

Appendix 13



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West Hertford Residential

Ecological Appraisal

Prepared by LUC
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1 Introduction

Scope

- 1.1 In July 2016, LUC was appointed by London and Regional to update an Ecological Appraisal of a site in the west of Hertford, North of Welwyn Road (hereafter referred to as 'the Site'). This updated a previous ecological appraisal undertaken in 2014, and was required to inform a planning application for proposed residential development.
- 1.2 The Ecological Appraisal comprises a desk study and an Extended Phase 1 Habitat Survey, and a series of protected species surveys. The findings and implications of these surveys are presented in this report, within the legal and policy context.
- 1.3 This report has been prepared for the exclusive of London and Regional. No part of this report should be considered as legal advice.

Site Description

- 1.4 The Site is situated west of Hertford (central grid ref. TL30301332). It is bounded to the north by woodland, including the area known as Archer's Spring, with arable land and small woodlands further to the north of the Site and to the east. The B1000 Welwyn Road forms the southern boundary, with woodland, arable land/fields and pasture to the south, including land associated with Panshanger Park.
- 1.5 The Site itself mainly comprises a mosaic of tall ruderal, grassland, and bare ground habitats, with heavily modified ground levels. The north west of the Site supports a Local Wildlife Site (LWS: Land west of Sele Farm). The Site is used for informal recreation including dog walking, with signs of regular use by off-road vehicles.

Project Description

- 1.6 The proposals comprise a large residential development, with associated infrastructure, community facilities and soft landscaping.

Policy and Legal Considerations

- 1.7 This appraisal has been prepared in cognisance of relevant legislation and policy. Further detail is provided in **Appendix 1**, with the key documents listed below:
 - The Wildlife and Countryside Act 1981 (as amended);
 - The Countryside and Rights of Way Act (CROW Act), 2000 (as amended);
 - The Natural Environment and Rural Communities Act (NERC Act), 2006;
 - The Conservation of Habitats and Species Regulations 2010 (as amended);
 - East Herts Local Plan, 2007 (saved policies); and
 - East Herts Local Plan: Sustainability Indicators and Targets Supplementary Planning Document, 2007.

2 Methods

2.1 The methods adopted in the survey and appraisal are outlined below. They accord with the best practice guidance documents for survey and appraisal produced by the Chartered Institute of Ecology and Environmental Management¹ and the British Standards Institute². All surveys were completed by suitably qualified and experienced ecologists during suitable weather conditions.

Desk Study

- 2.2 To provide additional background to the appraisal and to highlight likely features or species groups of interest, a study of available biological records was undertaken to identify sites designated for their nature conservation value, and existing records of protected or notable species of relevance to the Site. A search of the following resources was undertaken, within a 1km radius from the Site:
- Nature on the Map (Natural England, updated);
 - Multi-Agency Geographical Information for the Countryside (MAGIC)
 - Ordnance Survey (OS) mapping;
 - Aerial photography; and
 - Herts Environmental Records Centre (HERC)
- 2.3 Badger records are not normally provided through publicly available resources in an attempt to curb the persecution of the species and given that badgers were already known to be present at the Site, these were not specifically requested.
- 2.4 The absence of a species from biological records cannot be taken to represent actual absence. Species distribution patterns should be interpreted with caution as they may reflect survey/reporting effort rather than actual distribution.

Ecological Walkover Survey

- 2.5 On 29th June 2016, an ecological walkover survey was carried out in order to update the 2014 survey, and identify any major changes in habitat or species composition within the Site. Changes in habitats within the Site were mapped according to standard Phase 1 Habitat Survey Methods and informed by surveys undertaken in 2014.
- 2.6 Given the nature of the Site, due consideration was given to the Open Mosaic Habitat survey method³ during the ecological walkover to ascertain whether the habitats present qualified this as an Open Mosaic Habitat of Principle Importance in England (for more information relating to Habitats of principal importance, see **Appendix 1**).

Bat Surveys

- 2.7 A broad assessment of trees for bat roost potential was undertaken as part of the Extended Phase 1 Habitat Survey and ecological walkover. It was assumed that mature trees and woodland would

¹ Survey guidance is available at <http://www.cieem.net/sources-of-survey-methods-sosm-> and appraisal guidance is available at <http://www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpea->.

² British Standards Institute (2013). BS42020:2013 Biodiversity – Code of Practice for Planning and Development.

³ Lush, M.J; Kirby, P; and Shepherd, P (2013) *Open Mosaic Habitat Survey Handbook*.

not be lost as a result of the proposals and therefore detailed assessments of bat roost potential or detailed bat roost surveys were not undertaken.

- 2.8 Given the potential for use of the wider Site by foraging and commuting bats, two bat activity transects were surveyed on three separate evenings throughout the summer (20th July, 10th August and 12th September 2016). The aim of these transects was to provide an overview of bat activity within the Site as a whole, whilst also identifying levels of bat activity in specific areas.
- 2.9 Each transect incorporated key habitat features likely to provide opportunities for bat foraging and commuting, such as woodland edges, scrub and tree lines. Two surveyors walked a defined route, stopping to record bat passes at 10 point locations for a period of four minutes at each, before doubling back to make a second stop at each point. This method aided subsequent interpretation of bat data and ensured a suitably slow transect pace. The routes of the transects and point locations are shown in **Appendix 3, Figure 1**.
- 2.10 Surveys used BatBox Duet detectors, with bat calls and GPS coordinates also recorded using AnaBat Express recorders, for subsequent analysis using Analook software. All surveys were completed during suitable dry, mild weather conditions, beginning at least 15 minutes prior to sunset and continuing for approximately 2 hours after sunset, in accordance with best practice guidelines⁴. Further information about the surveys is provided in **Appendix 5**.

Reptile Surveys

- 2.11 A reptile survey was carried out during August and September 2016 with due consideration to best practice guidelines⁶. On the 28th July 2016, 113 artificial refugia (comprising roofing felt mats of approximately 1m x 0.5m) were placed across the Site in areas of suitable habitat (**Appendix 3, Figure 2**). During the placing of refugia consideration was made to the risk of disturbance by members of the public, as well as future growth of tall ruderal herb species.
- 2.12 Refugia were left for a period of 14 days to allow reptiles to become accustomed to them. The refugia were then checked on seven occasions in suitable weather conditions throughout August and September 2016.
- 2.13 Suitable weather conditions are generally considered to be dry sunny spells after rainfall or periods of intermittent sunshine on warmer days, with temperatures between 9°C and 18°C. Further detail, including survey dates and weather conditions are provided in **Appendix 6**.

Badger Survey

- 2.14 An inspection of all habitat types suitable for badger was undertaken across the Site on 10th August 2016, including an approximate 50m buffer from the Site boundary where accessible. All signs of activity were mapped including setts, footprints, paths, dung, latrines and hairs.
- 2.15 Particular attention was paid to areas of woodland, scrub and boundary habitats within the Site, especially areas with sloping ground or banks. These are favoured by badger as they provide suitable areas for foraging and sett building.
- 2.16 Any setts located were classified by the number of entrance holes and level of activity (the latter based on the 'openness' of the hole⁵). This is summarised in **Table 2.1**, below.

Table 2.1: Classification of Badger Setts

Sett type	
Main	A breeding sett, these usually have 5-20 entrances. These are large, well-established setts, normally in continuous use. Each group will use only one main sett and it will form the most likely location for the raising of cubs.
Annexe	These setts are usually found in close association with the main sett, and will often be linked to it by a well-worn path. Where a second litter of cubs

⁴ Hundt (2012) Bat Surveys: Good Practice Guidelines, 2nd Edition, Bat Conservation Trust

⁵ Harris et. Al. (1989) Surveying Badgers. Mammal Society

	is born they will be raised in the annexe sett.
Subsidiary	Subsidiary setts will usually have five or more holes, although not all of these will be in continuous use.
Outlying	These setts are used on an occasional basis and will usually consist of only one to three holes. Spoil heaps will generally be smaller than those found associated with the other sett types, indicating a smaller underground structure.
Level of activity	
Well used	Holes in regular use and are therefore free of debris. They may have been recently excavated.
Partially used	Debris, including leaves, twigs and other vegetation clutter the entrance to these holes, indicating they are not in regular use. The holes can be used after a minimum of clearance.
Disused	A considerable amount of clearance is needed before these holes can be used. The holes may become so blocked that only a depression in the ground is visible where the hole used to be.

Invertebrate Survey

- 2.17 An invertebrate survey was carried out in 2014 and the findings are summarised in the next section. Given the nature of the Site, and the absence of notable changes in the habitats present, it was not considered necessary to update this survey in 2016.

Limitations and Constraints

General Survey Limitations

- 2.18 While every attempt has been made to collect accurate baseline data, all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often transient and it is not possible to confirm the absence of a species through survey. It may be necessary update ecological surveys and data presented in this report should not be used for long-term analysis of species behaviour.

Reptile Surveys

- 2.19 The weather during July and August 2016 was at times very hot. In accordance with survey guidance, high temperatures are sub-optimal for reptile surveys. However surveys were only undertaken during appropriate weather conditions, and at times of the day when weather conditions were acceptable (for example early or late in the day when conditions were cooler), with survey visits well spread-out between May and August. This survey is therefore considered robust.

Badger Surveys

- 2.20 Some small areas within the northern boundary of the Site were not accessible due to the build-up of dense scrub and bracken. As a result, a detailed survey for badger was not possible in these areas, however, it is considered unlikely that badger setts were present given the absence of well-used mammal trails leading in to the scrub. Further surveys for badger will be recommended for completion prior to the commencement of development works.

Bat Surveys

- 2.21 A recording error on the Anabat Express occurred during the third bat activity survey of Transect 2, resulting in the data from the Anabat Express being lost. However, as the surveyor was also noting observations with a hand-held bat detector at the time, and due to the low levels of bat activity observed that night, it is considered that sufficient data was collected to give an overall

picture of bat activity within the Site. This is therefore not considered to represent a constraint to the survey findings.

Bat Call Analysis Limitations

- 2.22 The data collected on the Anabats represents single bat passes. It cannot always be ascertained if multiple passes in an evening represent multiple bats, or a single bat foraging around the location of the anabat. When weather conditions are good for foraging, i.e. stable temperatures, dry with low wind speeds then it is more likely that multiple passes are as a result of foraging (i.e. 1 bat flying multiple times around the same area) rather than multiple bats. Given the limitations to the data, caution is taken when reviewing the data and high numbers of bat passes are not automatically assumed to demonstrate use of a site by a large bat population.
- 2.23 The analysis of bat detector calls can be prone to some subjectivity, but has been undertaken by experienced surveyors, following appropriate guidance. Bat species identification was interpreted using known call parameters⁴ and existing literature on the ecology of UK bat species, including distribution, range, habitat associations and behavioural characteristics, in addition to professional judgement. Every attempt was made to identify bats to species level. However, it is not always possible to identify some *Pipistrelle* and *Nyctalus* bats to species level. For example, differentiating between the echolocation calls of the common pipistrelle (which echolocates at a peak frequency of approximately 45kHz) and the soprano pipistrelle (which peaks at approximately 55kHz) is not always possible where recordings peak at the intermediate frequency of 50kHz. This is a widely accepted limitation and in such cases these passes are therefore classified at the Genus level only (i.e. *Pipistrellus* sp. or *Nyctalus* sp.).

3 Baseline Data

Desk Study

- 3.1 The findings of the desk study are presented in the tables below. **Table 3.1** summarises both statutory and non-statutory designated sites within 2km of the Site. **Table 3.2** summarises records of protected and notable species of relevance given the Site.

