforded protection by the Habitat Regulations. European protected species include the great crested newt, dormice and all species of bats. The provision relating to wild animal offences is reproduced below:

Protection of certain wild animals: offences
43.—(1) A person who—
(a) deliberately captures, injures or kills any wild animal of a European protected species,
(b) deliberately disturbs wild animals of any such species,
(c) deliberately takes or destroys the eggs of such an animal, or
(d) damages or destroys a breeding site or resting place of such an animal,
is guilty of an offence.

(2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely—
(a) to impair their ability—
(i) to survive, to breed or reproduce, or to rear or nurture their young; or
(ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
(b) to affect significantly the local distribution or abundance of the species to which they belong.
(3) It is an offence for any person—
(a) to be in possession of, or to control,
(b) to transport,
(c) to sell or exchange, or
(d) to offer for sale or exchange,
anything to which this paragraph applies.
(4) Paragraph (3) applies to—
(a) any live or dead animal or part of an animal—
(i) which has been taken from the wild, and
(ii) which is of a species or subspecies listed in Annex IV(a) to the Habitats Directive; and
(b) anything derived from such an animal or any part of such an animal.
(5) Paragraphs (1) and (3) apply regardless of the stage of the life of the animal in question.
(6) Unless the contrary is shown, in any proceedings for an offence under paragraph (1) the animal in question is presumed to have been a wild animal.
(7) In any proceedings for an offence under paragraph (3), where it is alleged that an animal or a part of an animal was taken from the wild, it is presumed, unless the contrary is shown, that that animal or part of an animal was taken from the wild.
(8) A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine, or to both.
(9) Guidance as to the application of the offences in paragraph (1)(b) or (d) in relation to particular species of animals or particular activities may be published by—
(a) the appropriate authority; or
(b) the appropriate nature conservation body, with the approval of the appropriate authority.
(10) In proceedings for an offence under paragraph (1)(b) or (d), a court must take into account any relevant guidance published under paragraph (9).
(11) In deciding upon the sentence for a person convicted of an offence under paragraph (1)(d), the court must in particular have regard to whether that person could reasonably have avoided the damage to or destruction of the breeding site or resting place concerned.

Section 44 provides certain defences to the above.

The granting of a licence under Part 5 Section 55 of the Habitat Regulations

In order to carry out a lawful operation (e.g. development work which has full planning permission) that may result in any of the offences above, it is necessary to obtain a licence from Natural England to allow the operation to proceed.

However, in accordance with the requirements of the Habitats Regulations, a licence can only be issued after the following conditions have been satisfied:

- *that there is no satisfactory alternative, and*
- *that the action authorized will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*
- *that the action is required in preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*

Full planning permission is required to apply for a Natural England licence (where such a consent is necessary for the work to be carried out). In addition, a method statement which details the survey results, methodology of work to be undertaken, mitigation and compensation measures, must be submitted to Natural England with the licence application.

Plans and Projects & Designated Sites

The Regulations provide procedure whereby designated SAC or SPA and other European Protected Sites are afforded protection from plans and projects that may be likely to have a significant effect on the Features for which these sites are designated. Where a significant effect is considered likely in-combination with other projects an appropriate assessment is required to be undertaken. Details of this procedure can be found at Part 6 of the Act onwards, see link below.

For Full details of the 2017 Habitat Regulations see:
http://www.legislation.gov.uk/uksi/2017/1012/pdfs/uksi_20171012_en.pdf

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

This Act places a specific duty to conserve biodiversity on all public bodies, including Local Planning Authorities. In order to aid with this process Section 41 of the Act requires the Secretary of State to publish lists of living organisms and habitats which are of principal importance for the purpose of conserving biodiversity. These are the national Biodiversity Action Plan (BAP) lists, and BAP projects are also undertaken at a County, Borough or District level.

For further information see: https://www.legislation.gov.uk/ukpga/2006/16/part/3

ENVIRONMENT ACT 2021

Royal Assent 9 November 2021

The Environment Act 2021 has recently received Royal Assent and will introduce a number of nature conservation initiatives. These include Biodiversity Net Gain assessments. The following measures are part of the Act (see Gov.UK, 2021):

- Strengthened biodiversity duty;
- Biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- Duty upon Local Authorities to consult on street tree felling;

- Strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;
- Prohibit larger UK businesses from using commodities associated with wide-scale deforestation;
- Requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain, requires regulated businesses to report on their due diligence, introduces a due diligence enforcement system;
- Long-term targets to improve air quality, biodiversity, water, and waste reduction and resource efficiency;
- A target to halt the decline of nature by 2030;
- Environmental Improvement Plans, including interim targets;
- A cycle of environmental monitoring and reporting;
- Environmental Principles embedded in domestic policy making;
- Office for Environmental Protection to uphold environmental law;
- Air and Water pollution measures.

