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Ecological Surveys • Habitat Management • Arboricultural Surveys • Vegetation Clearance

Ecological Impact Assessment

Land Next to 15 Well Row, Bayford, SG13 8PX
[NGR: TL 31003 08570]

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On behalf of: Bonnel Homes Ltd

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1.0 Executive Summary

1.1 Rationale

Greenwillows Associates Ltd. was commissioned to conduct an ecological appraisal of a parcel of land at Land Next to 15 Well Row, Bayford, SG13 APX. The area surveyed is referred to as 'the site' for the purposes of this report.

The aim of the ecological appraisal was to provide inter alia, an assessment of the likely impacts a proposed scheme might have upon notable and/or protected species and habitats and the results of follow up detailed/specialist surveys.

The construction proposals relate to the construction of one detached dwelling with associated garden and car parking.

Essential Evidence, Conclusions and Recommendations

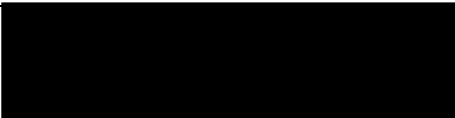
1.1.2 General Site Description

The site is comprised of a small ex-playground, which was removed in 2018. Prior to this, the land was used as a grassed tennis court. The site is predominantly modified grassland, containing mostly perennial rye grass, in addition to several immature trees, bramble scrub and shrubs. There are several recently felled trees scattered across the site.

Table One: Conclusions and Recommendations

Potential Receptor	Conclusions	Recommendations
Designated Sites	There are 36 ecological destinations within 2km of the site. More detail can be found in Section 6 and a full list of these can be found in Appendix Five.	There are no anticipated impacts to these sites and therefore no further recommendations have been made.
Nesting Birds	No evidence of nesting birds was recorded at the time of surveying, however, there is potential for nesting birds within the wooded vegetation, hedges, and trees within the site. There will be a very small loss of suitable nesting habitat as a consequence of the development of the site. If nests are disturbed during the process of incubation and rearing, then mortality of chicks could occur.	It is recommended that mitigation procedures are followed to avoid impacting on nesting birds and that nesting provisions are included in the design of the site. See Section 8 for more details.
Bats	The linear features of the	Those trees noted as having low bat

	<p>hedgerows/tree lines potentially provide good foraging and commuting habitat for bats. Multiple trees within the site have potential to support roosting bats, with Tree Sixteen (T16) assessed as having moderate-high bat potential (BP). The site was assessed as being of moderate suitability to support foraging and commuting bats.</p> <p>Any increase in lighting could adversely impact suitability of adjacent habitats for commuting/foraging bats.</p> <p>Four trees noted as having low bat roost potential (T13, T14, T18 and T19) are scheduled to be removed as part of the development. These trees have already been subject to a close torch inspection by a licensed ecologist with no evidence of bats found.</p> <p>If trees used as roosting habitat are removed/worked on without mitigation, there is a risk of killing/injuring bats and destroying roosting habitat.</p>	<p>roost potential should be subject to a further close inspection (with endoscope and/or torch and mirrors) by a licensed ecologist immediately prior to felling. Alternative roosting provisions for bats will be included in the design of the site.</p> <p>If plans change, and any other trees identified as having bat roost potential are scheduled to be removed or directly impacted upon, then further surveys are required to assess the current usage of the site by bats. See Section 8 for more details.</p>
Great Crested Newts	There are nine ponds within the potential zone of influence of the site (250m) – three of which	Mitigation measures will be followed to avoid impact on great crested newts using the site. A low impact

	<p>tested positive for great crested newts.</p> <p>The terrestrial habitats within the working areas have potential in supporting this species.</p> <p>Works pose a risk of injuring/killing individuals and destroying a resting/sheltering place.</p>	<p>mitigation licence from Natural England will be required for works to proceed. See Section 8 for more details.</p>
Reptiles	<p>There is some potential for reptilesto utilise the brash/log piles within the site, however no evidence was noted at the time of surveying.</p> <p>There is a low risk that any ground clearance of potential reptile areas could result in disturbing individuals during hibernation or killing/injuring.</p>	<p>It is recommended that mitigation procedures are followed to avoid impacting on reptiles. See Section 8 for more details.</p>
Hedgehog	<p>There is potential for hedgehogs to commute through and use the vegetation on site as nesting/shelter habitat, however no evidence was recorded at the time of surveying.</p> <p>Hedgehogs may become trapped in any open pits/trenches left open at night.</p> <p>The clearance of vegetation poses a risk of injuring/killing individuals.</p> <p>New fencing could restrict movements of hedgehogs, making commuting and foraging difficult.</p>	 <p>Mitigation measures to avoid causing harm to hedgehogs are recommended. It is also recommended that access is made in any new boundary fencing for hedgehogs to allow for commuting. See Section 8 for more details.</p>

2.0 Introduction and Terms of Reference

2.1 This report was commissioned to provide inter alia:

- An assessment of the likely impacts the proposed scheme might have upon notable and/or protected species and habitats and where such features might be affected to identify the need for any follow up detailed/specialist surveys.
- Recommendations to avoid potential adverse impacts upon notable and/or protected species and habitats identified as potential receptors within the construction footprint, or the relevant zones of influence associated with each receptor.
- An informative document for use by the Local Planning Authority as part of the planning process.

2.2 Based on the JNCC (2010) guidelines an Extended Phase 1 Habitat Survey was undertaken by means of a walkover of the site and its immediate environs, including the licensable impact zone relative to the individual species. Habitats were also identified in line with the UK Habitats Classification.

2.3 Phase 2 surveys relating to great crested newts were also undertaken.

2.4 The surveys were based on and proposed plans (Drawing No. W901, see Appendix One) provided by the client and aerial photographs.

2.5 This report outlines the methodology employed to undertake the surveys, results obtained and a discussion of the implications arising there from.

2.6 The areas surveyed are referred to as the 'site'. Anything beyond the site boundary, but within the same land ownership is referred to as 'the wider site'. Anything beyond this is referred to as 'neighbouring habitat'.

3.0 Site Location

3.1 The site is situated Land Next to 15 Well Row, Bayford, SG13 8PX [NGR: TL 31003 08570]
(see Appendix Two).

4.0 Legislation and Policy

4.1 Statutory Legislation

The Conservation of Habitats and Species Regulations 2017, or the ‘Habitats Regulations 2017’, transposes European Directives into English and Welsh legislation. This has recently been amended to the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) which continues the same provision for European Protected Species after Brexit. Under these regulations, wild animals of a European Protected Species and their breeding sites or resting places are protected. It is an offence to deliberately capture, injure or kill any such wild animal and, in the case of great crested newts, deliberately take or destroy their eggs. It is also an offence to deliberately damage or destroy a breeding site or resting place of any such wild animal.

Wild animals of a European Protected Species are protected from disturbance. Disturbance of such wild animals includes in particular any disturbance which is likely:

(a) To impair their ability:

- to survive, to breed or reproduce, or to rear or nurture their young; or
- in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

(b) To affect significantly the local distribution or abundance of the species to which they belong.

The Wildlife and Countryside Act 1981 (as amended) adds further protection to wildlife in England and Wales under Part 1. It is unlawful to intentionally kill, injure or take any wild bird or take, damage, or destroy the nest of any wild bird whilst the nest is in use or being built. If the bird is included on the Schedule 1 list, it is additionally an offence to intentionally disturb its nest during the breeding season.

Certain species of animal are protected under the Wildlife and Countryside Act 1981 (as amended) by being included in Schedule 5 in respect of certain offences under Section 9. Such offences include:

9(1) Intentional killing, injuring or taking of a Schedule 5 animal,

9(4a) Damage to, destruction of, obstruction of access to any structure or place used by a Schedule 5 animal for shelter or protection,

9(4b) Disturbance of a Schedule 5 animal occupying such a structure or place.

Under The Hedgerows Regulations 1997 it is an offence to remove most hedgerows without permission from the Local Planning Authority. Permission for the removal of hedgerows may

be refused if the Local Planning Authority determines any hedgerow to be ‘important’ under criteria listed in Part II of Schedule 1 of the Regulations.

4.2 Planning Policy

4.2.1 The National Planning Policy Framework (2021) relating to biodiversity (NPPF) is both guidance for local governing authorities on the content of their Local Plans and material consideration in determining planning applications. The NPPF has replaced much existing planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. However, the government circular 06/05: ‘Biodiversity and Geological Conservation- Statutory Obligations and their impact within the Planning System’, which accompanied PPS9, remains valid.

Paragraph 180 of the NPPF states: “When determining planning applications, local authorities should apply the following principles:

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

4.2.2 The Local Plan for East Hertfordshire (East Herts District Plan 2018) states that:

“East Herts has a high-quality environment, both within the towns and villages and in the countryside. The challenge is to ensure that this is recognised and protected whilst still allowing the necessary development to take place. It means protecting what is most important and ensuring that where new development takes place, it is of a high quality of design that takes account of its local setting. It is also about protecting the rich biodiversity in the district and responding to the challenge of climate change. This includes promoting sustainable development, both in terms of where it is located and how it is constructed.

By 2033, the rich biodiversity of East Herts will have been protected and enhanced. Where new development could potentially have an adverse effect on biodiversity and the ecological network of the district, measures will have been taken to ensure that the impact was either avoided or mitigated.

Working with partners to protect and enhance the high-quality environment, its unique landscapes, and places of special wildlife value. This would be achieved by place-shaping initiatives which would include measures to conserve areas of high biodiversity; the provision of new, alternative green spaces for people and wildlife; and the increase of green infrastructure connections between these areas, to provide greater opportunities for more sustainable access to nature for everyone living in the corridor.”