Table 3.1: Designated Sites within 2km of the Site

Site Name	Designation(s)	Qualifying Feature(s)	Distance/Orientation from Study Area
Statutory Sites			
Waterford Heath	LNR	Grassland, scrub, plantation woodland and a small area of ancient, semi-natural woodland. Important site for grizzled skipper butterflies.	1.75km NE
Non-Statutory Sites			
Land west of Sele Farm	Local Wildlife Site	Area of derelict old grassland and scrub including a north facing slope. The grassland is mainly rough and neutral in character with a shorter more acid community on the slope.	0.00km
Panshanger Park	Local Wildlife Site	Parkland with veteran trees, ancient woodland, riparian woodland and a variety of grassland ranging from acid to neutral and wet swards.	0.17km SW
Archer's Spring Conifer Plantation	Local Wildlife Site	A conifer plantation with remnants of original ancient broadleaved woodland.	0.17km W
Long Wood (Sele Farm)	Local Wildlife Site	Ancient semi-natural broadleaf woodland.	0.32km NE
Hanging Grove	Local Wildlife Site	Ancient semi-natural woodland on a west facing slope.	0.35km N
Selebroom Wood & Charterfield Plantation	Local Wildlife Site	Ancient woodland with some mixed plantation.	0.66km NW
Broadoak End Pastures	Local Wildlife Site	Predominantly neutral old grassland with moderate species diversity.	0.73km W

Site Name	Designation(s)	Qualifying Feature(s)	Distance/Orientation from Study Area
Grassland E. of Icehouse Wood	Local Wildlife Site	Old neutral to acid grassland with some areas of scattered scrub.	0.84km NE
Elevenacre Wood	Local Wildlife Site	Narrow strip of ancient semi-natural woodland on a steep north facing gravel escarpment.	0.87km E
Westend Meadow	Local Wildlife Site	Pasture with stream and spring-fed sedge fen swamp, and a swallowhole at the eastern end. The pasture supports species-rich neutral-acid grassland.	0.92km NW
North Road Cemetery, Hertford	Local Wildlife Site	Cemetery with semi-improved neutral grassland.	0.95km E
Golding's Meadows & Woods	Local Wildlife Site	Species rich grassland ranging from acid to neutral; ancient woodland; several watercourse with rich aquatic vegetation.	0.96km NE
Hook's Bushes and Barnsley's Wood	Local Wildlife Site	Ancient woodland.	1.31km NW
Beane Marsh	Local Wildlife Site	Species-rich neutral to acidic wet/marshy alluvial grassland with some tall fen/swamp vegetation and the river. Away from the river the pasture becomes drier.	1.48km E
St Mary's Churchyard, Hertingfordbury	Local Wildlife Site	Churchyard with moderately diverse neutral grassland.	1.50km SE
Waterford Marsh East	Local Wildlife Site	No information.	1.54km NE
Hertingfordbury Park, Lower Pastures	Local Wildlife Site	Series of low lying neutral grasslands contains several wet flushes and springs giving rise to marshy/fen conditions in places, which have produced a quaking bog and fen community especially uncommon in the locality and of considerable wildlife value.	1.57km SE
Willowmead	Local Wildlife Site	Mature riparian wet woodland with willow carr on a waterlogged peaty substrate. Tall fen swamp is present below. Drier areas support common woodland species. The	1.69km SE

Site Name	Designation(s)	Qualifying Feature(s)	Distance/Orientation from Study Area
		river's edge supports a good strip of marginal vegetation. The site is good for mosses and fungi.	
Great Mole Wood	Local Wildlife Site	Narrow strip of ancient semi-natural woodland on a steep north facing gravel escarpment.	1.75km NE
Holly Grove	Local Wildlife Site	Ancient woodland with a semi-natural canopy and moderately diverse ground flora. There is an overgrown pond in an old gravel pit.	1.78km NE
Cole Green Way	Local Wildlife Site	Secondary woodland with areas of species rich grassland.	1.81km S
Priest Wood	Local Wildlife Site	Ancient Woodland with some semi-natural areas and some areas replanted with conifers. Ground flora is species rich in semi-natural areas. Ponds and internal and external wood banks are present.	1.85km N
Riversmeet	Local Wildlife Site	Building and environs important for protected species.	1.86km SE
Meadow adjacent to Waterford Marsh	Local Wildlife Site	Grassland supporting a herb rich sward of typical marshy grassland species. Scrub hedges, a boundary ditch with running water and an old pond	1.89km NE
Waterford Heath (South)	Local Wildlife Site	Old gravel pit with settling beds and steep slopes and cliffs supporting a mosaic of habitats and a diverse flora including secondary woodland, grassland with neutral to calcareous indicator species and a seasonal pond.	1.91km NE
Red Wood	Local Wildlife Site	Ancient woodland.	1.93km NW
Mimram Road Ditch and Wasteground	Local Wildlife Site	Site comprising the River Mimram with records for Water Vole (<i>Arvicola amphibius</i>) and Grass Snakes (<i>Natrix natrix</i>) and adjacent waste ground supporting Slow Worms.	1.93km SE
Archers Green	Local Wildlife	Acid to neutral grassland with	1.95km W

Site Name	Designation(s)	Qualifying Feature(s)	Distance/Orientation from Study Area
	Site	areas of wetter marshy grassland.	
Meadow & River Lee by Leahoe Viaduct North-west	Local Wildlife Site	No information.	1.95km SE

Table 3.2: Protected and Notable Species Records within 2km of the Site

Species Name	Scientific Name	Distance/Orientation from Study Area	Year
Invertebrates			
Roman Snail	<i>Helix pomatia</i>	1.71km NE	2013
Mammals			
Brown Long-eared Bat	<i>Plecotus auritus</i>	2.00km SE	2004
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1.49km SW	2016
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	1.49km SW	2016
Noctule Bat	<i>Nyctalus noctula</i>	1.49km SW	2016
Leisler's bat	<i>Nyctalus leisleri</i>	1.49km SW	2016
Natterer's Bat	<i>Myotis nattereri</i>	1.49km SW	2016
Daubenton's Bat	<i>Myotis daubentonii</i>	1.49km SW	2007
Serotine	<i>Eptesicus serotinus</i>	2.00km SE	2016
Western Barbastelle	<i>Barbastella barbastellus</i>	2.00km SE	2016
Eurasian Badger	<i>Meles meles</i>	1.20km NW	2011
Amphibians and Reptiles			
Great Crested Newt	<i>Triturus cristatus</i>	2.00km SW	2001
Adder	<i>Vipera berus</i>	2.00km NE	1995
Grass Snake	<i>Natrix natrix</i>	0.87km SW	2016

Species Name	Scientific Name	Distance/Orientation from Study Area	Year
Slow-worm	<i>Anguis fragilis</i>	1.60km SE	2009
Birds			
Barn Owl	<i>Tyto alba</i>	1.50km SW	1999
Field fare	<i>Turdus pilaris</i>	1.54km SE	2011
Redwing	<i>Turdus iliacus</i>	1.54km SE	2007
Brambling	<i>Fringilla montifringilla</i>	1.50km SW	2009
Eurasian hobby	<i>Falco subbuteo</i>	1.90km SW	2010
Red kite	<i>Milvus milvus</i>	1.50km SE	2012

Summary of 2014 Surveys

- 3.2 Detailed surveys were undertaken in 2014 for the following species given the nature of the habitats present within the Site. These surveys were conducted as part of a separate project at the Site.

Bat Activity and Static Monitoring Surveys

- 3.3 Activity surveys recorded the following species of bat within the Site:

- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Serotine *Eptesicus serotinus*
- Unidentified big bat *Nyctalus* sp.(possible Leisler's bat *Nyctalus leisleri*)
- Two species of myotis bat *Myotis* spp.

- 3.4 In general, bat activity through the Site was relatively low indicating some local value for foraging and commuting bats. Static monitoring recorded low numbers of passes of species as noted above, with low level commuting and foraging activity recorded in the north and south of the Site.

Badgers

- 3.5 Five mammal burrows were recorded with possible current or historic use by badger, but no definitive badger setts were identified. These possible/historic setts were either located on the site boundary or in adjacent habitats.

Reptiles

- 3.6 A maximum of two adult grass snakes were recorded along the southern bund during one survey, along with two juvenile grass snakes within the LWS in the northern part of the Site. A total of ten observations of grass snakes and one shed skin were recorded during the surveys.

Invertebrates

- 3.7 The following notable invertebrate species (none of which are subject to legal protection) were recorded (for full results, see **Appendix 2**):

- A single species listed on the former UK Biodiversity Action Plan (cinnabar moth); and

- Nine species identified as Nationally Scarce 'B'⁶, including ground bugs and beetles, all of which are associated with bare, dry ground.

Ecological Walkover 2016

Study Area Description

3.8 The Site was largely vegetated by tall ruderal herb interspersed with areas of semi-improved neutral grassland. There were also areas of deciduous woodland and scrub. The Site was subject to frequent use by the public, including dog walkers and off-road vehicle users. The Site comprised three distinct parts:

- **The eastern half of the Site** was largely open, dominated by ruderal and grassland communities and with signs of apparent ground disturbance including large levelled areas and earth mounds. The northern boundary sloped steeply down to the woodland edge, while part of the west boundary sloped down to the LWS.
- **The southern part of the western half of the Site** was similar in nature to the above, but with a large earth bund forming its southern and western boundaries. This bund was planted with trees. There was also frequent bare ground associated with off-road vehicles.
- The northern part of the western half comprised **the LWS** within a basin at lower ground level to the rest of the Site. This supported an intricate habitat mosaic including scrub, woodland, grassland, tall herb and bracken. There was also regular disturbance and bare ground associated with off-road vehicles.

Habitat Descriptions

3.9 Habitat descriptions are set out below. While considering this information, reference should be made to the Phase 1 Habitat Map presented in **Appendix 3, Figure 3**, and target notes in **Appendix 4**.

3.10 The table below summarises the habitats identified during the survey and indicates their absolute and relative cover. In general the habitats within the Site remained broadly similar to those recorded in 2014. Some minor changes included:

- An increase in the area of poor semi-improved grassland (and resulting decrease of tall ruderal habitat) in the eastern part of the Site;
- An increase in tall ruderal habitat resulting in a loss of small areas of semi-improved neutral grassland towards the central part of the Site;
- A bund along the southern and western Site boundary which had previously been recorded as dense scrub had matured into plantation woodland;
- A small area of marshy grassland was recorded towards the southern part of the Site; and
- An area of continuous bracken in the north-west of the Site had increased in size.

Table 3.3: Habitat Summary

Habitat Type	JNCC Code	Area (Ha)
Semi-natural broad-leaved woodland	A1.1.1	2.10
Coniferous woodland plantation	A1.2.2	0.84
Broadleaved plantation woodland	A1.1.2	0.43

⁶ Taxa which are recorded in 16-100 hectads (10km squares) but not included in one of the IUCN Red List Categories

Habitat Type	JNCC Code	Area (Ha)
Dense scrub	A2.1	3.94
Dense scrub/Scattered trees	A2.1/A3.1	0.46
Semi-improved neutral grasslands	B2.2	3.52
Semi-improved neutral grasslands/Scattered trees	B2.2/A3.1	0.17
Semi-improved neutral grasslands/Ruderal/Scattered scrub	B2.2/C3.1/A2.2	0.51
Poor semi-improved grassland	B6	1.69
Marshy grassland	B5	0.08
Continuous bracken	C1.1	0.71
Ruderal	C3.1	6.53
Ruderal/Scattered scrub	C3.1/A2.2	0.31
Introduced shrubs	J1.4	0.14
Bare ground	J4	0.23
Total		21.66

Tall ruderal herbs

3.11 The majority of the Site supported tall ruderal herb communities. Typically, teasel *Dipsacus fullonum* and goat's-rue *Galega officinalis* were co-dominant while nettle *Urtica dioica* was locally dominant in patches and was particularly associated with the frequent earth mounds that punctuated the Site. Creeping cinquefoil *Potentilla repens* and white clover *Trifolium repens* were abundant. The dominant grasses were yorkshire fog *Holcus lanatus* and creeping bent *Agrostis stolonifera*. In some areas hemlock *Conium maculatum* was frequent to locally abundant.