For further information see:
https://www.legislation.gov.uk/ukpga/2021/30/pdfs/ukpga_20210030_en.pdf

Biodiversity Net Gain under the Environment Act

Mandatory biodiversity net gain in England is likely to become law in 2023 (through amendments to the Town & Country Planning Act). The key measures include (see eg Gov.uk & Local.gov.uk):

- Minimum 10% gain required using Biodiversity Metric;
- Habitat secured for at least 30 years via obligations/ conservation covenant;
- Habitat can be delivered on-site, off-site or via statutory biodiversity credits;
- Creation of a national register for net gain delivery sites;
- Continued use of mitigation hierarchy - avoid, reduce, off-set (mitigation and compensation);
- Will apply to Nationally Significant Infrastructure Projects (NSIPs)
- Will not apply to marine development;
- Works alongside existing legal environmental and wildlife protections.

Technical Appendix 2

Local Planning Policy

Adopted Reading Borough Local Plan 2019

EN11: WATERSPACES

Reading's waterspaces will be protected and enhanced, so that they can continue to contribute to local and regional biodiversity and ecology, flood mitigation, local character, heritage and visual amenity, the provision of accessible leisure and recreational opportunities and, where appropriate, navigation. There will be no adverse impact on the functions and setting of any watercourse and its associated corridor.

Where development in the vicinity of watercourses is acceptable, it will:-

- *Provide appropriate, attractive uses and buildings that enhance the relationship of buildings, spaces and routes to the watercourse, including through creating or enhancing views of the watercourse, and create a high quality public realm;*
- *Make positive contributions to the distinct character, appearance, historic significance, landscape and amenity of the watercourses;*
- *Provide a strengthened role for watercourses as important landscape features, wildlife corridors, historic features and recreation opportunities;*
- *Wherever practical and consistent with its biodiversity role, provide good, level access to and along the waterside for all those who want to use it;*
- *Be set at least ten metres back from the watercourse wherever practicable and appropriate to protect its biodiversity significance;*
- *Improve the quality of watercourse environment through protecting and enhancing habitats and ensuring that habitat creation is balanced with access and urban uses; and*
- *Pursue opportunities for deculverting of watercourses.*

EN12: BIODIVERSITY AND THE GREEN NETWORK

a) The identified Green Network, the key elements of which are shown on the Proposals Map, shall be maintained, protected, consolidated, extended and enhanced. Permission will not be granted for development that negatively affects the sites with identified interest or fragments the overall network. The Green Network comprises:

- *Sites with identified biodiversity interest - Local Wildlife Sites, Local Nature Reserves, Biodiversity Opportunity Areas, protected and priority species and their habitats, Priority and Biodiversity Action Plan habitats, and the River Thames and all its tributaries (including the River Kennet and the Kennet & Avon Canal); and*
- *Areas with potential for biodiversity value and which stitch the Green Network together - designated Local Green Space and open green spaces, and existing and potential Green Links.*

New development shall demonstrate how the location and type of green space, landscaping and water features provided within a scheme have been arranged such that they maintain or link into the existing Green Network and contribute to its consolidation. Such features should be designed to maximise the opportunities for enhancing this network. All new development should maximise opportunities to create new assets and links into areas where opportunities are as yet unidentified on the Proposals Map.

b) On all sites, development should not result in a net loss of biodiversity and geodiversity, and should provide a net gain for biodiversity wherever possible. Development should:

- *Protect and wherever possible enhance features of biodiversity interest on and adjacent to the application site, incorporating and integrating them into development proposals wherever practicable; and*
- *Provide new tree planting, wildlife friendly landscaping and ecological enhancements (such as wildlife ponds, bird and bat boxes) wherever practicable.*

In exceptional circumstances where the need for development clearly outweighs the need to protect the value of the site, and it is demonstrated that the impacts cannot be: 1) avoided; 2) mitigated or; 3) compensated for on-site; then new development will provide off-site compensation to ensure that there is "no net loss" of biodiversity. Provision of off-site compensation shall be calculated in accordance with nationally or locally recognised guidance and metrics. It should not replace existing alternative habitats, and should be provided prior to development.

