



**Blackthorn Cottage, Chawridge Lane,
Maiden's Green, Winkfield, Berkshire SL4 4QR**

**Ecological Appraisal
& Bat Mitigation Strategy**

September 2020

on behalf of Mrs T. Perry

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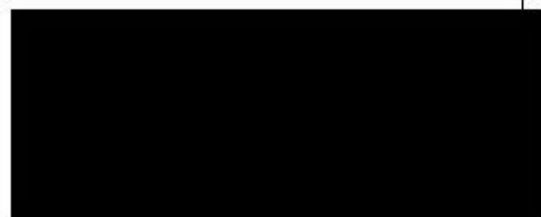
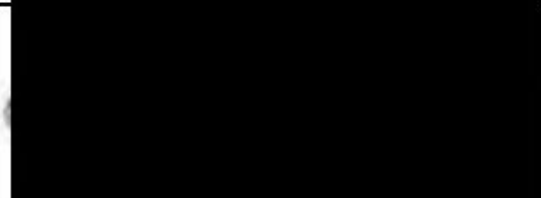
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1 Introduction

1.1 Site Description & Context

Blackthorn Cottage (referred for the purposes of this report as the “site”) is located to the western side of Chawridge Lane, on the northern edge of the village of Maiden’s Green, near Winkfield in Berkshire SL4 4QR. The approximate Ordnance Survey (OS) grid reference for the site is SU 900 732. A location plan is provided in Appendix 1.

The site comprises the detached dwelling of Blackthorn Cottage, an associated annex, a stable barn, a residential garden and an adjacent horse paddock. The dwelling is an L-shaped building of chalet bungalow style that is located in the eastern half of the site. It possesses brick walls and a hip and valley roof of clay tiles, with a western facing gable end. The annex is a comparatively small, single-storey building positioned in the north-eastern corner of the site. It is also of brick construction, with a gabled roof of clay tiles. The stable barn extends along part of the northern boundary to the east of the annex. It has shiplap timber walls and a pitched roof of corrugated asbestos panels.

The gardens which surround the cottage are laid to lawn with beds of ornamental flower and shrub planting and occasional garden trees. The eastern half of the site consists of a horse grazed paddock of improved grassland, around the margins of which are a number of trees. The site boundaries are formed by hedgerows to the north and south, a length of blackthorn *Prunus spinosa* hedge to the east, and a post and rail fence to the west.

Hedgerow-bound paddocks neighbour the site to the north, south and west, with a further grassland field present beyond Chawridge Lane to the east. Residential development within Maiden’s Green is concentrated to the south and includes detached residences arranged along Winkfield Lane; substantial gardens for a number of these properties extend north towards and in some cases beyond the site. Further afield, the landscape surrounding the village is characterised by agricultural land punctuated by low density residential development and pockets of woodland.

Chawridge Bourne Site of Special Scientific Interest (SSSI) is located approximately 160m of the site, to the north-west. This linear designated site extends along the banks of the stream after which it is named and encompasses a number of ecologically notable habitats including unimproved neutral to acid grassland, broadleaved woodland and an ancient parish boundary hedge which boasts a diverse woody assemblage.

Ponds and pools are a frequent landscape feature within the environs of the site, with an examination of OS maps indicating over 20 ponds or comparable water bodies being present within a 500m radius. Woodland within the near vicinity is generally contained to relatively small copses and coverts, while further afield more extensive tracts of woodland are present, the closest of which is Windsor Forest, located approximately 2.2km to the east.

1.2 Proposed Works

The exact nature and scale of proposed development works were not known at the time this report was prepared; however, it is understood that the three existing buildings will be demolished, and that new dwelling/s will be erected.

1.3 Aims of Study

The aims of this study are to describe and evaluate the habitats present within the site and to assess the potential for the site to support protected and notable species. The habitats are evaluated, and the report discusses the potential impacts of development on the ecology of the site and protected/notable species. Recommendations are made for appropriate mitigation & compensation measures in light of the impact assessment.

One specific aim of this study is to survey the Cottage, Annex and Stable Barn for bats and/or evidence of bats and to evaluate the nature conservation significance of the buildings for roosting bats. The potential impacts on bats are assessed in accordance with the legal protection afforded to bats under The Conservation of Habitats & Species Regulations 2017 (as amended) and advice on the requirements for mitigation and a European Protected Species (bat) licence is discussed in light of the impact assessment.

1.4 Bat Ecology

Bats are the only mammals to have developed the ability of true flight. At present, over 1,100 species of bat are recognised worldwide, making bats the second largest mammal group after rodents. As well as flight, bats have evolved a system of navigation and orientation using echolocation which has allowed many species to become nocturnal. There are 18 species of bat that occur within the British Isles, of which 17 are known to breed here. More species occur in the south and west of the country, with species numbers declining towards the north and into Scotland.

All bat species in the UK are nocturnal and feed exclusively on insects (they are insectivorous) which they catch in flight during their night-time activity, using echolocation to locate and home-in on their prey. Bats will roost during the daytime and seek out dark, enclosed and undisturbed places in which to do so, often using a variety of roosting sites within their home range. Different roost sites are used for different purposes (such as mating, giving birth and hibernation) and at different periods of a bat's life cycle.

During the summer, female bats will gather together in a maternity or breeding roost. In the UK, this starts to occur towards the end of May and the females will seek out a warm and undisturbed site in which to give birth. Because maternity roosts require a particular set of environmental attributes (such as location, temperature, orientation and size), breeding bats tend to return to roost and breed in the same locations year after year. Given that bats live a relatively long time (anywhere from 10-20 years), and only give birth to one pup a year, maternity colonies are crucial to the reproduction and survival of the local population and can be very sensitive to environmental change.

Relatively little is known about hibernation roosts, as tracking and locating hibernating bats is very difficult. However, many species (particularly those within the genera *Myotis* and *Rhinolophus*) have been found within underground sites such as caves, mines and cellars, where the temperature remains constant and low throughout the winter allowing the bats to remain in a state of torpor. The spring and autumn are periods of transition and bats can use a number of different locations on a temporary basis, often moving between roosts as environmental conditions change and temperatures fluctuate. In the autumn, bats will mate, and it has been shown that male and female bats will gather at particular locations (such as a building, cave or tree) to meet, socialise and copulate.

Bats choose to roost in a number of different locations, depending on the species, their activity pattern and the period of their lifecycle. Certain species, such as the pipistrelles, favour crevices and small cavities for roosting and will use features such as cracks, crevices and small rot holes in the boughs and trunks of trees and within certain features of buildings such as boxed eaves, gaps under roof tiles, hanging tiles and soffit boards. Other species favour large, uncluttered roof spaces and lofts within buildings where they can hang up on the underside of the roof and use the interior space for flying prior to emergence. Hollow trees, cellars, caves, barns, churches and cavity walls can also all be used for roosting, given suitable access. Certain species, such as the noctule, favour roosting sites within trees whilst others tend to favour buildings. Roost sites may be used by only a very small number of bats, such as solitary males, or may offer shelter to tens or hundreds of bats within maternity and hibernation roost sites.

The suitability of roosting sites is also highly influenced by the location or context of a tree, building or cave. Roost sites are most often favoured when they are within close proximity to foraging habitats

and where those habitats are connected to one another within the landscape by features such as hedgerows, woodlands, rivers or sunken lanes along which bats disperse and 'commute' from place to place. Suitable foraging habitats are any places where insect prey is diverse and abundant such as woodlands, ponds, lakes, rivers, scrub, hedgerows and unimproved grassland or pasture. Thus, the ecological context of a site is very important for determining if bats may be present within a roost and the potential for a roost to be present tends to be much higher within rural or village locations.

1.5 Great Crested Newt Ecology

Great crested newts are the largest of the three species of newt that occur in the UK. They are distinctive due to their relatively large size, dark colour and yellow or orange-coloured undersides covered in large black blotches. Males can be distinguished from females by the presence of a blue/grey flash on the tail and a jagged crest during the breeding season.

Great crested newts tend to spend the majority of their time on land, moving to ponds and pools to breed during the spring and summer (March to July), although some individuals can spend considerably longer within aquatic habitats. The female lays two or three eggs a day between March and mid-July, until a total of 200 to 300 eggs have been laid. The eggs are laid on submerged aquatic vegetation, each carefully wrapped in a leaf.

The larvae (or efts) hatch after about three weeks and live in the pond as aquatic predators until they metamorphose into adult newts. They are vulnerable to fish predation, and water bodies containing fish are rarely used for breeding (this means that they do not usually use running water or larger lakes or ponds where fish are present).

After metamorphosis into air-breathing juveniles at about four months old, they live a terrestrial life until old enough to breed, which is at about two or three years of age. Both the juvenile newts and the adults (outside the breeding season) live in terrestrial habitats with dense cover such as scrub, rough grass and woodland, usually within about 200-300 metres of the breeding pond. They rest during the day beneath rocks, logs or other shelters.

Larval newts usually feed on tadpoles, worms, insects and insect larvae. Adults hunt in ponds for other newts, tadpoles, froglets, worms, insect larvae and water snails. They also hunt on land for insects, worms and other invertebrates. During the winter months, the newts hibernate under logs and stones. The newts normally return to the same breeding site each year, and can live as much as 25 years, although up to about 10 years is more usual.

2 Methodology

2.1 Desk Study

The Thames Valley Environmental Records Centre (TVERC) was contacted in June 2020 to gather records that it holds for protected and notable species, and non-statutory sites of nature conservation importance from within a 1km radius of the site.

The Multi-Agency Geographic Information for the Countryside (www.magic.gov.uk) website was searched for information regarding internationally protected sites (e.g. Special Areas of Conservation) within 5km of the site and statutory sites of nature conservation importance (e.g. Sites of Special Scientific Interest) within a 1km radius.

Other Internet resources interrogated as part of the desk study include:

- Google Earth Pro
- Old Maps - www.old-maps.co.uk
- Where's the path - <https://wtp2.appspot.com/wheresthepath.htm>

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and the Bracknell Forest Biodiversity Action Plan 2018-2023 were consulted to gather information pertaining to priority habitats and species for conservation action at the national and local level.

Aerial photography interpretation was used to place the site into an ecological context and to provide information on the nature of the habitats beyond the site boundary. The information gathered is used to provide a baseline to the habitat assessment.

2.2 Extended Phase 1 Habitat Survey

An extended Phase 1 Habitat Survey was undertaken on 5th June 2020 by Robbie Birkett *MSci*. A walkover of the site was conducted, and a description of the habitats present was prepared using standard Phase 1 Habitat Survey methodology (JNCC 2010).

Target notes were also prepared on features of particular ecological interest within the site and an assessment was made of the site's potential to support protected and notable species (such as species listed under Section 41 of the NERC Act 2006).

2.3 Initial Bat Survey & Roost Assessment (Buildings & Trees)

An initial bat survey and preliminary bat roost assessment were also undertaken on 5th June 2020 by Robbie Birkett *MSci*. Mr Birkett holds a licence from Natural England to survey for bats within all counties of England (Licence No. Level 1 2019-39934-CLS-CLS) and has over three years of experience in undertaking bat surveys.

A detailed survey of the Cottage, Annex and Stable Barn (internal and external) was undertaken using a 1 million candle-power torch and close-focusing binoculars in order to look for bats and/or evidence of bats and to assess the potential of the buildings to support roosting bats. The buildings were inspected for evidence of bats including, bat droppings, urine stains, feeding remains (such as moth wings) and characteristic fur staining around access points.

Notes were made on the relative freshness, shape and size of bat droppings and the location and quantity of any feeding remains. 'Clean' gaps and crevices within the structure of the buildings were looked for as this can indicate where bats may have gained access to the interior spaces and the fabric of the walls.

The bat survey was undertaken according to best practice guidelines published by the Bat Conservation Trust (Collins 2016) and the *Bat Workers Manual* (JNCC, 2012).

The study also takes into account the structure and ecological context of the buildings, including the following factors which may increase the likelihood of roosting bats being present:

- Age of the building (pre-20th Century or early 20th Century construction)
- Nature of construction; traditional brick, stone or timber construction
- Large and complicated roof void with unobstructed flying spaces
- Large (>20 cm) roof timbers with mortice/tenon joints, cracks and holes
- Entrances and gaps for bats to fly and crawl through
- Poorly maintained fabric providing ready access points for bats into roofs, walls; but at the same time not being too draughty and cool.
- Roof warmed by the sun, south-facing roofs in particular
- Weatherboarding and/or hanging tiles with gaps
- Undisturbed roof voids
- Buildings and built structures in proximity to each other providing a variety of roosting opportunities throughout the year

- Buildings or built structures close to good foraging habitat, in particular mature trees, parkland, woodland or wetland, especially in a rural setting.

Trees within the site were also assessed for their potential to shelter roosting bats. The survey was undertaken from ground level, with trees inspected for potential roost features.

Potential roost features (PRFs) that may be used by bats include (Collins 2016):

- woodpecker holes;
- rot holes;
- hazard beams;
- other vertical or horizontal cracks and splits (such as frost cracks) in stems or branches;
- partially detached bark;
- knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar;
- man-made holes (e.g. cavities that have developed from flush cuts) or cavities created by branches tearing out from parent stems;
- cankers (caused by localised bark death) in which cavities have developed;
- other hollows or cavities, including butt-rots;
- double leaders forming compression forks with included bark and potential cavities;
- gaps between overlapping stems or branches;
- partially detached ivy with stem diameters in excess of 50mm; and bat, bird or dormouse boxes

The following criteria are used for as guidelines for assessing the potential suitability of buildings and trees for bats (Collins, 2016):

Table 1. Criteria for the assessment of buildings and trees for roosting bats (Collins 2016).

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features likely to be used by roosting 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 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). A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after the presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitats.

In addition to the bat survey, the buildings were checked for evidence of nesting birds including old birds' nests, bird droppings, feathers and eggs.

2.4 DNA Analysis of Bat Droppings

A sample of droppings was collected from the loft space of the cottage during the inspection undertaken on the 5th June 2020 and sent to Ecowarwicker Ecological Forensics laboratory for mammalian species identification through DNA analysis.

2.5 Bat Activity Surveys

Bat activity (emergence) surveys focusing on the Cottage at Blackthorn Cottage, Winkfield were conducted at dusk on the 30th June 2020, 29th July 2020 and 19th August 2020, in accordance with best practice (Collins 2016).