Semi-improved neutral grassland

3.12 Amongst the tall ruderal communities were frequent patches of rabbit grazed grassland, with four particularly large areas identified which included:

- An area in the north of the eastern half of the Site which was subject to frequent public use with several paths going through it. It was dominated by red rescue *Festuca rubra* and had locally frequent patches of teasel, sweet violet *Viola odorata*, early forget-me-not *Myosotis ramosissima*, perforate St John's-wort *Hypericum perforatum* and hard rush *Juncus inflexus*.
- An area in the south of the eastern half of the Site which had a higher sward than other grassland on the Site with some thatch. Yorkshire fog was dominant and cock's-foot *Dactylis glomerata* was frequent. Perforate St John's-wort was locally abundant, creeping thistle *Cirsium arvense* was frequent while evening primrose *Oenothera biennis*, wavy bittercress *Cardamine flexuosa*, common field speedwell *Veronica persica*, nettle and hemlock were locally frequent.
- An area in the southern part of the western half of the Site which was heavily grazed and disturbed by off-road vehicles. Rough meadow-grass *Poa trivialis* was dominant while perennial rye-grass *Lolium perenne* was frequent and red rescue, ragwort *Senecio jacobaea*,

creeping cinquefoil and white clover were abundant. Hard rush and hairy sedge *Carex hirta* were present but rare. Throughout the shorter areas of sward common cudweed *Filago vulgaris* was locally frequent to locally abundant.

- The LWS which formed a mosaic of grassland with scrub, tall ruderal communities and bare ground. The grassland was heavily grazed and disturbed by dirt bikes. Rough meadow-grass was dominant; perennial rye-grass was frequent; red rescue, ragwort, creeping cinquefoil, white clover were abundant; parsley-piert, thyme-leaved speedwell, creeping thistle, spear thistle, common mouse-ear *Cerastium fontanum*, and selfheal were occasional; and germander speedwell *Veronica chamaedrys* was rare.

Scrub habitats

3.13 There were several large areas of dense, continuous scrub habitat around the boundaries of the Site, with smaller patches associated with earth mounds within the Site. Particularly large areas of scrub included:

- An area along the eastern boundary which was dominated by bramble *Rubus fruticosus* agg. and hawthorn *Crataegus monogyna*, with frequent dog rose *Rosa canina*, blackthorn *Prunus spinosa* and *Salix* spp. There were locally frequent dead elm *Ulmus* sp. and ornamental cherry *Prunus* sp towards the south of the eastern boundary. Sycamore *Acer pseudoplatanus*, lilac *Syringa* sp. and garden privet *Ligustrum ovalifolium* were also present to the south.
- The large bund along the southern boundary. To the east this was dominated by bramble with frequent sycamore and flowering currant *Ribes sanguineum*. Further west, the bund was covered in scrub of tall butterfly-bush and bramble with scattered semi-mature trees.
- A strip of butterfly-bush *Buddleja davidii* (mapped as introduced shrub) in the centre of the site, south of the woodland belt.
- An area of the north facing slope on the southern boundary of the LWS was dominated by raspberry *Rubus idaeus*, and had abundant nettle, frequent bramble and occasional teasel and rosebay willowherb.
- The northern boundary of the LWS, adjacent to the coniferous plantation, was dominated by blackthorn and had frequent elder, bramble and hawthorn and occasional silver birch *Betula pendula* and sycamore.
- The eastern part of the LWS which was dominated by bramble and nettle with occasional elder, willow, oak, blackthorn, apple *Malus* sp. and hawthorn.

3.14 Scattered scrub occurred throughout the Site amongst areas of tall ruderal herbs and grassland communities, and along the roadside to the south of the Site. It was typically bramble dominated.

Woodland habitats

3.15 A narrow strip of semi-natural broadleaved woodland formed the boundary between the LWS and the eastern half of the Site. This was dominated by oak *Quercus robur* and elm with frequent elder, holly *Ilex aquifolium* and hawthorn. The ground flora was dominated by nettle with abundant cleavers, frequent ground ivy and occasional bluebell *Hyacinthoides non-scripta*. There was frequent standing and fallen dead wood.

3.16 There was a large area of semi-natural broad-leaved woodland to the north of the Site which was dominated by ash *Fraxinus excelsior* and oak *Quercus robur* with frequent willow, elm, hawthorn, elder, hornbeam *Carpinus betulus* and field maple *Acer campestre*. Snowberry *Symporicarpos albus* was locally dominant. An area to the east was dominated by mature hawthorn which appeared to have been planted. Areas of the ground flora were relatively dense at the time of the survey, in particular supporting frequent bluebell.

3.17 The western part of the woodland to the north of the Site comprised coniferous plantation dominated by Scots pine *Pinus sylvestris*. A tree line of hornbeam, oak and holly formed the western boundary. The ground was mostly bare, with scattered patches of bracken *Pteridium aquilinum*, wood sage *Teucrium scorodonia*, bluebell *Hyacinthoides non-scripta* and foxglove *Digitalis purpurea*.

3.18 Along the bund in the south and west of the site an area previously recorded as scrub had matured into plantation woodland. This was dominated by sycamore which had a very even age structure and sparse ground flora.

Continuous bracken

3.19 A bracken dominated area was noted within the LWS, to the south-east of the coniferous plantation.

Ephemeral/short perennial

3.20 Outside and to the north of the Site, in the north of the adjacent woodland habitats, was a field supporting ephemeral vegetation. Historical aerial photographs show that this area was cultivated for crops at least as recently as 2006 but has been allowed to regenerate for some years. It was dominated by bryophyte with abundant ragwort and willow-herb spp. with occasional regenerating butterfly-bush and silver birch (which had been cut).

Linear Habitats

3.21 Two parallel dry ditches with associated earth mounds formed the southern boundary of the eastern part of the Site. They supported semi-improved neutral grassland with locally abundant hogweed *Heracleum sphondylium* and rosebay willow-herb *Chamerion angustifolium*, and associated scattered scrub. These were presumably created to prevent vehicle access to the Site.

3.22 There were two defunct, species-poor hedgerows identified on the Site:

- A hedgerow formed the western boundary of the Site, alongside a farm track. It was gappy and leggy in places with dominant hawthorn, abundant blackthorn and ivy *Hedera helix* ssp *helix*, occasional elder and occasional mature sycamore and oak standards. It was also associated with a shallow, dry ditch.
- A hawthorn dominated hedge in the centre of the Site formed part of the southern boundary of the LWS. It was very gappy, leggy and outgrown.

Bare ground

3.23 There were frequent patches of bare ground throughout the Site, seemingly created by off-road vehicles. Particularly large areas were located within the LWS and at an informal access point to the Site from the Welwyn Road. Areas within the LWS were subject to erosion, particularly on the steep slopes.

Bats

Habitat

3.24 The habitats present throughout the Site continued to provide suitable foraging habitats for bats as recorded in 2014, with woodland and scrub edges in particular providing potential foraging and commuting routes. The woodland within and to the north of the Site provided potential roosts given the age and condition of some of the mature trees and the presence of standing dead wood. The habitats within the site and their suitability for bats remain broadly similar to those present in 2014.

Activity Surveys

3.25 Full bat activity transect results are provided in **Appendix 5** and summarised for each transect below. The transect routes and recording points are shown in **Appendix 3, Figure 1**.

Transect 1

3.26 In general, low levels of activity were recorded during this transect. The following species were recorded:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Noctule *Nyctalus noctula*;

- Leisler's bat *Nyctalus leisleri*; and
 - Brown long-eared bat *Plecotus auritus*.
- 3.27 The majority of activity represented common and soprano pipistrelle passes, with only occasional commuting passes recorded from noctules, leisler's bat and brown long-eared bats. Activity began 30 to 40 minutes after sunset, with common and soprano pipistrelles being the first species recorded. The greatest levels of activity were recorded between transect points 5 and 10, within and around the LWS. Foraging activity was most concentrated around the woodland edges along the northern boundary of the Site and along the strip of woodland extending southwards along the eastern boundary of the LWS.

Transect 2

- 3.28 Activity levels were also generally low during this transect. The following species were recorded:
- Common pipistrelle *Pipistrellus pipistrellus*;
 - Soprano pipistrelle *Pipistrellus pygmaeus*;
 - Unidentified noctule/ Leisler's bat *Nyctalus* sp.; and
 - Brown long-eared bat *Plecotus auritus*.
- 3.29 The majority of activity represented common and soprano pipistrelle passes, with only occasional commuting passes recorded from brown long-eared bats and *Nyctalus* sp. Activity generally began 30 minutes after sunset, with common and soprano pipistrelles being the first species recorded. Commuting and foraging activity was largely restricted the linear features such as tree-lines and scrub, with the majority of passes recorded along the south-western boundaries of the Site, between transect points 7 and 10. Foraging and commuting activity was also associated with the woodland along the eastern boundary of the LWS, between points 4 and 5.

Reptiles

Habitat

- 3.30 Areas of potentially suitable reptile habitat within the Site had slightly increased since the previous survey, including more widespread areas of tussocky grassland in the eastern part of the Site. This provided an increase in suitable foraging, basking and sheltering sites (although it is noted that much of the Site was previously considered suitable for reptiles). Areas of tall ruderal habitat may have provided opportunities for shelter but had grown too tall later in the year to provide basking opportunities, whilst shorter grassland areas did not provide opportunities for shelter. The habitat mosaic within the LWS also provided opportunities for reptiles to forage, bask and shelter. In addition, the numerous vegetated banks provided basking opportunities while cracks, crevices and mammal burrows throughout the Site, including in the woodland, provided sheltering or overwintering opportunities.

Surveys

- 3.31 Full details of the reptile surveys and survey findings can be found in **Appendix 6**.
- 3.32 A single juvenile grass snake was found on a sunny bank, near the south-eastern corner of the Site during a single survey in September (**Appendix 3, Figure 2**). This would appear to indicate a reduction in the population since the 2014 surveys, where a maximum of two individuals were found per survey, totalling ten reptile sightings throughout the survey period. However, the location was consistent, with the majority of sightings in 2014 also being located in the south-east of the Site. The juvenile record also proves successful breeding in the vicinity of the site.

Badgers

- 3.33 The woodland, scrub and grassland adjacent to and within the Site continued to provide suitable habitat for foraging badgers. There were numerous banks and areas of sloping ground which provided opportunities for sett building.
- 3.34 Badger activity within the Site appeared to have increased since 2014, with signs such as badger latrines, dung and mammal trails visible throughout the Site. However, the majority of these signs were related to foraging activity, with no badger setts observed within the proposed footprint of the development.
- 3.35 A potential badger sett was identified within the wider survey area, including footprints and discarded bedding. The sett was located under dense scrub and consequently could only be partially viewed, however, the features observed indicate that it is potentially a well-used main sett. Given the risk of persecution to badger, the location of this sett is not detailed in this report
- 3.36 Elsewhere, numerous collections of mammal holes were being used by rabbits. These features may have been used by badgers in the past and have the potential to be used by them in the future.

Dormice

- 3.37 The area of semi-natural broadleaved woodland to the north of the Site and extending into the Site provides optimal foraging and hibernation habitat for dormice, although no records were provided of this species in the vicinity. The grassland and scrub within the Site provide sub-optimal foraging opportunities for dormouse. In addition, predation by pets from existing, neighbouring residential properties would be likely to reduce the suitability of the Site for dormouse (during ecology surveys a number of cats were seen within the Site and within the woodland to the north of the Site).
- 3.38 Dormice surveys were therefore not considered necessary given that the current design principles are to include retention of woodland habitats.

Birds

- 3.39 The woodland and scrub throughout and surrounding the Site provided optimum breeding habitat for common woodland and garden birds. The open habitats were highly unlikely to support ground nesting birds given the tall height of ruderal vegetation, and nearby tree and woodland habitat which would discourage ground nesting birds (due to the increased predation risk), and given regular disturbance from Site users as well as predation by pets from neighbouring residential properties.