EN14: TREES, HEDGES AND WOODLANDS

Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal where they are of importance, and Reading's vegetation cover will be extended. The quality of waterside vegetation will be maintained or enhanced.

New development shall make provision for tree retention and planting within the application site, particularly on the street frontage, or off-site in appropriate situations, to improve the level of tree coverage within the Borough, to maintain and enhance the character and appearance of the area in which a site is located, to provide for biodiversity and to contribute to measures to reduce carbon and adapt to climate change. Measures must be in place to ensure that these trees are adequately maintained.

Technical Appendix 3

Ecological Appraisal Method

Introduction

The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM June 2006). Regardless of whether a statutory Environmental Impact Assessment is required, these guidelines provide a robust framework for ecological assessment at any scale.

Desk Study

The first stage of the appraisal is a desk study of the proposed development site and associated Zone of Influence. This provides background information on the site and local environment so as to more effectively target field survey and further desk research.

The Multi Agency Geographical Information for the Countryside (MAGIC) database and Natural England's 'Nature on the Map' are interrogated for information regarding nationally or internationally designated sites within 1km or 5km of the site respectively. The National Biodiversity Network (NBN) data base is interrogated primarily for any relevant local protected species records within the area. The NBN provides access to a substantial volume of biodiversity data for the UK. Although rarely site specific, it does provide valuable information on the local occurrence of protected species.

Where appropriate, the local environmental Record Centre is approached to provide information regarding locally identified sites and records of protected and/or notable species within and around 1km of the site and European Protected species within 5km of the site.

Site Survey Methodology

The aims of the survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities ecological value along with the potential to support protected species, species of principal importance, and any other notable species.

Where relevant, habitat immediately adjacent to the site is also assessed as this can have a bearing on the possible presence of protected species on the site and the ecology of adjacent areas can be affected by development nearby.

Habitats and Vegetation

Habitats and vegetation communities are recorded on a broad scale by visually noting contrasting land uses, vegetation zones and landscape features, such as hedgerows and trees. Dominant plant species are recorded in each of the areas identified, as are any notable plant species, such as protected species and habitats or notifiable weeds.

Protected Species

Many plant and animal species are legally protected in the UK. Some, such as bats, badger, water vole and great crested-newt are commonly encountered on development sites. Protected species law is a serious consideration for developers and land owners, as failure to confirm their presence during initial

project conception can later lead to serious programming delays and their associated costs and to prevent any infringement of the law.

Case law has established (Regina vs. The Cornwall County Council ex parte Hardy 2001) that "It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted.

For the most regularly encountered protected species, a brief summary of methods follows:

Bats

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats was considered, as was the site's potential for providing bat foraging habitat. The survey for signs of residence by bat species consisted of a slow, methodical search both internally and externally for actual roosting bats and their signs which could indicate the presence of a bat roost including:

- Bat droppings – e.g. on floors, stored articles, walls, beams, tiles, windowsills entry/exit points, etc. These can be used to aid species identification.
- Dark staining at well-used roost sites (e.g. ridge boards and timber joints, etc.) or entry/exit points.
- Wear marks at bat roost sites and entry/exit points. This can be a polishing and smoothing of rough wood surfaces and masonry or slight scuffing of very smooth wooden surfaces.
- Urine spots or streaking in the vicinity of bat roosts and entry/exit points.
- Similarly, the presence of spider webs at a potential roost can often indicate their absence at that time, but requires careful interpretation combined with other evidence.

All internal spaces of the building were searched for any roosting bats or signs to indicate their use by bats, including gaps at the roof timber frame joints. External surfaces of the building were also examined for evidence of use of any potential bat access points. This survey was achieved using a strong torch in dark internal areas, endoscope for inaccessible spaces, binoculars and, where appropriate, a ladder to examine the buildings externally.

The potential to support bat roosts either in the summer (nursery) or winter (hibernation) based previous experience of bat occupancy at other sites and upon the presence of suitable roost sites and access points was also considered. In particular, the potential for roost sites which are hidden from view is noted.