The presence of roosting bats was established during the first of these, with the subsequent surveys used to characterise the roosts present. For details of the surveyors employed during each of the surveys please see Table 2 below.

Table 2. Bat activity survey schedule.

Date	Surveyors
30/06/20	Jan-Piet Stuursma (Natural England Bat Survey Licence No. WLM-A34 Level 2: 2018-37063-CLS-CLS) Angela Mills (Natural England Bat Survey Licence No. WLM-A34 Level 2: 2015-10148-CLS-CLS) Robert Spencer (Natural England Bat Survey Licence No. WLM-A34 Level 2: 2015-14778-CLS-CLS)
29/07/20	Robbie Birkett <i>MSci</i> (Natural England Bat Survey Licence No. WLM-A34 Level 1 2019-39934-CLS-CLS) Oliver Bevan <i>MEnvSci</i> Reuben Hayden <i>BSc (Hons) QCIEEM</i>
19/08/20	Oliver Bevan <i>MEnvSci</i> Reuben Hayden <i>BSc (Hons) QCIEEM</i> Angela Mills (Natural England Bat Survey Licence No. WLM-A34 Level 2: 2015-10148-CLS-CLS)

Please refer to Table 3 for timing and weather conditions during the bat activity surveys and Figure 1 for the location of surveyors during each survey. Surveyors watched for bats emerging from the cottage at dusk and were equipped with either Echometer Touch or Anabat Walkabout Active bat detectors to record and analyse bat calls in real time.

Table 3. Timings and weather conditions during the bat activity surveys at Blackthorn Cottage, Winkfield.

Date	Timing	Sunset	Temp (Start)	Temp (Finish)	Weather (at start of survey)
30.06.20	20:49-22:34	21:04	17°C	16°C	Dry, overcast (100% cloud cover) with light breeze (Beaufort Scale 2)
29.07.20	20:39-22:24	20:54	18°C	17°C	Dry, overcast (80% cloud cover) with light breeze (Beaufort Scale 2)
19.08.20	20:01-21:46	20:16	20°C	20°C	Dry, cloudy (50% cloud cover) with light breeze (Beaufort Scale 2)



Figure 1. The position of the surveyors at Blackthorn Cottage, Winkfield during the bat activity surveys undertaken in 2020. Positions of surveyors during surveys on 30/06/20, 29/07/20 & 19/08/20 are shown as yellow dots. The study building (Cottage) is shown by the white outline. Site outlined in red.

2.6 Great Crested Newt Habitat Assessment

Two ponds within the locality of the site were assessed for their suitability to support great crested newts according to the criteria and method developed by Oldham *et al.* 2000. The work by Oldham, and others, hypothesises that the likely presence of breeding great crested newts can be predicted by a number of habitat characteristics such as pond size, location, shading, the presence of fish, wildfowl and aquatic plants.

These data are used to calculate a Habitat Suitability Index (HSI); represented as a number from 0 to 1. The higher the number, the more likely the pond is to be occupied by breeding great crested newts. Following Oldham's study, further work by Dr Lee Brady has resulted in a system for using HSI scores to define pond suitability for great crested newts on a categorical scale. This scale is shown in Table 4.

The studies by Oldham and Brady indicate that great crested newts tend to avoid ponds with low HSI scores. Ponds with relatively low HSI scores (poor to below average) typically only support great crested newt when they are located close to another occupied pond. Low scoring ponds are therefore only likely to support great crested newts in areas of high pond density. Ponds with relatively high HSI scores (good - excellent) frequently support great crested newts and survey work undertaken in England indicates that great crested newts are present in more than 90% of 'excellent' ponds.

Table 4. HSI categories for pond suitability.

HSI	Pond suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 - 0.69	Average
0.7 - 0.79	Good
> 0.8	Excellent

2.7 Great Crested Newt eDNA Survey

Environmental DNA (eDNA) samples were taken from the same two ponds in order to ascertain the presence/absence of great crested newts within these water bodies. The eDNA samples were taken on 30th June 2020 by Robbie Birkett *MSci*. Mr Birkett was working as an accredited agent under the licence of Edward Bodsworth *MA (Cantab) PhD MCIEEM*. Dr Bodsworth has a licence to survey for great crested newts in all counties of England (Natural England Licence No. 2016-20376-CLS-CLS).

The survey involved the collection of 20 samples of water from various locations around the ponds using sterile sampling equipment. The samples were then mixed and pipetted into 6 test tubes containing an alcohol preservative before being shipped to a laboratory for analysis. Polymerase Chain Reaction (PCR) analysis was used to multiply any great crested newt DNA present within the pond water to a detectable level, thus indicating the presence/absence of the species within a waterbody.

The eDNA sampling was undertaken in accordance with guidelines published by Cellmark eDNA Testing. The analysis of the samples followed the stipulated methodology published by DEFRA and adopted by Natural England (DEFRA 2015).

2.8 Limitations on Survey Data

As with any survey undertaken on a certain date, the data presented within this report provide information at particular points in time and presents a 'snap-shot' of the ecological status of the site. Ecosystems and species behaviour/activity are dynamic and can change over time. Whilst this report presents a characterisation and evaluation of habitat and species status at the time of the study, it should not be taken as an exhaustive representation of the ecological status of the site either at present or into the future.

3 Results & Evaluation

3.1 Ecological Context

3.1.1 National Character Profile

Blackthorn Cottage is located on the northern edge of the village of Maiden's Green in eastern Berkshire. It is covered by the Thames Valley National Character Area (NCA), as defined by Natural England.

The Thames Valley is a mainly low-lying, wedge-shaped area, widening from Reading, which includes Slough, Windsor, the Colne Valley and the southwest London fringes. The River Thames provides a unifying feature through a very diverse landscape of urban and suburban settlements, infrastructure networks, fragmented agricultural land, historic parks, commons, woodland, reservoirs and extensive minerals workings.

Hydrological features dominate the Thames Valley, and include the Thames and its tributaries, part of the Grand Union Canal and the reservoirs which form the South- West London Waterbodies Special Protection Area (SPA) and Ramsar site. These features provide essential water supply services for

London and the surrounds, as well as being important areas for wildlife and recreation in an essentially urban landscape. Flows and water levels in the River Thames are managed by a series of locks and structures upstream of Teddington. Flood defence and water quality improvement measures, such as the restoration of wetlands for flood management, provide opportunities for biodiversity and recreation.

3.1.2 Sites of Nature Conservation Importance

3.1.2.1 Statutory Sites

Windsor Forest & Great Park Special Area of Conservation (SAC)

Part of the extensive Windsor Forest & Great Park SAC is located within a 5km radius of the site, being located within 2.3km at its closest point.

Windsor Forest & Great Park SAC is an internationally designated site of conservation importance. Annex I habitats that are the primary reason for its selection are old acidophilous oak woods with *Quercus robur* on sandy plains. It has the largest number of veteran oaks *Quercus* spp. in Britain (and probably in Europe), a consequence of its management as wood-pasture. It is of importance for its range and diversity of saproxylic invertebrates, including many rare species (e.g. the oak click beetle *Lacon querceus*), some known in the UK only from this SAC, and has recently been recognised as having rich fungal assemblages. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this SAC are Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer.

An Annex II species that is a primary reason for selection of this site is the violet click beetle *Limoniscus violaceus*. The site is thought to support the largest of the known populations of this species in the UK. There is a large population of ancient trees on the site, which, combined with the historical continuity of woodland cover, has resulted in Windsor Forest being listed as the most important site in the UK for fauna associated with decaying timber on ancient trees.

Chawridge Bourne Site of Special Scientific Interest (SSSI)

Chawridge Bourne SSSI is located approximately 160m to the north-west of the site and lies along the banks of a small stream, covering an area of 8.94 ha. This designated site is of national conservation importance and comprises areas of old unimproved grassland, ancient broadleaved woodland and scrub. The northern part of the SSSI is managed by the Berkshire, Buckinghamshire & Oxfordshire Wildlife Trust (BBOWT) as a nature reserve, named Chawridge Bank.

The SSSI is divided into three units. The first of these exhibits unimproved neutral to acid grassland which is stretched out along the western facing bank. Positive indicator species noted within the grassland sward include lady's bedstraw *Galium verum*, common bird's-foot-trefoil *Lotus corniculatus*, agrimony *Agrimonia eupatoria*, dyer's greenweed *Genista tinctoria*, tormentil *Potentilla erecta* and rough hawkbit *Leontodon hispidus*.

The second unit is located in closest proximity to Blackthorn Cottage and comprises a relatively narrow stretch of ancient woodland which extends alongside the stream before widening into Steven's Copse in the north. The woodland consists of neglected coppice stands with typical woody species including oak *Quercus* sp., hazel *Corylus avellana*, ash *Fraxinus excelsior*, wild service tree *Sorbus torminalis*, crab apple *Malus sylvestris*, elder *Sambucus nigra* and maple *Acer* spp. The ground flora is fairly species-rich and contains species rare in Berkshire such as goldilocks buttercup *Ranunculus auricomus*, hart's-tongue fern *Phyllitis scolopendrium* and soft shield-fern *Polystichum setiferum*.

The third unit contains an area of open grassland that is isolated from other areas of grassland within the SSSI by mature scrub. Dyers greenweed is abundant within the sward, while agimont, lady's

bedstraw and tormentil are frequent. The upper slopes are noted to be more species-rich than the lower slopes, while brambles encroachment is noted to the southern side of the unit.

3.1.2.2 Non-statutory Sites

Two Local Wildlife Sites (LWS) and one Biodiversity Opportunity Area (BOA) are present within a 1km radius of the site.

Maiden's Green LWS

Maiden's Green LWS lies approximately 380m to the south-west of the site and covers an area of 4.4ha. This LWS comprises two main areas, which are separated by a road. The area to the south-east of the road features an historic moat and is predominately unimproved neutral grassland. The moat, along with the boundaries are mostly wooded, with some areas of standing water, damp grassland and scrub. The area of LWS to the north-west of the road has not been subject to recent survey but was noted when last surveyed as being species-rich.

Stirrups Country House Hotel Field LWS

This LWS is located approximately 925m to the south west of the site, occupying a footprint of 1.62ha. It comprises two small areas of unimproved grassland with areas of impeded drainage, surrounded and intersected by a scrubby hedgerow. When last surveyed, the grasslands had 13 species associated with Lowland Meadow including sneezewort *Achillea ptarmica*, pepper saxifrage *Silaum silaus*, devil's-bit scabious *Succisa pratensis* and large bird's-foot trefoil *Lotus pedunculatus*. Species associated with wetter grassland habitats could be found around the areas of poor drainage, including floating sweet-grass *Glyceria fluitans*, purple loosestrife *Lythrum salicaria*, marsh thistle *Cirsium palustre* and wild angelica *Angelica sylvestris*.

Chawridge Valley BOA

The Chawridge Valley BOA covers the narrow valley of the Chawridge Bourne centred on Chawridge Bourne SSSI. The BOA extends up to the boundary of Blackthorn Cottage. It includes areas of areas of Lowland Meadow within Chawridge Bourne SSSI, Lowland Mixed Deciduous Woodland along the stream within the SSSI, on the valley slopes and along Hogoak Lane, and extensive areas of scrub along the valley and scattered scrub in the grassland habitats.

The targets and opportunities for the BOA are:

- Management and re-creation of lowland meadow habitat to extend an important but fairly isolated site.
- Woodland management
- Scrub management.

3.1.3 Protected Species Records

The following sections provide a summary of the data search results from Thames Valley Environmental Records Centre (TVERC) and refers to the most pertinent species, given the nature of the habitats present within the site and the immediate locality of the site. Please refer to Appendix 3 for a full list of protected species records provided by TVERC.

3.1.3.1 Amphibians

The data search returned 26 records of amphibians, with three species represented including the great crested newt *Triturus cristatus*, smooth newt *Lissotriton vulgaris* and common toad *Bufo bufo*.

The great crested newt accounts for 14 of the 26 records, with this species having been recorded at five different locations between 1993 and 2018. Recording locations include one field record made within the site itself in 1997, with the additional four locations being spread to the east, west and south-west. Six records were made in 2018 at a pond situated along Winkfield Lane, approximately 290m to the east of the site, with records indicating a confirmed breeding presence. Two records

made in 2005 pertain to Tow's Bourne Pond, located on the opposite side of Winkfield Lane, 330m to the east of the site. The species has also been recorded on three occasions in 2003 at Whitelocks Farm approximately 900m to the west and on two occasions, in 1993 & 2005, close to Moat Farm approximately 485m to the south-west. It is ambiguous as to whether all of these recordings were for animals observed within a pond or seen terrestrially. Given the quite large number of ponds within the local landscape and the spread of locations where this species has been previously recorded, it is considered probable that other ponds within the locality are also utilised by this species for breeding.

The data search returned 11 smooth newt records, with this species for the most part having been recorded co-inhabiting the same ponds/habitats as those where the great crested newt has been recorded. There is no record for this species within the site.

There is one record for common toad, with this having been made in 2005 at a location close to Moat Farm, approximately 485m to the south-west.

3.1.3.2 Reptiles

Only one species of reptile has been recorded from the local area, and this is the grass snake *Natrix helvetica*. Four records are held by the local records centre, dating from between 1994 to 2015. Locations for recording include Chawridge Bank BBOWT reserve to the north-west, Stirrups Country House Hotel Field LWS to the south-west and a location on Winkfield lane approximately 200m to the south.

The improved grassland and garden habitats of the site are not considered to be suitable for this species, with the grazed paddock and mown lawns offering no shelter or protection to reptiles. Boundary hedgerows may provide some limited shelter for reptiles but are unlikely to form a key habitat resource.

3.1.3.3 Birds

A number of protected/notable bird species have been recorded within the 1km radius around the site. These include species that use hedgerow and/or garden habitats such as dunnock *Prunella modularis*, house sparrow *Passer domesticus*, linnet *Linaria cannabina*, bullfinch *Pyrrhula pyrrhula*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris* and redwing *Turdus iliacus*.

The site's boundary hedgerows, along with trees and shrubs within the garden and paddock offer potential nesting habitat for these species.

3.1.3.4 Plants

A number of woodland plant species such as bluebell *Hyacinthoides non-scripta* and wild service tree *Sorbus torminalis*, and grassland plant species such as Dyer's Greenweed *Genista tinctorial* and Devil's-bit Scabious *Succisa pratensis* have been recorded within the 1km search radius. The vast majority of these plant records come from either Chawridge Bourne SSSI to the north-west or Maiden's Green LWS and Stirrups Country House Hotel Field LWS to the south-west. There is also a concentration of records from along Hogoak Lane about 1km to the north-west.

