LAND AT 25 ORCHARD WAY, HARWELL

ECOLOGICAL APPRAISAL

MARCH 2019

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1.0 INTRODUCTION

1.1 Background

1.1.1 Aluco Ecology Ltd was commissioned to carry out an ecological appraisal of the land at 25 Orchard Way, Harwell, Oxfordshire by Feltham Properties.

1.1.2 An 'Ecological Appraisal' is a general investigation of the likely ecological and nature conservation issues associated with the site and its potential development. The aim of an Ecological Appraisal 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; and
- recommend any further work (such as targeted protected species surveys) if required in order to fully assess the value of the site.

1.1.3 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework (revised NPPF, 2019). 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 (see Section 15 of the revised NPPF, 2019).

1.2 Outline of the Scheme and Site Location

1.2.1 The site is located at the south west edge of Harwell. The proposals for the site are for a small residential development within the garden of 25 Orchard Way.

1.2.2 The location of the site is shown at **Figure 1**, and the site main survey boundaries are shown at **Figure 2**.

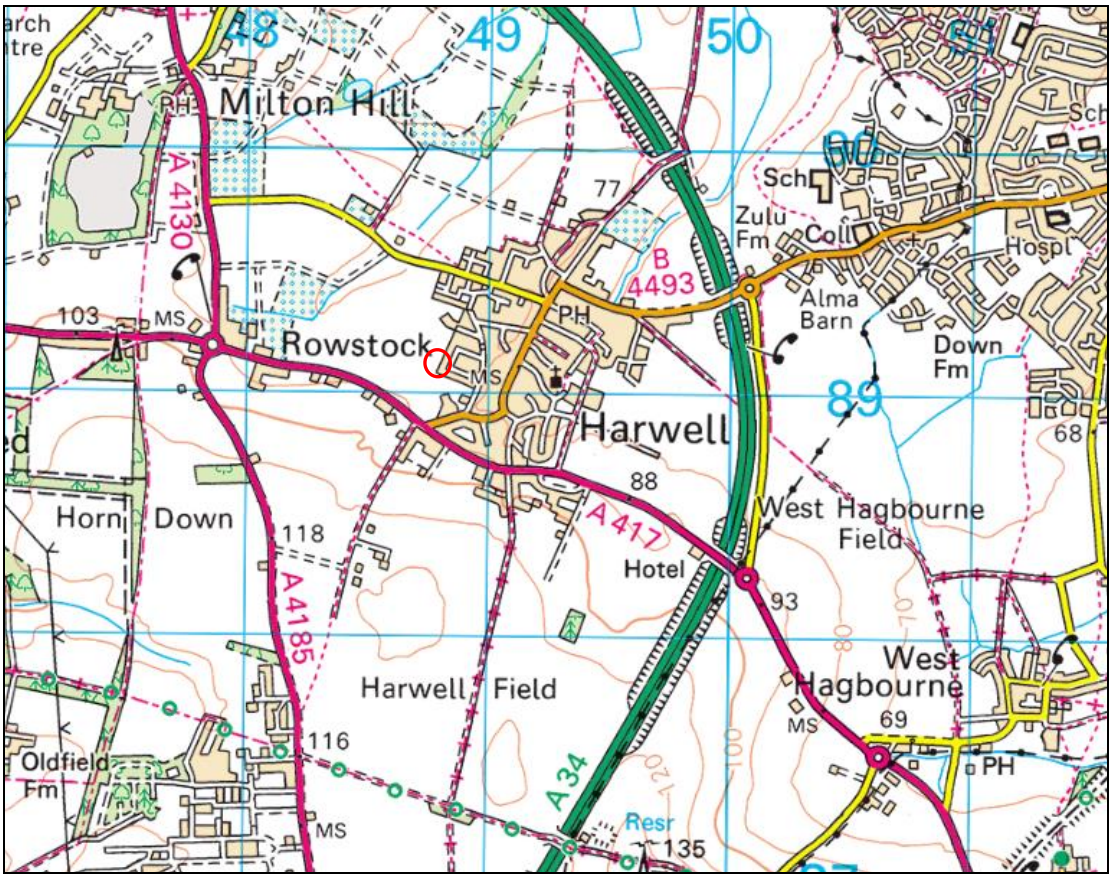

Figure 1 Site Location

1.3 Relevant Legislation and Policy

1.3.1 The outcomes of this Ecological Appraisal 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 National Planning Policy Framework and the legislation outlined above, the strategic and local planning policies are the principal policies against which the outcomes of this ecological assessment will be considered; the Vale of White Horse District Council Local Plan contains policies relating to ecology, these are outlined at **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 have been prepared for habitats and species of conservation concern, including national BAPs and a Biodiversity Action Plan for Oxfordshire (www.oncf.org.uk) is

considered in the general ecological site appraisal. The local area does not fall within a Conservation Target Area, the closest being the Berkshire Downs Escarpment.

2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

2.1.1 The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (IEEM, 2006; CIEEM, 2016). Regardless of whether a statutory Environmental Impact Assessment is required, these guidelines provide a robust framework for ecological assessment.

2.2 Site Survey Methodology

2.2.1 The first stage of the appraisal is a desk study of the proposed development site and associated zone of influence and data search from the biological records centre. 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 ecological value of the habitats and vegetation communities, 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.**

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 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.

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

3.2.1 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 locally within the site. The main potential influence off site is the potential for pollution derived from on-site construction.

3.2.2 Consequently, desk surveys have been carried out within this zone and backed up by field survey where required.

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 localised vegetation clearance, removal of any built structures and topsoil stripping. This phase may affect habitat suitable for wildlife, including protected and/or notable species.

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

3.4.1 During the operational phase it is possible that the scheme may result in changes from current site use; and this may have impacts on features of ecological value or designated sites within the wider area.

Key:

Main Survey Area

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Figure 2: Site Main Survey Area

4.0 BASELINE CONDITIONS WITHIN THE ZONE OF INFLUENCE

4.1 Introduction

4.1.1 This 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 any proposed development. A walkover survey of the site and initial bat assessment was undertaken on 18th & 25th February 2019.

4.2 Statutory & Non-Statutory Designated Sites

Statutory Designated Sites

4.2.1 There are no Sites of Special Scientific Interest (SSSI) designated of regional to national importance, or European Site (Special Area of Conservation/Special Protection Area/Ramsar Site) present within 7km of the site.