Evaluation

The aim of this Bat Survey is to evaluate the potential suitability of the proposed development site in relation to bat use and bat roosts using the Bat survey guidelines (Bat Conservation Trust (2016) Bat Surveys Good Practice Guidelines 3rd Edition), which provides guidance on assessing and evaluating development sites and features for bat roost potential. The potential for structures to support roosting or breeding bats is evaluated under the protocol for the visual internal and external inspection (Negligible, Low, Moderate or High).

Survey Constraints and Limitations

Lack of bat evidence cannot always be taken to mean the lack of use by bats as signs of bats can be easily washed off by wind or rain; droppings are hard to see where rubble and other floor debris may obscure them; low numbers of droppings can easily be missed especially where they may become damp and deteriorate; evidence of bats may not be apparent where bats roost out of view, such as in tree and wall cavities, etc.

The survey was carried out during a brief window of time and, therefore, the survey has provided only a snapshot of the site use. Since bats regularly move between different roost sites, particularly to satisfy their varying requirements at different times of the year, a bat survey often concentrates upon searching for signs to indicate the presence of roosting bats at any time of the year. Due to these survey limitations an assessment using professional judgement has been used to interpret the findings and the potential for supporting bats and is used to guide any recommendations for precautionary approaches to carrying out the proposed work.

Badgers

The site and its boundaries were systematically searched for the presence of Badgers *Meles meles*, in particular badger setts, on or near (30-40m) of the site. The area was also assessed for the presence of badger foraging activity and territorial behaviour. Such signs include foraging trails, foraging scrapes in short grass, which are commonly known as 'snuffle holes' (shallow scrapes in soft ground or even turf rolling created by foraging for ground-dwelling invertebrates such as worms and grubs), footprints, hairs caught under fences, sett entrances, and latrine sites.

Dormice

The presence of Dormouse on or near the site was considered during the survey, principally through habitat suitability, combined with data on occurrence within the area. Where suitable habitat occurs, further survey for feeding signs on hazel nuts and honeysuckle where it occurs along with searches for arboreal nests. If it a site is considered suitable, further survey may be recommended.

Other Mammals

Consideration is also given to the potential for habitats to support other legally protected mammals and those of nature conservation importance. Where any water bodies occur on or near to the site species including Water Vole Arvicola terrestris and Otter Lutra lutra are considered. Depending upon the geographic location consideration is also given to species such as Red Squirrel .

Breeding Birds

Any notable bird species seen during the survey are recorded. The type and quality of breeding, foraging and roosting habitats available for birds is also considered and interpreted with particular reference to protected or more notable bird species.

Consideration is given to any features which could support nesting birds, (Buildings and other structures, and areas of vegetation) that will be cleared or disturbed as a result of the development.

Reptiles

Any areas of habitat considered suitable for supporting reptiles were noted (for example, areas of rough grassland and scrub, banks, burrows, and rubble piles, compost heaps).

Great Crested Newt

Due to declines in numbers predominantly due to habitat loss and restricted European range, Great Crested Newts *Triturus cristatus* are protected under Section 9 of the Wildlife and Countryside Act, 1981 (as amended) and Regulation 39 of the Conservation (Natural Habitats &c) Regulations 1994, which protects Great Crested Newts from harm, injury and deliberate capture, killing, disturbance, damage and destruction of eggs, breeding site or resting place. This includes deliberate or reckless damage or disturbance.

Survey was by habitat suitability (the occurrence of suitable ponds and terrestrial habitat) combined with knowledge on there distribution from biological records for the area. If it a site is considered suitable, further survey is usually required if an impact is considered likely.

Invertebrates

A very small proportion of invertebrates are afforded legal protection under the Wildlife and Countryside Act 1981 (as amended), although a relatively high number of invertebrates are included within the UK and local BAPs, and many more species are identified as being Nationally Scarce. Most invertebrates require specialist knowledge in order to identify them, although some groups, including butterflies and dragonflies, can be readily identified by generalists. Therefore, apart from recording any species of these readily identifiable groups, the survey concentrated on recording the presence of any key habitats of nature conservation importance considered suitable for supporting more scarce and restricted invertebrates, for example bare ground, dead wood and botanically rich habitats.

Survey Constraints and Limitations

Walkover surveys are carried out during a brief window of time. And therefore, the survey will provide only a snapshot of the range of plants and animals that might be present. However, professional judgement is used to interpret the habitat features recorded, and their likely value for supporting protected and notable species, including species of principal importance. Where timing is likely to significantly affect the results of a survey, further survey work is often recommended. Survey can also be restricted through land access, especially land adjacent to the site.