The two records made in closest proximity to the site include one record for ragged robin *Lychnis flos-cuculi* made in 1996 at a location approximately 90m to the north-west and a record for a wild service tree beside Chawridge Lane approximately 85m to the south, made in 1999.

No rare or uncommon wild plant species were observed within the garden, paddock or boundary habitats at Blackthorn Cottage.

3.1.3.5 Invertebrates

The data search returned invertebrate records for various species of beetle, butterfly and moth, along with two species of Hymenoptera and one species of fly. As with plant records the vast majority invertebrate records were made at locations within Chawridge Bourne SSSI.

The stag beetle *Lucanus cervus* has been recorded on seven occasions between 1996 and 2018. This includes two records made within the site in 1996. This saproxylic (requiring rotten wood to complete their lifecycle) species spends the majority of its life cycle in larval form, during which it feeds on decaying wood, often buried underground. During its adult stage, males and females take to the wing in order to find mates and it is at this stage that the beetles are most conspicuous and are most likely to be recorded. The site is considered largely unsuitable for stag beetles during their larval stage due to the scarcity of lying and buried deadwood present.

Butterfly species that have been recorded include grassland species such as the dingy skipper *Erynnis tages*, grizzled skipper *Pyrgus malvae* and small heath *Coenonympha pamphilus*. Areas of grassland within the site (both grazed paddock and amenity grassland/lawn) are not suitable for these species and are unlikely to support a rare or diverse invertebrate assemblage due to the nature of the management to which they are subject. The white-letter hairstreak *Satyrrium w-album* has also been recorded at Chawridge Bank and along Hogoak Lane. This species tends to breed where elms occur in sheltered hedgerows, mixed scrub and on the edges of woodland rides; although an elm hedgerow is present along the site's northern boundary, this habitat feature is sub-optimal for this species which typically breeds on mature trees, or on abundant sucker growth near dead trees.

3.1.3.6 Bats

There are records of brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *pipistrellus pygmaeus*, lesser noctule *Nyctalus leisleri*, noctule *Nyctalus noctule* and unspecified *Myotis* bat from within the search area, with the majority of records dating from since 2010.

3.1.3.7 Other Mammals

Records for other mammals include those for brown hare *Lepus europaeus*, badger *Meles meles*, water vole *Arvicola amphibius* and harvest mouse *Micromys minutus*. Most records for these species pertain to locations within Chawridge Bourne SSSI, with badger and harvest mouse having also been recorded on one occasion at locations to the south of the site.

Habitats within the site and its immediate surrounding are considered unsuitable for water vole. The habitats present are also considered to be of negligible value to brown hare which generally inhabits large, open farmland fields.

3.2 Habitats

3.2.1 Overview

The site can be divided into two areas; an eastern section which contains the cottage, annex and stable barn, with these being set within a residential garden, and a western section comprising a horse grazed paddock within which are located six young to semi-mature trees. The northern and southern site boundaries are formed by managed hedgerows. A blackthorn hedge forms the eastern boundary while a timber post and rail fence denotes the western boundary, separating the site from a neighbouring paddock.

A plan showing the location of the three buildings is presented in Figure 2. Photographs of the site (including buildings) can be found in Appendix 1.

3.2.2 Buildings

3.2.2.1 Blackthorn Cottage

Blackthorn cottage is located centrally within the eastern half of the site. It is a detached dwelling of chalet bungalow style which occupies an L-shaped footprint of roughly 160m². The cottage's walls are constructed of painted brickwork and are punctuated by PVC framed windows in all elevations. The walls are in a good state of repair, lacking any perceivable gaps or cracks which could be exploited by roosting bats.

The roof is of a hip and valley design with a gable end at the western aspect. The roof surface consists of a clay tiles and ridge tiles, laid over a bitumen and hessian felt, and supported by a timber frame. The roof surface is generally in a good condition; however, it does possess relatively frequent gaps, with these being the product of either lifted or deformed tiles, and on occasion a slipped tile. These gaps within the roof surface are considered to form potential self-contained roost features for bats as well as potential bat access point into the cottage's loft void. There are timber boxed eaves at the roof-wall junctions with these found to be tightfitting throughout.

The cottage contains a single enclosed loft void which extends over the eastern section of the 'L' footprint, with the roof space in the smaller western section having been converted for liveable accommodation. The loft void has a floor-to-ridge height of roughly 2.2m and is somewhat cluttered by trusses and two chimney stacks. The void was noted to be dark, with no significant light spill entering the void from outside. The underside of the roof is lined with a bitumen and hessian underfelt which is for the most part free from significant rips or tears.

The cottage is assessed as having 'high' potential to offer shelter to roosting bats (Collins 2016) due to the presence of suitable roost features within the tiled roof surface, the presence of an enclosed loft void that is likely to be accessible to bats, and the building's rural setting.

3.2.2.2 Annex

The annex is a single-storey, detached structure located in the north-east corner of the site, across an area of hard-standing from the cottage. This comparatively small building occupies a simple rectangular footprint of approximately 26m². It possesses painted brick walls and a gabled roof of clay tiles over a timber frame. Fenestration consists of PVC framed windows in the eastern and western elevations, a timber door in the southern elevation and a glazed skylight in the eastern pitch of the roof. There are timber boxed eaves at the eastern and western aspects and close-fitting timber bargeboards at the northern and southern gable ends. There are no enclosed loft voids within the internal space.

The annex is in a good state of repair. The brickwork is intact with no perceivable gaps or cracks that could be used by roosting bats. The clay tile roof surface is generally very tight fitting; there are occasional slightly deformed tiles on the roof however these are not considered to create gaps within the roof surface that are suitable crevice roost features for bats.

The annex is assessed as having 'negligible' potential to offer shelter to roosting bats (Collins 2016) due to its simple construction and lack of suitable roost features.

3.2.2.3 Stable Barn

The stable barn is a single storey, detached structure located on the site's northern boundary, adjacent to the annex to the west. The building has an elongated rectangular footprint and is of simple construction with shiplap timber walls and a pitched roof of corrugated cement fibre panels arranged over a timber frame. The external walls are backed by timber boarding on the interior up to a height of 1m, above which they are single-skin. The external shiplap boarding is in a very good condition throughout with no locations noted where damage or warping has created potential crevice roost

features for bats. Fenestration includes a series of stable doors in the southern elevation, glazed windows in the northern elevation, skylights inserted in the roof surface and a double, shuttered door in the western elevation. The structure's eaves are open with a 5cm gap leading directly into the interior.

The interior of the barn is subdivided into three spaces by MDF board partition walls. Each internal space is open to the underside of the roofing panels. All internal spaces are well illuminated by the multiple large skylights and windows; the building contains no dark, enclosed voids that could act as potential roost locations for bat species which favour voids within which to roost.

The stable barn is assessed as having 'negligible' potential to offer shelter to roosting bats (Collins 2016) due to the very simple nature of its construction, the unsuitability of its internal spaces and the lack of any potential roost features within its external fabric.



Figure 2. Aerial photograph showing the location of three buildings at Blackthorn Cottage, Winkfield. Source: Google Earth Pro

3.2.3 Garden

3.2.3.1 Amenity Grassland

A lawn (amenity grassland) extends around the western and southern side of the cottage, occupying much of the space within the garden in the eastern half of the site. The lawn is managed to a short sward, exhibiting a height of c.5cm at the time of survey. It possesses a quite consistent species composition throughout, being dominated by vigorous grasses with accompanying common and widespread herbs including daisy *Bellis perennis*, white clover *Trifolium repens*, dandelion *Taraxacum officinale*, mouse-ear chickweed *Cerastium vulgatum* and broad-leaved plantain *Plantago major*.

The lawn is not considered to meet the criteria of any habitats of 'principal importance' as listed under Section 41 of the NERC Act 2006, such as 'Lowland Meadows', due to the fact that it managed for its amenity value and that the species present are typical of lawns throughout southern England, containing widespread and common herbs, with no rare or scarce plants observed.

The amenity grassland habitat is considered to be of low/negligible ecological value.

3.2.3.2 Ornamental Planting

Flowerbeds and shrubberies, with occasional small trees are present around the margins of the cottage and around the peripheries of the garden, with the largest beds being to the west of the building. The beds and shrubberies are managed for their ornamental value and appear to be fairly long-established with native 'weedy' species growing in some areas.

Plants, shrubs and young to semi-mature trees present in these areas include the following species (as well as additional ornamentals): wisteria *Wisteria* sp., apple *Malus domestica*, *Euonymus* sp., Portuguese laurel *Prunus lusitanica*, Leyland cypress *Cupressus* × *leylandii*, *Rhododendron* sp., foxglove *Digitalis* sp., spearmint *Mentha spicata*, herb Robert *Geranium robertianum*, oxeye daisy *Leucanthemum vulgare*, fuchsia *Fuchsia* sp. and garlic mustard *Alliaria petiolata*.

Areas of ornamental planting do not meet the criteria of any Section 41 Habitats of 'principal importance' and are considered to be of ecological value within the context of the site only, given the fact that they have been planted and managed for their amenity value.

Denser areas of woody vegetation offer some potential nesting habitat for bird species typical of garden habitats, including notable species such as song thrush and dunnock that have been recorded within the local area. They may also provide some limited shelter for native wildlife such as amphibians, invertebrates and small mammals. The small number of trees present are also considered to be of ecological value within the context of the site only given their limited size and maturity, and their loose connectivity to nearby woodland.

3.2.3.3 Hard-standing

Areas of hard-standing are present in the form of a tarmac driveway to the east of the cottage and south of the annex, paving to the north-west of the cottage, and a concrete walkway which runs in parallel with the southern edge of the stable barn.

Areas of hard-standing are considered to be of negligible ecological value.

3.2.4 Horse Paddock

3.2.4.1 Improved Grassland

The western half of the site consists of a paddock of improved grassland. The grassland was subject to horse grazing at the time of survey and exhibited a short-cropped sward of <5cm. The sward is species-poor, being dominated by vigorous grasses including perennial ryegrass *Lolium perenne*, cocks-foot grass *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*, with a low diversity of accompanying herbaceous species including creeping buttercup *Ranunculus repens*, broad-leaved dock *Rumex obtusifolius* and daisy.

The improved grassland paddock is not considered to meet the criteria of any habitats of 'principal importance' as listed under Section 41 of the NERC Act 2006, such as 'Lowland Meadows'. It possesses a botanical assemblage typical of agriculturally improved ground utilised for livestock grazing and a short, uniform structure.

The improved grassland habitat is considered to be of low ecological value.

3.2.4.2 Trees

A small number of trees are dotted amongst the improved grassland in the western half of the site. This includes a cluster of four planted fruit trees in the east comprising a mature apple, a young apple, a semi-mature plum *Prunus domestica* and a semi-mature cherry *Prunus avium* that is in poor health and has been heavily pruned back to the trunk.

Old aerial photography indicates that until around 2008, this eastern area of the paddock formed part of the residential garden for Blackthorn Cottage and it is likely that the four fruit trees were planted as ornamentals.

The two additional trees include a semi-mature ash tree *Fraxinus excelsior* located in the south-west and a semi-mature oak *Quercus robur* located close to the southern boundary.

Of the six trees, the mature apple, semi-mature ash and semi-mature oak are considered to be of highest ecological value within the context of the site due to their size and maturity. The other three fruit trees are considered to be of lower ecological value due to their limited size and age.

3.2.5 Boundaries

3.2.5.1 Northern Boundary – Hedgerow

The western half of the site's northern boundary is formed by an elm hedgerow *Ulmus procera* with a standard young field maple *Acer campestre* and standard young oak. The hedgerow has a squared off shape indicative of regular trimming and is relatively dense to ground level. The underlying ground flora is quite scant due to heavy shading and includes species such as creeping buttercup and grasses species abundant within the paddock it bounds.

The hedgerow along the northern boundary meets the criteria for 'Hedgerows' under Section 41 of the NERC Act 2006 but does not qualify as an 'important' hedgerow under the Hedgerow Regulations 1997 due to the dominance of one native woody species.

The hedgerow provides nesting opportunities for breeding birds and shelter for small mammals and other native wildlife. It exhibits good connectivity to the wider hedgerow network and is considered to be of ecological value within the local context.

The eastern half of the northern boundary is denoted by a timber fence which runs behind the stable barn and annex.

3.2.5.2 Southern Boundary – Hedgerow

The majority of the site's southern boundary is formed by a native hedgerow with occasional standards and a parallel dry ditch on the northern side. The hedgerow is between 4-6m in height and shows some evidence of trimming. It is quite thick and dense along the majority of its length with a double row of shrubs evident in some places. Component woody species noted including blackthorn, ash, elm, elder *Sambucus nigra*, dog rose *Rosa canina* and dogwood *Cornus sanguinea*.

The ground flora contains shade tolerant species such as ivy *Hedera helix*, bramble *Rubus fruticosus* agg., garlic mustard and ground ivy *Glechoma hederacea*. The dry ditch is populated by grasses and some ruderals including cow parsley *Anthriscus sylvestris*, bramble, cleavers *Galium aparine* and greater willow herb *Epilobium hirsutum*.

The southern boundary hedgerow is considered to meet the ecological criteria for an 'important' hedgerow under the Hedgerow Regulations 1997 and is also considered to qualify as a habitat of principal importance ('Hedgerows') under Section 41 of the NERC Act 2006. The hedgerow provides nesting opportunities for breeding birds with an active blackbird nest *Turdus merula* noted at the time

of survey. It also provides potential foraging habitat and shelter for small mammals and other native wildlife such as amphibians. It exhibits connectivity to the wider hedgerow network at its eastern end. The southern boundary hedgerow is considered to be of ecological value within the local context.

3.2.5.3 Eastern Boundary – Hedge

The eastern site boundary is denoted by a hedge which separates the site from Chawridge Lane. The hedge is dominated by blackthorn with additional woody species noted in low abundance including hawthorn and elm. It contains a standard young oak tree and is intersected by the access driveway onto the property in two locations. The hedge is approximately 2.5m in height and has a squared off shape indicative of trimming. The underlying ground flora is dominated by ivy.