Non Statutory Designated Sites

4.2.2 There are no non statutory designated sites within 1km of the site.

4.3 Habitats and Vegetation

Introduction

4.3.1 The following description is based on the site visit carried out in February 2019.

4.3.2 The vegetation and main features of the application site are described below and shown at **Figure 3**. The site consists of a residential dwelling with long garden in Orchard Way, Harwell.

Grasslands

4.3.3 The grasslands on site are maintained as short cropped lawns and are typical amenity lawns dominated by grasses and moss, with some herb species. The lawns (Target Note (TN) 1 at **Figure 3**) are dominated by Fescue *Festuca cf. rubra*, with other species noted including Cocks Foot *Dactylis glomerata,* Meadow Grass *Poa sp.* Rye Grass *Lolium perenne,* and Yorkshire Fog *Holcus lanatus.* Herb density is low to locally moderate and includes White & Red Clover *Trifolium repens & T. pratense,* Yarrow *Achillea millefolium,* Buttercups *Ranunculus sp.* Daisy *Bellis perennis,* Dandelion *Taraxacum agg.* Cut-leaved Cranesbill *Geranium dissectum* and Self Heal *Prunella vulgaris*. The survey was undertaken during the winter period so not all grass/herb species may be obvious and other species may also be present. The main rear lawn areas is shown at **Photo 1** below.

Boundaries & Shrubs/Woody Habitat

4.3.4 All of the garden boundaries are fenced. There are also planted ornamental shrubs or hedges along some of the boundaries (see **photos 2-4** below). These are well maintained and are 2m x 1.5m comprising non-native species. At the end of the garden is a bed of Japanese Rose *Rosa rugosa*, forming a short hedge along the fence line (TN3 at **Figure 3**).

4.3.5 Away from the boundaries are a small number of planted ornamental shrubs and bushes, and a number of fairly young fruit trees within the managed lawns (TN2 at **Figure 3** and **photo 5**). These include Apple, Cherry, and Plum trees. Off site to the south is a mature Sycamore *Acer pseudoplatanus*, set away from the garden boundary (TN4 of **Figure 3**).

Waterbodies

4.3.6 No waterbodies are present on site. Just off site to the north, a lined ornamental Koi Carp pond is present in the garden of 27 Orchard Way (TN6 at **Figure 3**). It is c3m x 2m x 0.75m and lacks semi-natural emergent aquatic vegetation, and is well stocked with fish (see **Photo 6** below). A stand alone and maintained formal swimming pool is also present in the garden of no 25 (TN7 at **Figure 3** and **Photo 7**). A small informal artificially lined pond is also present at the rear of the garden of no. 27. It is very small c1m x 0.5m and relatively shallow. It is lined and with limited aquatic vegetation (TN8 at **Figure 3** and **Photo 8**). In addition to the above waterbodies are water butts in the garden of no. 27, including one that is raised to 1m, open on top, and containing goldfish.

Hardstanding

4.3.7 Hardstanding and driveways exists at front and rear of no. 25 Orchard Way.

Buildings Associated with 25 Orchard Way

4.3.9 The main dwelling at 25 Orchard Way is a detached bungalow. It is a brick built structure with tile roof. A small single garage is also present, along with small wooden sheds and a greenhouse. See **Photos 9 & 10** below.

Photo 1: Showing main lawn area at 25 Orchard Way (TN1)

Photo 2: Examples of boundary - no 25 western/north western boundary

Photo 3: Examples of boundary – boundary between 25 & 27

Photo 4: Examples of boundary - no 25 south western boundary

Photo 5: Fruit Trees

Photo 6: Ornamental Koi Carp Pond in no. 27 (TN6 – off site)

Photo 7: Swimming Pool (TN7 – off site).

Photo 8: Miniature Lined Pond (TN8 – off site)

Photo 9: Main dwelling at no. 25 from rear (TN9)

Photo 10: Garage at no. 25

Flora

4.3.7 No rare species or species of conservation concern were noted within the site

Evaluation

4.3.8 The vegetation and habitats on site are considered to be of **negligible value** (hardstanding/driveways) to **value within the zone of influence** (larger gardens with associated woody shrubs/ornamental planting).

4.4 Protected Species

Birds

4.4.1 Nesting birds are protected under the Wildlife & Countryside Act, with certain species given additional protection (see **Technical Appendix 1**). The site contains some woody habitat, particularly boundary hedges, which may provide potential nesting habitat for common bird species. Two species of conservation concern (Eaton et al, 2015) was noted during the site survey. These were House Sparrow *Passer domesticus*, which is likely to breed within local dwellings, perhaps along Orchard Way; and Mistle Thrush *Turdus viscivorus,* which was singing off site to the west in farmland. The Schedule 1 Wildlife & Countryside Act species Red Kite *Milvus milvus* was noted overflying the site, but no nesting habitat exists on site or around the site boundaries.

4.4.2 Previous survey work on land north of the site (Aluco Ecology, 2014) also recorded Starling *Sterna vulgaris*, Song Thrush *Turdus philomelos,* and Dunnock *Prunella modularis*, House Sparrow, Starling, Mistle Thrush & Song Thrush are common and widespread species that have been 'red listed' on account of a greater than 50% decline in populations over the last 30 or so years, and Dunnock is 'Amber listed' for being a species with a greater than 25% decline in populations during the monitoring period, and Red Kite is Amber listed for being a species of European Concern (Eaton *et al,* 2015*)*. Sparrowhawk *Accipiter nisus* was also recorded during the current survey. The data search has returned a number of records of Swift *Apus apus* from the Harwell area. No evidence of either Swift or House Martin *Delichon urbicum* was noted on the dwelling, and being a bungalow it is of a lower potential for use, by Swift particularly.

Bats

4.4.3 Bats are protected under the Wildlife & Countryside Act and the Habitat Regulations (see **Technical Appendix 1**). There is a single dwelling and garage on site, along with a number of sheds and greenhouses that are not of potential roosting value to bats. The gardens contain a small number of young trees/fruit trees. These features were assessed for bat roosting potential both internally and externally by a qualified and licensed bat surveyor using the methods outlined in **Technical Appendix 5**.

4.4.4 Number 25 Orchard Way is a brick built bungalow with tile roof. It is described in the annotated **Photos 11-16** below. The house contains features suitable for small numbers of eg. crevice roosting bats such as Pipistrelles *Pipistrellus sp.*, but no evidence of bats was recorded in either the house or associated garage. The house is considered to be of **moderate-low** potential to support roosting bats, and the garage is considered to be of **low** potential to support roosting bats.