Assessment Guidelines

Introduction

The IEEM guidelines (2006) provide three principal reasons for an ecological feature being valued and therefore included within the EcIA: biodiversity value, social/community value, and economic value.

The evaluation and assessment undertaken assigns one of a number of value labels based on a geographic scale as follows:

- International
- National
- Regional
- County
- District
- Local (Parish)
- Within the zone of influence

Value is determined with reference to the following factors:

- level of designation (sites) or biodiversity-based protection (legal and policy);
- biodiversity value (e.g. inclusion in Biodiversity Action Plans, rarity, position in ecosystem, assemblages and communities, size and diversity);
- social and economic value;
- legal issues (eg protected sites).

All impacts of the scheme on features of local importance or greater are assessed in the impact assessment stage

Assessment of Likely Impacts

The ecological impact assessment methodology used is based on the following considerations.

Characterisation of Likely Impacts

The potential impacts identified as a result of the proposals are characterised according to the following parameters:

- Positive or negative
- Magnitude (and extent if not synonymous)
- Duration
- Reversibility
- Timing and frequency

Significance of Impact

A significant impact on a valued ecological feature (whether negative or positive) is defined in IEEM's guidelines as an impact on the integrity of a defined site or ecosystem, and/or the conservation status of habitats or species within a given geographical area. These terms are defined below.

Integrity

Integrity is defined as follows. '*The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*.' A site or ecosystem that achieves this is considered to be at favourable conservation status.

Conservation Status

For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, which may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.

For species, conservation status is determined by the sum of the influences acting on the species, which may affect the long-term distribution and abundance of its populations within a given geographical area.

Impact Prediction

For guidance as to whether an impact is likely to result in an adverse effect on the integrity or conservation status of a feature, reference has been made to the conservation objectives for that feature where they are available, for example in habitat and species action plans. Otherwise professional judgement has been made based on available information.

The confidence in the prediction that an activity will give rise to a significant adverse impact on a valued ecological feature is given based on a four point scale:

- Certain (or near-certain);
- Probable;
- Unlikely; and
- Extremely unlikely

Drawing the Assessment Together

The above factors – value, integrity and conservations status of the feature, prediction and characterisation of the impact and overall significance of the impact is brought together in the final assessment. This is done without additional mitigation measures that may be proposed. An impact is then summarised as significant or not.

Mitigation, Compensation and Enhancement

Where impacts are characterised as significant mitigation or compensation may be offered to prevent, reduce or offset such impacts. In addition enhancement measures may be built into a scheme to ensure that the scheme is compliant with the proactive measures outlined in the latest Government policy on nature conservation (PPGs).

Technical Appendix 4

Bats Survey

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats was considered, as was the site's potential for providing bat foraging habitat. The survey for signs of residence by bat species consisted of a slow, methodical search both internally and externally for actual roosting bats and their signs which could indicate the presence of a bat roost including:

- Bat droppings – e.g. on floors, stored articles, walls, beams, tiles, windowsills entry/exit points, etc. These can be used to aid species identification.
- Dark staining at well-used roost sites (e.g. ridge boards and timber joints, etc.) or entry/exit points.
- Wear marks at bat roost sites and entry/exit points. This can be a polishing and smoothing of rough wood surfaces and masonry or slight scuffing of very smooth wooden surfaces.
- Urine spots or streaking in the vicinity of bat roosts and entry/exit points.
- Similarly, the presence of spider webs at a potential roost can often indicate their absence at that time, but requires careful interpretation combined with other evidence.

All internal spaces of the building were searched for any roosting bats or signs to indicate their use by bats, including gaps at the roof timber frame joints. External surfaces of the building were also examined for evidence of use of any potential bat access points. This survey was achieved using a strong torch in dark internal areas, endoscope for inaccessible spaces, binoculars and, where appropriate, a ladder to examine the buildings externally.

The potential to support bat roosts either in the summer (nursery) or winter (hibernation) based previous experience of bat occupancy at other sites and upon the presence of suitable roost sites and access points was also considered. In particular, the potential for roost sites which are hidden from view is noted.

Survey Constraints and Limitations

Lack of bat evidence cannot always be taken to mean the lack of use by bats as signs of bats can be easily washed off by wind or rain; droppings are hard to see where rubble and other floor debris may obscure them; low numbers of droppings can easily be missed especially where they may become damp and deteriorate; evidence of bats may not be apparent where bats roost out of view, such as in tree and wall cavities, etc.