The eastern boundary hedge meets the criteria for 'Hedgerows' under Section 41 of the NERC Act 2006 but does not qualify as an 'important' hedgerow as it is dominated by one native woody species. It provides some limited nesting opportunities for breeding birds and shelter for small mammals. The hedge is considered to be of ecological value within the context of the site.

3.2.5.4 Western Boundary – Fence

The western boundary is demarcated by a timber post and rail fence which separates the site from a neighbouring horse grazed paddock. The fence has negligible ecological value, providing no habitats for wildlife.

3.3 Species

3.3.1 Amphibians

There are no ponds or standing open water habitats within the site that amphibians could use for breeding. Ponds and standing waterbodies are however a frequent habitat feature within the local landscape, with an examination of Ordnance Survey maps indicating the presence of up to 24 ponds or similar open water bodies within a 500m radius of Blackthorn Cottage, 11 of which are located within 250m.

Given that three amphibian species have been recorded within a 1km radius, including the great crested newt, consideration therefore needs to be given as to whether amphibians could move onto the site during their terrestrial phase.

The areas of improved and amenity grassland which together occupy the majority of the site's footprint are considered (in their current condition) to be unsuitable for amphibians, including the great crested newt. This is due to their very short sward heights which provide little to no shelter for amphibians.

The flowerbeds and shrubberies in the eastern half of the site provide some limited ground cover that could be used as temporary shelter by amphibians but lack the structural and botanical diversity that typifies good amphibian foraging habitat. The northern and southern boundary hedgerows are considered to provide suitable amphibian foraging and sheltering habitat.

The distribution of amphibians during their terrestrial phase is largely dictated by availability of suitable breeding habitat, with all native species requiring an aquatic environment within which to breed. It is believed that great crested newts can disperse up to 500m from a breeding pond, however the majority of individuals will typically be found within 250m. Research by Creswell and Whitworth (2004) found that the majority of great crested newts are found within approximately 50m of a breeding pond, given sufficient suitable habitat in close proximity, and they also found a significant drop-off in newt capture rates beyond 100m of a pond.

3.3.1.1 Great Crested Newt HSI Assessments

Permission was not secured to access nine of the eleven ponds/waterbodies within a 250m radius of the site. Two of the ponds in closest proximity to the site were subject to HSI assessment:

- Pond 1 – Located approximately 43m to the south-west of the site boundary (Ordnance Survey grid reference SU 8997 7315).
- Pond 2 – Located approximately 110m to the north-west of the site boundary (Ordnance Survey grid reference SU 8998 7333)

Please refer to Figure 3 for the location of these two ponds, and the other nine ponds/waterbodies within a 500m radius of the site.

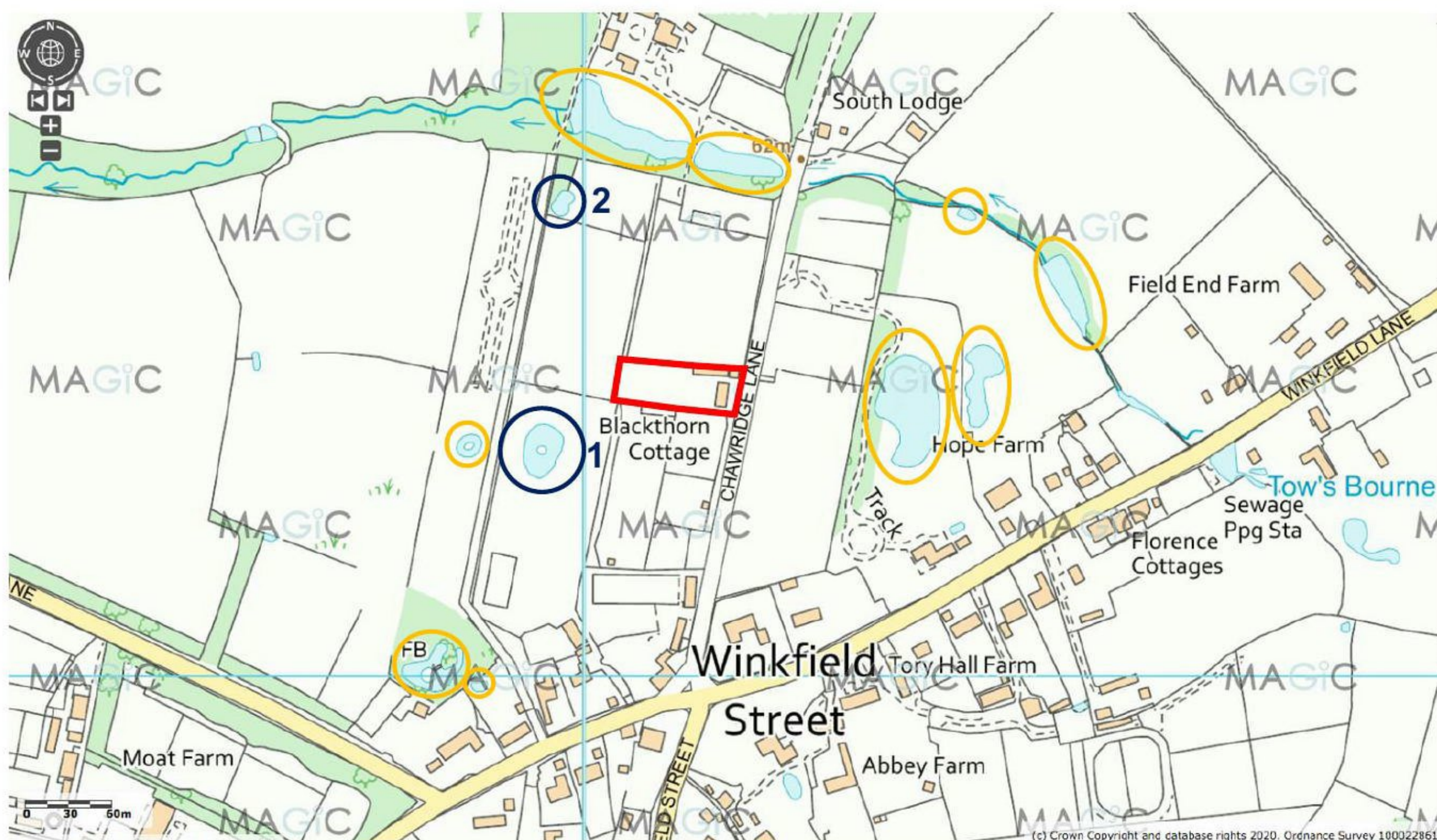


Figure 3. Plan showing ponds within a 250m radius of the site. Ponds circled in blue were included within the HSI and eDNA survey, numbered Pond 1 and Pond 2. Ponds circled in yellow were not surveyed. Blackthorn Cottage, Winkfield is outlined in red.

Pond 1

Pond 1 is the pond/waterbody is closest proximity to the site boundary. An HSI assessment of the pond identified it as having 'excellent' (HSI of 0.84) suitability for breeding great crested newts. Results of the HSI assessment of Pond 1 are presented in Table 5.

Table 5. HSI assessment of Pond 1.

Characteristic	Score
Sl ₁ Location	1
Sl ₂ Pond Area	0.985
Sl ₃ Pond Drying	0.9
Sl ₄ Water Quality	0.67
Sl ₅ Shade	1
Sl ₆ Fowl	0.67

Characteristic	Score
Sl ₇ Fish	0.7
Sl ₈ Ponds	1
Sl ₉ Terrestrial Habitat	1
Sl ₁₀ Macrophytes	0.65
Habitat Suitability Index	0.84
Suitability	Excellent

Pond 2

An HSI assessment of Pond 2 identified it as also having 'excellent' (HSI of 0.82) suitability for breeding great crested newts. Results of the HSI assessment of Pond 2 are presented in Table 6.

Table 6. HSI assessment of Pond 2.

Characteristic	Score
Sl ₁ Location	1
Sl ₂ Pond Area	0.4
Sl ₃ Pond Drying	0.5
Sl ₄ Water Quality	0.67
Sl ₅ Shade	1
Sl ₆ Fowl	1
Sl ₇ Fish	1
Sl ₈ Ponds	1
Sl ₉ Terrestrial Habitat	1
Sl ₁₀ Macrophytes	1
Habitat Suitability Index	0.82
Suitability	Excellent

3.3.1.2 Great Crested Newt eDNA Sampling Survey

Great crested newt eDNA sampling surveys of Ponds 1 & 2 were undertaken to establish presence/absence of this species within these waterbodies. Please refer to Appendix 5 for an extract from the technical report containing the results of the eDNA analysis.

Pond 1

Pond 1 tested negative for great crested newt DNA indicating that breeding great crested newts are absent from this waterbody.

Pond 2

Pond 2 tested positive for great crested newt DNA. It is therefore considered that breeding great crested newts are likely present within this waterbody.

Given the above results and taking into account the prevalence of ponds within the local landscape and available records of great crested newts held by the local records centre, it is considered likely that a number of further suitable ponds/standing waterbodies within a 500m radius of the site will support breeding great crested newts.

3.3.2 Reptiles

Habitats within the site, including areas of improved grassland, amenity grassland and ornamental planting are considered unsuitable for reptiles. Both grassland habitats have short swards which lack the structural and botanical diversity favoured by reptiles. Areas of ornamental planting within the garden possess only very limited ground cover that could provide shelter for reptiles and little to no foraging value.

Hedgerows along the northern and southern site boundaries offer some suitable shelter for reptiles, however given the nature of the off-site habitats which neighbour these boundary features (horse paddocks), reptiles are considered likely to absent or only very infrequent visitors.

3.3.3 Birds

No evidence of nesting birds was noted in association with the three buildings within the site.

Bird species observed within the site during the extended Phase 1 habitat survey include great tit *Parus major*, robin *Erithacus rubecula* and blackbird *Turdus merula*. An active blackbird nest was noted within the southern boundary hedgerow.

Trees and woody shrubs within the site as well as the hedgerows on the northern, eastern and southern boundaries offer nesting opportunities to breeding birds. The breeding bird assemblage is likely to be dominated by common and widespread species of garden bird, and possibly some farmland species given the site's rural context. The assemblage may include species listed as Species of Principal Importance within Section 41 of the NERC Act 2006 such as dunnock and song thrush.

The site is considered unsuitable for ground nesting bird species such as skylarks *Alauda arvensis*.

3.3.4 Plants

No rare or scarce plants were noted within the site. In particular, no rare grassland flowering plants were observed within the garden or horse paddock.

3.3.5 Invertebrates

Grassland habitats within the site possess a limited botanical diversity and are not predicted to support a particularly diverse invertebrate assemblage.

Trees and ornamental shrubs within the garden are likely to support an assemblage of common and widespread invertebrates, with flowers offering a resource of pollen and nectar. The boundary hedgerows and larger trees in the western half of the site will also be of value to invertebrates and may well support some moth species listed as Principal Importance under Section 41 of the NERC Act 2006. Oak trees in particular are known to support an array of invertebrate life.

There are no significant dead wood habitats that provide suitable larval habitat for stag beetles.

3.3.6 Bats

3.3.6.1 Building Inspection – 5th June 2020

Blackthorn Cottage

No bats were observed in association with the Cottage during the building inspection on the 5th June. Two accumulations of bats droppings were however observed within the building's loft space. This included an accumulation of approximately 16 bat droppings below the ridge at the southern end of the loft and an accumulation of approximately 40 bat droppings at the northern end of the loft, below the meeting point between the ridge board and main hip rafters.

The majority of droppings seen appeared relatively fresh and are considered to likely date from either the 2019 or 2020 bat activity periods. All droppings were the size and shape indicative of the brown long-eared bat *Plecotus auritus*. DNA analysis of a sample of the bat dropping present confirmed that they are those of the brown long-eared bat (please refer to Appendix 6 for a copy of the results).

The Cottage is assessed as having 'high' potential to offer shelter to roosting bats (Collins, 2016).

Annex and Stable Barn

No bats or evidence of bats were observed in association with either the Annex or Stable Barn. Both buildings are assessed as having 'negligible' potential to offer shelter to roosting bats (Collins, 2016). No further surveys of these buildings are deemed necessary.

3.3.6.2 Bat Activity Surveys

30th June 2020

Three common pipistrelles *Pipistrellus pipistrellus* and one brown long-eared bat were seen to emerge from the cottage on the 30th June 2020:

- 21:36 – common pipistrelle emerged from beneath tile on eastern side of the roof and flew north-west (Figure 4)
- 21:38 – common pipistrelle emerged from beneath roof tile on western roof pitch and flew south-west (Figure 5)
- 21:59 – common pipistrelle emerged from beneath roof tile between chimney stacks on eastern side and flew north-east (Figure 4)
- 22:18 – brown long-eared bat emerged from tiles on northern roof hip (exact location not identified) and flew east (Figure 6). Considered likely that brown long-eared bat seen to emerge was roosting within the Cottage's loft void.



Figure 4. Yellow circles depict the approximate locations of common pipistrelle emergences from the Cottage's eastern roof pitch on the 30/06/20.



Figure 5. Yellow circle depicts the approximate location of common pipistrelle emergence from the Cottage's western roof pitch on the 30/06/20.



Figure 6. Yellow circle depicts the approximate location of brown long-eared bat emergence from the Cottage's northern roof pitch on the 30/06/20.

Bat activity around the site was modest with activity being dominated common pipistrelles commuting, with odd short foraging bouts. Occasional soprano pipistrelle bats were also recorded, as was a noctule bat *Nyctalus noctula*.

29th July 2020

One common pipistrelle was seen to emerge from the Cottage on the 29th July 2020:

- 21:12 – common pipistrelle emerged from beneath a roof tile close to small chimney on western side of the roof and flew south-west. Location of emergence close to or the same as that for common pipistrelle recorded emerging at 21:38 on the 30th June 2020 (Figure 5).

Bat activity was low and dominated common and soprano pipistrelle bats commuting, with some short foraging bouts. Pipistrelle foraging was concentrated along southern boundary hedgerow. A noctule bat was recorded commuting high over the building at 21:14, with a second noctule heard at 21:44. A likely brown long-eared bat was seen but not heard, flying beside the Cottage in an east-west direction, at 21:47.

19th August 2020

Two common pipistrelles were seen to emerge from the Cottage on the 19th August 2020:

- 20:17 – common pipistrelle emerged from beneath roof tile close to ridge on southern roof pitch and flew south (Figure 7).
- 20:33 - common pipistrelle emerged from beneath same roof tile as bat at 20:17 and flew north-west (Figure 7).