Photo 11: Externally the main bungalow has gaps of moderate-low potential at the bottom of the roof by the gutter. This is present on both front and rear of the property.

Photo 12: Internal main loft space. This is relatively light with a window at the southern end. The loft is bitumen lined. There was a small amount of light egress in a couple of areas suggesting access possibility (although upon inspection of the exterior this potential access point where light was entering was not identified). Overall no evidence of bats was recorded and considered unlikely to support roosting bats in the internal loft space.

Photo 13: Window allowing light into main loft area reducing potential value to roosting bats

Photo 14: Loft well insulated with a double layer of fibreglass insulation installed against eaves reducing potential access points into the loft space.

Photo 15: A more recent extension to the loft. This area is darker (although two Velux windows have potential to provide some light at the eastern end). The space is Tyvek lined. Again fibreglass is installed to the eaves, although minimal trussing is of value to eg Long-eared Bats, and there are a small number of features for crevice dwelling bats, including some missing mortar in-between breezeblock of the gable ends. However no evidence of bats was recorded and considered unlikely to support roosting bats in internal loft space.

Photo 16: Bargeboards on garage contains small external gap with limited potential. Gaps could be inspected fully and no evidence of bats was noted. This gap is not considered to allow bat access into the interior of the building.

4.4.5 The trees on site were considered for bat roost potential. The woody vegetation is relatively recently planted, young, and doesn't contain any potential bat roost features, with the exception of a single Apple tree in no. 25 rear garden (see TN2 at **Figure 3**), which contained a gap in a smaller diameter branch, which was considered to be a potentially suitable bat roost feature. This is shown at **Photo 17** below.

4.4.6 The gardens and their boundaries have potential to be used for foraging and commuting bats that are present in the local area.

4.4.7 The data search has shown that nine species of bat have been recorded within 2km, including Common and Soprano Pipistrelle *Pipistrellus pipistrellus & P. pygmaeus*; Brown Long Eared *Plecotus auritus*; Serotine *Eptesicus serotinus*; Noctule *Nyctalus noctula*; Leisler's Bat *N. leisleri,* Daubenton's & Natterer's Bat *Myotis daubentonii, & M. nattereri,* and Western Barbastelle *Barbastellus barbastellus*. Four records of Barbastelle bat were returned from the farmland north of Harwell (two from the northern edge of Harwell and two from Milton Hill c1.7km further northwest of the site). This suggests that a population may be present in the wider farmed landscape around Harwell and this part of Vale of White Horse District. As a localised and rare species in the UK and a UK BAP species, it is afforded additional protection under the Habitat Regulations, and listed on Annex II and IV of the Habitats Directive 92/43/EC (see **Technical Appendix 1**).

4.4.8 The majority of habitats on site are of **value in the zone of influence** to local bat populations, being well maintained gardens with some woody vegetation for foraging and commuting. The buildings and a small feature on a single Apple tree contains some **moderate-low** roosting potential for bats, however no evidence of bats was recorded during internal and external visual survey work.

Photo 17: Upward facing slit in branch of Apple tree c0.5m gap likely to be present.

Other Mammal Species

4.4.9 Badgers *Meles meles* are protected under the Protection of Badgers Act 1992. Signs of use of the site by Badger were searched for during the site visit. No evidence of Badger was recorded on site, although the wider area contains open farmland west of the site that is likely to have habitats of value to Badgers. The data search has returned a number of Badger records from within 2km of the site, with records from the Didcot area east of the A34 and from farmland around the Milton Interchange, suggesting Badgers are widespread in the local farmland landscape.

4.4.10 No other legally protected mammal species are likely to occur on site. There is only limited potential Dormice *Muscardinus avellanarius* habitat that this is not connected to wider habitats with significant potential for their presence, therefore it is considered unlikely that Dormouse is present on site. The data search has not provided any local records for the species, with the nearest location recorded on the Downs over 5km to the south. The BAP species Brown Hare *Lepus europeaus* may be present in the wider local countryside, with the data search returning a number of records within 2km, but there is only limited habitat on site. There is also some limited suitable habitat for Hedgehog *Erinaceus europaeus*, which has been recorded in Harwell.

Reptiles

4.4.11 Commoner reptile species are protected from harm under the Wildlife & Countryside Act (see **Technical Appendix 1**). The data search has not returned any reptile records within 2km of the site. A survey in 2014 on the open ground north of the site also returned no records of reptile use (see Aluco Ecology, 2014).

4.4.12 The site appraisal considered the potential for reptile habitat being present on site. The site is a predominantly well maintained garden with only limited suitable reptile habitat present over the majority of the site. The landscaped areas around the boundaries are formally managed, so also providing limited habitat potential. Compost piles/bins are present to the rear of no. 25, along with a currently non-maintained allotment area which again only provides limited habitat. The western/north western boundary adjoins a ditch and informal path area that contains some limited suitable reptile habitat. A reptile survey of more suitable linked habitat immediately to the north did not record any reptiles in 2014 (Aluco Ecology, 2014).

4.4.13 The habitats on site are considered to be mostly of **negligible value to value in the zone of influence** for reptiles, with limited habitat present.

Amphibians

4.4.14 Great Crested Newt *Triturus cristatus* is afforded protection under the Wildlife & Countryside Act and under the Habitat Regulations (see **Technical Appendix 1**). There are two ponds in the garden of 27 Orchard Way immediately north of the site, and their potential for supporting Great Crested Newt has been assessed. Given their size, location, lack of adjacent ponds/habitats and presence of high quantity of fish in the larger pond, it is considered unlikely that Great Crested Newts are present (Habitat Suitability Index assessment results for these ponds is provided in **Technical Appendix 6** – both are of low/poor suitability). The site

contains limited good quality suitable terrestrial habitat for amphibians with formal gardens and limited semi-natural habitats or areas of low formal management.

4.4.15 Two water bodies are shown on OS mapping just under 500m from the site, to the eastern edge of Harwell and associated with the small watercourse at the eastern edge of the village. These ponds were viewed from public roads as far as possible, and given the nature of these ponds associated with the watercourse, and distance from the site with suburban habitats in between, the connectivity to the site is low, and potential for Great Crested Newt presence within these ponds is low.

4.4.16 The data search returned a single record of Great Crested Newt *Triturus cristatus* over 1km from the site and to the east of the A34. A small number of records of Common Frog *Rana temporaria* and Common Toad *Bufo bufo* are also provided locally.