Invertebrates

- 3.40 The 2016 ecological walkover survey confirmed that the Site continued to meet the criteria for Open Mosaic Habitat; therefore notable invertebrates may continue to be present. There are records of Roman snails within the vicinity of the Site but it is unlikely that they are present on the Site itself because they are strongly associated with chalky soils, whilst the soils on the Site are sandy and gravelly in nature.

4 Discussion

Designated Sites

Discussion

- 4.1 The Site includes the Land west of Sele Farm LWS which is largely identified for its grassland habitats associated with the slopes, as well as the general habitat mosaic. The site is subject to heavy use by off-road vehicles. Under the current proposals the LWS will be excluded from the development area therefore given the proposals it is considered that effects on the LWS will be limited. However increased recreational pressure has the potential to result in impacts on the LWS such as degradation of habitats and fly-tipping.

Mitigation

- 4.2 The following measures are recommended:
- Exclusion of motorcycle use from the LWS;
 - Removal of fly-tipping;
 - Retention of mature trees; and
 - Retention of the most valuable habitats, including bare ground and grassland areas.
- 4.3 As well as excluding off-road vehicles in order to allow re-colonisation of grassland, management of site visitors is also recommended in order to reduce damage to habitats within the LWS whilst providing an educational and recreation resource for the enjoyment of nature.

Enhancement

- 4.4 Opportunities to enhance the LWS as part of the proposals include enhancement of the habitat mosaic through management of scrub and bracken to reduce colonisation of open habitats and increase habitat diversification. The creation of wildlife features, such as log/brash piles, wetland areas and retention of deadwood and bare ground features in more open areas, would also result in an enhancement if carefully designed.

Habitats

Discussion

- 4.5 Individually the habitats identified within the Site do not have particularly high ecological value, being relatively common and widespread habitats. However, given the large size of the Site and the high diversity of habitats which exist in a complex mosaic the Site as a whole can be considered to have relatively high biodiversity value compared to surrounding agricultural and developed land.
- 4.6 The Site was assessed in the context of the Biodiversity Action Plan criteria for Open Mosaic Habitat on Previously Developed Land (OMH) during 2014, and during the 2016 walkover was found to continue to meet these criteria.
- 4.7 The woodland habitats to the north of the Site provide opportunities for wildlife. Although this woodland is not included in the Natural England Ancient Woodland Inventory some ancient woodland indicator species, such as bluebell, are present. Historical mapping shows that the eastern plantation part of the woodland has been wooded since at least 1834 while the western part has been planted since 1958.

Mitigation

- 4.8 Mitigation recommendations include:
- Retention of habitats within the south-eastern part of the Site, where possible;
 - Strengthening of the southern Site boundary in order to improve connectivity by planting a hedgerow/native scrub border; and
 - Removal of non-native buddleia scrub.
- 4.9 In addition to the above, mature trees and woodland habitats should also be retained, where possible, although localised thinning and diversification of existing, retained scrub/young tree planting would be beneficial.
- 4.10 Although the creation of Open Mosaic Habitat within the development would not be feasible, habitat creation could include the following to compensate for the loss of OMH within the development area:
- Creation and management of wildflower grassland habitat in open space;
 - Landscape planting to include native species and ornamental species of known benefit to wildlife;
 - Creation of a mosaic of habitats, including trees, scrub and grassland areas.
 - Enhancement and management of the LWS (see above); and
 - Potential for localised living roofs and walls.

Bats

Discussion

- 4.11 Relevant legislation afforded to bats is detailed in **Appendix 1**. The habitats present within the Site, such as woodland edge and scrub, provide good foraging and commuting opportunities for bats with good connectivity to the wider landscape. Despite this, bat activity recorded within the Site was relatively low given the habitats present.
- 4.12 The majority of bat passes recorded represented common and soprano pipistrelle, both of which are relatively common and widespread species. Commuting and foraging activity was mostly associated with the woodland along the northern boundary of the Site and around the LWS. In addition, the tree-line and scrub along the southern boundary of the Site was used as a commuting corridor. It is understood, however, that these areas will be retained and protected as part of the development proposals.
- 4.13 Lighting and noise associated with development proposals both have the potential to impact on foraging and commuting bats by rendering dark commuting corridors and foraging areas unsuitable for use by bats.

Mitigation

- 4.14 The following mitigation will ensure impacts on bats are avoided or minimised.
- The lighting scheme should be designed to keep light spillage to a minimum, in particular in the vicinity of the Local Wildlife Site and northern woodland which supports commuting and foraging bats. Guidance on wildlife friendly lighting is provided by the Bat Conservation Trust and can be found at the following address: http://www.bats.org.uk/pages/bats_and_lighting.html; and
 - The tree-line along the southern boundary should be retained or, where this is not possible, the creation of a new hedgerow will retain connectivity and commuting and foraging routes for bats around the Site perimeter.
- 4.15 The above habitat mitigation measures will maintain habitat suitable for bat foraging and commuting.

4.16 It is understood all mature trees are to be retained. However should removal of mature trees be required, further bat surveys would need to be undertaken to determine whether roosts are present. If bat roosts are confirmed which may be affected by works, a NE European Protected Species licence will be sought, including mitigation to address potential impacts (such as timing of works, sensitive working methods, and provision of alternative roosts).

Enhancement

4.17 Habitat enhancement measures as detailed above for habitats will increase the Site's suitability for bat foraging. In addition, bat boxes could be installed on mature trees within the Site to provide additional bat roost features. Furthermore, bat roost features (such as self-contained bat bricks) could be installed within new buildings, where appropriate.

Reptiles

4.18 Legislation afforded to reptiles is summarised in **Appendix 1**. The Site continues to provide suitable foraging, basking and sheltering opportunities for these species, with a slight increase in suitable habitat areas. Despite this, only a single juvenile grass snake was recorded during the 2016 surveys, which represents a low population level, according to best practice guidance. The presence of a juvenile individual does, however, demonstrate that breeding has been successful and that adults are likely to still be present in the local area.

4.19 Given the low population level and the habitat mitigation measures outlined above, any impacts of the development on reptiles are considered to be low. However, the clearance of some areas of suitable habitat does have the potential to cause injury to reptiles, whilst development works may inadvertently improve the development sites for these species in the short term by creating opportunities for shelter underneath materials etc.

Mitigation

4.20 To prevent impacts on this species, a combination of habitat manipulation and exclusion fencing is recommended to prevent reptiles from straying into the development area during construction. This would include:

- Gradual habitat clearance of areas associated with the development. This should include cutting over a period of several days during warm weather between April-September (inclusive) to encourage any transitory reptiles to move prior to commencement of works;
- Consideration of localised exclusion fencing to prevent access by reptiles during works.

Enhancement

4.21 The above habitat measures will ensure that retained habitats, particularly the LWS, and new areas of open space provide opportunities for reptiles, particularly grass snake.

Badgers

Discussion

4.22 Legislation afforded to badger is summarised in **Appendix 1**. No setts or possible setts were recorded within or immediately adjacent to the proposed development site. A potential main badger sett which is in frequent use, was identified within the Local Wildlife Site, however, this is considerably more than 50 meters from the proposed development site.

4.23 The presence of latrines and foraging trails throughout the Site indicate moderate use by badgers as a foraging habitat, although the above measures will retain habitat for this species.

4.24 Numerous mammal holes and areas of sloping ground, some of which are situated within the proposed development site, provide potential opportunities for sett building. Badger are highly mobile and can rapidly establish setts, therefore there is potential for setts to be created within the site at any time.

Mitigation

- 4.25 Currently no mitigation is required relating to badger because the development will avoid disturbance to setts while maintaining and protecting key habitat areas. However, any enhancement measures, particularly within the Local Wildlife Site, would need to be carried out in consultation with ecologists to avoid impacts on badger setts.
- 4.26 Given the mobility of badgers and that they can readily establish new setts, an updated survey is recommended prior to the commencement of works, to ensure no further badger setts are present. Such surveys should be carried out no longer than 6 months prior to the commencement of works. If active setts are identified within 50 meters of the development site boundary, mitigation measures should be employed to reduce potential impacts, such as the sensitive implementation of works, timing of works and possible application for a NE licence for disturbance to badger.
- 4.27 Areas of dense scrub within the development site should be carefully cleared by hand under ecological supervision in case these conceal previously unrecorded badger setts.

Birds

Discussion

- 4.28 Relevant legislation afforded to nesting birds is detailed in **Appendix 1**. Woodland and scrub habitats within the Site provide suitable nesting habitat for common species of woodland and garden birds. The Site is considered sub-optimal for ground nesting bird species given the high levels of disturbance by dog walkers and local residents. Use of the Site by off-road vehicles further reduces suitability for such species.

Mitigation

- 4.29 The above habitat measures will maintain opportunities for birds, including for nesting.
- 4.30 To avoid impacts any nesting birds, the removal of trees and scrub within the Site should be undertaken between September-February (inclusive) to avoid the season during which birds are most likely to nest. Where clearance of suitable habitat is programmed during the bird breeding season, which is typically March to August inclusive, prior to works, a suitably qualified person must undertake a survey to determine whether birds are nesting in the area. If a nest is discovered, clearance or other construction works would need to be delayed within an exclusion zone. Works may only recommence once it is confirmed that chicks have fledged and that no other nests are in use within the exclusion zone.
- 4.31 Any suitable bird nesting habitat lost as a result of the development works should be replaced on a like-for-like basis.

Enhancement

- 4.32 As discussed above habitat enhancement measures will retain opportunities for nesting birds. Enhancement of the LWS grassland will also increase opportunities for foraging by providing a nectar-rich resource for invertebrates.
- 4.33 In addition, bird boxes could be installed within the woodland or retained scrub areas in order to increase nesting opportunities for such species. Landscaping within the development could include either native scrub species, or non-native berrying species in order to provide further enhancement.

Invertebrates

Discussion

- 4.34 The 2014 invertebrate surveys recorded nine notable invertebrate species (none of which are subject to legal protection; See **Appendix 2** for full species list), the majority of which were

ground-dwelling bugs or beetles associated with bare, dry ground habitats. Development within these areas will therefore result in a reduction in suitable habitat for such species.

- 4.35 There are records of Roman snail within 1km of the Site. However the Site itself is considered sub-optimal given the preference of this species for chalk-based substrates. The Site comprises predominantly sandy/gravel substrate which is considered sub-optimal for this species, and Roman snail were not recorded during the invertebrate surveys.

Mitigation

- 4.36 Given the relative continuity of the habitat types within the Site, an updated invertebrate survey is not considered necessary for the purposes of renewing the current planning application.
- 4.37 Measures detailed above in relation to habitats (in particular those relating to enhancement of the LWS and creation of OMH character habitats) will ensure the Site remains suitable for invertebrates by maintaining a diverse range of habitats through the site to provide opportunities for such species. It will not be possible to maintain suitable open/bare ground habitats in their current location given the proposals, but such habitats can be maintained and enhanced within the LWS.
- 4.38 The eastern part of the LWS should specifically be managed to recreate bare ground habitats in areas currently being colonised by scrub with the loss of grassland habitats. This should be undertaken in advance of development works, providing replacement habitats prior to loss of existing higher value invertebrate habitats. This may include:
- Scrub removal and ground disturbance to expose underlying substrates; and
 - Use of log retaining features to create new ground levels with potential importation of substrates from the eastern half of the site to recreate bare ground areas.
- 4.39 The north facing south boundary of the LWS could also be managed to reduce scrub cover with the creation of terraced areas with bare substrates. There may also be opportunities for excavation and relocation of substrates from the higher value areas within the development site, which may successfully relocate invertebrates.
- 4.40 It is acknowledged that although the above measures will aim to recreate habitats for notable species, that the success of this cannot be confirmed given issues recreating the current conditions including levels of disturbance (access and vehicle movement) which are in part responsible for maintaining these habitats. However, other habitat creation/enhancement measures also identified previously (see Habitats), will result in a diverse range of habitats to support adverse invertebrate assemblages even if the composition of the invertebrate assemblage changes.

Appendix 1

Policy and Legal Considerations

Statutory nature conservation sites and protected species are a ‘material consideration’ in the UK planning process (DCLG 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK and EU law.