Figure 7. Yellow circle depicts the approximate location of both common pipistrelle emergences from Cottage's southern roof pitch on the 19/08/20

Bat activity was again low, being dominated by passes of common pipistrelles and more infrequently soprano pipistrelles, with the majority of activity focused to the south of the Cottage. A noctule was heard, but not seen by all surveyors at 20:15. Further noctule recordings were made at 20:41 and 21:16. A brown long-eared bat was recorded foraging between southern hedgerow and southern aspect of Cottage at 20:44. A brown long-eared bat was also heard, but not seen at 21:14.

3.3.6.3 Summary of Bat Roosts

The following roosts have been identified within the Cottage:

- Day roost of three common pipistrelles beneath roof tiles
- Day roost for one brown long-eared bat within loft void

Bat surveys undertaken at Blackthorn Cottage in the summer of 2020 indicate that gaps beneath the Cottage's roof tiles are being used as a day roost site for low numbers of non-breeding common pipistrelles (Peak count of 3 bats) during the active season, and that the Cottage's loft void is being used as a day roost site for one non-breeding brown long-eared bat during the active season. There is no evidence to indicate the presence of a bat roost of higher conservation significance such as a maternity colony for either species.

Common pipistrelles and brown long-eared bats are 'common' species of bat and the conservation significance of the day roosts for low numbers of these species are considered to be of 'low' conservation significance (with reference to Mitchell-Jones 2004).

Bats will choose to roost within different locations within the summer and winter periods, favouring dark, enclosed, humid and cool locations for hibernation such as caves and cellars (Figure 8). These locations must maintain a constant low temperature (2-8°C), but temperatures must also not go below freezing. In addition, bats favour places that are undisturbed and retain relatively high humidity during the winter period. The Cottage's loft void and external crevices are not considered to be suitable for hibernation due to the fact that they are highly unlikely to maintain the constantly cool and humid conditions which are required by overwintering bats. The conditions within the loft space, as well as within the exterior crevice features, are likely to fluctuate in temperature with external climatic conditions.

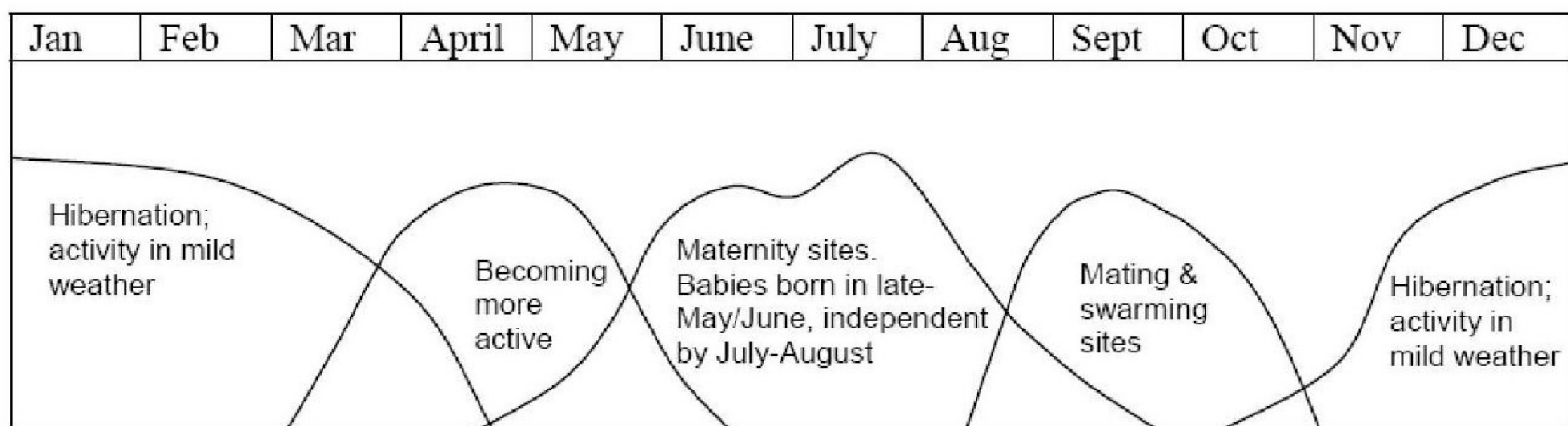


Figure 8. Diagram showing the yearly life cycle of a bat. Taken from the Bat Mitigation Guidelines by Mitchell-Jones 2004.

3.3.6.4 Status of Bat Species Present

The Common Pipistrelle

The common pipistrelle is the most common species in the UK and is widely distributed throughout Britain (Bat Conservation Trust 2000). It is known to be frequent and widespread in the county of Berkshire with numerous roosts in rural, urban and suburban areas. The species is a generalist in terms of its habitat requirements and will exploit a number of foraging habitats including gardens,

woodland, hedgerows, parkland and wetland. Although breeding roosts can number over a hundred bats, maternity colonies typically involve smaller gatherings (10's of bats). The species can use loft spaces for roosting but is typically associated with crevice features within the fabric of a building, often exploiting the smallest of gaps.

Recent trends from the National Bat Monitoring Programme indicate the population of common pipistrelle in Great Britain is considered to have increased since 1999. There is an estimated population of 2,430,000 soprano pipistrelle bats in the UK.

The Brown Long-eared bat

The brown long-eared bat is one of the UK's most common species of bat and is also a species frequently encountered within rural buildings. The distribution atlas of bats in Britain and Ireland describes brown long-eared bats as being widespread throughout Britain and Ireland except for the Scottish islands.

Recent trends from the National Bat Monitoring Programme indicate the population of brown long-eared bat in Great Britain is currently considered to have been stable since 1999. There is an estimated population of 245,000 brown long-eared bats in the UK. The species is considered to be common at a local level and widely distributed throughout the county of Berkshire. Although common and widespread, the species is listed as a priority for conservation within Section 41 of the NERC ACT 2006 due to recent declining population trends.

3.3.6.5 *Bats & Trees*

All trees present within the site lack features that roosting bats could use for shelter and are assessed as having 'negligible' bat roost potential.

3.3.7 *Hedgehogs*

The site's northern and southern boundary hedgerows provide potentially suitable habitat for commuting, foraging and sheltering hedgehogs *Erinaceus europaeus*, a species of 'principal importance' under Section 41 of the NERC Act 2006.

Hedgehogs may also frequent areas of amenity grassland and ornamental planting, however these habitats are considered unlikely to form an important foraging or sheltering resource for local hedgehog populations. There are no obvious habitat features within the site such as log piles, brash piles or compost heaps that this species could utilise for prolonged shelter during hibernation.

3.3.8 *Other Mammals*

There are no badger setts within the site and no evidence of badgers, such as latrines and foraging scrapes, was noted.

The northern and southern boundary hedgehogs are considered largely unsuitable for breeding harvest mice due to the lack of long or tussocky grass zones at the hedgerow bases. Other habitat types present are considered entirely unsuitable for this species.

4 Discussion

4.1 Relevant Legislation & Policy Guidance

4.1.1 *Great Crested Newts*

Great crested newts are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and under The Conservation of Habitats and Species Regulations 2017. Taken together, these make it an offence to:

- (a) Deliberately capture or intentionally take a great crested newt
- (b) Deliberately or intentionally kill or injure a great crested newt
- (c) To be in possession or control of any live or dead wild great crested newt or any part of, or anything derived from a wild great crested newt
- (d) Damage or destroy a breeding site or resting place of such an animal or intentionally or recklessly damage, destroy or obstruct access to any place that a wild great crested newt uses for shelter or protection
- (e) Intentionally or recklessly disturb any wild great crested newt while it is occupying a structure or place that it uses for shelter or protection.
- (f) Deliberately disturb any great crested newt, in particular any disturbance which is likely
 - to impair their ability;
 - (i) to survive, breed, reproduce or to rear or nurture their young; or
 - (ii) in the case of hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species.

The law applies to aquatic habitats used by great crested newts (ponds and other wetland features) as well as suitable non-aquatic habitats (suitable areas of grassland, woodland, hedgerow, gardens etc.) used by the species during its terrestrial phase.

Although the law provides strict protection to great crested newts, it also allows this protection to be set aside (derogation) through the issuing of licences. These licences in England are currently determined by Natural England (NE) for development works. Where a lawful operation is required to be carried out, but which is likely to result in one of the above offences, a licence may be obtained from NE to allow the operation to proceed. However, a licence can only be issued where the following requirements are satisfied:

- The proposal is necessary 'to preserve 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';
- 'There is no satisfactory alternative';
- The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

These are often referred to as the 'three tests' of the legislation.

4.1.2 *Nesting Birds*

Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. The nesting season for most species is between March and August inclusive.

4.1.3 *Bats*

As with many animal species within the UK, declines in the abundance and distribution of many bat species have been documented through recent decades. The reasons for these declines are various and complex but it is considered that the major factors are changes in landuse and agriculture, the loss of woodlands and hedgerows and the loss of suitable roosting sites.

Bats are particularly sensitive to human activity due to the fact that they roost within buildings, trees and underground structures such as mines, and the availability of suitable roost sites is considered to be a key factor in the conservation of bats within the UK. As a consequence, all species of bat and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and under The Conservation of Habitats and Species Regulations 2017. Taken together, these make it an offence to:

- (a) Deliberately capture or intentionally take a bat
- (b) Deliberately or intentionally kill or injure a bat
- (c) To be in possession or control of any live or dead wild bat or any part of, or anything derived from a wild bat
- (d) Damage or destroy a breeding site or resting place of such an animal or intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- (e) Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection
- (f) Deliberately disturb any bat, in particular any disturbance which is likely
 - to impair their ability;
 - (i) to survive, breed, reproduce or to rear or nurture their young; or
 - (ii) in the case of hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong

A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

Although the law provides strict protection to bats, it also allows this protection to be set aside (derogation) under The Conservation of Habitats and Species Regulations 2017 through the issuing of licences. Where a lawful operation is required to be carried out but which is likely to result in one of the above offences, a licence may be obtained from Natural England (the statutory body in England with responsibility for nature conservation) to allow the operation to proceed. However, in accordance with the requirements of The Conservation of Habitats and Species Regulations 2017, a licence can only be issued where the following requirements are satisfied:

- The proposal is necessary 'to preserve 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';
- 'There is no satisfactory alternative';
- The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

4.1.3.1 Bat Mitigation Class Licence (BMCL)

In 2015, Natural England launched a new class licence (WML-CL21), which provides a streamlined process to the European Protected Species Licence (EPSL) described above. The Bat Mitigation Class Licence (formerly the Low Impact Bat Class Licence) permits work that has a low or temporary impact on certain bat species and certain roost types, but which still needed to be licensed in order to meet legal requirements. Specifically, the criteria for using the class licence are set out below.

Bat species

The Bat Mitigation Class Licence can be used for sites where the following species are roosting:

- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Brown long-eared *Plecotus auritus*
- Whiskered *Myotis mystacinus*
- Brandt's *Myotis brandtii*
- Daubenton's *Myotis daubentonii*
- Natterer's *Myotis nattereri*

- Serotine *Eptesicus serotinus*¹
- Lesser horseshoe *Rhinolophus hipposideros*²

Assemblage of bats

Sites that support a maximum of three bat species listed above can be registered for the class licence. Sites with a more diverse assemblage of bat roosts must apply for an individual European Protected Species (EPS) licence.

Number of bats

Sites that support individuals or small numbers (in total) of the bat species listed above can register for the Bat Mitigation Class Licence. If more than one bat species will be affected, it is the total number of bats which must be considered. The conservation status of bats varies across regions, and must be considered by the ecologist when determining what constitutes 'small numbers'.

Roost type

The Bat Mitigation Class Licence applies to roosts of low conservation significance, and is regulated to cover the following types of roosts in buildings:

- Feeding roosts
- Night roosts
- Day roosts
- Transitional roosts / occasional roosts

Sites with roosts of higher conservation significance such as maternity roosts, hibernation sites or swarming sites do not qualify.

Number of roosts

The Bat Mitigation Class Licence is applicable to sites that support no more than three roosts in total (across all structures).

Impacts

Natural England's Bat Mitigation Class Licence permits activities resulting in the disturbance and/or capture of certain bat species (listed above) and/or the damage or destruction of roosts of low conservation significance. Works should be short term and usually only last for up to 6 months.

Natural England's Bat Mitigation Class Licence is held by Registered Ecological Consultants and sites must be registered with, and approved by Natural England before any licensable work can commence. The ecological consultant must apply to Natural England's Sustainable Development Wildlife Licensing to register the site with at least 3 weeks (15 working days) notice and no more than 12 weeks before commencement of any licensable activities.

¹ Under Annex C (for use in the following counties Berkshire, Buckinghamshire, Devon, Dorset, East Sussex, Essex, Greater London, Hampshire, Hertfordshire, Kent, Oxfordshire, Somerset, Surrey, West Sussex and Wiltshire) the low impact bat class licence also covers damage and destruction of no more than 3 feeding, day, night and transitional serotine bat roosts and the disturbance and capture serotine bats in appropriate small numbers.

² Under Annex D (for use in the following counties Cornwall, Devon, Dorset, Gloucestershire, Herefordshire, Somerset and Wiltshire) the low impact bat class licence also covers damage and destruction of no more than 3 low conservation significance day and transitional lesser horseshoe bat roosts and disturb and capture lesser horseshoe bats in appropriate small numbers.

4.1.3.2 European Protected Species Licence (EPSL)

A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

Although the law provides strict protection to bats, it also allows this protection to be set aside (derogation) under The Conservation of Habitats and Species Regulations 2017 through the issuing of licences. Where a lawful operation is required to be carried out, but which is likely to result in one of the above offences, a licence may be obtained from Natural England (the statutory body in England with responsibility for nature conservation) to allow the operation to proceed. However, in accordance with the requirements of The Conservation of Habitats and Species Regulations 2017, a licence can only be issued where the following requirements are satisfied:

- The proposal is necessary 'to preserve 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';
- 'There is no satisfactory alternative';
- The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

These three criteria are often referred to as the 'three tests' of the Regulations. All three must be satisfied in order for a licence to be granted.