4.4.17 It is therefore considered unlikely that Great Crested Newt are present on site.

Invertebrates

4.4.18 Limited semi-natural habitats are present on site for invertebrates. The gardens may provide nectaring for commoner invertebrates found in suburban garden habitats, no significant woody or dead wood habitat is present. The site is generally considered to be of **value within the zone if influence** for invertebrates.

Key:

Target Notes (TN):

1 – Lawn of 25 Orchard Way
2 – Fruit Trees
3 – *R. rugosa* hedge western boundary
4 – Mature Sycamore (off site)
5 – Tree no longer present
6 – Ornamental fish pond
7 – raised swimming pool
8 – minature artificial pond
9 – 25 Orchard Way
10 – Hazel Hedge north of site

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Figure 3: Survey Results

5.0 ASSESSMENT OF LIKELY IMPACTS & POTENTIAL FOR MITIGATION

5.1 Introduction

5.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Sections 2 and 3, this section identifies potential ecological impacts within the predicted zone of influence. No detailed plans are provided for impact assessment, so the sections below are based on likely impacts from a housing development, and providing recommendations for mitigation and/or further survey work.

5.2 Impacts on Habitats & Species on Site

Potential Impacts on Habitats and Vegetation

5.2.1 The site contains relatively well managed if larger garden habitats. A development is likely to see the loss of the existing garden habitat on site and creation of smaller garden compartments. Impacts on these features are not considered significant.

Potential Impacts on Birds

5.2.2 There is a small amount of suitable woody vegetation and a number of buildings/sheds are present on site that may be used by nesting birds. If such habitat were to be removed during the breeding season there is potential to destroy bird nests, which would be contrary to Section 1 of the Wildlife and Countryside Act 1981 (as amended). Mitigation measures for birds include carrying out works on any woody vegetation at an appropriate time of year, usually considered to be between September to February. Small amounts of vegetation may be able to be removed at other times of year, but only if it is able to be checked to ensure that no nesting birds are present by a suitably qualified ecologist beforehand.

Potential Impacts on Bats

5.2.3 The main building on site provides moderate to low potential to support roosting bats, with no evidence of bat roosts noted during the site survey. A single visit emergence survey is recommended during the active bat season in favourable conditions (ideally late April/May – August). This would add further confidence to the visual survey site interpretation, and inform the need for further survey work depending upon the findings of the emergence survey (up to three emergence surveys may be necessary depending upon findings of the initial survey, as based on emergence survey guidelines), and need for a mitigation strategy for demolition.

5.2.4 The single Apple tree highlighted in no. 25 rear garden contains a potential bat roost feature. This does not require emergence survey and can be checked by a licensed bat surveyor should it be required to be felled as a part of the development. If there is no evidence of use by bats the tree should be felled following the methodology set out in **Technical Appendix 6** on 'soft tree felling for bats' and again can be included under a construction method statement.

5.2.5 If evidence of roosting bats were to be recorded during implementation of the above recommendations a European Protected Species licence for bats (or low impact licence) would need to be applied for.

5.2.6 A development scheme should consider creation of linear foraging and commuting routes through the development site to maintain connectivity. This can be through creation of new woody habitats and connected habitats around the site boundaries. Where external lighting of the site is proposed, this should consider potential impacts on bats and should be designed to be directional, pointing away from the boundary woody features including any newly created landscaping, to retain dark corridors allowing bats to move through the site and have regard to best practice guidance on bats and external lighting (BCT & ILP, 2018). This is particularly important on the western/north western boundary adjacent to the fields to the west.

5.2.7 The data search has returned a small number of records of the rare Western Barbastelle, suggesting it may be widespread but local in farmland adjacent to Harwell. This size, location and nature of the site, and nature of future development proposals, mean that the development is not likely to have a significant impact on this species or its habitats, especially where lighting recommendations are taken into account to ensure that there is no adverse impacts from light spill from a future development on retained farmland habitats off site to the west/northwest.

Potential Impacts on Reptiles

5.2.8 There is only limited suitable reptile habitat on site. With linkage to the wider countryside, there is potential for a very low population of common reptiles to be present. Given the survey results a development is unlikely to affect local reptile populations, however to ensure reptiles are not harmed, it is recommended that pre-construction mitigation involves habitat manipulation and a phased removal of any suitable habitat (eg compost areas and any rough edges to former allotment and western edge of the gardens) during the active reptile season, with potential for pre-construction monitoring and consideration of a phased destructive search where considered necessary (April – Sept/Oct).

5.3 Potential for Mitigation & Biodiversity Gain in Masterplanning

5.3.1 The development can provide mitigation/biodiversity gain through the following potential measures, a combination of these may provide benefits to biodiversity in the local area:

- Planting of a new native species hedgerow along the western/north western edge of the development in order to enhance wildlife corridors along these boundaries of the site were semi-natural habitats exist along a field edge/informal footpath. Planting a native species hedge along the south western boundary would also provide additional linear semi-natural habitat. A diverse species mix including locally native species (such as Hazel, Hawthorn, Blackthorn, Field Maple, Dogwood, Wayfaring Tree, Dog Rose) along this boundary would be suitable. This will enhance the wildlife corridor on the boundary here providing connectivity for ecology features such as birds and bats;
- Where a new path linking the recreation ground to the south of the site is provided, this will enable the existing informal access on the western/north western boundary to become part of the hedge/field edge improving habitats along this boundary;
- Provision of native species plantings in new gardens, including native garden shrubs along boundaries and/or semi-natural ‘native amenity mix’ lawns with low flowering

herbs. Providing lawns with a fine grass species (such as Red Fescue *Festuca rubra*, Crested Dog's-tail *Cynosurus cristatus* or Sweet Vernal Grass *Anthoxanthum odoratum)*.

- provision of bat boxes/bat bricks and access points to new buildings, suitably located by an ecologist;
- provision of bird boxes in new boundary habitat, and/or as part of new buildings, (such as *Schwegler* conventional and/or sparrow Terrace/Swift box/House Martin box would be appropriate) suitably located by an ecologist. With a number of Swift records from Harwell (see **Technical Appendix 4**), Swift bricks/boxes on two storey dwellings may help provide new opportunities for this local population.

6.0 CONCLUSIONS

6.1 An Ecological Appraisal was undertaken of the site with visits in February 2019. The survey on site recorded limited semi-natural habitats, with the majority of the site relatively formally maintained, albeit larger, gardens Potential for protected species and species of conservation concern is relatively limited given the habitats on site. Potential for impacts are highlighted and recommendations are provided for mitigation/biodiversity gain and further survey to ensure that a future protect will comply with legislation and planning policy for biodiversity.