Natural England Standing Advice aims to support Local Planning Authorities decision making in respect of protected species (Natural England 2012). Standing advice is a material consideration in determining the outcome of applications, in the same way as any individual response received from Natural England following consultation.

The Conservation of Habitats and Species Regulations 2010 transpose the requirements of the European Habitats Directive (Council Directive 92/43/EEC) and Birds Directive (Council Directive 79/409/EEC) into UK law, enabling the designation of protected sites and species at a European level.

The Wildlife and Countryside Act 1981 (as amended) forms the key piece of UK legislation relating to the protection of habitats and species.

The Countryside Rights of Way Act 2000 provides additional support to the Wildlife and Countryside Act 1981; for example, increasing the level of protection for certain species of reptiles.

The Protection of Badger Act 1992 provides specific protection for this species.

The Wild Mammals Protection Act 1996 sets out the welfare framework in respect to wild mammals, prohibiting a range of activities that may cause unnecessary suffering.

Species and Habitats of Principal Importance for Conservation in England and Wales and priority habitats and species listed on the Local Biodiversity Action Plans (BAPs) are species and habitats which are targeted for conservation. The government has a duty to ensure that involved parties take reasonable practice steps to further the conservation of such species under Section 41 of the Natural Environment and Rural Communities Bill 2006. In addition, the Act places a biodiversity duty on public authorities who ‘must, in exercising their functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’ (Section 40 [1]). Criteria for selection of national priority habitats and species in the UK include international threat and marked national decline.

The National Planning Policy Framework (DCLG 2012) states (Section 11), that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity where possible. It also states that local planning authorities and planning policies should:

- Plan positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.
- Take account of the need to plan for biodiversity at a landscape-scale across local authority boundaries.
- Identify and map components of the local ecological networks, including: international, national and local sites of importance for biodiversity, and areas identified by local partnerships for habitat restoration or creation.
- Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the recovery of priority species populations, linked to national and local targets and identify suitable indicators for monitoring biodiversity in the plan.

Bats

All British species of bat are listed on the Wildlife and Countryside Act 1981 (as amended) Schedule 5. It is an offence to deliberately kill, damage, take (Section 9(1)) a bat; to intentionally or recklessly disturb a bat whilst it occupies a place of shelter or protection (Section 9(4)(b)); or to deliberately or recklessly damage, destroy or obstruct access to a bat roost (Section 9(4)(c)). Given the strict nature of these offences, there is an obligation on the developer and owner of a site to consider the presence of bats.

All British bats are listed on the Conservation of Habitats and Species Regulations 2010, Schedule 2. Regulation 41 strengthens the protection of bats under the 1981 Act against deliberate capture or

killing (Regulation 41(1) (a)), deliberate disturbance (Regulation 41(1) (b))^[1] and damage or destruction of a resting place (Regulation 41(1) (d)).

A bat roost is defined as any structure or place which is used for shelter or protection, irrespective of whether or not bats are resident. Buildings and trees may be used by bats for a number of different purposes throughout the year including resting, sleeping, breeding, raising young and hibernating. Use depends on bat age, sex, condition and species as well as the external factors of season and weather conditions. A roost used during one season is therefore protected throughout the year and any proposed works that may result in disturbance to bats, and loss, obstruction of or damage to a roost are licensable.

Application for a Natural England EPS Licence

Development works that may cause killing or injury of bats or that would result in the damage, loss or disturbance of a bat roost would require a Natural England (NE) Bat Mitigation Licence.

For a Mitigation licence to be granted three tests must be met. Evidence is needed to determine these three tests: whether there is a need for the development which justifies the impact on the European Protected Species (EPS); whether there is an alternative which would avoid the impact and need for an EPS licence; and whether mitigation proposed is sufficient to maintain the conservation status of the EPS in question.

A Mitigation Licence application will generally only be considered by NE on receipt of planning consent, and once any pre-commencement conditions of relevance to ecology have been discharged.

There are two licensing routes now available for bats, which comprise:

Full NE England EPS Mitigation Licence:

- NE aim to determine the application within six weeks (although this can take longer).
- The application comprises three components including an application form (broad details of the applicant, site and proposals); a detailed Method Statement providing the survey methods and findings, impact assessment and mitigation measures (including detailed maps and schedule of works); and a Reasoned Statement outlining the 'need' for the development and consideration of alternatives.

NE Low Impact Class Licence

- This new route provides an alternative, quicker route (with a much reduced application form, and a target of 10 days to determine an application).
- This Low Impact Class Licence is only available to Registered Consultants identified by NE.
- This is available for sites which support up to three low status roosts (day roosts, night roosts, feeding roosts and transitional roosts) of a maximum of three common species. The common species which can be covered by this licence include common pipistrelle, soprano pipistrelle, brown long-eared, whiskered, Brandt's, Daubenton's and Natterer's bat.
- All licensed works require evidence that there is a need for the development and that appropriate mitigation, including seasonal constraints and provision of alternative habitat and/or roosting structures is considered.
- Before Natural England can confirm the site is registered and licensable works can commence, an assessment of the three tests must be undertaken by the Registered Consultant. Although this does not need to be submitted to NE, NE may subsequently undertake a review of the project and request to see all evidence as collected by the Consultant. This can only be undertaken following a survey and impact assessment which must be carried out in accordance with licence conditions and BCT survey guidelines.
- This licence cannot be used in relation to trees.

Several species of bat, including brown long-eared and soprano pipistrelle are listed as species of principal importance under the NERC Act (2006). Section 41 of the Act is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section

^[1] Relates specifically to deliberate disturbance in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young or ii) the local distribution of that species.

40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Badgers

Badgers are subject to legal protection under the Protection of Badgers Act (1992). Works which may result in damage to a badger sett, or potential disturbance to badger using setts, must be undertaken under a Natural England licence.

Reptiles

All UK reptiles and amphibians are legally protected from intentional and reckless killing and injury under the Wildlife and Countryside Act 1981 (as amended).

Nesting Birds

Birds and their nests are protected by the Wildlife and Countryside Act 1981 (as amended). This Act gives protection to all species of bird with regard to killing and injury, and to their nests and eggs with regard to taking, damaging and destruction. Certain species listed on Schedule 1 of the Act, are afforded additional protection against protection.

Appendix 2

Invertebrate Survey Results

Species of conservation concern in ***bold***.

Isopoda	Armadillidae	<i>Armadillidium vulgare</i>	Common Pill Woodlouse
	Oniscidae	<i>Oniscus asellus</i>	Common Shiny Woodlouse
<i>woodlice</i>	Philosciidae	<i>Philoscia muscorum</i>	Common Striped Woodlouse
	Porcellionidae	<i>Porcellio scaber</i>	Common Rough Woodlouse
Diplopoda	Glomeridae	<i>Glomeris marginata</i>	Pill millipede
<i>millipedes</i>	Julidae	<i>Tachypodoiulus niger</i>	
	Polydesmidae	<i>Polydesmus angustus</i>	
Insecta			
Orthoptera	Acrididae	<i>Chorthippus brunneus</i>	Common Field Grasshopper
<i>grasshoppers and crickets</i>		<i>Chorthippus parallelus</i>	Meadow Grasshopper
	Conocephalidae	<i>Conocephalus fuscus</i>	Long-winged Cone-head
	Phaneropteridae	<i>Leptophyes punctatissima</i>	Speckled Bush Cricket
	Tetrigidae	<i>Tetrix undulata</i>	Common Ground Hopper
	Tettigoniidae	<i>Metrioptera roeselii</i>	Roesel's Bush Cricket
Dermoptera	Forficulidae	<i>Forficula auricularia</i>	Common Earwig
Heteroptera	Anthocoridae	<i>Anthocoris confusus</i>	
<i>true bugs</i>		<i>Anthocoris nemoralis</i>	
		<i>Anthocoris nemorum</i>	
	Coreidae	<i>Coreus marginatus</i>	Dock Bug
		<i>Coriomeris denticulatus</i>	Denticulate Leatherbug
		<i>Syromastus rhombeus</i>	Rhombic Leatherbug
	Cydnidae	<i>Sehirus luctuosus</i>	Forget-me-not Shieldbug
	Lygaeidae	<i>Drymus sylvaticus</i>	
		<i>Graptopeltus lynceus</i>	
		<i>Heterogaster urticae</i>	

		<i>Megalonotus chiragra</i>	
		<i>Megalonotus praetextatus</i>	
		<i>Peritrechus geniculatus</i>	
		<i>Scolopostethus thomsoni</i>	
	Miridae	<i>Adelphocoris lineolatus</i>	
		<i>Apolygus lucorum</i>	
		<i>Calocoris norvegicus</i>	
		<i>Capsus ater</i>	
		<i>Chlamydatus pullus</i>	
		<i>Deraeocoris ruber</i>	
		<i>Leptopterna dolabrata</i>	
		<i>Liocoris tripustulatus</i>	
		<i>Lygocoris pabulinus</i>	
		<i>Lygus rugulipennis</i>	
		<i>Notostira elongata</i>	
		<i>Phytocoris varipes</i>	
		<i>Pithanus maerkelii</i>	
		<i>Plagiognathus arbustorum</i>	
		<i>Plagiognathus chrysanthemi</i>	
		<i>Stenodema calcarata</i>	
		<i>Stenotus binotatus</i>	
	Nabidae	<i>Himacerus mirmicoides</i>	Ant Damsel Bug
		<i>Nabis flavomarginatus</i>	
		<i>Nabis rugosus</i>	
	Pentatomidae	<i>Aelia acuminata</i>	Bishop's Mitre
		<i>Dolycoris baccarum</i>	Hairy ShieldBug
		<i>Palomena prasina</i>	Common Green Shieldbug
		<i>Podops inuncta</i>	Turtle Shieldbug
		<i>Troilus luridus</i>	Bronze Shieldbug

	Rhopalidae	<i>Rhopalus subrufrus</i>	
	Tingidae	<i>Tingis ampliata</i>	
Auchenorrhyncha	Aphrophoridae	<i>Aphrophora alni</i>	
<i>leafhoppers</i>		<i>Neophilaenus lineatus</i>	
		<i>Philaenus spumarius</i>	Common Froghopper
	Cicadellidae	<i>Agallia consobrina</i>	
		<i>Anoscopus albifrons</i>	
		<i>Aphrodes makarovi</i>	
		<i>Doratura stylata</i>	
		<i>Elymana sulphurella</i>	
		<i>Eupelix cuspidata</i>	
	Cixiidae	<i>Cixius nervosus</i>	
	Delphacidae	<i>Dicranotropis hamata</i>	
		<i>Javesella pellucida</i>	
		<i>Stenocranus minutus</i>	
Mecoptera	Panorpidae	<i>Panorpa cognata</i>	
scorpion flies			
Lepidoptera	Hesperiidae	<i>Thymelicus sylvestris</i>	Small Skipper
<i>butterflies</i>	Nymphalidae	<i>Aglais urticae</i>	Small Tortoiseshell
		<i>Inachis io</i>	Peacock
	Pieridae	<i>Pieris brassicae</i>	Large White
		<i>Pieris rapae</i>	Small White
	Satyridae	<i>Maniola jurtina</i>	Meadow Brown
		<i>Pyronia tithonus</i>	Gatekeeper
<i>moths</i>	Arctiidae	<i>Tyria jacobaeae</i>	Cinnabar Moth
	Zygaenidae	<i>Zygaena filipendulae</i>	Six-spot Burnet
Coleoptera	Anthicidae	<i>Notoxus monoceros</i>	
<i>beetles</i>	Apionidae	<i>Apion haematodes</i>	
		<i>Aspidapion aeneum</i>	