4.1.4 Hedgerow Regulations 1997

The Hedgerow Regulations 1997 set out criteria for the Local Planning Authority to use in assessing whether a hedgerow is 'important'. The criteria relate to the value of the hedgerows from an archaeological, historical, landscape or wildlife perspective. Hedgerows less than 30 years old are excluded, but if a hedgerow is at least 30 years old and qualifies under any one of the criteria it is deemed to be important.

The Hedgerows Regulations 1997 provide protection by prohibiting the removal of 'important' hedgerows without first notifying the Local Planning Authority. 'Removal' includes acts which could result in the destruction of a hedgerow. If the hedgerow is 'important' according to criteria set out in the Regulations, the Local Planning Authority may prohibit its removal by issuing a retention notice within 42 calendar days from receipt of notification.

This legislation only applies to country hedgerows, which includes hedges next to common land, Nature Reserves, Sites of Special Scientific Interest (SSSIs) or land used for agriculture, forestry, or land used for the breeding/keeping of horses, ponies or donkeys. Domestic (e.g. garden) hedges are excluded from this legislation. To be defined as important, a hedgerow must be at least thirty years old, and must fulfil one of a number of criteria set out in the legislation. For example, one criterion is that the hedge is next to a public footpath, and contains a certain number of woody plant species. Another is concerned with habitats of rare or protected birds and animals.

4.1.5 Special Areas of Conservation

Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the habitat types and species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).

The legal requirements relating to the designation, protection and management of SACs in England are set out in the Conservation of Habitats and Species Regulations 2017 (often referred to as 'the Habitats Regulations'). All terrestrial SACs in England are also Sites of Special Scientific Interest (SSSIs).

The Habitats Regulations require that any plans, projects or activities which are proposed and require a permission of some kind and may significantly affect a SAC must be subject to special scrutiny and first require a detailed 'appropriate assessment'. The decision-making authority may only permit or undertake the proposals if the assessment concludes that there would no adverse effect on the integrity of the SAC. Where it cannot reach this conclusion, the project can then only proceed in particular circumstances. This process allows those proposals which clearly will not impact upon the special European wildlife interest of a SAC to proceed.

4.1.6 *Sites of Special Scientific Interest*

Under the Wildlife and Countryside Act 1981 the government has a duty to notify as a Site of Special Scientific Interest (SSSI) any land which in its opinion is of special interest by reason of any of its flora, fauna, geological or physiographical features. In England, SSSIs are designated by Natural England. This body is known as the designating body. An SSSI is not necessarily owned by a conservation organisation or by the Government. The designation is primarily to identify those areas worthy of preservation. An SSSI is given certain protection against damaging operations, and any such operations must in theory be authorised by the designating body. The status also affords a certain amount of planning protection, depending on the reasons for designation.

The Countryside and Rights of Way Act 2000 has made some significant changes to SSSI legislation in England and Wales. The Countryside and Rights of Way Act 2000 strengthened the law giving greater power to the designating body to enter into management agreements, to refuse consent for damaging operations, and to take action where damage is being caused through neglect or inappropriate management. Local Authorities and other public institutions now also have a statutory duty to further the conservation and enhancement of SSSIs both in carrying out their operations, and in exercising their decision-making functions, which includes planning decisions. SSSIs form the basic unit of UK protected area legislation; most higher designations (SPAs & SACs) are superimposed onto existing SSSIs.

4.1.7 *The Natural Environment and Rural Communities Act 2006*

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on the Secretary of State to publish, review and revise lists of living organisms and types of habitat in England that are of principal importance for the purpose of conserving English biodiversity.

It also requires the Secretary of State to take, and promote the taking of, steps to further the conservation of the listed organisms and habitats. This is important in the context of planning decisions as the National Planning Policy Framework (paragraph 117) affords planning policy protection to the habitats of species listed by virtue of Section 41.

Habitats listed within Section 41 of the NERC Act 2006 that are considered to be relevant to the site include:

- Hedgerows (northern & southern site boundaries)

Species listed within Section 41 of the NERC Act 2006 that are considered to be potentially relevant to the site include:

- Great crested newt
- Brown long-eared bat

- Bird species including dunnock, song thrush and bullfinch
- Hedgehog

4.1.8 *The National Planning Policy Framework (NPPF)*

The revised National Planning Policy Framework was updated in February 2019 and sets out the government's planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012 and revised in July 2018.

The NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by:

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

Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

- The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- The cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
- Any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

To protect and enhance biodiversity and geodiversity, plans should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should apply the following principles:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

The following should be given the same protection as habitats sites:

- ❖ Potential Special Protection Areas and possible Special Areas of Conservation;
- ❖ Listed or proposed Ramsar sites; and
- ❖ Sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

4.2 Potential Impacts

4.2.1 Sites of Nature Conservation Importance

There are no foreseeable direct or indirect impacts on Windsor Forest & Great Park SAC. This is due to the distance between the site and this SAC (2.2km) and the small scale of proposed development. Indirect adverse impacts from factors such as increased footfall are considered likely to be negligible. This is due to the fact that woodland habitats, and the species that they support, are unlikely to be adversely affected by a very minor increase in visitor pressure. The ecological integrity of old acidophilous oak woods and the violet click beetle will remain unaffected.

There are no predicted significant impacts on Chawridge Bourne SSSI. The site currently comprises a residence and horse paddock, with the habitats present considered to make no tangible contribution towards the ecological value of this SSSI. Chawridge Bourne is designated due to the unimproved grassland, broadleaved woodland and scrub habitats that it supports, none of which are present within or immediately adjacent to the site. The Chawridge Bourne stream, prior to its passing through the SSSI, flows at its closest point within approximately 135m of the site. Assuming good construction practices are followed, it is considered that the stream will be sufficiently buffered from the site to avoid adverse impacts such as sedimentation or pollution from surface runoff.

There are no foreseeable adverse impacts on Maiden's Green LWS and Stirrups Country House Hotel Field LWS as a result of development at Blackthorn Cottage. This is due to the distance of the Local Wildlife Sites from the site, and the unlikelihood of any indirect impacts outside of the site boundary.

None of the habitat types identified as targets for management within the Chawridge Valley BOA are represented within the site.

4.2.2 Habitats

Detailed development proposals had not been drawn up at the time this report was prepared, however it is likely that development will result in the loss of buildings, areas of hard-standing, amenity grassland, ornamental planting and possibly areas of improved grassland and some trees in the western half of the site. The majority of these habitats are considered to be of either negligible or low ecological value, with their loss not predicted to have a significant ecological impact.

Although areas of ornamental planting offer some value to native wildlife, such as nesting opportunities for birds, they comprise predominantly non-native and hybrid species and are managed for their amenity value; it is considered that the loss of ornamental planting can be adequately compensated for through appropriate new landscape planting within the redeveloped site. Likewise, it is considered that the loss of planted trees can be compensated for through new garden tree planting.

The hedgerows along the site's northern and southern site boundaries are considered to be the habitat features of greatest ecological value present. Both of these hedgerows meet the criteria for 'Hedgerows' as listed within Section 41 of the NERC Act 2006, while the southern boundary hedgerow also qualifies as an 'Important' hedgerow within the Hedgerow Regulations 1997. It is considered that without mitigation, the loss of these hedgerows could have an ecological impact at the local level.

4.2.3 Species

4.2.3.1 Amphibians

There are no ponds or waterbodies within the site that could form potential breeding habitat for great crested newts or other native amphibians. There is accordingly no foreseeable loss in amphibian breeding habitat. Records held by the Local Records Centre, along with the confirmed presence of

great crested newt eDNA within Pond 2 (located ~110m north-west of the site boundary), do however confirm that breeding populations of this species are present within the local landscape.

With the exception of the northern and southern hedgerows, habitats within the site are considered to be either unsuitable or sub-optimal for inhabitation by amphibians, including the great crested newt, during their terrestrial phase. Areas of ornamental planting offer only very limited foraging or sheltering value to amphibians and lack features that could be used for sheltering during dry periods or be used as shelter during brumation.

Habitats such as the improved grassland, amenity grassland and sealed hard-standing offer almost no shelter to these species are therefore likely entirely avoided. There are no habitat features such as log piles, brash piles or drystone walls that offer obvious sheltering habitat. The northern and southern boundary hedgerows are of greater suitability for amphibians, offering potential foraging and sheltering habitat.

Given the presence of great crested newts within the environs of the site, Natural England's Rapid Risk Assessment Tool was employed in order to examine the risk of an offence (under domestic legislation) being committed due to development at Blackthorn Cottage. Two assumptions are made when using the tool in the first instance: firstly that, with the exception of Pond 1 where eDNA sampling has confirmed absence, great crested newt breeding populations are present within all nearby ponds; secondly that all land within the site will be subject to development.

The results of the Assessment Tool indicate that as more than 0.01 hectares of on-site terrestrial habitat falls within 100m of a potential breeding pond, without the adoption of avoidance measures, an offence may occur (see Table 7). The tool does not however take into account the site-specific risk assessment, which has identified the majority of habitats present as being either unsuitable or sub-optimal for amphibians, including the great crested newt.

Notably, the majority of on-site terrestrial habitat within 100m of a potential breeding pond is located in the extreme east of the site where concrete hard-standing, a habitat type entirely unsuitable for great crested newts, occupies much of the space present. If the space covered by concrete hard-standing is factored out when using the Rapid Risk Assessment Tool, then the amount of on-site terrestrial habitat present within 100m of a potential breeding pond falls below 0.01 hectares and an offence is indicated to be 'highly unlikely' (see Table 8).

It is also noted that although a number of hedgerows criss-cross the agricultural land which surrounds the site, providing potential dispersal corridors for great crested newts through the landscape, most of the ponds within a 250m radius are located adjacent or in close proximity to what appear to be terrestrial habitats of higher suitability for amphibians such as woodland, scrub and rough grassland. This includes Pond 2 to the north-west of the site, where there is a band of deciduous woodland along Chawridge Bourne to the north and an area of rough grassland to the immediate east. As such, it is predicted that where these local ponds do indeed support breeding great crested newts, most individual members of these populations will be concentrated in these nearby areas of suitable habitat during their terrestrial phase rather than commuting relatively large distance to habitats of lesser suitability at Blackthorn Cottage.

Table 7. Great Crested Newt Rapid Risk Assessment where site-specific assessment not taken into account. Tool source: Natural England's Great Crested Newt Method Statement for EPS Licence Application.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.01 - 0.1 ha lost or damaged	0.3
Land 100-250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250m from any breeding pond(s)	No effect	0
Individual great crested newts	No effect	0
	Maximum:	0.3
Rapid risk assessment result:	AMBER: OFFENCE LIKELY	

Table 8. Great Crested Newt Rapid Risk Assessment where areas of hard-standing within 100m of potential breeding ponds are factored out. Tool source: Natural England's Great Crested Newt Method Statement for EPS Licence Application.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.001 - 0.01 ha lost or damaged	0.05
Land 100-250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250m from any breeding pond(s)	No effect	0
Individual great crested newts	No effect	0
	Maximum:	0.1
Rapid risk assessment result:	GREEN: OFFENCE HIGHLY UNLIKELY	

In light of the above discussion, it is considered that with the adoption of non-licensed avoidance measures during works, development at Blackthorn Cottage will not lead to the damage, destruction or obstruction of great crested newt habitat, the killing/injury of individual newts or result in any disturbance which is likely to impair individual newts' ability to survive, breed or reproduce. Consequently, a European Protected Species (newt) Licence is not considered necessary for development to lawfully proceed.

4.2.3.2 Birds

The felling of trees and clearance of woody vegetation during the breeding bird period may result in the destruction of active birds' nests and the possible killing or injury of eggs and young, if nests are present at the time the works are undertaken.

There is no evidence to indicate the presence of nesting birds within the three buildings present, with the demolition of these buildings therefore predicted to have no impacts breeding birds.

4.2.3.3 Bats

Without mitigation, the proposed demolition of the Cottage will result in the loss of day roost sites used by low numbers of common pipistrelles (Peak count: 3 bats) and one brown long-eared bat (Peak count: 1 bat).

Only small numbers of two common and widespread bat species are roosting within the building; there are no predicted impacts on breeding colonies (maternity roosts) or hibernating bats. The roosts present are considered to be of low conservation significance (Mitchell-Jones, 2004). If bats are present at the time of the works, there is the potential for the killing and injury of small numbers of bats.

There are no predicted impacts on roosting bats in trees.

External lighting can have an impact on bats by affecting their activity and behaviour. In that certain species of bat have been shown to be attracted to mercury vapour lamps which emit light over a very broad-spectrum including UV light to which insects are particularly sensitive.

Furthermore, insects can be attracted in large numbers to mercury lamps and so can bats of the genera *Nyctalus* and *Pipistrellus*, including noctules *N. noctula* and common pipistrelles *P. pipistrellus* (Rydell and Racey 1993). Lighting has shown to have an opposite effect on certain other species, such as the lesser horseshoe bat *Rhinolophus hipposideros*, which have been shown to avoid areas of artificial light (Stone *et al.* 2009).

As a result of this discussion, new external lighting associated with development has the potential to have an adverse impact on foraging and commuting bats both within the site and its surrounding area, with brown long-eared bats being particularly sensitive to increased light levels and pipistrelle species being more tolerate.

4.2.3.4 Hedgehogs

Proposals may lead to the loss of hedgehog foraging habitat. It is considered unlikely that this loss would have a significant impact on local hedgehog populations, particularly if suitable hedgehog foraging habitat is provided within the redeveloped site and consideration is given to ensuring the redeveloped site be made permeable to hedgehog movement.

4.2.3.5 Other Species

There are predicted to be no significant impacts on other notable/protected species such as rare or scarce plants, invertebrates, reptiles or badgers.

5 Recommendations

5.1 Habitats

5.1.1 Hedgerows

It is recommended that boundary hedgerow habitats are retained and protected. In particular it is recommended that the southern boundary hedgerow be retained in its entirety. Hedgerow protection should include the establishment of appropriate root protection zones in accordance with British Standard 5837:2012.

If hedgerow removal is required, for example the garden hedge on the eastern boundary, it is recommended that any loss be compensated for through new native hedgerow planting elsewhere on the site boundaries.

5.1.2 Landscape Planting

It is recommended that any new areas of garden planting associated with development are designed, planted and managed to maximise their value to wildlife. One key element of this would be the species used within the planting, which should comprise native species where possible, as well as ornamental plants of known value to wildlife. The key will be to provide a variety of flowers and fruits throughout the year in order to provide food for insects and birds, as well as providing potential nest sites through the planting of trees and shrubs.