7.0 REFERENCES

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

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 is 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

Local Plan 2031 Part 1, Adopted 2016

Core Policy 46: Conservation and Improvement of Biodiversity

Development that will conserve, restore and enhance biodiversity in the district will be permitted. Opportunities for biodiversity gain, including the connection of sites, large-scale habitat restoration, enhancement and habitat re-creation will be actively sought, with a primary focus on delivery in the Conservation Target Areas. A net loss of biodiversity will be avoided.

The highest level of protection will be given to sites and species of international nature conservation importance (Special Areas of Conservation and European Protected Species). Development that is likely to result in a significant effect, either alone or in combination, on such sites and species will need to satisfy the requirements of the Habitat Regulations*.

Development likely to result in the loss, deterioration or harm to habitats or species of importance to biodiversity or of importance for geological conservation interests, either directly or indirectly, will not be permitted unless:

i. the need for, and benefits of, the development in the proposed location outweighs the adverse effect on the relevant biodiversity interest;
ii. it can be demonstrated that it could not reasonably be located on an alternative site that would result in less or no harm to the biodiversity interests; and
iii. measures can be provided (and are secured through planning conditions or legal agreements), that would avoid, mitigate against or, as a last resort, compensate for, the adverse effects likely to result from development.

The habitats and species of importance to biodiversity and sites of geological interest considered in relation to points i) to iii) comprise:

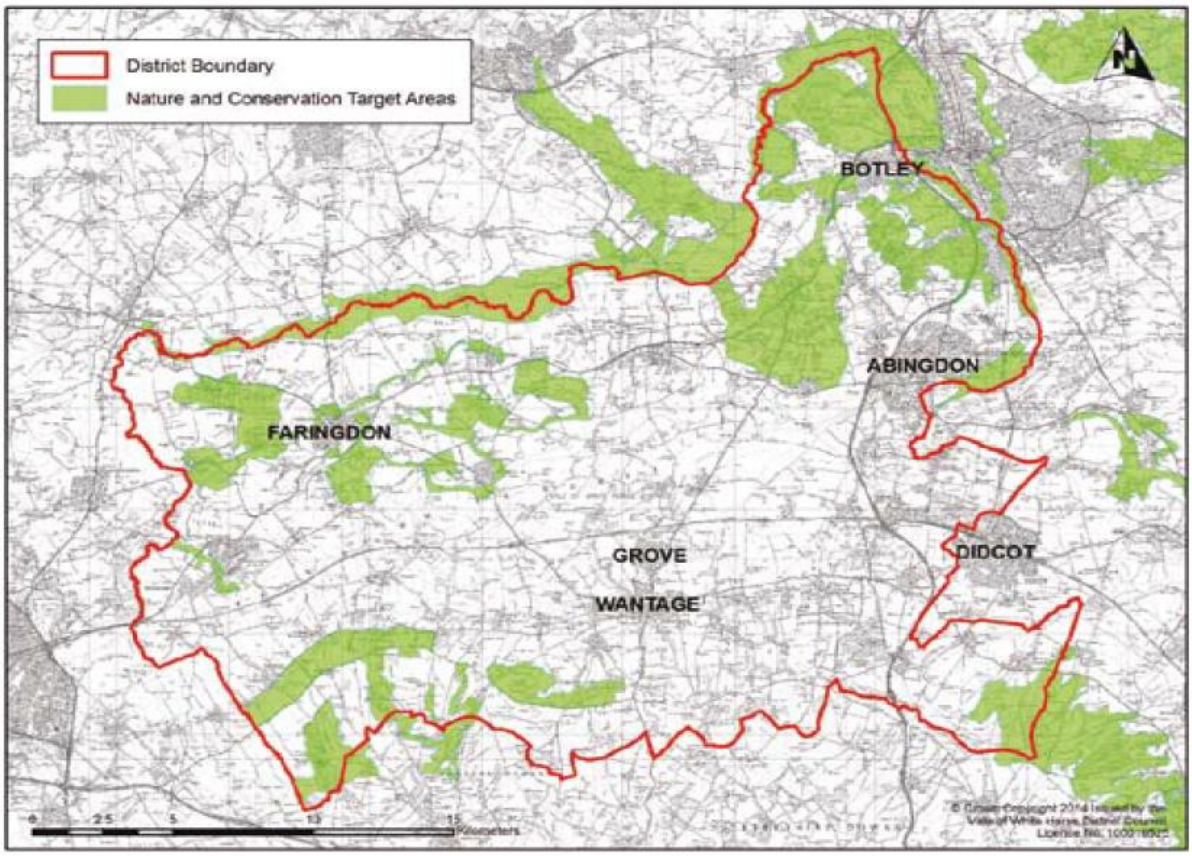
- Sites of Special Scientific Interest (SSSI)
- Local Wildlife Sites
- Local Nature Reserves
- Priority Habitats and species listed in the national and local Biodiversity Action Plan
- Ancient Woodland and veteran trees
- Legally Protected Species
- Locally Important Geological Sites

The level of protection and mitigation should be proportionate to the status of the habitat or species and its importance individually and as part of a wider network.

It is recognised that habitats/areas not considered above *(i.e. Nationally or Locally designated and not priority habitats)* can still have a significant biodiversity value within their local context, particularly where they are situated within a Conservation Target Area and/or they have good potential to be restored to priority habitat status or form/have good potential to form links between priority habitats or act as corridors for priority species. These habitats will be given due weight in the consideration of planning applications. If significant harm to these sites cannot be avoided (through locating on an alternative site with less harmful impacts) it will be expected that mitigation will be provided to avoid a net loss in biodiversity or, as a last resort, compensation will be required to offset the impacts and achieve a net gain in biodiversity.

* Habitats Directive 92/43/EEC of 21 May 1992.

Figure 6.2: Vale of White Horse Conservation Target Areas



Core Policy 45: Green Infrastructure

A net gain in Green Infrastructure, including biodiversity, will be sought either through on-site provision or off-site contributions and the targeted use of other funding sources. A net loss of Green Infrastructure, including biodiversity, through development proposals, will be resisted.

Proposals for new development must provide adequate Green Infrastructure in line with the Green Infrastructure Strategy. All major applications must be accompanied by a statement demonstrating that they have taken into account the relationship of the proposed development to existing Green Infrastructure and how this will be retained and enhanced. Proposals will be required to contribute to the delivery of new Green Infrastructure and/or the improvement of existing assets including Conservation Target Areas in accordance with the standards in the Green Infrastructure Strategy and the Habitats Regulations Assessment.