Policy NE3 states that:

“Development should always seek to enhance biodiversity and to create opportunities for wildlife. Proposals must demonstrate how the development improves the biodiversity value of the site and surrounding environment. Evidence will be required in the form of up-to-date ecological surveys undertaken by a competent ecologist prior to the submission of an application. The biodiversity value of a site pre and post development will be determined by applying a locally approved Biodiversity Metric where appropriate. Submitted information must be consistent with BS 42020 2013. Where insufficient data is provided, permission will be refused.

- Where adverse impacts are unavoidable, appropriate mitigation and compensation measures must be employed, commensurate to the importance, the legal protection or other status of the species or habitat. The District Council will impose conditions / planning obligations which seek to:
- Integrated bird and bat boxes will be expected in all development bordering public green space and beneficial habitat.”

4.3 Notable Species and Habitats

4.3.1 The UK Biodiversity Action Plan (UK BAP) was drafted for ‘Priority’ species and habitats in which specific conservation targets were set and are regularly reviewed. UK BAP features do not receive any legal protection per se but have biodiversity value within a national context. The UK BAP also serves as a framework for local biodiversity conservation efforts. UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action under the UK BAP. The original lists of UK BAP priority species and habitats were created between 1995 and 1999, and were subsequently updated in 2007, following a 2-year review of UK BAP processes and priorities, which included a review of the UK priority species and habitats lists. As a result of new drivers and requirements, the ‘UK Post-2010 Biodiversity Framework’, published in July 2012, has now succeeded the UK BAP. The UK BAP lists of priority species and habitats remain, however, important, and valuable reference sources. Notably, they have been used to help draw up statutory lists of priorities in England and BAP species and habitats are still referred to at a

local level (JNCC, 2013).

4.3.2 The Natural Environment and Rural Communities (NERC) Act 2006: Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.

4.3.3 The Section 41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

4.3.4 Section 17 of The Crime and Disorder Act (1998) places a duty on the local authority to inter alia “exercise its various functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent, crime in its area”; this includes prevention of wildlife crime.

4.3.5 Part 6, Section 102 of the Environment Act 2021 sets out amendments to Section 40 of the Natural Environment and Rural Communities Act 2006 (duty to conserve biodiversity) with emphasis on enhancing biodiversity rather than simply conserving it.

4.3.6 Schedule 14 of the Environment Act 2021 sets out an amendment to Schedule 7A, Part 1 of the Town and Country Planning Act 1990, as amended:

“1(1) This Schedule makes provision for grants of planning permission in England and Wales to be subject to a condition to secure that the biodiversity gain objective is met.

2(1) The biodiversity gain objective is met in relation to development for which planning permission is granted if the biodiversity value attributable to the development exceeds the pre-development biodiversity value of the onsite habitat by at least the relevant percentage.

(2) The biodiversity value attributable to the development is the total of:

(a) the post-development biodiversity value of the onsite habitat,

(b) the biodiversity value, in relation to the development, of any registered offsite biodiversity gain allocated to the development, and

(c) the biodiversity value of any biodiversity credits purchased for the development.

(3) The relevant percentage is 10%.”

4.3.7 The 10% requirement for biodiversity net gain set out above will be brought into force through secondary legislation at a date not yet known and, as such, currently has no legal effect.

5.0 Methodology

5.1 Desktop Study

A search of the Multi-Agency Geographic Information for the Countryside (MAGIC) website was undertaken with regards to the presence of statutory nature conservation sites within the potential zone of influence. In addition, a high-level screening review of the National Biodiversity Network (NBN) website was undertaken for an indication of the potential presence of protected species within 2km of the survey site; and records held by Hertfordshire Environmental Records Centre (HERC) of protected/notable species and designated sites within 2km of the target site, since 2012, were also consulted.

A search for waterbodies within 250m of the site was also undertaken using a range of mapping resources, including Google Earth, MAGIC, and OS Maps.

A search of the local planning portal for neighbouring planning applications was undertaken to aid identification of local species/habitat records and identify potential cumulative impacts.

5.2 Field Surveys

5.2.1 Extended Phase 1 Habitat Survey

A walkover of the site was undertaken on 7th April 2022, by Emma Parnwell and Alice Burgess to identify and map the habitats present within the site and to assess their condition. The survey followed both the UK Habitats Classification (2018) and Phase 1 methodology (2010) for identification of the habitats, while condition assessment followed methodologies set out in Natural England's Technical Supplement (2021) relating to use of the Biodiversity Metric 3.1.

The survey was extended to include a search for signs of protected, principal importance and biodiversity action plan priority species and an assessment of the habitats present for their likelihood to support such species (see Annex One). Target notes (TN) are shown on a habitat map in Appendix Three. Although Phase 1 survey methodologies were followed, habitats are identified in accordance with the UK Habitats Classification, to facilitate use of the Biodiversity Metric 3.1 if required.

5.2.2 Preliminary Ground Level Roost Assessment - Trees

A preliminary ground level roost assessment was also carried out on the 7th April 2022, by Emma Parnwell and Alice Burgess. The aim of the survey was to determine the potential presence of bats within trees that are near the working areas and the need for further survey work and/or advise on the impact on bats and legal obligations prior to any tree works being carried out.

The ground level roost assessment was carried out by Emma Parnwell, a Level 2 class licensed bat worker [Licence No: 2015-17704], and Alice Burgess, a trained bat worker. The survey included a detailed inspection from the ground level of the exterior of the trees to be removed

to look for features that bats could use for roosting including:

- Woodpecker holes;
- Rot holes;
- Hazard beams;
- Other vertical or horizontal cracks and splits;
- Partially detached bark;
- Knot holes from pruning or naturally shed branches;
- Tear-outs;
- Cankers;
- Other hollows or cavities;
- Double-leaders with compression forks;
- Overlapping stems or branches;
- Ivy cladding (diam. >50mm)
- Bat, bird, dormouse boxes.

Equipment available for the survey included ladders, high-powered hand-held torches and close-focusing binoculars. Detailed information on each Potential Roosting Feature (PRF) was recorded, including type of feature, height above ground level and aspect. Each tree was then categorised using the following scoring system in the BCT Good Practice Guidelines (2016):

- Negligible - negligible features likely to be used by roosting bats
- Low – a tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
- Moderate – A tree with one or more potential roosting sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status.
- High – A tree with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.

5.2.3 Phase 2 Great Crested Newt Surveys- eDNA Surveys

When great crested newts inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. Analysis of pond water samples for these small environmental DNA (eDNA) traces can be undertaken to confirm great crested newt habitation or establish great crested newt absence.

Ponds 1, 2, 4, 5, 6, and 7 were subject to eDNA surveying with water samples collected on 31st May by Alice Burgess and Nina Taylor, both trained newt workers who have been trained in the use of eDNA sampling.

The samples were taken from the waterbodies and were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Biggs et al., 2014).

5.3 Constraints and Survey Limitations

Surveys only provide a ‘snap-shot’ of information temporally and spatially from which behaviour can be extrapolated to make an ecological evaluation. Ecological conditions can vary on a yearly and seasonal basis.

Waterbodies were identified using multiple mapping sources during the desktop survey. Some waterbodies are not illustrated on maps, particularly those that are small in size and within residential properties. Therefore, some waterbodies may have gone undetected.

Ponds 3, 8 and 9 were dry on inspection and therefore could not be sampled for eDNA.

6.0 Results

6.1 Background Data

6.1.1 Statutory and Non-Statutory Nature Conservation Sites

Table Two: Statutory and Non-Statutory Nature Conservation Sites

A total of 36 nature conservation designated sites were found to be present within 2km of the site. A full description of reasons for designation is contained within Appendix Five.

Site Name	Designation	Grid Ref	Distance from site
Bayford Wood	ASNW	TL302082	280m west
Blackfan/gidners Woods	ASNW	TL312074	500m south
Scrub south of Bayford Station	CWS	TL315081	620m south-east
Weepings Wood	ASNW	TL315093	640m north-east
Great Groves Wood	ASNW	TL318085	640m east
Harmond's Woods	ASNW	TL320091	870m north-east
Grasslands E. of The Wall House	CWS	TL299080	970m south-west
Long Leys	CWS	TL320082	1km east
Bells Wood	ASNW	TL301075	1.1km south-west
Brickendon Green	CWS	TL321078	1.2km south-east
Back Lane, Brickendon	CWS	TL323085	1.3km west
Sailor's Grove	CWS	TL319099	1.3km north-east
Pollard Wood	CWS	TL298094	1.3km north-west
Hooks Grove (Bayfordbury)	CWS	TL313099	1.3km north
Brickendon Lane	CWS	TL327090	1.3km north-

Road Verges and Pond			east
Bucks Alley Wood	CWS	TL295075	1.4km south-west
Pond south of Blackfan Wood	CWS	TL309070	1.4km south
Little Berkhamsted House Meadow	CWS	TL292082	1.4km west
Claypits Meadow (Epping Green)	CWS	TL308069	1.4km south-west
Wormley-Hoddesdonpark Woods	SAC	TL320058	1.5km south-east
Wormley-Hoddesdonpark Woods North	SSSI	TL343080	1.5km south-east
Ashen Grove	ASNW	TL306068	1.5km south
Culver Wood	CWS	TL293088	1.5km north-west
Bayfordbury Lake	CWS	TL313102	1.6km north-east
Breach Lane and Stream Course	CWS	TL290085	1.6km north-west
Bush Farm Meadows	CWS	TL297073	1.6km south-west
River Lea, Water Hall to Leaside Cottage	CWS	TL301099	1.6km north-west
Light's Wood	ASNW	TL326093	1.7km north-east
Devil's Lane	CWS	TL320069	1.7km south-east
Hertfordshire University, Bayfordbury	CWS	TL314103	1.7km north-east
Broxbourne Woods	NNR	TL320058	1.8km south-east

Calves Grove	ANSW	TL307065	1.8km south
Ditches in former Bayfordbury Meadow	CWS	TL307104	1.8km north-west
Rough Hills Grasslands, Bayfordbury	CWS	TL319103	1.8km north-east
Roxford Area	CWS	TL303104	1.9km north-west
Meadow and Spring near the Rectory	CWS	TL290080	1.9km west

Nb. SSSI= Site of Special Scientific Interest, SAC= Special Area of Conservation, NNR= National Nature Reserve, ASNW= Ancient Semi-natural Woodland, CWS= County Wildlife Site

6.1.2 Notable Species and/or Protected Species

Within the records consulted, notable species of relevance to the onsite habitats recorded within 2km of the site, since 2012, included: soprano pipistrelle; pipistrellus sp.; brown long-eared bat; noctule bat; Nathusias’ bat; Natterer’s bat; serotine bat; barbastelle bat; great-crested newt [REDACTED] hedgehog; common lizard; grass snake; slow-worm and common toad.