		<i>Ceratapion onopordi</i>	
		<i>Ischnopterapion loti</i>	
		<i>Protapion fulvipes</i>	
	Byrrhidae	<i>Byrrhus pilula</i>	Pill Beetle
		<i>Cytilus sericeus</i>	
	Cantharidae	<i>Cantharis nigra</i>	
		<i>Rhagonycha fulva</i>	
	Carabidae	<i>Abax parallelepipedus</i>	
		<i>Agonum muelleri</i>	
		<i>Amara aenea</i>	
		<i>Amara apricaria</i>	
		<i>Amara bifrons</i>	
		<i>Amara communis</i>	
		<i>Amara familiaris</i>	
		<i>Amara ovata</i>	
		<i>Amara similata</i>	
		<i>Amara tibialis</i>	
		<i>Badister bullatus</i>	
		<i>Bembidion lampros</i>	
		<i>Bembidion properans</i>	
		<i>Bembidion quadrimaculatum</i>	
		<i>Brachinus crepitans</i>	
		<i>Calathus fuscipes</i>	
		<i>Carabus violaceus</i>	
		<i>Curtonotus aulicus</i>	
		<i>Curtonotus convexiusculus</i>	
		<i>Harpalus affinis</i>	
		<i>Harpalus latus</i>	
		<i>Harpalus rubripes</i>	

		<i>Harpalus rufipes</i>	
		<i>Harpalus tardus</i>	
		<i>Leistus spinibarbis</i>	
		<i>Microlestes maurus</i>	
		<i>Nebria brevicollis</i>	
		<i>Nebria salina</i>	
		<i>Ophonus rufibarbis</i>	
		<i>Notiophilus substriatus</i>	
		<i>Panagaeus bipustulatus</i>	
		<i>Pterostichus madidus</i>	
		<i>Pterostichus melanarius</i>	
		<i>Pterostichus vernalis</i>	
		<i>Syntomus foveatus</i>	
	Chrysomelidae	<i>Altica palustris</i>	
		<i>Bruchus loti</i>	
		<i>Cassida rubiginosa</i>	Thistle Tortoise Beetle
		<i>Chaetocnema hortensis</i>	
		<i>Chrysolina hyperici</i>	
		<i>Cryptocephalus fulvus</i>	
		<i>Cryptocephalus moraei</i>	
		<i>Gsstrophysa polygoni</i>	
		<i>Longitarsus dorsalis</i>	
		<i>Longitarsus flavidicornis</i>	
		<i>Longitarsus luridus</i>	
		<i>Neocrepidodera ferruginea</i>	
		<i>Phyllotreta undulata</i>	
		<i>Podagrion fuscicornis</i>	
		<i>Psylliodes napi</i>	
		<i>Sermylassa halensis</i>	

		<i>Sphaeroderma testaceum</i>	
	Coccinellidae	<i>Adalia bipunctata</i>	2-spot Ladybird
		<i>Adalia decempunctata</i>	10-spot Ladybird
		<i>Coccinella septempunctata</i>	7-spot Ladybird
		<i>Harmonia axyridis</i>	Harlequin Ladybird
		<i>Hippodamia variegata</i>	Adonis' Ladybird
		<i>Propylea quattuordecimpunctata</i>	14-spot Ladybird
		<i>Psyllobora vigintiduopunctata</i>	22-spot Ladybird
		<i>Rhyzobius litura</i>	
		<i>Scymnus frontalis</i>	
		<i>Subcoccinella vigintiquattuorpunctata</i>	24-spot Ladybird
		<i>Tytthaspis sedecimpunctata</i>	16-spot Ladybird
	Curculionidae	<i>Anthonomus rubi</i>	
		<i>Barynotus obscurus</i>	
		<i>Barypeithes pellucidus</i>	
		<i>Ceutorhynchus obstrictus</i>	
		<i>Ceutorhynchus pallidactylus</i>	
		<i>Glocianus distinctus</i>	
		<i>Gronops lunatus</i>	
		<i>Hypera plantaginis</i>	
		<i>Hypera postica</i>	
		<i>Mecinus pascuorum</i>	
		<i>Nedyus quadrimaculatus</i>	
		<i>Otiorhynchus ovatus</i>	Strawberry-root Weevil
		<i>Otiorhynchus raucus</i>	
		<i>Phyllotribus pyri</i>	
		<i>Phyllotribus roboretanus</i>	
		<i>Phyllotribus vrideaeris</i>	

		<i>Rhinoncus castor</i>	
		<i>Rhinoncus pericarpinus</i>	
		<i>Sitona hispidulus</i>	
		<i>Sitona humeralis</i>	
		<i>Sitona lineatus</i>	
		<i>Sitona suturalis</i>	
		<i>Trichosirocalus troglodytes</i>	
		<i>Tychius picirostrus</i>	
	Elateridae	<i>Agriotes lineatus</i>	
		<i>Agriotes obscurus</i>	
		<i>Agriotes sputator</i>	
		<i>Athous campyloides</i>	
		<i>Denticollis linearis</i>	
		<i>Prosternon tesselatum</i>	
	Histeridae	<i>Saprinus semistriatus</i>	
	Kateretidae	<i>Brachypterus ater</i>	
		<i>Brachypterus urticae</i>	
	Latridiidae	<i>Corticicara gibbosa</i>	
	Leiodidae	<i>Catops grandicollis</i>	
		<i>Nargus velox</i>	
		<i>Ptomaphagus subvillosum</i>	
	Malachiidae	<i>Cordylepherus viridis</i>	
		<i>Malachius bipustulatus</i>	
	Nitidulidae	<i>Meligethes aeneus</i>	
	Oedemeridae	<i>Oedemera lurida</i>	
		<i>Oedemera nobilis</i>	
	Phalacridae	<i>Stilbus testaceus</i>	
	Scarabaeidae	<i>Amphimallon solstitialis</i>	
		<i>Onthophagus joannae</i>	

		<i>Serica brunnea</i>	
	Silphidae	<i>Silpha atrata</i>	
		<i>Silpha laevigata</i>	
	Staphylinidae	<i>Anotylus rugosus</i>	
		<i>Anotylus tetricarinaratus</i>	
		<i>Drusilla canaliculata</i>	
		<i>Ocypus olens</i>	
		<i>Philonthus carbonarius</i>	
		<i>Philonthus cognatus</i>	
		<i>Quedius curtipennis</i>	
		<i>Quedius semiobscurus</i>	
		<i>Stenus providus</i>	
		<i>Tachinus rufipes</i>	
		<i>Tachyporus dispar</i>	
		<i>Tachyporus hypnorum</i>	
		<i>Tachyporus nitidulus</i>	
		<i>Tachyporus solutus</i>	
		<i>Tasgius melanarius</i>	
		<i>Tasgius morsitans</i>	
		<i>Xantholinus linearis</i>	
Diptera	Asilidae	<i>Dioctria rufipes</i>	
flies		<i>Leptogaster cylindrica</i>	
	Calliphoridae	<i>Calliphora vicina</i>	
		<i>Calliphora vomitoria</i>	
		<i>Lucilia caesar</i>	
		<i>Pollenia angustigena</i>	
		<i>Pollenia rudis</i>	
	Conopidae	<i>Conops vesicularis</i>	
	Dolichopodidae	<i>Chrysotus gramineus</i>	

		<i>Dolichopus festivus</i>	
		<i>Dolichopus ungulatus</i>	
		<i>Sciapus platypterus</i>	
	Empididae	<i>Empis livida</i>	
	Lauxaniidae	<i>Calliopum aeneum</i>	
		<i>Meiosimyza rorida</i>	
		<i>Minettia longipennis</i>	
		<i>Tricholauxania praeusta</i>	
	Lonchopteridae	<i>Lonchoptera lutea</i>	
	Muscidae	<i>Coenosia tigrina</i>	
		<i>Helina erecta</i>	
		<i>Helina impuncta</i>	
		<i>Musca autumnalis</i>	
		<i>Muscina prolapta</i>	
		<i>Phaonia errans</i>	
		<i>Phaonia tugoriorum</i>	
		<i>Polites lardaria</i>	
	Opomyzidae	<i>Geomyza tripunctata</i>	
		<i>Opomyza florum</i>	
		<i>Opomyza germinationis</i>	
	Platystomatidae	<i>Platystoma seminationis</i>	
	Rhagionidae	<i>Chrysopilus cristatus</i>	
		<i>Rhagio scolopaceus</i>	
	Rhinophoridae	<i>Paykullia maculata</i>	
	Sarcophagidae	<i>Sarcophaga crassimargo</i>	
		<i>Sarcophaga haemorrhoa</i>	
		<i>Sarcophaga incisilobata</i>	
		<i>Sarcophaga nigriventris</i>	
		<i>Sarcophaga subvicina</i>	

		<i>Sarcophaga vagans</i>	
		<i>Sarcophaga variegata</i>	
	Scathophagidae	<i>Scathophaga stercoraria</i>	
	Sciomyzidae	<i>Coremacera marginata</i>	
		<i>Euthycera fumigata</i>	
		<i>Pherbellia cinerella</i>	
		<i>Trypetoptera punctulata</i>	
	Sepsidae	<i>Sepsis fulgens</i>	
	Stratiomyidae	<i>Beris vallata</i>	
		<i>Chloromyia formosa</i>	
		<i>Pachygaster atra</i>	
	Syrphidae	<i>Cheilosia proxima</i>	
		<i>Dasysyrphus albostriatus</i>	
		<i>Episyrrhus balteatus</i>	
		<i>Eristalis pertinax</i>	
		<i>Eristalis tenax</i>	
		<i>Melanostoma mellinum</i>	
		<i>Pipizella vittata</i>	
		<i>Platycheirus albimanus</i>	
		<i>Platycheirus clypeatus</i>	
		<i>Sphaerophoria scripta</i>	
		<i>Syritta pipiens</i>	
		<i>Syrphus ribesii</i>	
	Tachinidae	<i>Eriothrix rufomaculata</i>	
		<i>Tachina fera</i>	
	Tephritidae	<i>Acidia cognata</i>	
		<i>Urophora cardui</i>	
	Therevidae	<i>Thereva nobilitata</i>	
	Tipulidae	<i>Nephrotoma flavescens</i>	

		<i>Tipula oleracea</i>	
Hymenoptera – Aculeata	Apidae	<i>Andrena flavipes</i>	
<i>bees, wasps & ants</i>		<i>Andrena minutula</i>	
		<i>Bombus hortorum</i>	Small Garden Bumble Bee
		<i>Bombus lapidarius</i>	Large Red-tailed Bumble Bee
		<i>Bombus lucorum</i>	White-tailed Bumble Bee
		<i>Bombus pascuorum</i>	Common Carder Bee
		<i>Bombus pratorum</i>	Early Bumble Bee
		<i>Bombus terrestris</i>	Buff-tailed Bumble Bee
		<i>Halictus rubicundus</i>	
		<i>Halictus tumulorum</i>	
		<i>Lasioglossum albipes</i>	
		<i>Lasioglossum fulvicorne</i>	
		<i>Lasioglossum morio</i>	
		<i>Lasioglossum villosum</i>	
		<i>Megachile versicolor</i>	
	Chrysididae	<i>Trichrysis cyanea</i>	
	Crabronidae	<i>Cerceris arenaria</i>	Sand Tailed Digger Wasp
		<i>Entomognathus brevis</i>	
		<i>Harpactus tumidus</i>	
		<i>Tachysphex pompiliformis</i>	
		<i>Trypoxylon attenuatum</i>	
	Formicidae	<i>Formica fusca</i>	
		<i>Lasius flavus</i>	Yellow Meadow Ant
		<i>Lasius niger</i>	Black Ant
		<i>Myrmica ruginodis</i>	Red Ant
	Pompilidae	<i>Anoplius nigerrimus</i>	
		<i>Arachnospila anceps</i>	