Development Policy 21: External Lighting

Development that involves external lighting will be permitted provided that:

i. there would not be an adverse effect on the character of the area, the amenity of neighbouring uses or on local biodiversity
ii. there would not be a hazard for pedestrians or people using any type of transportation, and
iii. the lighting proposed is the minimum necessary to undertake the task for which it is required

Where permission is granted for external lighting, conditions may be imposed that require:

iv. the fitting of devices to reduce glare and light spillage, and
v. restricting the hours during which the lighting may be operated.

Development Policy 30: Watercourses

Development of land that contains or is adjacent to a watercourse will only be permitted where it would not have a detrimental impact on the function or setting of the watercourse or its biodiversity, or the detrimental impact can be appropriately mitigated.

Plans for development adjacent to or encompassing a watercourse should include a minimum 10 m buffer zone along both sides of the watercourse to create a corridor of land and water favourable to the enhancement of biodiversity.

Proposals which involve culverting a watercourse are unlikely to be considered acceptable.

Development which is located within 20 m of a watercourse will require a construction management plan to be agreed with the Council before commencement of work to ensure that the watercourse will be satisfactorily protected from damage, disturbance or pollution.

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 Chartered Institute of Ecology and Environmental Management (IEEM June 2006, CIEEM 2016). 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 is searched for information regarding nationally or internationally designated sites within proximity of the development site.

The National Biodiversity Network (NBN) data base is searched to provide background information on local protected species records. The NBN provides access to a substantial volume of biodiversity data for the UK. Although rarely site specific, it does provide valuable background information on the local occurrence of protected species.

Where appropriate, the local environmental/biological records centre is consulted to provide information regarding locally identified sites and records of protected and/or notable species within the zone of influence of the proposed development.

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.

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 sites potential for providing bat foraging habitat. An Appraisal survey will consider potential features that could support a Bat roost, and this may include external inspections of the trees and buildings on site. The Appraisal survey will also consider bat habitats in relation to foraging and commuting potential, with semi-natural vegetation features considered and evaluated.

Where an inspection is undertaken this will look for the presence of bats as well as signs of their presence such as Bat droppings, e.g. within cavities and buildings; Staining at potential roost access points; Lack of bat evidence cannot be taken to mean the lack of use by bats because of a number of potential limitations:

- 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 cavities etc.

Badgers
An initial inspection is undertaken during the Appraisal survey for evidence of the presence of Badgers *Meles meles*, in particular Badger setts, on or near to the site. The Appraisal will search for 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 Appraisal survey will consider the potential for presence of Dormouse on or near the site, principally through habitat suitability, combined with data on occurrence within the area from the data search. Where suitable habitat occurs, further survey for feeding signs on hazel nuts where Hazel occurs, and searches for arboreal nests. If it a site is considered suitable, further Phase 2 survey work may be required.

Other Mammals
Consideration is also given in an Appraisal survey to the potential for habitats to support other legally protected mammals, and those of nature conservation significance. Where waterbodies and watercourses occur on or near to the site, the potential presence of species including Water Vole *Arvicola amphibious* 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 Appraisal 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 notable bird species, and birds of conservation concern.

Consideration is given to any features which could support nesting birds, including buildings and other structures, and areas of vegetation that may be affected by a development.

Reptiles
Any areas of habitat considered suitable for supporting reptiles are noted (for example, areas of rough grassland and scrub, banks, burrows, and rubble piles, compost heaps). If it a site is considered suitable, further Phase 2 survey is usually required if an impact from the development or project is considered likely.

Great Crested Newt
An Appraisal Survey considers habitat suitability, through the occurrence of suitable ponds and/or terrestrial habitat, and this will be combined with knowledge on their distribution from biological records for the area. If it a site is considered suitable, further Phase 2 survey is usually required if an impact from the development or project 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, an Appraisal Survey concentrates 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
An Appraisal survey is carried out during a brief window of time. Therefore the survey can only provide 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. Survey was restricted through land access as it is unusual to have a landowner owning land surrounding that which is being surveyed.

Assessment Guidelines

Introduction

The IEEM guidelines (2006) and updated in 2016 (CIEEM, 2016) provide three principal reasons for an ecological feature being valued and therefore included: 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 CIEEM'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 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 (National Planning Policy Framework).

Technical Appendix 4

Data Search Summary

Taxon Name	Common Name	European Directives	UK Legislation	NERC s41	Other Designations	Earliest Record	Latest Record	No. of Records	Max. Abundance
Amphibians									
Triturus cristatus	Great Crested Newt	HabDir-A2np HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a	NERC-S41			23/08/2014	1	Present
Bufo bufo	Common Toad		WACA-Sch5-s9.5a	NERC-S41		01/07/2012-31/10/2012	01/07/2012-31/10/2012	1	3
Rana temporaria	Common Frog	HabDir-A5	WACA-Sch5-s9.5a			1987 - 2004	05/01/2015	4	3
Birds									
Perdix perdix	Grey Partridge			NERC-S41	Bird-Red	15/09/2004	15/09/2004	1	4
Milvus milvus	Red Kite	BirdsDir-A1	WACA-Sch1-p1		RL-Global-post2001-NT	17/04/2004	05/01/2015	5	2
Accipiter gentilis	Goshawk		WACA-Sch1-p1			06/03/2006	06/03/2006	1	1
Falco tinnunculus	Kestrel				Bird-Amber	29/06/2009	29/06/2009	1	Present
Falco subbuteo	Hobby		WACA-Sch1-p1			14/05/2001	14/05/2001	1	1
Pluvialis apricaria	Golden Plover	BirdsDir-A1				14/10/1998	14/10/1998	1	20
Vanellus vanellus	Lapwing			NERC-S41	Bird-Red	19/12/1998	03/06/2006	9	600
Streptopelia turtur	Turtle Dove			NERC-S41	Bird-Red	08/04/2003	08/04/2003	1	1
Tyto alba	Barn Owl		WACA-Sch1-p1			24/02/2006	03/10/2006	2	1
Apus apus	Swift				Bird-Amber	27/04/2004	06/07/2018	23	50
Anthus pratensis	Meadow Pipit				Bird-Amber	29/03/1998	26/01/2000	2	50
Turdus pilaris	Fieldfare		WACA-Sch1-p1		Bird-Red	21/02/1998	18/01/2004	2	400
Muscicapa striata	Spotted Flycatcher			NERC-S41	Bird-Red	07/07/1999	21/05/2001	2	3
Linaria cannabina	Linnet			NERC-S41	Bird-Red	02/11/2006	02/11/2006	1	11
Emberiza citrinella	Yellowhammer			NERC-S41	Bird-Red	31/03/1999	17/05/2015	2	1
Emberiza calandra	Corn Bunting			NERC-S41	Bird-Red	21/02/1998	24/12/2006	9	57
Higher Plants - Flowering Plants									
Cephalanthera damasonium	White Helleborine			NERC-S41	RL-Eng-post2001-VU RL-GB-post2001-VU	07/05/2012	07/05/2012	1	485
Anacamptis morio	Green-winged Orchid				RL-Eng-post2001-VU RL-GB-post2001-NT	1990	1990	1	Present
Hyacinthoides non-scripta	Bluebell		WACA-Sch8			1990	1990	1	Present
Sorbus anglica	English Whitebeam				Status-NR RL-Eng-post2001-VU RL-GB-post2001-NT RL-Global-post94-VU	05/01/2015	05/01/2015	1	Present
Plantago media	Hoary Plantain				RL-Eng-post2001-NT	28/04/1990-23/06/1990	28/04/1990-23/06/1990	1	Present
Monotropa hypopitys	Yellow Bird's-nest			NERC-S41	Oxon-Scarce RL-Eng-post2001-EN RL-GB-post2001-EN	07/05/2012	07/05/2012	1	Present