6.2 Field Survey - Habitats

6.2.1 Vegetation

6.2.1.1 Modified Grassland

The sward present within the site is grass-dominated and includes perennial ryegrass, cock’s foot, red fescue, and timothy grass. Forb species present include cow parsley, dock sp., ground ivy, common nettle, speedwell sp., cleavers, lord and ladies, garlic mustard, green alkanet and planted daffodils. Scattered self-set elm saplings are also present.

Across the grassland areas are tree stumps where it appears semi-mature trees and stands of cherry laurel have been relatively recently felled.

6.2.1.2 Boundary Hedgerow/Trees

The north-west boundary contains a line of trees, large cherry laurel and a small hedgerow (H1).

Table Three: Hedgerows

Hedgerow	Height (m)	Width (m)	Description
H1	5	1	Planted immature hedge that has not been laid. Comprised of hawthorn, dogrose, and privet species. Borders the site on the north-west

			boundary.
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Nb. All measurements are approximate

On the south-west boundary there is a line of immature beech trees and cherry laurel, intertwined with holly and ivy.

On the north-east boundary is an existing metal fence and locked gate, with bramble and climbing ivy present. It is overshadowed by a line of large leylandii cypress growing from the neighbouring garden.

The south-east boundary contains a line of mixed deciduous trees including cherry and hawthorn.

6.2.1.3 Ornamental Shrubs

Also present on the south-east boundary is a large stand of bamboo and felled cherry laurel.

6.2.2 Scrub

The site also contains two large areas of dense bramble scrub.

6.2.3 Miscellaneous

6.2.3.1 Bare Earth

There is a small area of retained bitumen/asphalt on the northern corner of the site.

6.2.4 Neighbouring Habitat

The site is situated in the small village of Bayford in East Hertfordshire. The site is bordered by residential terraced housing to the south-east, and an old vicarage with large garden and swimming pool to the north-west. To the north-east is Well Row, and to the south-west are pasture fields, used for hay and owned by the vicarage. Access to the new dwelling will be off Well Row which is a main road that runs through the village.

There are no on-site ponds, however there are nine ponds within the potential zone of influence with the closest being in the immediate neighbour's garden to the south.

6.3 Field Survey – Notable and/or Protected Species

6.3.1 Nesting Birds

The hedgerows, trees, scrubby vegetation, and brash piles onsite could support nesting birds during the breeding season. No evidence was noted at the time of surveying.

6.3.2 Bats

6.3.2.1 Trees

The trees on site were assessed for their potential to support roosting bats, the results of which are given in Table Four.

Table Four: Results of Preliminary Ground Level Tree Roost Assessment

Tree reference	Species	Potential Roosting Features (PRFs) and General Comments	Bat Roost Potential H = high, M = medium, L = low, N = negligible
T1	Oak	Large veteran oak with Tree Protection Order. Wound on north-east face, partially occluded. Limb removed in mid-section with a crack that may be suitable for bats but could not be assessed from ground level.	M
T2	Beech	No suitable PRFs noted.	N
T3	Elm	Very immature, not suitable to support bats.	N
T4	Oak	Immature, not suitable to support bats.	N
T6	Cherry laurel	Large specimen with no suitable PRFs noted.	N
T9	Cherry	No suitable PRFs noted.	N
T10	Holly	Large tree, unsuitable for bats.	N
T11	Hawthorn	No suitable PRFs noted.	N
T12	Hawthorn	Succumbed to ivy. No suitable PRFs.	N
T13	Cherry	Area of lifted bark on base but generally unsuitable for bats.	L
T14a	Beech	Immature tree with small area of rot, inspected with torch at ground level but no evidence of bats noted.	L-N
T14b	Beech	Immature tree with no PRFs noted.	N

T15	Ash	Immature tree with no PRFs noted.	N
T16	Beech	Vertical lesion noted 2m from ground floor on trunk, was inspected with torch at ground level. No evidence of bats noted, however a highly suitable PRF.	H
T17	Beech	Immature tree with no PRFs noted.	N
T18	Beech	Immature tree with some possible PRFs.	L
T19	Beech	Some rot noted on the trunk however appeared shallow with limited roosting potential on closer inspection.	L
T20	Elm	Very immature, not suitable to support bats.	N
T21	Hawthorn	Succumbed to ivy. Very immature with a thin stem, unsuitable for bats.	N
T22	Ash	No suitable PRFs noted.	N
T23	Hawthorn	No suitable PRFs noted.	N
T24	Ash	Very immature, not suitable to support bats.	N
T25	Ornamental	No suitable PRFs noted.	N
T26	Ash	Very immature, not suitable to support bats.	N

6.3.2.2 Foraging/Commuting

The hedgerows and trees offer linear features that could be used by foraging and commuting bats.

6.3.4 Great Crested Newt

6.3.4.1 Terrestrial Habitat

The habitats on site offer good opportunities to foraging/commuting resting/sheltering great crested newts. The brash (TN2) and log piles (TN3) may also support hibernating individuals. However, there is anecdotal evidence from an immediate neighbour that encountered a single great crested newt in a trench within their garden six years prior (Pers Comm.).

6.3.4.2 Waterbodies

There are no ponds on site, however, there are nine ponds in the neighbouring habitat and within the 250m zone of influence.

6.3.4.3 Habitat Suitability Index (HSI) Assessment

The waterbodies within the potential zone of influence were subject to an HSI assessment. The results of this are given in Table Five and the key to the score given in Table Six.

Pond 1 (within the neighbouring garden) was assessed as having 'poor' suitability due to its small size and frequent water treatment/management. Pond 2 was assessed as having 'good' suitability and being only 46m south-east of Pond 1, has the potential for connectivity. Pond 3 was assessed as having 'poor' suitability and appears to have been neglected with lots of overgrowing vegetation. By the time of the revisit for the eDNA survey, Pond 3 was found to be dry. Between the site and Ponds 1 and 2 and 3, there is a main road which is considered a potential substantial dispersal barrier but not substantial enough to completely discount any risk to great crested newts.

Pond 4 was assessed as having 'excellent' suitability and is a suitable commuting distance from Pond 3, with no dispersal barriers in between. Pond 5 was assessed as having 'below average' suitability due to stocking fish. Pond 6 was assessed as having 'average' suitability, however, immediately neighbours Pond 7 which was assessed as having 'good' suitability, in addition to an isolated terrestrial pocket of vegetation. Pond 8 was assessed as having 'average' suitability as it dries annually, however is only 58m north-west of Ponds 6 and 7 and would be a suitable commuting distance for newts. By the time of the revisit to undertake the eDNA survey, Pond 8 was found to be dry. Pond 9 could not be accessed at the time of the initial survey but was found to be dry during the revisit to undertake the eDNA survey.

Table Five: Habitat Suitability Index Scores

Pond reference:	P1	P2	P3	P4	P5	P6	P7	P8
Location	1	1	1	1	1	1	1	1
Pond area	0.05	1	0.2	1	0.95	0.5	1	0.4
Pond drying	0.9	0.9	0.1	0.9	0.9	0.9	0.9	0.1
Water quality	0.33	0.67	0.33	1	1	0.67	0.67	0.67
Shade	1	1	0.3	1	1	0.8	1	1
Fowl	1	0.67	1	0.67	0.67	0.67	0.67	1
Fish	0.01	0.67	1	0.67	0.01	0.67	0.67	1
Ponds	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Terrestrial habitat	0.33	0.67	0.67	1	0.67	0.67	0.67	0.67
Macrophytes	0.4	0.6	0.3	0.5	0.6	0.4	0.5	1
HSI	0.33	0.79	0.45	0.84	0.54	0.69	0.78	0.66

Table Six: Categorisation of HSI Scores

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

6.3.4.4 Phase 2 Great Crested Newt Surveys- eDNA

The results from the eDNA survey of Ponds 2, 6 and 7 were positive for the presence of great crested newt. Ponds 1, 2, 4 and 5 were negative. The results are given below in Table Seven. A full report of eDNA results can be seen in Appendix Five.

Table Seven: eDNA Survey Results

Pond Reference	Result	Positive Replicates
1	Negative	0/12
2	Positive	8/12
4	Negative	0/12
5	Negative	0/12
6	Positive	9/12
7	Positive	2/12

6.3.5 Reptiles

There are some small patches of suitable reptile habitat within the site, such as areas of brash and log piles, and potentially the areas of modified grassland.

6.3.6 Hedgehog

The hedgerows and brash/log piles offer potential for hedgehogs to commute and hibernate within, however no evidence of hedgehog was found during the survey.