The survey was carried out during a brief window of time and, therefore, the survey has provided only a snapshot of the site use. Since bats regularly move between different roost sites, particularly to satisfy their varying requirements at different times of the year, a bat survey often concentrates upon searching for signs to indicate the presence of roosting bats at any time of the year. Due to these survey limitations an assessment using professional judgement has been used to interpret the findings and the potential for supporting bats and is used to guide any recommendations for precautionary approaches to carrying out the proposed work.

Bat Emergence Survey - Buildings

Introduction

Evening surveys are completed in order to monitor the building for any bats emerging from potential roosts and monitor bat activity within or around the site.

Methods

Bat detectors are used to listen for bats and observations are made for any bats emerging from roosts. Bats flying over the site are also identified and their behaviour assessed e.g. commuting, foraging or other behaviour to determine how any bats on or adjacent to the site may use it.

During a survey buildings are monitored from 15 minutes before sunset onwards, for at least one two hours depending upon activity levels. Following the emergence checks, bat activity surveys are then carried out over the site. These concentrate on those areas assessed as having greatest potential to be used by bats as flight lines (e.g. linear features) or foraging habitat (sheltered areas where the abundance of insects is likely to be high).

Surveyors are positioned so that all possible bat exits on each building can be observed time and the line-of-sight should not exceed C50 m wherever possible.

Both heterodyne, time-expansion and frequency division bat detectors (eg Bat box duet, Pettersson D240x, Anabat SD1) are used. In addition recordings of bat echolocations are made if required for later computer analysis, to assist in confirming species identification.

Since different species of bats echolocate using different frequencies, there is a risk that certain species will be missed with heterodyne bat detector if they are not tuned to the frequency used by that species at the time. Therefore, during the survey period, surveyors using heterodyne detectors scan through different frequency ranges to ensure as many bats are recorded as possible. The use of continual recording frequency division bat detectors increases survey coverage.

Survey work is programmed so that it occurs during suitable weather conditions when bats would be expected to be active.

Limitations of Survey

A bat survey is often based upon searching for signs to indicate use by bats at any time of the year because bats regularly move between different roost sites to satisfy their varying requirements throughout the year. The evening emergence survey is a useful addition to the bat survey in order to confirm use of a building by bats. Very small numbers of bats can be difficult to detect as can emergence from high roof areas.

Seasonality and Behaviour: Any bat survey can only provide a ‘snapshot’ view of activity in time. Bat behaviour can be affected by temperature, wind, rain and insect emergence.

Visual Detection: Being nocturnal, bats are difficult to see and some species such as Long eared bats emerge late in the evening when they may be hard to see against the night sky or vegetation. It is possible therefore that emergence counts and field surveys could overlook numbers of individuals.

Use and Interpretation of Bat Detectors: Long eared bats in particular are quiet bats, which are seldom heard on a bat detector. The surveyor needs to be in close range to the bat to detect it. Furthermore bat detectors are directional instruments meaning that a bat may not be detected flying at certain angle to a detector.

Weather conditions: Weather conditions, particularly wind strength and direction are likely to have a significant effect upon where bats forage since insects, upon which bats feed, will tend to gather in sheltered areas when conditions are breezy. Therefore, observations of areas used by bats during the present surveys may differ at other times during different (e.g. more severe) weather conditions and with differing wind directions.

Bat Activity Monitoring

Introduction

Anabat / Song Meter Automated recorders are used to allow greater survey intensity than with manual bat detector surveys. They can allow longer periods of time coverage than could be practically covered by manual survey, providing more comparable results and recorded results, or be used to provide a more flexible timetable for surveying. Automated systems are triggered by sound (via a detector) and these sounds are then recorded as event / bat passes and can be left on site to record bats night after night. Detectors are usually left for three or more days to allow for variation in weather conditions etc. The remote automated detector is set to activate at least 30 minutes before dusk and switch off at 30 minutes after dawn. In long term studies it is also useful to correlate results to weather conditions.

The remote equipment can be used at any time of year but appropriate interpretation is required depending upon the environmental conditions of the survey and the roost / habitat type and weather. As the numbers of bat passes recorded can vary appreciably from night to night, season to season and location. Depending upon environmental conditions, bat regularly arouse from hibernation but as activity levels will be lower in winter, detection can be very sporadic and most likely to be picked up close to a roost site.