		<i>Priocnemis fennica</i>	
		<i>Priocnemis perturbator</i>	
	Vespidae	<i>Vespula vulgaris</i>	Common Wasp
Arachnida – Araneae	Araneidae	<i>Araneus diadematus</i>	
spiders		<i>Araniella cucurbitina</i>	
	Clubionidae	<i>Cheiracanthium erraticum</i>	
		<i>Clubiona trivialis</i>	
		<i>Phrurolithus festivus</i>	
	Dictynidae	<i>Dictyna arundinacea</i>	
		<i>Dictyna uncinata</i>	
	Dysderidae	<i>Dysdera crocata</i>	
	Gnaphosidae	<i>Drassyllus pusillus</i>	
		<i>Haplodrassus signifer</i>	
		<i>Micaria pulicaria</i>	
		<i>Zelotes latreillei</i>	
	Linyphiidae	<i>Bathyphantes parvulus</i>	
		<i>Dismodicus bifrons</i>	
		<i>Erigone atra</i>	
		<i>Erigone dentipalpis</i>	
		<i>Leptyphantes tenuis</i>	
		<i>Leptyphantes zimmermanni</i>	
		<i>Meioneta saxatilis</i>	
		<i>Neriene peltata</i>	
		<i>Oedothorax fuscus</i>	
	Lycosidae	<i>Alopecosa pulverulenta</i>	
		<i>Pardosa amentata</i>	
		<i>Pardosa nigriceps</i>	
		<i>Pardosa prativaga</i>	

		<i>Pardosa pullata</i>	
		<i>Trochosa terricola</i>	
	Philodromidae	<i>Tibellus oblongus</i>	
	Pisauridae	<i>Pisaura mirabilis</i>	
	Salticidae	<i>Euophrys frontalis</i>	
		<i>Heliophanus cupreus</i>	
	Tetragnathidae	<i>Metellina mengei</i>	
		<i>Pachygnatha degeeri</i>	
	Theridiidae	<i>Enoplognatha ovata</i>	
		<i>Robertus lividus</i>	
		<i>Theridion sisyphium</i>	
		<i>Theridion varians</i>	
	Thomisidae	<i>Ozyptila simplex</i>	
		<i>Xysticus cristatus</i>	
	Zoridae	<i>Zora spinimana</i>	
Arachnida – Opiliones	Leiobunidae	<i>Leiobunum rotundatum</i>	
harvestmen	Nemastomatidae	<i>Nemastoma bimaculatum</i>	
	Phalangiidae	<i>Mitopus morio</i>	
		<i>Opilio saxatilis</i>	
		<i>Paroligolophus agrestis</i>	
		<i>Phalangium opilio</i>	
		<i>Platybunus triangularis</i>	
	Sclerosomatidae	<i>Homalenotus quadridentatus</i>	

Appendix 3

Figures



West Hertford Residential

Figure 1: Bat Activity Transect Routes

■ Bat activity transect points

Bat activity transect route

— Transect 1

— Transect 2

Map Scale @ A4: 1:2,500

LUC



West Hertford Ecology
Residential

Figure 2: Reptile Survey
Locations

Yellow diamond: Refugia location

Red star: Reptile location



West Hertford Residential

Figure 3
Phase 1 Habitat Survey 2016

- Target note
- Defunct species-rich hedgerow
- - - Dry ditch
- Bare ground
- Coniferous plantation woodland
- Continuous bracken
- Dense/continuous scrub
- Dense/continuous scrub, Broad-leaved parkland/scattered trees
- Introduced shrubs
- Marshy/marshy grasslands
- Plantation
- Poor semi-improved grasslands
- Ruderal
- Ruderal, Scattered scrub
- Semi-improved neutral grasslands
- Semi-improved neutral grasslands, Broad-leaved plantation/scattered trees
- Semi-improved neutral grasslands, Ruderal, Scattered scrub
- Broad-leaved semi-natural woodland

Map Scale @ A3: 1:2,000



Source: LUC

Appendix 4

Target Notes, 2014 results updated 2016

Target Note	Description
1	Dense continuous scrub dominated by bramble <i>Rubus fruticosus agg.</i> with frequent dog rose <i>Rosa canina</i> , blackthorn <i>Prunus spinosa</i> and <i>Salix spp.</i>
2	Poor semi-improved grassland with patches of tall ruderal vegetation. Grassland dominated by chick's-foot and Yorkshire fog with locally dominant false oat-grass. Goart's-rue and teasel are frequent to abundant with creeping cinquefoil and common nettle occasional. Brid's-foot trefoil and perforate St. John's-wort were present but rare, as were ragwort <i>Senecio jacobaea</i> , field forget-me-not <i>Mysotis arvensis</i> , dove's-foot <i>Geranium molle</i> and cut-leaved cranesbill <i>Geranium dissectum</i> .
3	Semi-natural deciduous woodland.
4	Tall ruderal herbs with a similar species composition to target note '2' with nettle and teasel being dominant and with the addition of frequent hemlock <i>Conium maculatum</i> . Scattered scrub dominated by bramble.
5	As above with locally abundant patches of hairy sedge <i>Carex hirta</i> .
6	Low earth mound - active rabbit warren with tall ruderal herbs and grazed areas. Nettles dominate with abundant hemlock, frequent teasel and cleavers <i>Galium aparine</i> and occasional green alkanet <i>Pentaglottis sempervirens</i> , white dead-nettle <i>Lamium album</i> , red dead-nettle <i>Lamium purpureum</i> , field forget-me-not and common field speedwell. There is also occasional elder <i>Sambucus nigra</i> and butterfly-bush <i>Buddleja davidii</i> .
7	Mature ivy-covered ash <i>Fraxinus excelsior</i> with BRP along woodland edge.
8	Semi-improved neutral grassland. Similar species composition to target note '2' but with grasses more dominant due to rabbit-grazing. Perennial rye-grass <i>Lolium perenne</i> is the dominant grass species and thyme-leaved speedwell <i>Veronica serpyllifolia</i> , stinking iris <i>Iris foetidissima</i> and ground ivy <i>Glechoma hederacea</i> are also present.
9	Area of uneven ground similar in species composition to target note '6'.
10	North facing bank which slopes down to woodland edge. Nettle is dominant.
11	Semi-natural deciduous woodland with oak <i>Quercus robur</i> , elm <i>Ulmus sp.</i> , dead semi-mature elm, elder, holly <i>Ilex aquifolium</i> and hawthorn <i>Crataegus monogyna</i> . The ground flora is dominated by nettle with abundant cleavers, frequent ground ivy and occasional bluebell <i>Hyacinthoides non-scripta</i> . There is frequent standing and fallen dead wood.
12	Heavily rabbit-grazed semi-improved neutral grassland. Rough meadow-grass <i>Poa trivialis</i> is dominant, annual meadow-grass <i>Poa annua</i> and perennial rye-grass <i>Lolium perenne</i> are frequent. There is abundant bryophyte and occasional scentless mayweed <i>Tripleurospermum inodorum</i> , greater plantain <i>Plantago major</i> , ragwort and selfheal <i>Prunella vulgaris</i> .
13	Tall mound similar to target note '6' with some exposed earthy banks.

Target Note	Description
14	Semi-improved neutral grassland similar to target note '12.'
15	Tall ruderal dominated by goat's rue and teasel, with locally abundant Yorkshire fog and false oat-grass. Hemlock is rare to locally abundant and hard rush, perforate St. John's wort, burdock and pendulous sedge are all present but rare.
16	Scrub with scattered trees - ornamental cherry <i>Prunus</i> sp. (one at northern end with BRP), hawthorn, dead elm with suckering and one dead ivy-covered tree with BRP at southern end.
17	Rough poor semi-improved grassland with a higher sward than other areas on the site and with some thatch. Yorkshire fog is dominant and cock's-foot <i>Dactylis glomerata</i> is frequent. Perforate St John's-wort is occasional, and creeping thistle, evening primrose <i>Oenothera biennis</i> , wavy bittercress <i>Cardamine flexuosa</i> , common field speedwell, nettle, hemlock, and campion <i>Silene</i> spp. are present but rare.
18	Tall ruderal herbs with nettle dominant. Includes areas of spoil from adjacent gardens.
19	Dense continuous scrub with blackthorn dominant and bramble, hawthorn, sycamore <i>Acer pseudoplatanus</i> , lilac <i>Syringa</i> sp. and garden privet <i>Ligustrum ovalifolium</i> also present.
20	Two parallel dry ditches with earth mounds forming their banks consisting of semi-improved neutral grassland with locally abundant hogweed <i>Heracleum sphondylium</i> and rosebay willow herb. There is scattered scrub along the roadside consisting of ornamental cherry, bramble and elder.
21	Rough semi-improved neutral grassland similar to target note '17'.
22	Small area of heavily grazed grassland with lichen and cudweed sp. Parsley-piert <i>Alchemilla arvensis</i> is also present here.
23	Tall ruderal herbs similar to target note '2' with locally dominant broad-leaved dock <i>Rumex obtusifolius</i> .
24	Possible badger entrance.
25	Butterfly-bush scrub.
26	Bare ground.
27	Scrub dominated by bramble with sycamore and flowering currant <i>Ribes sanguineum</i> .
28	Tall ruderal herbs similar to target note '2'. Locally dominant patch of hard rush at southern end. Several mounds with nettle dominant. Large mound at the northern end.
29	Semi-improved neutral grassland – heavily grazed and disturbed by dirt bikes. Rough meadow-grass is dominant, perennial rye-grass is frequent, red rescue, ragwort, creeping cinquefoil, white clover are abundant, parsley-piert, thyme-leaved speedwell, creeping thistle, spear thistle, common mouse-ear <i>Cerastium fontanum</i> , and selfheal are occasional and germander speedwell <i>Veronica chamaedrys</i> is rare.
30	Tall ruderal herbs similar to target note '28'.

Target Note	Description
31	Large mound with dominant nettle. White bryony <i>Bryonia dioica</i> is also present here.
32	Secondary woodland- abundant sycamore, occasional willow and ash. Shrub layer includes butterfly bush and bramble.
33	Scrub consisting of young sycamore.
34	Hedgerow with gaps, leggy in places. Hawthorn is dominant, blackthorn and ivy <i>Hedera helix</i> are abundant and there are occasional elder and sycamore and oak standards.
35	Semi-natural scrub dominated by elder with occasional hawthorn, sycamore, silver birch <i>Betula pendula</i> and blackthorn. At the western field edge there is a mature coppiced hornbeam <i>Carpinus betulus</i> and a mature oak. The ground flora is dominated by nettle.
36	Scots pine <i>Pinus sylvestri</i> plantation. The old tree line remains at the western field boundary, consisting of hornbeam oak and holly. The ground is mostly bare, with scattered patches of bracken <i>Pteridium aquilinum</i> , wood sage <i>Teucrium scorodonia</i> , bluebell and foxglove <i>Digitalis purpurea</i> .
37	Tall ruderal herbs dominated by nettle with abundant bracken and occasional burdock <i>Arctium</i> sp., teasel, ground ivy, bramble and great mullein <i>Verbascum Thapsus</i> .
38	Dense continuous scrub dominated by blackthorn with frequent elder, bramble and hawthorn.
39	Semi-improved neutral grassland similar to target note '29' with scattered bramble scrub.
40	Mosaic of rabbit grazed grassland, tall ruderal herbs dominated by nettle with abundant rosebay wilowherb and scattered scrub dominated by bramble with frequent elder and hawthorn.
41	Bracken with abundant nettle and frequent dog's mercury <i>Mercurialis perennis</i> .
42	Area previously recorded as semi-improved neutral grassland. Now dense scrub dominated by Willow <i>Salix</i> Sp. Ground flora includes Yorkshire fog, germander speedwell, ivy-leaved speedwell <i>Veronica hederifolia</i> , white clover, ground ivy, creeping bent and perennial rye-grass.
43	Dense continuous scrub dominated by bramble with occasional elder, willow, oak, blackthorn and hawthorn.
44	Semi-natural deciduous woodland dominated by ash with frequent willow, elm, hawthorn, elder.
45	Scrub with bramble and nettle codominant with occasional hawthorn and apple <i>Malus</i> sp.
46	Defunct hawthorn hedgerow.
47	Semi-improved neutral grassland similar to target note '29'.
48	Bare ground.