7.0 Impact Assessment Criteria

The assessment of the impacts and effects² on important ecological features within the Zone of Influence (Zol) of the Scheme has been based on the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines (2018). This process includes:

- Identification of ecological features likely to be affected;
- Identification of which ecological features are ‘important’, and therefore should be subject to detailed assessment;
- Characterising whether the effect on these ecological features is ‘significant’ in terms of the extent, magnitude, duration, reversibility, frequency/timing and whether it is likely to have a positive or negative effect.

7.1 Identifying the Zone of Influence (Zol)

The ‘Zone of Influence’ for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This may be confined to within the site boundaries and land immediately adjacent, but for some ecological features may extend beyond the project site. For example, great crested newts (and breeding colonies) could potentially also be affected within 250-500m metres of construction activities, depending on the scale of works and habitats present.

7.2 Evaluation

7.2.1 Determining Importance of Ecological Features and Resources

The CIEEM Guidelines acknowledge that determining importance of ecological features and resources is a complex and subjective process, but it provides key factors to take into consideration. These include geographic context; legal protection or control; site designations and features; habitat type and priority; biodiversity value; species of conservation value (including population size, distribution, and abundance); ecosystem value/natural capital.

Focusing on assessments of biodiversity value, there are various characteristics that can be used to identify ecological resources or features that are likely to be important in terms of biodiversity. These include:

- Rare or uncommon species in the local, national or international context;
- Endemic or locally distinct sub-populations of a species;
- Species on the edge of their distribution;

² Note: The following definitions are used for the terms ‘impact’ and ‘effect’:

Impact – Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow.

Effect – Outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow (CIEEM 2018).

- Notably large populations of animals or concentration of animals considered uncommon or threatened in a wider context;
- Species-rich assemblages of plants or animals;
- Ecosystems and their component parts which provide the habitats required by the above species, populations and/or assemblages;
- Plant communities (and associated animals) considered typical of valued natural/semi-natural vegetation types;
- Habitat diversity, connectivity and/or synergistic associations.

This assessment also measures the contribution to nature conservation interest from non-statutory sites, and the presence of habitats and species which, although not specially protected, are still considered to be of local, regional, or national conservation importance.

This latter category includes identification of flora and fauna that are listed as Species of Principal Importance under the Natural Environmental and Rural Communities Act 2006 (NERC), those prioritised under the UK Biodiversity Action Plan (UK BAP)/Local Biodiversity Action Plans (LBAP), as well as Red Data Book Species.

7.2.2 Considering Geographic Context

The following frame of reference³ is used when considering the importance of an ecological feature:

- International and European;
- National;
- Regional;
- Metropolitan, County, vice-county or other local authority-wide area;
- River Basin District;
- Estuarine system/Coastal cell; and
- Local⁴

³ Note- this is not a hierarchy

⁴ Where appropriate, impacts may also be assessed at the site scale, although it is acknowledged that this can be difficult to assess

7.2.3 Prediction of Ecological Impacts and Effects

This assessment has considered potential impacts on each ecological feature determined as ‘important’ from all phases of the project. Impacts are characterised, through consideration of their magnitude and/or extent, the route through which they occur (whether direct, indirect, secondary or cumulative) and their duration and their reversibility. Positive impacts are assessed as well as negative ones.

7.2.4 Significance of Effects

The CIEEM guidelines (2018) explain ‘significant effect’ with the following definition:

“For the purpose of EclA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local.”

A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.

The following characteristics are considered when describing ecological impacts and effects:

- positive or negative
- extent
- magnitude
- duration
- frequency and timing
- reversibility

Following the characterisation of impacts and effects, an assessment of the ecological significance of an effect is made. The Guidelines promote a transparent approach in which a beneficial or adverse effect is determined to be significant or not, in ecological terms, in relation to the conservation objectives of the defined site, the structure and functions of the ecosystem(s) and/or the conservation status⁵ of habitats or species within a given geographical area. The Guidelines also advise that it is important to consider the likelihood of a predicted impact.

⁵ Habitats: conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area

Species: conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

The Guidelines also state that:

“After assessing the impacts of the proposal, all attempts should be made to avoid and mitigate ecological impacts. Once measures to avoid and mitigate ecological impacts have been finalised, assessment of the residual impacts should be undertaken to determine the significance of their effects on ecological features. Any residual impacts that will result in effects that are significant, and the proposed compensatory measures, will be the factors considered against ecological objectives (legislation and policy) in determining the outcome of the application.”

For the purposes of this report, a detailed impact assessment has only been presented for residual effects present after mitigation, although the above assessment has been undertaken for each important ecological feature pre-mitigation, to inform the recommendations outlined in Section Eight.

7.2.5 Key Principles Underpinning Recommendations

The following hierarchy of principles underpin EclA and are followed in the assessment undertaken in this report:

- Avoidance - Seek options that avoid harm to ecological features (for example, by locating on an alternative site). This is the preferred option.
- Mitigation - Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- Compensation - Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancement - Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation, or compensation.

7.2.6 Potential Effects

Based on the results outlined in Section Six, Table Eight provides a summary of the important species and habitats that are known to be present and/or have potential to be significantly affected by the proposed construction without mitigation.

Table Eight: Potential Receptors

Potential Receptor
Bats
[REDACTED]
Great Crested Newts
Hedgehog

8.0 Impact Assessment, Conclusions and Recommendations

8.1 General Description and Best Practice Recommendations

8.1.1 Conclusions

The site is based within the small village of Bayford, within with East Hertfordshire countryside and is comprised of residential dwellings and pastureland. The site is a disused ex-playground which was formerly used as a grassed tennis court up to the mid 80's, belonging to the neighbouring vicarage.

The site boundaries are predominantly comprised of trees, with one small hedgerow on the north-west side. On the south-east side, a newly built wooden fence runs behind the line of trees to separate the land from the neighbouring property. On the north-west boundary, there is a short wire fence that runs behind the hedgerow and trees, in addition to a wooden fence that runs approximately 20m west from the metal gate at the entrance to the site.

There are several mammals runs (TN1) and lifted areas of fencing across the site. A large brash pile (TN2) was noted in the southern corner of the site and a small log pile (TN3) in the north-west corner of the site.

The neighbouring habitat consists of residential terraced housing to the south-east and a large vicarage and grounds to the north-west. To the west there is a pasture field bordered by hedgerows, owned by the vicarage, and used to produce hay. At the eastern end of the site is Well Row, a main road used to travel through the village. Neighbouring habitats include pastureland and sporadically positioned, large, detached dwellings.

The proposed works will entail the creation of one detached dwelling with associated garden to the rear, and car parking. The eastern elevation will consist of two levels, where the ground is higher, and the western elevation, where the ground is lower, will consist of three levels.

8.1.2 Recommendations

Any works close to trees and/or hedgerows will be undertaken in accordance with the British Standard BS 5837: 2012 and National Joint Utilities Group Guidelines (NJUG 4).

8.2 Desktop Search Results - Designated Sites and Notable/Protected Species

8.2.1 Conclusions

There are 36 ecological destinations within 2km of the site. These include Bayford Wood (280m west), Blackfan/gidners Woods (500m south), Scrub south of Bayford Station CWS (620m south-east), Weepings Wood (640m north-east), Great Groves Wood (640m east), Harmond's Woods (870m north-east), Grasslands East of The Wall House CWS (970m south-west), Long Leys CWS (1km east), Bells Wood (1.1km south-west), Brickendon Green CWS (1.2km south-east), Back Lane, Brickendon CWS (1.3km west), Sailor's Grove CWS (1.3km north-east), Pollard Wood CWS (1.3km north-west), Hooks Grove CWS (1.3km north), Brickendon Lane Road Verges and Pond CWS (1.3km north-east), Bucks Alley Wood CWS

(1.4km south-west), Pond south of Blackfan Wood CWS (1.4km south), Little Berkhamstead House Meadow CWS (1.4km west), Claypits Meadow CWS (1.4km south-west), Wormley-Hoddesdonpark Wood SAC and SSSI (1.5km south-east), Ashen Grove Woods (1.5km south), Culver Wood CWS (1.5km north-west), Bayfordbury Lake CWS (1.6km north-east), Breach Lane and Stream Course CWS (1.6km north-west), Bush Farm Meadows CWS (1.6km south-west), River Lea, Waterside to Leaside Cottage CWS (1.6km north-west), Light's Wood (1.7km north-east), Devil's Lane CWS (1.7km south-east), Hertfordshire University CWS (1.7km north-east), Broxbourne Woods NNR (1.8km south-east), Calves Grove Wood (1.8km south), Ditches in former Bayfordbury Meadow CWS (1.8km north-west), Bayfordbury Rough Hills Grasslands CWS (1.8km north-east), Roxford Area CWS (1.9km north-west), and Meadow and Spring near the Rectory CWS (1.9km west).

Impacts on these sites are not anticipated and further recommendations have, therefore, not been made in relation to designated sites.

Within the records consulted, notable species of relevance to the onsite habitats recorded within 2km of the site, since 2012, included: soprano pipistrelle; pipistrellus sp.; brown long-eared bat; noctule bat; lesser noctule bat; Nathusias' bat; Natterer's bat; serotine bat; barbastelle bat; great-crested newt; [REDACTED] hedgehog; common lizard; grass snake; slow-worm and common toad.

8.2.2 Recommendations

Species-specific recommendations have been detailed below under the appropriate headings for most of the species found with the records consulted.

8.3 Nesting Birds

8.3.1 Conclusions

Several species of bird have been recorded within 2km of the site boundary including red kite, barn owl, redwing, swallow, and fieldfares.

The hedgerow and trees within the site and site boundary provide suitable habitat for general nesting birds.