Taxon Name	Common Name	European Directives	UK Legislation	NERC s41	Other Designations	Earliest Record	Latest Record	No. of Records	Max. Abundance
Sanicula europaea	Sanicle				RL-Eng-post2001-NT	1990	1990	1	Present
Invertebrates - Butterflies									
Coenonympha pamphilus	Small Heath			NERC-S41	RL-GB-post2001-NT	09/01/1990	09/01/1990	1	Present
Invertebrates - Moths									
Sitochroa palealis	Sulphur Pearl				Notable	08/03/1994	08/03/1994	2	1
Timandra comae	Blood-vein			NERC-S41		07/11/1981	07/11/1981	1	Present
Caradrina morpheus	Mottled Rustic			NERC-S41		07/11/1981	07/11/1981	1	Present
Hoplodrina blanda	Rustic			NERC-S41		07/11/1981	07/11/1981	1	Present
Melanchra persicariae	Dot Moth			NERC-S41		07/11/1981	07/11/1981	1	Present
Graphiphora augur	Double Dart			NERC-S41		07/11/1981	07/11/1981	1	Present
Mammals - Terrestrial (bats)									
Barbastella barbastellus	Western Barbastelle	HabDir-A2np HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41	RL-Global-post2001-NT	05/07/2013	12/09/2014-17/09/2014	4	1
Eptesicus serotinus	Serotine	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b			06/06/2013-07/06/2013	01/06/2017-30/08/2017	3	1
Myotis	Unidentified Bat	HabDir-A2np HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41	RL-Global-post2001-NT	18/08/2005	01/06/2017-30/08/2017	8	1
Myotis daubentonii	Daubenton's Bat	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b			21/05/2013-22/05/2013	01/06/2017-30/08/2017	3	1
Myotis nattereri	Natterer's Bat	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b			01/06/2017-30/08/2017	01/06/2017-30/08/2017	1	1
Nyctalus leisleri	Lesser Noctule	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b			01/06/2017-30/08/2017	01/06/2017-30/08/2017	1	1
Nyctalus noctula	Noctule Bat	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41		05/07/2013	01/06/2017-30/08/2017	4	1
Pipistrellus	Pipistrelle Bat species	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41		23/02/1993	22/08/2014	3	1

Taxon Name	Common Name	European Directives	UK Legislation	NERC s41	Other Designations	Earliest Record	Latest Record	No. of Records	Max. Abundance
Pipistrellus pipistrellus	Common Pipistrelle	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b			01/07/2012-30/09/2012	01/06/2017-30/08/2017	9	1
Pipistrellus pygmaeus	Soprano Pipistrelle	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41		01/07/2012-30/09/2012	01/06/2017-30/08/2017	9	4
Plecotus auritus	Brown Long-eared Bat	HabDir-A4	HabReg-Sch2 WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41		01/07/2012-30/09/2012	01/06/2017-30/08/2017	8	1
Mammals - Terrestrial (excl. bats)									
Erinaceus europaeus	West European Hedgehog			NERC-S41		08/11/2006	2014	4	2
Meles meles	Eurasian Badger		Badgers-1992			20/03/2013	05/01/2015	20	1
Lepus europaeus	Brown Hare			NERC-S41		19/03/1999	06/06/2015	6	2

Techncial Appendix 5

Bat Survey Methodology

(1) Trees Survey Method

Introduction

All bat species and their roosts are fully protected in Britain under the Wildlife and Countryside Act 1981(as amended) and the Habitat Regulations.

Initial Survey

Tree survey methodology involves looking for any suitable holes, cracks, niches or crevices which could be used by bats for roosting. In addition, large or apparently unhealthy trees which have a dense covering of Ivy possibly covering holes or crevices also have some potential to support bats. These are all termed potential roost features.

A survey for signs of residence by bat species consists of a slow methodical search of all aspect of the tree for actual roosting bats and their signs. Droppings around holes, on the tree trunk or on the ground beneath can be used to identify species. Scratch marks and staining at roost entry and exit holes. The presence of spider webs at a potential roost can often indicate their absence at that time although does not mean that the hole is not used at all. Careful attention is given to any sounds indicating the presence of a breeding bat roost (i.e. audible social calls). The survey is completed using binoculars from ground level and high powered torch and endoscope to inspect cavities with ladder where safe access permits.

Detailed Tree survey

Where the value of an individual tree or woodland area is found to be high during a preliminary survey, a more comprehensive survey in order to fully assess the likely value of the potential bat feature is undertaken. The scope of additional work will vary depending on a range of environmental factors.

Survey techniques are likely to include:

- Emergence survey during early evening (i.e. prior to emergence and at emergence), with the aid of a bat detector for ultrasonic calls.
- Climb-and-inspect assessment of selected trees to check for cavities and inspection with an endoscope or mirrors if appropriate.
- Foraging and transect walks through habitat surrounding potential tree roosts to understand local bat use of the site.

Survey work is tailored to each individual case, and the degree of evening emergence and foraging work undertaken is based on the following factors:

- size of the site;
- number of trees to be affected;
- habitats on site (eg water features/woodland);
- habitats and protected sites in the wider countryside;
- knowledge of bat use in local area;
- geographical range of rare species;
- proximity to known or suspected roosts.