Appendix 4 recommends a number of suitable species for landscape and garden planting schemes, including non-native species for more formal areas, although the species mix should by no means be limited to this list. Planting should aim to provide ground cover for animals such as amphibians, hedgehogs and invertebrates, and so low-growing ground cover should be encouraged. Native species such as bugle, ivy and periwinkle could be used for this purpose, or ornamental species such

as lady's mantle, elephant's ears or perennial geraniums may also be suitable for formal areas of ornamental planting. A diversity of structure should also be encouraged through the planting of small trees, with shrubs and herbaceous plant species established below.

Given that a number of trees are present within the site, should tree removal be required then it is recommended that new trees be planted within the developed site to compensate for this loss.

5.2 Species

5.2.1 Amphibians

As discussed previously, a European Protected Species (newt) Licence is not considered necessary for the proposed development at Blackthorn to proceed.

There will be no significant destruction of terrestrial habitat and no ponds will be impacted upon. Although it is considered possible that individual great crested newts could migrate to and through the site, the risk of encountering an animal during works is considered to be low.

Consequently, with the adoption of non-licenced avoidance measures during works, no significant impacts on great crested newts are predicted under The Conservation of Habitats and Species Regulations 2017 (as amended), with works not predicted to result in the contravention of legislation which protects this species

The adoption of the following Precautionary Working Method Statement (PWMS) is recommended in order to avoid potential adverse impacts on great crested newts and also safeguard individuals of other amphibian species. The key elements of the Method Statement are the protection of great crested newts and other amphibians from killing and injury during site clearance and the construction phase. The strategy has been developed in accordance with the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

5.2.1.1 Timing of Sensitive Works

Vegetation clearance and ground preparation works should be carried out during great crested newt active period, March-October inclusive. These works should also be avoided during prolonged spells of cold weather (night-time temperatures below 5°C) during the active period.

An exception to the above scheduling may be required in regard to woody vegetation that offers potential nesting habitat to breeding birds. Where the removal of woody vegetation suitable for nesting birds such as trees and larger shrubs is required, it is recommended that this takes place outside of the period of bird breeding period March-August inclusive (as detailed in Section 5.2.4.). Such vegetation clearance should be limited to above-ground works, i.e. stumps retained until March-October. Care should also be taken to minimise ground disturbance.

5.2.1.2 Tool-Box Talk

A tool-box talk should be delivered to the contractors by a suitably experienced newt ecologist prior to the commencement of vegetation clearance or ground preparation works. The talk should include great crested newt identification and what to do if newts are found, the legislative protection and any specific on-site reasonable avoidance measures or other requirements (including any seasonal timing constraints for vegetation clearance, and on-site works).

5.2.1.3 Protection of Retained Habitats

A well-defined working compound should be decided upon prior to the commencement of works. Clear signage should be used to demarcate the perimeter of this area during the construction phase.

Habitats falling outside of the working compound should be protected from clearance and disturbance throughout the construction phase of development, including disturbance by heavy vehicles, machinery or the storage of demolition debris or building materials.

5.2.1.4 Vegetation & Site Clearance

Existing amenity and improved grassland habitats should be maintained in their current short condition in the lead up to the commencement of works through either livestock grazing or regular mowing, thereby maintaining their unsuitability for amphibians.

Where required, any other vegetation within the working compound (such as areas of ornamental planting) should be subject to directional clearance, with vegetation being carefully cut to ground level using handheld machinery. The direction of working should be north to south, to encourage amphibians to disperse towards the southern boundary hedgerow. All arisings should be raked (where possible) and removed from the working zone on the same day. There should be no piling of arisings within the working compound.

Vegetation cutting and clearance should be carried out under supervision of a suitably qualified and licenced ecologist. Once vegetation cutting has been completed, a hand search of these areas should be undertaken, checking beneath any natural or artificial refugia for sheltering animals. Likewise, any potential refugia within areas of hard-standing such as unsealed patio slabs, flowerpots, water butts etc. should be lifted and checked under the supervision of the ecologist. Once checked all refugia should be directly removed from the site.

Once the ecologist is satisfied that no potential amphibian refugia remains, they should supervise the final clearance of ground vegetation, including turf stripping using an excavator, leaving bare earth. Once the initial clearance is complete, the working compound should be maintained free of vegetation throughout the construction phase.

5.2.1.5 Storage of Machinery, Materials and Tools

Machinery, materials and tools should be either stored on areas of existing hardstanding or raised off the ground on pallets. This includes any retained spoil or rubble produced during ground excavations.

Waste materials should be removed off site immediately or stored in skips so as to avoid creating new refugia for amphibians.

5.2.1.6 Ground works & Trenches

All excavations and trenches will be covered overnight or will be provided with shallow ramps to allow any trapped animals to escape. Excavations and trenches should be managed so as not to create temporary waterbodies which may attract amphibians into the working area.

5.2.1.7 Vigilance and Sympathetic Working

All on-site operatives should be made aware of the presence of great crested newts within the local landscape and the possibility that amphibians may be encountered. Vigilance for amphibians and other native species should be maintained throughout. An agreed Precautionary Working Method Statement should be made available to all on-site operatives.

5.2.2 Discovery of Common Amphibians

If any common amphibians are found within the working compound, they should in the first instance be given the opportunity to vacate the area to a safe location under their own power. If they are unable to escape, or show no inclination to do so, then they should be carefully removed by hand and relocated directly to a suitable location, such as retained hedgerow habitat well away from the working zone. Amphibians should be moved to a terrestrial habitat rather than being placed in a pond or other waterbody.

Amphibians should be lifted gently by placing fingers under their body, rather than grasping their limbs. Care should be taken to avoid allowing an animal to escape whilst in transit and fall onto hard surfaces. Handling should be kept to a minimum with non-latex gloves used where possible.

In the unlikely scenario that a brumating amphibian is discovered, they should be covered over and advice sought from a suitably experienced ecologist as to how to proceed.

5.2.3 *Discovery of a Great Crested Newt*

If a suspected great crest newt is discovered when a suitably qualified newt ecologist is not present, works should halt in this area immediately, and advice be sought from a suitably qualified ecologist who will make an assessment as to how to proceed within the parameters of the law.

If disturbance to small numbers of great crested newts were to occur, it is unlikely to impair their ability to survive, breed, and reproduce or to rear or nurture their young or to significantly affect the local distribution or abundance of the species.

Therefore, works may be able to continue once advice has been given and the issue has been resolved. However, individual situations will have to be evaluated on a case by case basis and a European Protected Species Licence may be required to allow works to proceed if the impacts are considered to be significant under The Conservation of Habitats and Species Regulations 2017 (as amended).

If the newt discovered can **confidently** (100%) be identified as species other than the great crested newt, then the procedure set out above regarding common amphibians should be followed.

5.2.4 *Birds*

It is recommended that any clearance of shrubs, trees or other woody vegetation be undertaken outside of the breeding bird period, avoiding March to August inclusive.

If woody vegetation clearance is required between March and August, an ecologist should be appointed to assess if there are any risks to breeding birds to ensure compliance with the legal protection afforded to nesting birds under the Wildlife and Countryside Act 1981. This may require a survey for nesting birds by an ecologist immediately prior to the vegetation clearance. If nesting birds were present, works would need to be delayed in the vicinity of the nest to avoid disturbance until the young have fledged.

The erection of bird nesting boxes is recommended in order to provide suitable nest sites for species within the local area, as nest boxes can be excellent substitutes for the nesting potential of trees. Over 60 species are known to adopt nest boxes including blue tits, great tits, starlings, robins and sparrows. The location and nature of the nest box depends on the species it is designed for; boxes for tits, sparrows or starlings should be fixed two to four metres up a tree or a wall; open-fronted boxes for robins and wrens need to be low down, below 2m, and well-hidden in vegetation. Unless there are trees or buildings which shade the box during the day, boxes should be faced between north and east, thus avoiding strong sunlight and the wettest winds.

On new buildings, the integration of bird boxes is particularly recommended as species such as the house sparrow *Passer domesticus* will readily adopt such features as nest sites, with new integrated nesting features securing a biodiversity enhancement in the long term.

Recommended integrated boxes are:

- Bird Brick Houses Standard Box or Sparrow Box
- Schwegler Brick Box Type 24

Other recommended boxes are:

- 1B Schwegler Nest Box
- 2H Schwegler Robin Box

5.2.5 Bats

5.2.5.1 Licencing

It is recommended that the demolition of the Cottage be carried out under a Bat Mitigation Class Licence (BMCL) from Natural England. This licence will allow for the destruction of day roosts used by small numbers of non-breeding common bat species (common pipistrelles and brown long-eared bat).

A Registered Consultant should be sought to apply for this licence and to register the site (Blackthorn Cottage) with Natural England under the low impact scheme (Bat Mitigation Class Licence).

5.2.5.2 Timing

No strict timing is required in this instance.

5.2.5.3 Careful Work Practices

A 'toolbox talk' delivered by the Registered Consultant or Accredited Agent will inform contractors about the possible risks of bats roosting in the Cottage. Contractors will be made aware of where bats are known to roost, and which locations offer the best opportunities for bats to roost.

Immediately prior to the commencement of works to demolish the Cottage, the loft space will be checked for bats by the Registered Consultant or Accredited Agent, with any resident bats rescued by hand (where possible).

Works should proceed in a careful and controlled manner, with the removal of the roof tiles and underfelt by hand, checking below for any bats that may be present. The Registered Consultant or Accredited Agent will be present on site to advise on which features of the building should be removed by hand and where inspections for bats and evidence of bats should be undertaken.

Contractors will be briefed regarding the fact that bats are highly mobile and the potential presence of small numbers of bats and will remain vigilant for bats and any evidence of bats (bat droppings) when removing the roof tiles and the underfelt.

If bats are encountered during these procedures, they will be rescued by the Registered Consultant or Accredited Agent by hand and released at an appropriate time and in a safe place. If release is not possible, the bats will be placed in a pre-erected bat box on a nearby tree.

After the Registered Consultant or Accredited Agent has left, in the unlikely event that bats or significant evidence of bats (for example large accumulations of droppings) are encountered, works will stop, and advice sought from the Registered Consultant or Accredited Agent.

5.2.5.4 Replacement Roost Features

It is recommended that compensatory bat roost features are integrated into new buildings within the redeveloped site in order to mitigate for the loss of existing roost sites within the Cottage.

It is recommended that a Schwegler 1FF bat box (see Figure 9) is erected on a nearby mature tree, prior to the commencement of works. This box can be used to house rescued bats, if necessary, and is to remain in perpetuity.

It is recommended that integrated bat roost features are provisioned on new buildings within the redeveloped site in order to compensate for the loss of roost sites used by small numbers of common pipistrelles and one brown long-eared bat. Creating a new bat loft for brown long-eared bats in this scenario is considered disproportionate when considering the loss of a roost that is used by an individual brown long-eared bat, seen on one occasion during the active season.

All new roost features once installed should be kept in perpetuity. The recommended bat roost features are as follows:

- Two Schwegler 1FR bat tubes integrated into the external walls, on either southern or south-eastern elevations (see Figure 10). These bat tubes can be concealed behind external render, leaving only the lower access point exposed.



Figure 9. Schwegler 1FF bat box



Figure 10. A Schwegler 1FR bat tube, for integration into external walls.

- Four 'bat tiles' along the ridge of a new building/s roof, but no access into the interior space below (see Figure 10 and 11). On the building/s where these new features are to be created, bitumen and hessian underfelt should be used as a roof underlay to avoid the risk of entanglement posed to bats by modern breathable membranes.

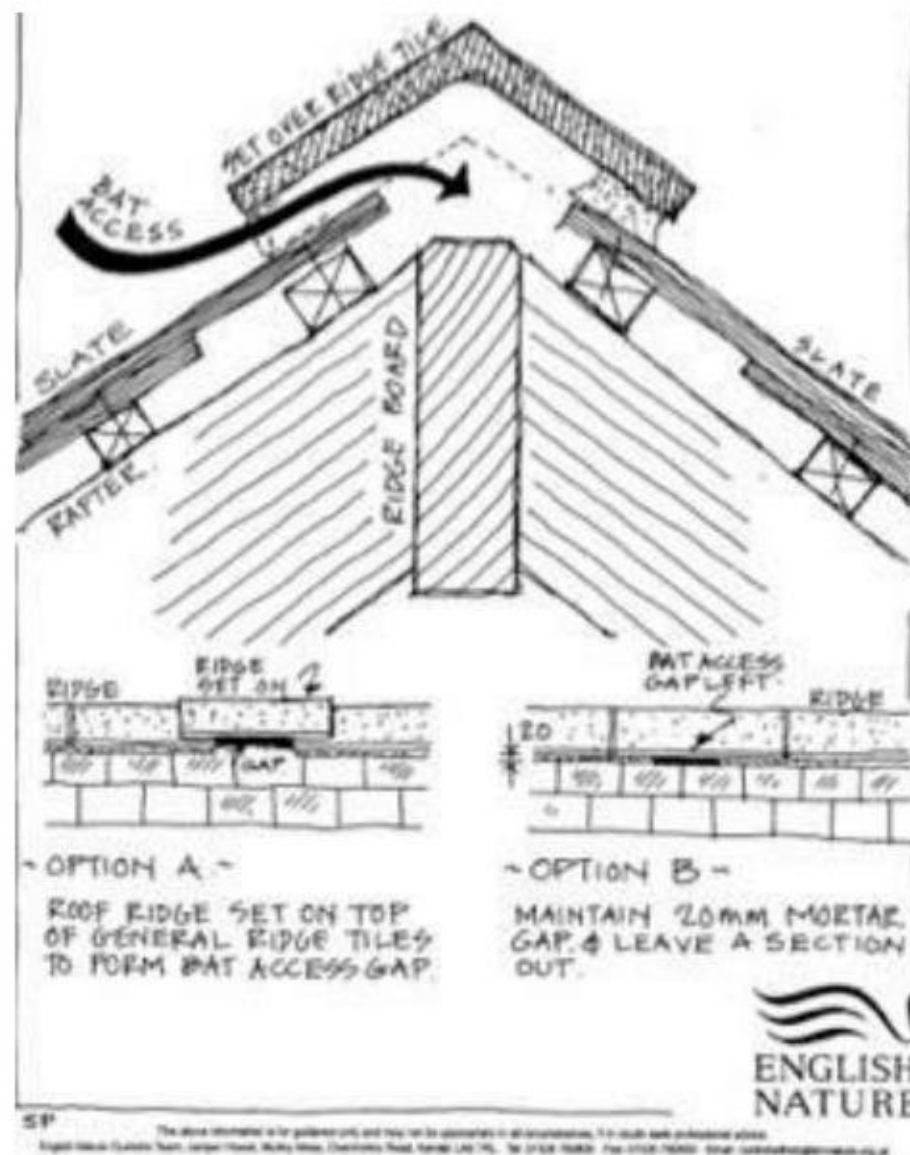


Figure 10. Creation of a bat tile along the ridge of a building.