If birds' nests are disturbed during the process of incubation and rearing, then mortality of chicks could occur.

8.3.2 Recommendations

Where possible, hedgerows and/or trees will be retained.

Any works involving vegetation clearance will avoid the bird breeding season (late February to August inclusive) to avoid damage to nesting species. If this is not practicable then an experienced ecologist will undertake a nesting bird survey to ascertain the number of birds using the site and where they are so they can be avoided. Results of nesting bird surveys are only valid for 48hrs and, therefore, multiple surveys may be required for phased works.

It is recommended that the new site plans include a provision of nesting habitats in the form of nest boxes. One Schwegler Integrated Bird Box (25mm) will be included in the design of the new building. In addition, a minimum of two Sparrow terraces and one Schwegler 16 S Swift Box will be incorporated into the design of the building (See Appendix Four for locations, and Appendix Seven for more details).

Following mitigation and enhancement measures, so no significant effect is anticipated on this species assemblage.

8.4 Bats

8.4.1 Conclusions

Several species of bat were found within 2km of the site boundary, the closest being a Barbastelle approximately 1.4km north.

No immediate evidence for bats was noted during the survey, however the linear features of the hedgerows/tree lines potentially provide good foraging and commuting habitat for bats. T16 (beech) was assessed as having high suitability for supporting bats and T1 (oak) was assessed as having moderate suitability to support bats. Most of the younger trees assessed within the hedges and along the boundary were identified as having low to negligible potential for bats however provide good corridors in themselves to connecting the site to the wider landscape.

Overall, in accordance with Bat Conservation Trust guidelines (Collins, 2016), the site was assessed as being of moderate suitability to support foraging and commuting bats, albeit providing a relatively small area of suitable habitat within the wider landscape.

Four trees noted as having low bat roost potential are scheduled to be removed as part of the development. As the features noted were at ground level, these trees have already been subject to a close torch inspection by a licensed ecologist with no evidence of bats found.

8.4.2 Recommendations

Those trees noted as having low bat roost potential should be subject to a further close inspection (with endoscope and/or torch and mirrors) by a licensed ecologist immediately prior to felling. Alternative roosting provisions for bats will be included in the design of the site.

If plans change, and any other trees identified as having bat roost potential are scheduled to be removed or directly impacted upon, then further surveys are required to assess the current usage of the site by bats.

A minimum of one integrated bat roost box (Ibstock Enclosed Bat Box 'C' or Habibat Bat Box) will be included in the design of the new building as mitigation for roosting bats (see Appendix Seven for more details).

Lighting levels will be kept to a minimum on the boundary hedgerows/trees to retain dark commuting corridors. Generally, any potential new lighting impacts associated with the

proposed development (both during and post-construction phase) will be minimised using warm white light sources and directional downlights - illuminating below the horizontal plane which avoids light trespass into the environment. The use of light directional accessories such as baffles, hoods and louvres can assist with this. Particular attention will be made to avoid lighting of the trees, buildings, and boundary hedgerows within and neighbouring the development site. Lighting types to be avoided include any blue-white light sources, metal halide and mercury lamps, and any form of up-lighting, which lights above the horizontal plane, illuminating trees, buildings, and foraging habitat.

There is the potential to enhance the site for bats through bat friendly planting. See Appendix Seven for details.

Following mitigation and enhancement measures, no significant impact is anticipated on this species group.



8.6 Great Crested Newts

8.6.1 Conclusions

The closest desktop record of great crested newts is 1.2km south-east from the site boundary.

There were nine waterbodies noted within the zone of influence of the proposed area of works during the desktop survey.

All ponds identified within the potential zone of influence that held water at the time of the initial Phase 1 survey were subject to an HSI assessment. Ponds 1 and 3 were assessed as being 'poor', Ponds 2 and 7 were assessed as being 'good', Pond 5 was assessed as being 'below average', Ponds 6 and 8 were assessed as 'average' and Pond 4 was assessed as being 'excellent' in potentially supporting great crested newts.

Ponds 1, 2, 4, 5, 6, and 7 were subject to eDNA testing. Ponds 2, 6 and 7 were positive for the presence of great crested newt, and ponds 1, 2, 4 and 5 were negative. Ponds 3, 8 and 9 could not be tested as they were dry at the time of surveying.

The terrestrial habitats within the site and neighbouring habitat are suitable for commuting/sheltering individuals. The positive eDNA result for Pond 2 (50m away) could suggest that great crested newts have the potential to use the site for resting/sheltering/hibernating.

8.6.2 Recommendations

The site meets the criteria for the proposed works to be undertaken under a GCN Low Impact Licence which will be obtained from Natural England. The licence will need to be applied for post planning consent and prior to works beginning on site. One-way amphibian fencing will be erected at the site to prevent individuals being injured/killed during the works and a fingertip search prior to installation will be conducted to ensure newts are not present during site clearance. A licensed GCN ecologist will then supervise a destructive search of the site before works commence. Site clearance under licensed supervision must happen outside of the GCN hibernation season (November- February inclusive, in suitable weather conditions). The fencing must remain in place for the duration of the construction period.

A refugia pile in the form of logs will be created on site as compensation.

Following mitigation, compensation and/or enhancement measures, no significant impact on this species is anticipated.

8.7 Reptiles

8.7.1 Conclusions

The closest desktop record for a reptile is a grass snake 140m south-west of the site boundary. The site presents some potential sheltering and foraging reptile habitat, particularly the piles of brash (TN2) and logs (TN3), however, the footprint of this suitable habitat is relatively small taken into context within the wider landscape.

Any sensitive or suitable areas that are removed without due care could result in injuring/killing individual species.

8.7.2 Recommendations

As a precautionary measure, it is recommended rubble piles are removed sensitively and with an ecologist present and the grassland is high cut first, and from the centre outwards to give any potential animals a chance to escape and find alternative shelter. The proposed mitigation for GCN will also benefit reptiles.

With proposed mitigation it is assessed there will be no significant effect on reptiles.

8.8 Hedgehog

8.8.1 Conclusions

The closest record for a hedgehog is 100m south-east of the site boundary.

There is potential within the hedgerows, brash pile, and bramble scrub on site for hedgehogs to use these habitats for shelter, foraging and commuting.

Hedgehogs may become trapped in any pits/trenches created by the works if left uncovered at night and the clearance of vegetation poses some risk of injuring/killing individuals. Installation of new fencing could restrict foraging and commuting routes of hedgehogs.

8.8.2 Recommendations

It is recommended that hedgerows are retained wherever possible.

Pits/trenches created during the works should be covered up or fenced off each night. If this is not practicable then ramps will be placed in each pit, nightly to allow individuals to escape.

Clearance of hedgerows and vegetation will be undertaken by hand, avoiding frosty days when hedgehogs may be hibernating.

Provisions will be made to allow free movement of individuals in/out of the site (see Appendix Seven).

With proposed mitigation/ compensation it is assessed there will be no significant effect on this species.

9.0 References

- BSI (BS 42020:2013) Biodiversity - Code of practice for planning and development. British Standards Institute.
- BSI (BS 5837:2012) Trees in Relation to Design, Demolition and Construction – Recommendations. British Standards Institute.
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester
- CIEEM, CIRIA, IEMA (2016) Biodiversity Net Gain: Good Practice Guidelines for Development.
- Collins, J. (ed.) (2016) Bat surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.) The Bat Conservation Trust, London.
- East Hertfordshire Council, (2017). East Herts District Plan (2018).
- EU Habitats Directive:
https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
- Froglife (2001). Great Crested Newt Conservation Handbook.
- HMSO (1981) Wildlife and Countryside Act. HMSO, London.
- HMSO (1992) Protection of Badgers Act. HMSO, London.
- HMSO (1994) Biodiversity The UK Action Plan. HMSO London. Available at:
<http://jncc.defra.gov.uk/ukbap>
- HMSO (1997) Hedgerow Regulations. HMSO, London.
- HMSO (1998) Crime and Disorder Act, c, 17 (1)(a). HMSO, London
- HMSO (2000) Countryside and Rights of Way (CRoW) Act. HMSO, London.
- HMSO (2006) Natural Environment and Rural Communities Act 2006. HMSO, London.
- HMSO (2017) Conservation of Habitats and Species Regulations 2017. HMSO, London.
- HMSO (2021) Environment Protection Act 2021. HMSO, London.
- Jehle, R., Thiesmeier, B. and Foster, J. (2011). The Great Crested Newt a Dwindling Pond Dweller Laurenti-Verlag Bielefeld Germany.
- JNCC (2010) Handbook for Phase 1 Habitat Survey. Peterborough.
- Miles et al., (2018) Bats and Artificial Lighting in the UK. Bats and the Built Environment: Guidance Note 08/18. Institution of Lighting Professionals & Bat Conservation Trust.
- Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework
- Multi-Agency Geographic Information for the Countryside: <http://www.magic.gov.uk/>.

National Biodiversity Network Website: <https://nbn.org.uk/>

NJUG (2007) Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. The National Joint Utility Group, Volume 4.

Office of the Deputy Prime Minister (2005) Government Circular 06/05: Biodiversity and Geological Conservation- Statutory Obligations and Their Impacts Within The Planning System. ODPM London available at <https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005>

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

Stace, C. (2019). *New Flora of the British Isles*, 4th Edition. C & M Floristics, Middlewood Green, Suffolk.