Limitations of Tree Survey

Bats may move regularly between different tree roosts, and if used infrequently, signs to indicate the use of such trees by bats are unlikely to be evident. In addition, any signs which are left on trees by bats as a result of their use of a roost site (e.g. droppings below a roost exit) may be washed off as a result of wind and rain. Consequently, it is often difficult to confirm the presence of a bat tree roost. Surveys are best described as a sampling tool to assess presence of different bat species using the site at that time and place and general use of the area by bats.

Evaluation of Potential Suitability of Proposed Development Sites for bats (including Buildings & Trees)

The latest bat survey guidelines has provided guidance on assessing and evaluating development sites and features for bat roost potential:

The potential for trees to support roosting or breeding bats is evaluated under the following protocol for the visual inspection of trees:

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[a] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[b]). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.[c]	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[a] and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[a] and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

[a] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
[b] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
[c] This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Table from (BCT 2016 at p35)

(2) Bats in Buildings Survey Method

Introduction

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats needs to be considered in an ecological assessment of a development site. Building survey methodology is provided below.

Methods

The survey for signs of residence by bat species consists of undertaking 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 & 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 buildings are searched, including gaps at the roof timber frame joints. External surfaces of the building are also examined for evidence of use of any potential bat access points. The surveyor uses a strong torch in dark internal areas and shaded outdoor 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 is 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 wall cavities etc.

Surveys are carried out during a brief window of time, and therefore, provide only a snapshot of the site use. As 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 is also 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.

Reference

Bat Conservation Trust. (2016) Bat Surveys Good Practice Guidelines. 3rd Edition. Bat Conservation Trust.

Bat Conservation Trust. (2012) Bat Surveys Good Practice Guidelines. 2nd Edition. Bat Conservation Trust. March 2012. ISBN-13: 9781872745985

Mitchell-Jones ed. (2006) "Bat Conservation Handbook" Third Edition, English Nature

Safe Tree Felling Methodology

Best practice methods for Tree Work

Works to trees used by bats (even if the bats are not present at the time) may result in an offence being committed under this law. If bats or bat roosts are found to be present in a tree, a European Protected Species (EPS) license from Natural England is likely to be required to legally undertake works on that tree. Where a satisfactory survey has resulted in no evidence of bats being found, and bats are then incidentally discovered during work, it is a legal requirement that the activities are halted immediately and Natural England consulted.

To reduce the chance of disturbing a bat roost it is important to avoid the summer (breeding season) and winter (hibernation) months. Works to trees with potential for bats is best done in September when young bats are mobile and on the wing, female bats are unlikely to be pregnant and the hibernation season has not yet begun. March is also a suitable time, (although careful survey is required for nesting birds as these are legally protected during this period).

Bats may move regularly between different tree roosts, and if used infrequently, signs to indicate the use of such trees by bats are unlikely to be evident. In addition, any signs which are left on trees by bats as a result of their use of a roost site (e.g. droppings below a roost exit) may be washed off as a result of wind and rain.

Consequently, it is often difficult to confirm the presence of a bat tree roost, and as a result an assessment of the trees to identify those with potential to support a bat roost is usually undertaken with trees with bat potential categorised into three categories.

There are a number of procedures that can be used by tree surgeons to ensure that best practice is maintained when undertaking tree felling/pruning operations. These are detailed below. The application of these principals apply to both Category 1 and Category 2 listed trees (see BCT, 2012).

These methods should be used on these trees during the suitable tree felling periods (September and March).

- Keep tree work to a minimum retaining all potential roosts where possible.

- A precautionary inspection of the tree(s) by the tree surgeon looking for signs of bats should be carried out before starting work. This should include an inspection of all holes and niches using a torch and preferably an endoscope. If bats or signs of bats are found no work should start and Natural England should be contacted for further advice.

- Where possible avoid cross cutting in proximity to cavities or hollows.

- Limbs with internal fissures should be pruned carefully to maintain integrity of features as potential roost sites.

- Any sections felled containing cavities should be lowered carefully and left on the ground (preferably for 24 hours) with the openings clear, allowing anything inside an opportunity to escape.

- Split limbs that are under tension may need to be wedged open to prevent their closure when pressure is released, potentially trapping bats.

- Where ivy covers areas of a tree's trunk or branches, there may be hidden roosting potential behind it. Dealing with ivy covered trees depends on the amount of ivy. If there is a thick mass of ivy growth it may be practical to consider felling the tree on the basis that the thickness of the foliage will soften the fall and reduce the shock. This tree can then be inspected on the ground and if possible left for 24hours, before section cutting. If the tree is only partially covered, pruning or sectioning may be more appropriate. If the works are not urgent cutting the ivy at its base and completing the work when the ivy is dead, thus reducing the bat roosting potential should be considered. However where stems of ivy create a dense mass against the trunk there will always be roosting potential.

If bats or evidence of bats are found at anytime, all works must stop immediately and the Ecologist and Natural England contacted for further advice.

Technical Appendix 6

Habitat Suitability Index for Ponds Adjacent to Site

Pond 1 – Ornamental Koi Carp Pond (see Photo 6 & TN6 above)

HSI Assessment

HSI Criteria	**Score**
1 – Geographic Location	1
2 – Pond Area	0.05
3 – Permanence	Never dries = 0.9
4 – Water Quality	Poor (clear but low invert diversity) = 0.33
5 – Shade	1
6 – Waterfowl	Absent = 1
7 – Fish	Present in high density = 0.01
8 – Pond Count in 1km	0.4
9 – Terrestrial Habitat	0.67
10 – Macrophyte Cover	0.35
Score: (Sum of 1-10)$^{0.1}$	**0.33 = Poor**

Pond 2 – Miniature Artificial Pond (see Photo 8 & TN8 above)

HSI Assessment

HSI Criteria	**Score**
1 – Geographic Location	1
2 – Pond Area	0.05
3 – Permanence	Never dries = 0.9
4 – Water Quality	Poor = 0.33
5 – Shade	0.6 (shaded by adjacent hedge)
6 – Waterfowl	1
7 – Fish	1
8 – Pond Count in 1km	0.4
9 – Terrestrial Habitat	0.67
10 – Macrophyte Cover	0.31
Score: (Sum of 1-10)$^{0.1}$	**0.48 = Poor**

References

ARG UK (2010) Great Crested Newt Habitat Suitability Index. ARG UK Advice Note 5

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155