Note: Myotis species have similar echo location and specific identification is not always certain, and Long Eared Bat species, due to their quiet echolocation are often poorly recorded in open foraging habitats although do more regularly register within buildings.

Automated systems allow greater survey intensity than with manual bat detector surveys with more consistent and recorded results. They can allow longer periods of time coverage than could be practically covered, providing more comparable results, or be used to provide a more flexible timetable for surveying.

Automated systems are triggered by sound (via a detector) and these sounds are then recorded as events. The Anabat SD1 and Song Meter SM2 are remote system for the recording and analysis of ultrasonic bat calls which can be left on site to record bats night after night and can be left recording for two weeks or more.

Method

The remote equipment can be used at any time of year but appropriate interpretation is required depending upon the environmental conditions of the survey and the roost / habitat type and weather. As the numbers of bat passes recorded can vary appreciably from night to night, season to season and location. Depending upon environmental conditions, bat regularly arouse from hibernation but as activity levels will be lower in winter, detection can be very sporadic and most likely to be picked up close to a roost site.

The remote automated detector is set to activate at least 30 minutes before dusk and switch off at 30 minutes after dawn. In long term studies it is also useful to correlate results to weather conditions.

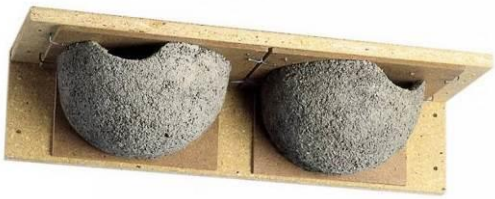
Technical Appendix 5

Nighttime Visual Aid
Screengrabs
19 June 2024

Technical Appendix 6

Bat & Bird Box Mitigation Examples

Examples of Bird Nesting Opportunities for buildings

Swift Nesting Brick – It needs to be positioned near Apex or high up – position advised by ecologist. Designs shown are from Ibstock Bricks: https://www.ibstockbrick.co.uk/kevington/eco-products/ S Brick Action for Swifts: https://www.actionforswifts.com/galvanised-steel-s-brick Manthorpe Swift Brick: https://www.nhbs.com/manthorpe-swift-brick Birdbrickhouses: https://www.birdbrickhouses.co.uk/products/bird-brick-houses/ ***see also:*** https://www.rspb.org.uk/globalassets/downloads/documents/conservation--sustainability/help-swifts/swift-bricks.pdf	
House Martin Schwegler Nest Placed under roof overhang, bargeboard – high up position advised by ecologist Design shown Schwegler from NHBS: https://www.nhbs.com/9a-schwegler-house-martin-nest	

House Sparrow Terrace Schwegler Usually placed under roof overhang, bargeboard – high up position advised by ecologist Design shown Schwegler from Wildcare: https://www.wildcare.co.uk/sparrow-terrace.html and Birdbrickhouses: https://www.birdbrickhouses.co.uk/products/bird-brick-houses/	
Blue/Great Tit Schwegler Nest – usually tree mounted ***Design shown Schwegler from NHBS:*** https://www.nhbs.com/1b-schwegler-nest-box Starling inbuilt nest brick: https://www.birdbrickhouses.co.uk/products/bird-brick-houses/	

Examples of Bat Bricks/Mitigation for buildings

Schwegler Bat Roost Unit 2FR This Tube system meets the characteristic behavioural requirements of the types of bats that inhabit buildings. Made with Schwegler wood-concrete, the design maintains excellent climatic conditions inside the roost unit allowing the animals to either hang onto the wooden rear or onto the wood-concrete front. The box, once installed is maintenance free and self cleaning. The roost unit can be installed within any external walls (brick, block or panelling) either flush or beneath the wall surface (with suitable entrance ramp extension) Dimensions: height 47.5 x width 20 x depth 12.5 cm, Entrance: width 15 x height 2 cm, Weight: ca. 9,8 kg Within Brick, can also be placed within cavity with only entrance visible	

Birdbrickhouses: Bat boxes (also referred to as bat tubes) can be supplied in brick fronted, half bond and quarter bond brickwork or alternatively with a stainless steel mesh fitted to the front. The mesh is designed for optimum adhesion in render and stonework applications. A basic version can be fitted directly behind weatherboarding or into studwork. See: https://www.birdbrickhouses.co.uk/products/bat-brick-houses/	