10.0 Photographs



The site entrance via locked gate



Overview of site from entrance



Area of recently felled cherry laurels and ephemeral weeds on the south-east aspect



Metal fencing on north-east boundary



<p>The north-west boundary with overhanging leylandii cypress from neighboring garden</p>	<p>Small hedge (H1) on the north-west boundary</p>
 <p>A small line of trees on the south-west boundary</p>	 <p>Area of recently felled trees and bamboo on the south-east boundary</p>
 <p>An example of a mammal run (TN1)</p>	 <p>Large brash pile (TN2)</p>



Log pile (TN3)



Dense area of bramble scrub



T1 – Veteran Oak Tree



Vertical split with BRP on T16



Pond 1



Pond 2



Pond 3 – Dry



Pond 4





Pond 5



Pond 6



<p>Pond 7</p>	<p>Pond 8 - Dry</p>
	
<p>Pond 9 – Dry</p>	<p>Well Row - Potential dispersal barrier between ponds</p>

11.0 Appendices

Appendix One: Proposed Client Plan

Appendix Two: Location Plan and Location of Surrounding Ponds

Appendix Three: Habitat Map with Target Notes

Appendix Four: Location of Mitigation/Enhancement Features

Appendix Five: Statutory and Non-Statutory Nature Conservation Sites

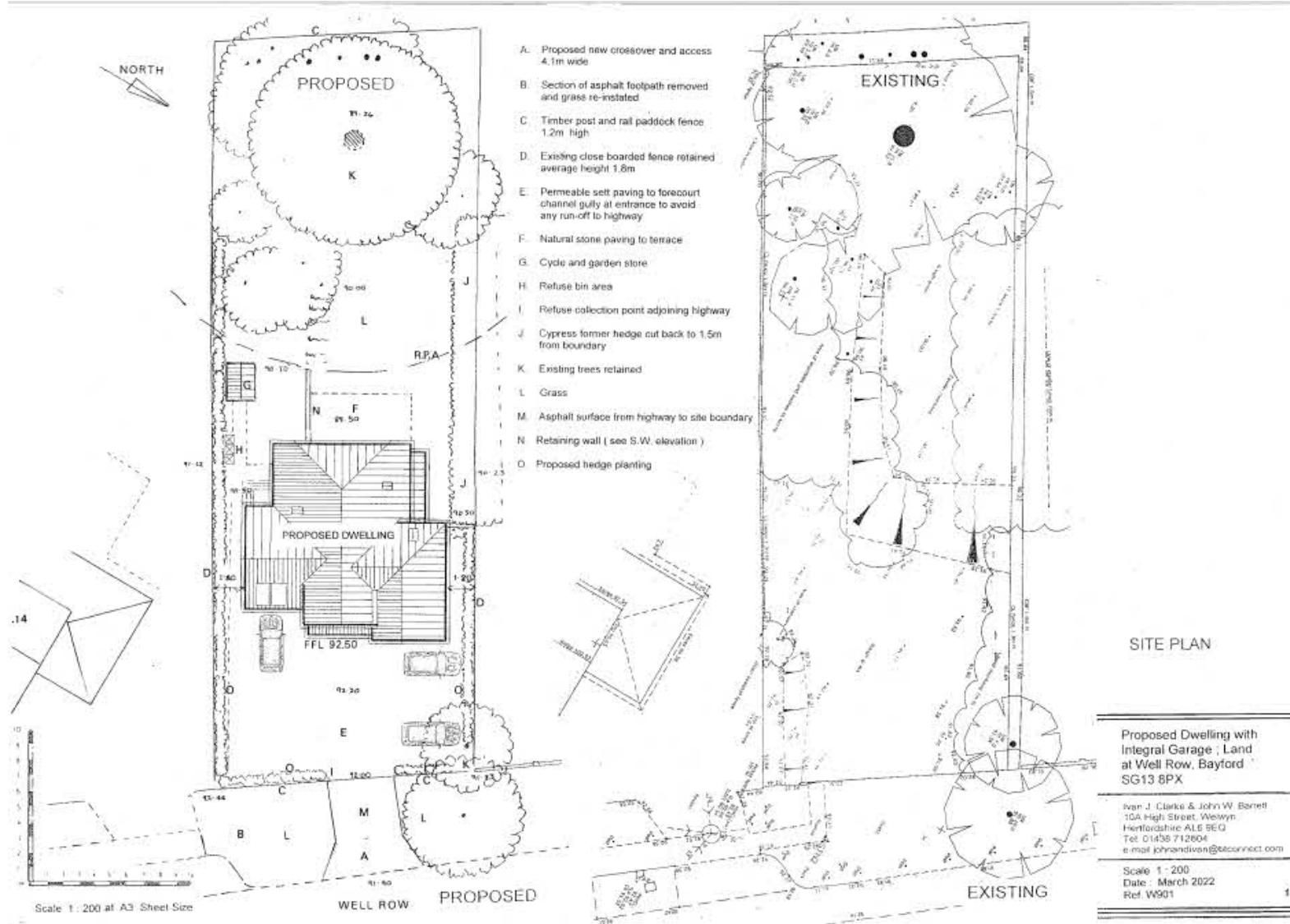
Appendix Six: eDNA Results

Appendix Seven: Examples of Potential Site Compensation/ Enhancement

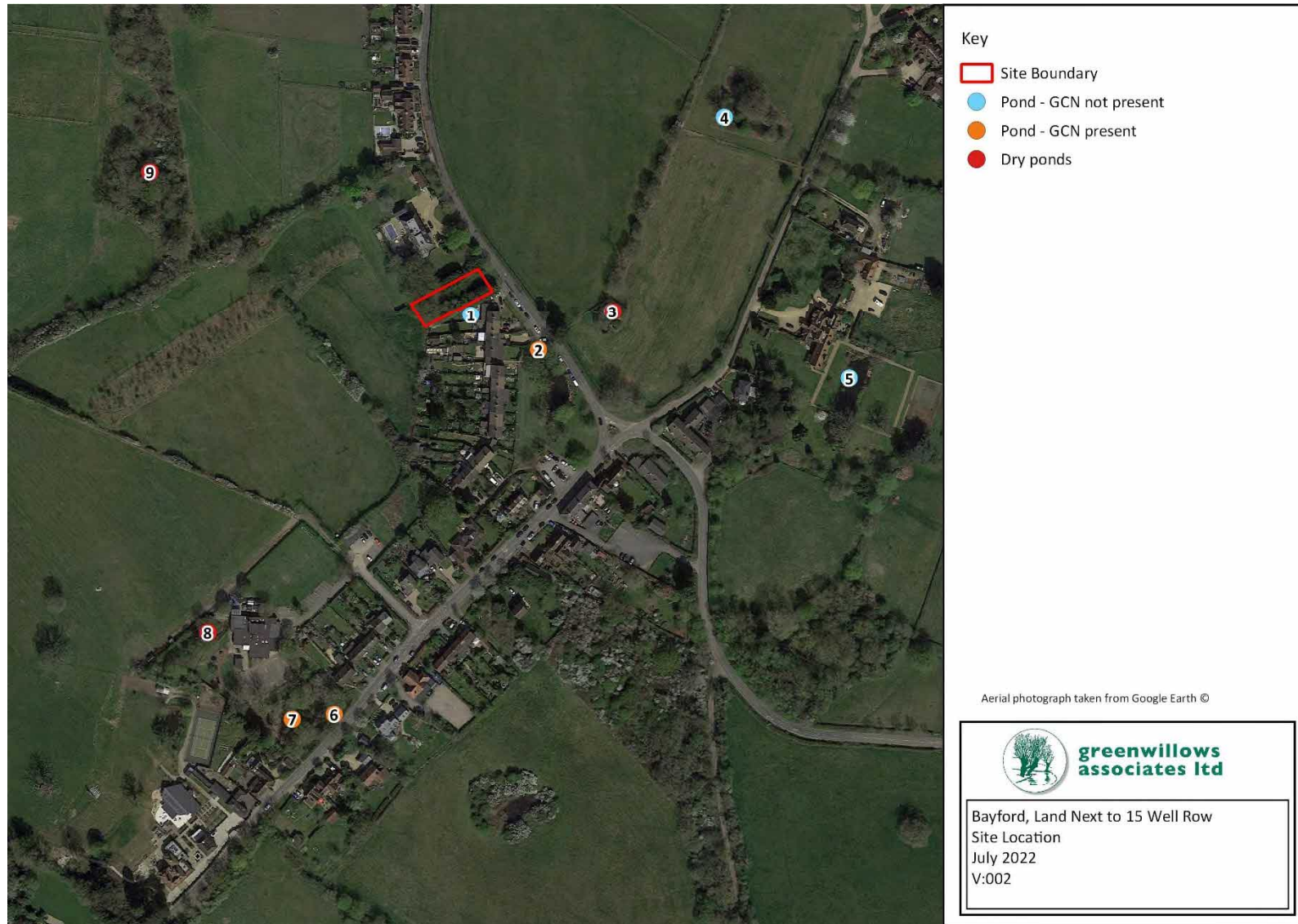
Appendix Eight: Flora and Fauna Referred to in the Report (Common and Latin Names)