Figure 11. Example of a bat ridge tile set below the ridge, giving access below.

5.2.5.5 Lighting

External lighting should be minimised within the development proposals, unless it is necessary for reasons of security and safety. In particular, lighting and light spillage should be avoided on new bat roost features and along the southern boundary hedgerow where bat activity was noted to be concentrated during bat activity surveys. Avoidance of external lighting will ensure that bat activity is not adversely affected.

Where external lighting is required, it should be kept at low level and a low intensity, with hoods and baffles used to direct the light to where it is required (Bat Conservation Trust 2018, Emery 2008). To minimise the impact on bats, the use of low pressured sodium lamps is recommended in preference to mercury or metal halide lamps which have a UV element that can affect the distribution of insects and attract bats to the area, affecting their natural behaviour (Bat Conservation Trust 2018).

The key principals for choosing a suitable type of lamp are:

- Avoid blue-white short wavelength lights: these have a significant negative impact on the insect prey of bats. Use alternatives such as warm-white (long wavelength) lights as this will reduce the impact on insects and therefore bats.
- Avoid lights with high UV content: (e.g. metal halide or mercury light sources) or reduce/completely remove the UV content of the light. Use UV filters or glass housings on lamps which filter out a lot of the UV content.

Selecting an appropriate lamp unit that is designed to be environmentally friendly will minimise light spill, but further controls can be imposed by installing directional accessories such as baffles, hoods and louvres on lamps to direct light away from ecologically sensitive areas such as boundary hedgerows.

LED (Light Emitting Diode) units are an effective way to direct the light into small target areas such as car parking. Composite LEDs can be switched off to reduce/direct the light beam to specific areas.

5.2.6 Hedgehogs

It is recommended that any new garden fences or walls erected within the development (that could act as a barrier to hedgehog movement) be made permeable for hedgehogs. This can be achieved

by cutting or leaving a 13cm by 13cm hole at the base of a fence or wall; this is sufficient for any hedgehog to pass through and this is too small for nearly all pets.



Figure 12. An example of a hole cut within a fence, creating a 'hedgehog highway' Source: <https://www.hedgehogstreet.org/help-hedgehogs/link-your-garden/>

6 References

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7 Appendix 1. Photographs



Photograph 1. The Blackthorn Cottage, viewed from the north-west.



Photograph 2. The Cottage, viewed from the west.



Photograph 3. Tiled surface on eastern roof pitch of the Cottage.



Photograph 4. Loft space within the Cottage.



Photograph 5. Accumulation of brown long-eared bat droppings within loft space of the Cottage.



Photograph 6. The Annex viewed from the south-west.



Photograph 7. The Stable Barn viewed from the south-east.



Photograph 8. Interior of the Stable Barn.



Photograph 9. Amenity grassland (lawn) in eastern half of site.



Photograph 10. Bed of ornamental planting in eastern half of site.



Photograph 11. Area of garden to west of Cottage.



Photograph 12. Improved grassland (horse paddock) in western half of site.



Photograph 13. Semi-mature oak tree on southern edge of paddock.



Photograph 14. Cluster of fruit trees in eastern area of paddock.



Photograph 15. Northern boundary hedgerow.



Photograph 16. Southern boundary hedgerow.



Photograph 17. Eastern boundary hedge.



Photograph 18. Tarmac parking area to east of the Cottage.



Photograph 19. Pond 1 (off-site).

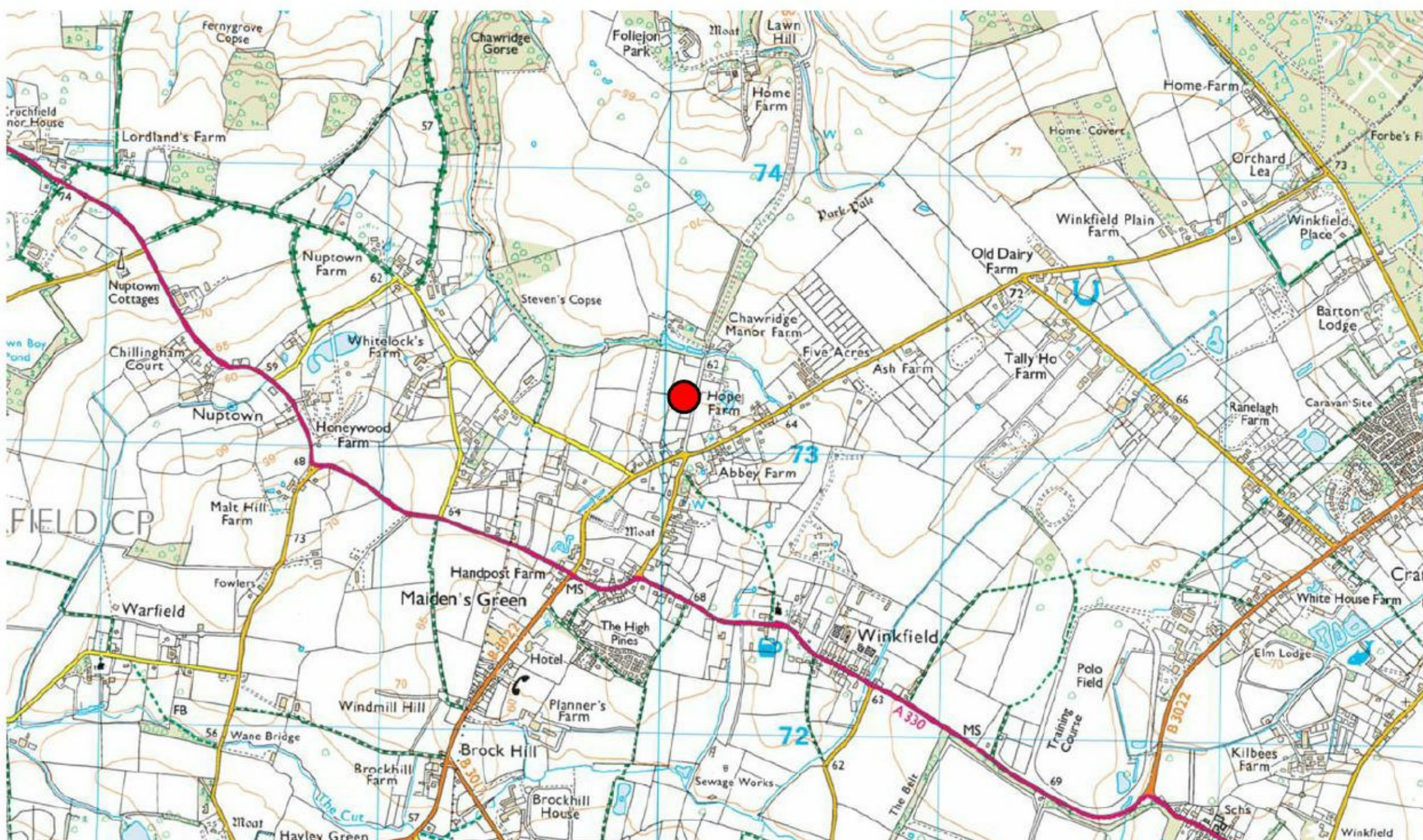


Photograph 20. Pond 2 (off-site).

8 Appendix 2. Site Location Plans



Aerial photograph showing the location of Blackthorn Cottage, Winkfield (outlined in red). Source: Google Earth Pro



Ordnance Survey map showing the location of the site (indicated by the red dot) within the local area. Source: www.bing.com/mapspreview/

9 Appendix 3. TVERC Biodiversity Report

Please refer to separate report prepared by Thames Valley Environmental Records Centre.

10 Appendix 4. Species for Landscape and Ornamental Planting

Common Name	Botanical Name
Trees	
Field maple*	<i>Acer campestre</i>
Beech*	<i>Fagus sylvatica</i>
Hornbeam*	<i>Carpinus betulus</i>
Willow*	<i>Salix sp.</i>
Silver birch*	<i>Betula pendula</i>
Rowan*	<i>Sorbus aucuparia</i>
Whitebeam*	<i>Sorbus aria</i>
Alder*	<i>Alnus glutinosa</i>
Wild cherry*	<i>Prunus avium</i>
Flowering cherry	<i>Prunus sp.</i>
Flowering pear	<i>Pyrus calleryana</i>
Crab apple*	<i>Malus sylvestris</i>
Fruiting apple	<i>Malus sp.</i>
English oak*	<i>Quercus robur</i>
Elm*	<i>Ulmus sp.</i>
Small-leaved lime*	<i>Tilia cordata</i>
Shrubs	
Holly*	<i>Ilex aquifolium</i>
Hazel*	<i>Corylus avellana</i>
Wayfaring tree*	<i>Viburnum lantana</i>
Wild service tree*	<i>Sorbus torminalis</i>
Buckthorn*	<i>Rhamnus cathartica</i>
Guelder rose*	<i>Viburnum opulus</i>
Hawthorn*	<i>Crataegus monogyna</i>
Hebe	<i>Hebe sp.</i>
Rosemary	<i>Rosmarinus</i>
Ceanothus	<i>Ceanothus sp.</i>
Weigela	<i>Weigela sp.</i>
Dog rose	<i>Rosa canina</i>
Dogwood*	<i>Cornus sanguinea/alba</i>
Rose (single flowered varieties)	<i>Rosa sp.</i>
Wild privet*	<i>Ligustrum vulgare</i>
Garden privet	<i>Ligustrum ovalifolium</i>
Lilac	<i>Syringa vulgaris</i>
Escallonia	<i>Escallonia sp.</i>
Lavender	<i>Lavandula sp.</i>
Flowering currant	<i>Ribes sp.</i>
Honeysuckle*	<i>Lonicera periclymenum</i>
Mexican orange blossom	<i>Choisya sp.</i>
Spiraea	<i>Spiraea sp.</i>
Amelanchier	<i>Amelanchier lamarckii/canadensis</i>
Cotoneaster	<i>Cotoneaster sp.</i>
Yew*	<i>Taxus baccata</i>
Broom	<i>Cytisus sp.</i>

Common Name	Botanical Name
Rose of Sharon	<i>Hypericum calycinum</i>
Firethorn	<i>Pyracantha sp.</i>
Butterfly bush	<i>Buddleia davidii</i>
Clematis	<i>Clematis sp.</i>
Perennials	
Elephant's ears	<i>Bergenia cordifolia</i>
Sage	<i>Salvia sp.</i>
Lamb's ears	<i>Stachys byzantia</i>
Periwinkle*	<i>Vinca major & Vinca minor</i>
Ivy*	<i>Hedera helix</i>
Bugle*	<i>Ajuga reptans</i>
Lady's mantle	<i>Alchemilla mollis</i>
Geraniums	<i>Geranium sp.</i>
Globe thistle	<i>Echinops ritro</i>
Monk's hood	<i>Aconitum sp.</i>
Yarrow*	<i>Achillea millefolium</i>
Teasel*	<i>Dipsacus fullonum</i>
Oriental poppy	<i>Papaver orientalis</i>
Michaelmas daisy	<i>Aster sp.</i>
Bear's breeches	<i>Acanthus spinosus</i>
Montbretia	<i>Crocsmia sp.</i>
Purple coneflower	<i>Echinacea purpurea</i>
Ornamental onion	<i>Allium sp.</i>
Catmint	<i>Nepeta sp.</i>
Verbena	<i>Verbena sp., Verbena bonariensis</i>
Marjoram	<i>Origanum majorana</i>
Thyme	<i>Thymus sp.</i>
Crocus	<i>Crocus sp.</i>
Daffodil	<i>Narcissus sp.</i>
Snowdrop	<i>Galanthus nivalis</i>
Winter aconite	<i>Eranthis sp.</i>
Bluebell*	<i>Hyacinthoides non-scripta</i>
Primrose*	<i>Primula veris</i>
Forget-me-not*	<i>Myosotis sp.</i>
Grape hyacinth	<i>Muscari botryoides</i>
Hollyhock	<i>Althaea rosea</i>
Lenten rose	<i>Helleborus orientalis</i>
Foxglove*	<i>Digitalis purpurea</i>
Greater knapweed*	<i>Centaurea scabiosa</i>
Great mullein*	<i>Verbascum thapsus</i>
Toadflax*	<i>Linaria vulgaris</i>
Meadow crane's-bill*	<i>Geranium pratense</i>
<i>*indicates native species</i>	

11 Appendix 5. Extract from Great Crested Newt eDNA Technical Report



eDNA Technical Report

Customer	Windrush Ecology	Date Report Issued	08/07/2020
Case Reference	NW20.99		
Scientific Contact	Helen Belcher		

OS Reference	Pond 1/SU 8997 7315
Kit Reference	CMD/000326/20
Pond Location	Blackthorn Cottage, Maidens Green
Date Sample Received	01/07/2020

RESULT

Sample Check	Degradation Check	Inhibition Check	Result	Positive replication
PASS	PASS	PASS	Negative	0 out of 12

OS Reference	Pond 2/SU 8998 7333
Kit Reference	CMD/000282/20
Pond Location	Blackthorn Cottage, Maidens Green
Date Sample Received	01/07/2020

RESULT

Sample Check	Degradation Check	Inhibition Check	Result	Positive replication
PASS	PASS	PASS	Positive	11 out of 12

12 Appendix 6. Results of DNA Analysis of Bat Droppings (Loft)



4 August 20

Re: Identification Results for Robbie Birkett, Windrush Ecology

Job number 15565, received 22 July 2020

Sample labelled: Blackthorn Cottage, 5/6/20

PCR amplification successful. DNA sequence:

ATGACCAACATTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGACTCATTTCATTG
ACTTACCTGCTCCCTCAAATATTTTCATCATGATGAAACTTTGGATCTCTTCTAGGCAT

Phylogenetic analysis identification: *Plecotus auritus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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