Target Note	Description
49	Scrub east of young sycamore scrub. Dominated by raspberry <i>Rubus idaeus</i> , with abundant nettle, frequent bramble and occasional teasel and rosebay willowherb.
50	Semi-improved neutral grassland dominated by Yorkshire fog, with abundant red fescue, <i>Poa</i> spp., creeping thistle, white clover, frequent ragwort and teasel, locally frequent goat's-rue and occasional common mouse-ear, perforate St. John's-wort, ribwort plantain, dove's-foot, common field -speedwell and fairy flax <i>Linum catharticum</i> .
51	Nettle covered mound.
52	Ephemeral/ruderal regrowth. Dominated by bryophyte with abundant ragwort and willowherb spp., occasional field forget-me-not, thyme-leaved speedwell, nettle, fescue spp., annual meadow grass, cudweed sp., changing forget-me-not <i>Mysotis discolor</i> , parsley-piert, common mouse-ear and occasional regenerating butterfly-bush and silver birch.
53	Semi-natural deciduous woodland. Dominated by ash and oak with frequent hornbeam and field maple <i>Acer campestre</i> . Snowberry <i>Symporicarpos albus</i> is locally dominant.
54	Probable badger set. Badger footprint observed.
55	Mature hawthorn dominated woodland.
56	Hairy sedge present but rare.
57	Locally frequent common cudweed.
58	Small area of marshy grassland dominated by hard rush.

Appendix 5

Bat Survey Data

Times and Weather Conditions for Bat Activity Transects

Survey Date	Survey Start	Survey End	Sunrise	Sunset	Wind ¹	Cloud Cover ²	Rain ³	Weather
20/07/2016	21:06	23:06	N/A	21:06	3	0		24°C, dry ground, light breeze
10/08/2016	20:19	22:34	N/A	20:34	1	3		16°C, still, warm dry.
12/09/2016	19:06	20:51	N/A	19:21	1	8		22 °C, warm, cloudy and dry.

Bat Activity Transect Data from hand-held detectors

Survey Date	Surveyor/Location	Detector	Transect Point	Observation time	Species from Sonogram	Species from observation	No. bats	Seen/not seen (S/NS)	Activity Type (E/R/C/F)	Comments	Species recorded but not noted by surveyor
20/07/2016	KL Transect 1	EX01	7	21:52	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	2 or more	S	F	Continuous in and out of range along tree-line	<i>P. auritus</i>
				21:52	NR	<i>P. pygmaeus</i>	1 or more	S	F	Continuous in and out of range along tree-line	
				21:57	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	2	S	F	Continuous along tree-line	

			<i>Pipistrellus</i> sp.	1 or 2	NS	F	Continuous in and out of range around woodland
		22:03	<i>P.pygmaeus</i>				
8		22:09	NR	<i>P.pipistrellus</i>	1S	F	Foraging continuously in and out of range around woodland
		22:10	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1NS	F	3 passes
		22:11	NR	<i>P.pygmaeus</i>	1NS	F	2 passes
9		22:12	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1NS	C/F	1 pass
9		22:24	NR	<i>P.pipistrellus</i>	1NS	F	2 passes
8		22:31	NR	<i>P.pipistrellus</i>	1NS	F	5 passes
		22:31	NR	<i>P.pygmaeus</i>	1NS	C/F	1 pass
7		22:40	NR	<i>P.pipistrellus</i>	1NS	C/F	1 pass
		22:40	<i>P. auritus</i>	ND	1	C	1 pass
6		22:42	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1NS	C/F	1 pass
6 - 5		22:51	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1NS	C/F	1 pass
5		22:53	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 or more	NS	F
			<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 or more	NS	F
4					NS		
3		23:03	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1NS	C	1 pass
2		23:09	<i>P.pipistrellus</i>	ND	1		1 pass

			4 21:32 - 21:36	NR	<i>P. pygmaeus</i>	1S	F	feeding in trees	<i>P. auritus,</i> <i>Nyctalus</i> sp.
			7 - 8 22:04	NR	<i>Pip. sp</i>	1NS	C	brief	
			8 22:09	<i>P. pygmaeus</i>	<i>Pip. sp</i>	1NS	C	brief	
			9 22:26	NR	<i>P. pipistrellus</i>	1NS	F		
			10 22:27	NR	<i>Pip. sp</i>	1NS	F		
			22:33	NR	<i>Pip. sp</i>	1NS	F		
			22:34	NR	<i>Pip. sp</i>	more than 1	NS	F	
			7 22:40	NR	<i>Myotis?</i>	1			
			6 22:44	<i>P. pygmaeus</i>	?	1			
			5 22:50	NR	<i>Pip. sp</i>	1	F		
			4 22:55	NR	<i>Pip. sp</i>	1		brief	
			2 23:03	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	1	C?		
			5 - 6 21:05	<i>P. pygmaeus</i>	<i>P. pygmaeus</i>	1S	F	continuous	
			6 - 7 21:13	NR	<i>P. pygmaeus</i>	1NS	C		
			7 21:15	<i>N. noctula</i>	<i>P. pygmaeus?</i>	1NS	C	1 pass	<i>N. noctula,</i> <i>N. leisleri,</i> <i>P. auritus</i>
			7 - 8 21:20	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	1NS	C	1 pass	
			8 21:22	<i>P. pipistrellus</i>	<i>Pipistrellus</i> sp.	1NS	C/F	2 passes	
			21:24	NR	<i>P. pipistrellus</i>	1S	C	flying to woodland	
			9 21:28	NR	<i>P. pygmaeus</i>	1NS	C	distant	
				NR	<i>P. pipistrellus</i>	1NS	C		
				NR	<i>P. pipistrellus</i>	1NS	C		
			10 21:34	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	1NS	C/F	3 passes	
			10 21:38	<i>P. pipistrellus</i>	<i>P. pipistrellus</i>	1NS	C/F	4 passes and feeding buzzes	

			9 21:41	NR	<i>P.pipistrellus</i>	1 NS	F	distant 2 passes	
			8 21:49	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C/F	2 passes	
			6 22:00	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C		
			5 22:08	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	F	continuous in and out of range	
			5 22:08	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 NS	F	continuous in and out of range	
			4 - 5 21:13	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	F	several passes	
			3 22:21	<i>P.pygmaeus</i>	<i>Pipistrellus</i> sp.	1 S	C	Flew NE into woodland	
			3 - 2 22:26	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C		
			2 22:28	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C		
			2 22:28	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C/F	2 passes	
			2 22:32	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1 NS	C		
NB Transect 2	EX08		9 21:24	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 NS	F		<i>Nyctalus</i> sp., <i>P. auritus</i>
			9 - 10 21:27	NR	<i>P.pygmaeus</i>	1 NS	F		
			10 21:32	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 S	F	lots of foraging	
			9 21:38	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 S	F	lots of foraging	
			9 21:43	<i>P.pygmaeus</i>	<i>P.pygmaeus</i>	1 S	F	same bat as above still foraging	
			7 21:46	NR	<i>P.pygmaeus</i>	1 NS	F/C		

			721:50	<i>P.pipistrellus</i>	<i>P.pipistrellus</i>	1S	F/C	flew west
			621:55	<i>P.pipistrellus</i>	<i>P.pygmaeus</i>	>1NS	F/C	
			422:07 - 22:11	<i>P.pipistrellus</i> & <i>P.pygmaeus</i>	<i>P.pygmaeus</i>	>1NS	F/C	
			322:19	<i>P.pipistrellus</i>	<i>P.pygmaeus</i>	1NS	F	
			122:34	<i>Pipistrellus</i> sp.	?	1NS	C	
12/09/2016	RT transect 1	EX04	920:05	NR	<i>P.pipistrellus</i>	1NS	C	Brief pass.
			720:18	NR	<i>Pip. sp</i>	1NS	C	
	NB Transect 2	EX02	1020:01	Recording error	?	1NS	F/C	
			1020:06		<i>P.pygmaeus</i>	1NS	F/C	
			10 - 920:09		<i>P.pipistrellus</i>	1NS	F/C	
			820:14		<i>P.pipistrellus</i>	1NS	F/C	
			520:25		<i>P.pygmaeus</i>	1NS	F/C	
			220:36		<i>P.pygmaeus</i>	1NS	C	
								<i>Nyctalus</i> sp.

Bat Activity Transect Data Recorded from Anabat Express Detectors

Transect 1								
Row Labels	BLE	Leisler	Noctule	Nyctalus	Pip.sp.	Pip45	Pip55	Grand Total
20/07/2016	1					11	6	18
21:52						1		1
21:57						1		1
22:02							1	1
22:03							1	1
22:10							2	2
22:12							1	1
22:34						1		1
22:40	1							1
22:42						1		1
22:51						2		2
22:53						1		1
22:54						1		1
22:56							1	1
22:57						1		1
23:02						1		1
23:09						1		1
10/08/2016	1	1	1		1	20	13	37
21:05							2	2
21:06							2	2
21:16			1					1
21:20						1		1
21:33						1		1
21:34						1		1
21:38						2		2
21:39						1		1
21:40	1							1
21:49						1		1
21:58		1						1
22:00						1		1
22:07						1	1	2
22:08						3		3
22:09						1	1	2
22:10							2	2
22:13						2	2	4
22:14							1	1
22:21							1	1

22:26							1	1
22:27						2		2
22:32						1		1
22:34					1			1
22:41						2		2
12/09/2016				1		2	1	4
19:51							1	1
20:08						1		1
20:12				1				1
20:55						1		1
Grand Total	2	1	1	1	1	33	20	59

Transect 2						
Row Labels	BLE	Nyctalus	Pip.sp.	Pip45	Pip55	Grand Total
20/07/2016	3	1	2	18	12	36
22:10					3	3
22:11					1	1
22:12					2	2
22:13			1			1
22:14				1		1
22:15					2	2
22:16				1	1	2
22:44					1	1
23:01				1		1
23:02				1		1
23:04				1		1
23:05	1					1
23:06				1		1
23:08			1	1		2
23:09				1		1
23:10				1	2	3
23:11	2					2
23:16				1		1
23:20		1				1
23:25				1		1
23:26				1		1
23:29				1		1

23:30				2		2
23:31				1		1
23:38				1		1
23:45				1		1
10/08/2016	1	1	2	39	47	90
21:24					2	2
21:25					1	1
21:29				1	1	2
21:30				1	2	3
21:31				2	1	3
21:32				1	2	3
21:33				2	1	3
21:34				2	1	3
21:35				1		1
21:36			1	4	3	8
21:37				1	1	2
21:38				1	4	5
21:39				2	3	5
21:40				2	2	4
21:41					3	3
21:42				2	4	6
21:43				1	1	2
21:47				1		1
21:50				1		1
21:55				1		1
21:58		1				1
22:08				2	3	5
22:09				3	4	7
22:10					2	2
22:11					1	1
22:12	1					1
22:13				2	3	5
22:15				2		2
22:16				1		1
22:20				1		1
22:25				2	1	3
22:34			1			1
22:35					1	1
12/09/2016 - Data lost due to a recording error						
Grand Total	4	2	4	57	59	126

Appendix 6

Reptile Survey Data

Visit No.	Date	Surveyor	Start time	Weather	Grass snake	Common Lizard	Slow Worm	Other	Other comments
1	10/08/2016	RG	7.20	Sunny, slight breeze, slight cloud cover. 11°	0	0	0	0	N/A
2	11/08/2016	KL	9.00	Gentle breeze, mild, mostly cloudy, 14°.	0	0	0	0	N/A
3	16/08/2016	RG	9.10	Partly cloudy, gentle cool breeze, dry. 17°	0	0	0	0	N/A
4	12/09/2016	RT	11.00	Partly cloudy, mild, humid. 18°	1 (Area 4)	0	0	0	Juvenile
5	20/09/2016	KL	9.20	Overcast, slight breeze, cool 13°	0	0	0	0	N/A
6	22/09/2016	KL	9.40	Overcast, gentle breeze, warm 16°	0	0	0	0	N/A
7	27/09/2016	KL	9.30	Mild, slightly breezy, overcast. 15°	0	0	0	0	N/A