Annex One: Standard Survey Methodologies

Appendix One: Proposed Client Plan



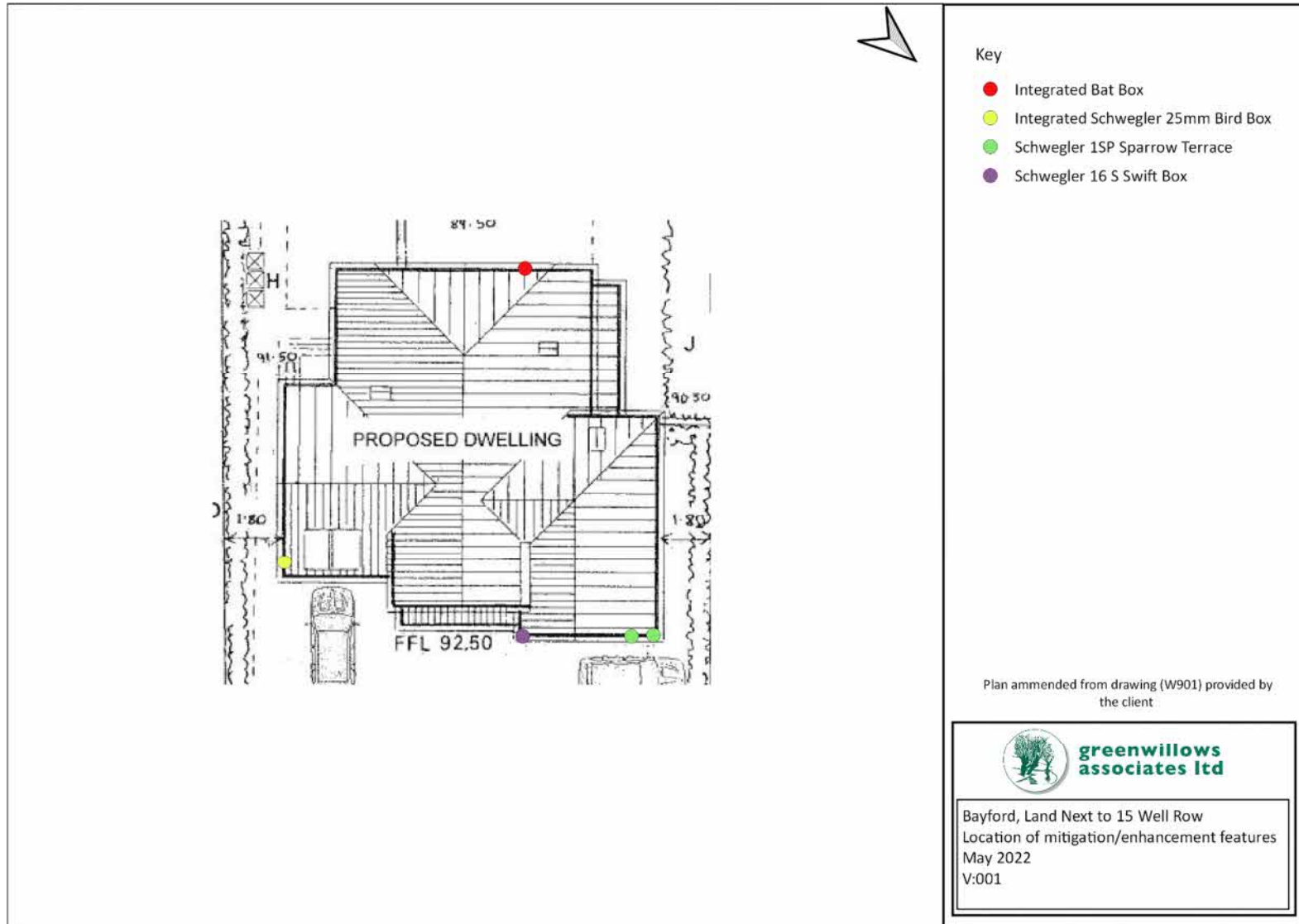
Appendix Two: Location Plan and Location of Surrounding Ponds



Appendix Three: Habitat Map with Target Notes



Appendix Four: Location of Mitigation/Enhancement Features



Appendix Five: Statutory and Non-Statutory Nature Conservation Sites

Site Name	Designation	Grid Ref	Distance from site	Reasons for designation
Bayford Wood	ASNW	TL302082	280m west	<p>Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) coppice-with-standards woodland. There are standards of Pedunculate Oak and Ash (<i>Fraxinus excelsior</i>) with the latter becoming increasingly dominant in the north-east. Some of the wood has been planted with Silver Birch (<i>Betula pendula</i>) and conifers. The ground flora support ancient woodland indicators including Bluebell (<i>Hyacinthoides non-scripta</i>), Dog's Mercury (<i>Mercurialis perennis</i>), Yellow Archangel (<i>Lamiastrum galeobdolon</i>), Wood Melick (<i>Melica uniflora</i>), Wood Sorrel (<i>Oxalis acetosella</i>) and Wood Anemone (<i>Anemone nemorosa</i>). Some rare plants in Hertfordshire have also been recorded including Opposite-leaved Golden Saxifrage (<i>Chrysosplenium oppositifolium</i>), Small Teasel (<i>Dipsacus pilosa</i>), Violet Helleborine (<i>Epipactis purpurata</i>), Spurge Laurel (<i>Daphne laureola</i>) and Early Purple Orchid (<i>Orchis mascula</i>). Open rides and incised streams add to the habitat diversity. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.</p>
Blackfan/gidners Woods	ASNW	TL312074	500m south	<p>Ancient semi-natural woodland with areas of Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) coppice, including some Hornbeam pollards, and other areas with predominantly birch (<i>Betula</i> spp.) and Ash (<i>Fraxinus excelsior</i>). Bracken (<i>Pteridium aquilinum</i>) glades are present and large areas have been cleared for grazing. The ground flora supports ancient woodland indicators such as Bluebell (<i>Hyacinthoides non-scripta</i>), Dog's Mercury (<i>Mercurialis perennis</i>), Wood Sorrel (<i>Oxalis acetosella</i>), Giant Fescue (<i>Festuca gigantea</i>), Remote Sedge (<i>Carex remota</i>), Broad Buckler-fern</p>

				(<i>Dryopteris dilatata</i>), Slender Buckler-fern (<i>Dryopteris carthusiana</i>) and violets (<i>Viola</i> spp.). There are pits, ponds supporting marginal vegetation, and damp areas. Species recorded within the clearings include Common Sorrel (<i>Rumex acetosa</i>), Sheep's Sorrel (<i>Rumex acetosella</i>) and several rushes (<i>Juncus</i> spp.). Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.
Scrub south of Bayford Station	CWS	TL315081	620m south-east	Scrub with remnants of rough, damp grassland supporting a moderately species-rich flora. Species recorded include Common Sorrel (<i>Rumex acetosa</i>), Tufted Vetch (<i>Vicia cracca</i>), Wild Angelica (<i>Angelica sylvestris</i>), Meadowsweet (<i>Filipendula ulmaria</i>), Tufted Hair-grass (<i>Deschampsia cespitosa</i>), Common Centaury (<i>Centaureum erythraea</i>), Hedge Bedstraw (<i>Galium mollugo</i>), Sneezewort (<i>Achillea ptarmica</i>) and several rushes (<i>Juncus</i> spp.) and sedges (<i>Carex</i> spp.). Woody species recorded include Blackthorn (<i>Prunus spinosa</i>), Silver Birch (<i>Betula pendula</i>), Hawthorn (<i>Crataegus monogyna</i>), Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>), Goat Willow (<i>Salix caprea</i>) and a single coppiced Hornbeam (<i>Carpinus betulus</i>). Wildlife Site criteria: Scrubland; woody species.
Weepings Wood	ASNW	TL315093	640m north-east	Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) woodland of mainly Hornbeam coppice with Pedunculate Oak and Ash (<i>Fraxinus excelsior</i>) standards. There is some Hazel (<i>Corylus avellana</i>) coppice with frequent Field Maple (<i>Acer campestre</i>). Areas of dense Blackthorn (<i>Prunus spinosa</i>) with Hawthorn (<i>Crataegus monogyna</i>) thickets are present. The ground flora supports ancient woodland indicators such as Dog's Mercury (<i>Mercurialis perennis</i>), Wood Sedge (<i>Carex sylvatica</i>) and Common Dog-violet (<i>Viola riviniana</i>) with species such as Lady's Smock (<i>Cardamine pratensis</i>),

				Meadowsweet (<i>Filipendula ulmaria</i>) and Pendulous Sedge (<i>Carex pendula</i>) in marshier areas. A grassy ride, ditches, ponds and banks increase the habitat diversity of the wood. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.
Great Groves Wood	ASNW	TL318085	640m east	Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) coppice-with-standards woodland. The woodland is mainly Hornbeam coppice with some large Pedunculate Oak standards. Ash (<i>Fraxinus excelsior</i>), Field Maple (<i>Acer campestre</i>) coppice and Silver Birch (<i>Betula pendula</i>) are also present along with many other woody species such as Hazel (<i>Corylus avellana</i>), Midland Hawthorn (<i>Crataegus laevigata</i>) and Wild Service-tree (<i>Sorbus torminalis</i>). Some areas of mixed plantation are present. The ground flora is diverse and supports many woodland indicators including Bluebell (<i>Hyacinthoides non-scripta</i>), Wood Sorrel (<i>Oxalis acetosella</i>), Yellow Pimpernel (<i>Lysimachia nemorum</i>), Pignut (<i>Conopodium majus</i>), Wood Spurge (<i>Euphorbia amygdaloides</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Giant Fescue (<i>Festuca gigantea</i>), Hairy Wood-rush (<i>Luzula pilosa</i>), Common Cow-wheat (<i>Melampyrum pratense</i>) and Wood Millet (<i>Milium effusum</i>). Broad-leaved Helleborine (<i>Epipactis helleborine</i>) has also been recorded. There are ponds and brooks within the wood and banks and ditches to parts of the boundary. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.
Harmond's Woods	ASNW	TL320091	870m north-east	Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) woodland. The wood is mainly old Hornbeam coppice with some Ash (<i>Fraxinus excelsior</i>) and Pedunculate Oak standards plus areas of Hawthorn (<i>Crataegus monogyna</i>) scrub and Hazel (<i>Corylus avellana</i>) coppice. Other trees include Silver

				<p>Birch (<i>Betula pendula</i>), Downy Birch (<i>Betula pubescens</i>), Field Maple (<i>Acer campestre</i>) and Sycamore (<i>Acer pseudoplatanus</i>). The wood is quite wet and supports meandering streams with some willows (<i>Salix</i> spp.), ponds and wide grassy wet rides. The ground flora includes numerous ancient woodland indicators, mainly Dog's Mercury (<i>Mercurialis perennis</i>) with species such as Broad Buckler-fern (<i>Dryopteris dilatata</i>), Hairy-brome (<i>Bromopsis ramosa</i>), Wood Spurge (<i>Euphorbia amygdaloides</i>), Yellow Archangel (<i>Lamiastrum galeobdolon</i>), Bugle (<i>Ajuga reptans</i>) and several sedges (<i>Carex</i> spp.). Early Purple Orchid (<i>Orchis mascula</i>) has been recorded at the edge of the wood. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.</p>
Grassland s E. of The Wall House	CWS	TL299080	970m south-west	<p>Semi-improved neutral grassland supporting common grasses and herbs including a number of indicator species. Plants recorded include Meadow Buttercup (<i>Ranunculus acris</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Bugle (<i>Ajuga reptans</i>), Pignut (<i>Conopodium majus</i>), Field Wood-rush (<i>Luzula campestris</i>), Common Sorrel (<i>Rumex acetosa</i>) and Sheep's Sorrel (<i>Rumex acetosella</i>). Wildlife Site criteria: Grassland indicators</p>
Long Leys	CWS	TL320082	1km east	<p>Buildings and environs important for protected species. Wildlife Site criteria: Species.</p>
Bells Wood	ASNW	TL301075	1.1km south-west	<p>Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) coppice woodland degraded by part clearance for a caravan park. The woodland retains a largely semi-natural canopy of Hornbeam coppice with standards plus some standards of Pedunculate Oak and Silver Birch (<i>Betula pendula</i>) along with some conifers. Numerous ornamental shrubs have also been planted. The ground flora is sparse but supports some ancient woodland indicators, mainly Bluebell with some Dog's</p>

				Mercury (<i>Mercurialis perennis</i>), Wood Anemone (<i>Anemone nemorosa</i>), Wood Sorrel (<i>Oxalis acetosella</i>) and Common Dog-violet (<i>Viola riviniana</i>). Wood Horsetail (<i>Equisetum sylvaticum</i>) has been recorded from the wood, though is now thought to be extinct here. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.
Brickendon Green	CWS	TL321078	1.2km south-east	Village green supporting species-rich, partly damp, neutral to acidic grassland. Species recorded in the sward include Sweet Vernal-grass (<i>Anthoxanthum odoratum</i>), Red Fescue (<i>Festuca rubra</i>), Common Sorrel (<i>Rumex acetosa</i>), Common Knapweed (<i>Centaurea nigra</i>), Field Wood-rush (<i>Luzula campestris</i>), Heath Bedstraw (<i>Galium saxatile</i>), Upright Tormentil (<i>Potentilla erecta</i>) and several rushes (<i>Juncus</i> spp.) and sedges (<i>Carex</i> spp.). The green is crossed by old ditches and there is a pond with a good diversity of aquatic species recorded including Bogbean (<i>Menyanthes trifoliata</i>) and Pond Water-crowfoot (<i>Ranunculus peltatus</i>). Wildlife Site criteria: Grassland indicators.
Back Lane, Brickendon	CWS	TL323085	1.3km west	Ancient green lane bordered by thin strip of ancient broadleaf woodland supporting Pedunculate Oak (<i>Quercus robur</i>) and Ash (<i>Fraxinus excelsior</i>) standards over old Hornbeam (<i>Carpinus betulus</i>) coppice. The ground flora is dominated by Dog's Mercury (<i>Mercurialis perennis</i>) along with other woodland indicators recorded such as Wood Meadow-grass (<i>Poa nemoralis</i>), Hairy-brome (<i>Bromopsis ramosa</i>), Giant Fescue (<i>Festuca gigantea</i>) and Wood Melick (<i>Melica uniflora</i>). Wildlife Site criteria: Wooded green lane with features and structure indicative of ancient origins; woodland indicators.
Sailor's Grove	CWS	TL319099	1.3km north-east	Ancient semi-natural woodland site now largely secondary woodland comprising old plantings, but still encompassing some semi-

				<p>natural ancient woodland. The ancient woodland is composed of coppiced Hornbeam (<i>Carpinus betulus</i>) with mature Pedunculate Oak (<i>Quercus robur</i>) and Ash (<i>Fraxinus excelsior</i>) and the occasional Beech (<i>Fagus sylvatica</i>) and Sycamore (<i>Acer pseudoplatanus</i>). There is an understorey of coppiced Hazel (<i>Corylus avellana</i>) and Hawthorn (<i>Crataegus monogyna</i>) with young Pedunculate Oak and Ash and an area of Field Maple (<i>Acer campestre</i>) coppice. Plantations comprise both conifers and broadleaf species, including European Larch (<i>Larix decidua</i>), Corsican Pine (<i>Pinus nigra</i> ssp. <i>laricio</i>) and Pedunculate Oak. Ponds, ditches, pits and an old double-hedged trackway add to the habitat diversity of the site. The ground flora is diverse and rich in indicator species with Bluebells locally abundant plus other species recorded such as Wood Sedge (<i>Carex sylvatica</i>), Yellow Archangel (<i>Lamium galeobdolon</i>), Hairy Wood-rush (<i>Luzula pilosa</i>), Wood Melick (<i>Melica uniflora</i>), Goldilocks Buttercup (<i>Ranunculus auricomus</i>) and Common Dog-violet (<i>Viola riviniana</i>). Wildlife Site criteria: Ancient woodland with restorable elements of its previous semi-natural canopy and ancient features; woodland indicators.</p>
Pollard Wood	CWS	TL298094	1.3km north-west	<p>Ancient semi-natural Hornbeam (<i>Carpinus betulus</i>) pollard woodland with some Hazel (<i>Corylus avellana</i>) and Hawthorn (<i>Crataegus monogyna</i>) coppice and Elder (<i>Sambucus nigra</i>) scrub. The ground flora is dominated by Dog's Mercury (<i>Mercurialis perennis</i>) with occasional Bluebell (<i>Hyacinthoides non-scripta</i>). Other species recorded include Yellow Archangel (<i>Lamium galeobdolon</i>) and Wood Melick (<i>Melica uniflora</i>). Wildlife Site criteria: Ancient woodland with a semi-natural canopy and field evidence suggesting an ancient origin; woodland shown on; woodland indicators.</p>

Hooks Grove (Bayfordbury)	CWS	TL313099	1.3km north	A small area of ancient semi-natural woodland composed of mixed Hornbeam (<i>Carpinus betulus</i>) and Hazel (<i>Corylus avellana</i>) coppice with mature standards of Pedunculate Oak (<i>Quercus robur</i>) and Ash (<i>Fraxinus excelsior</i>). The wood also supports mature Redwood standards (one Wellingtonia (<i>Sequoia giganteum</i>) and several Coastal Redwoods (<i>Sequoia sempervirens</i>)), mature Corsican Pine (<i>Pinus nigra</i> ssp. <i>laricio</i>), Scots Pine (<i>Pinus sylvestris</i>) and Wild Service-tree (<i>Sorbus torminalis</i>). The ground flora supports ancient woodland indicators with species such as Bluebell (<i>Hyacinthoides non-scripta</i>), Yellow Archangel (<i>Lamium galeobdolon</i>), Wood Meadow-grass (<i>Poa nemoralis</i>), Dog's Mercury (<i>Mercurialis perennis</i>), Goldilocks Buttercup (<i>Ranunculus auricomus</i>) and Early Dog-violet (<i>Viola reichenbachiana</i>). Amphibians have been recorded in the pond and wet areas within the wood. Wildlife Site criteria: Ancient woodland with some semi-natural canopy; shown on 1st Ed 1 OS; woodland indicators.
Brickendon Lane Road Verges and Pond	CWS	TL327090	1.3km north-east	A network of road verges of varying width supporting a mosaic of habitats including semi-improved neutral grassland, patches of scrub, broadleaved woodland, hedges and ponds. Species recorded from the grassland include Lotus corniculatus, Common Sorrel (<i>Rumex acetosa</i>), Common Knapweed (<i>Centaurea nigra</i>), Meadow Buttercup (<i>Ranunculus acris</i>), Sheep's Sorrel (<i>Rumex acetosella</i>), Burnet-saxifrage (<i>Pimpinella saxifraga</i>) and Tufted Hair-grass (<i>Deschampsia cespitosa</i>). The scrub is mainly Hawthorn (<i>Crataegus monogyna</i>) and Blackthorn (<i>Prunus spinosa</i>) with some woodland areas containing Hornbeam (<i>Carpinus betulus</i>), Pedunculate Oak (<i>Quercus robur</i>), Ash (<i>Fraxinus excelsior</i>) and Elder (<i>Sambucus nigra</i>) with several woodland indicators in the ground flora, including Dog's Mercury (<i>Mercurialis</i>

				<p>perennis), Hairy-brome (<i>Bromopsis ramosa</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Wood Meadow-grass (<i>Poa nemoralis</i>) and Giant Fescue (<i>Festuca gigantea</i>). The pond supports marginal vegetation such as Pendulous Sedge, Remote Sedge and Hard Rush. Common Toads (<i>Bufo bufo</i>) have been recorded breeding in one of the pond. Wildlife Site criteria: Mosaic; grassland indicators.</p>
Bucks Alley Wood	CWS	TL295075	1.4km south-west	<p>Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) woodland with some European Larch (<i>Larix decidua</i>) plantation in the north-west corner. The north-east corner of the wood is comprised of old Hornbeam coppice with some incursion of Sycamore (<i>Acer pseudoplatanus</i>). Southwards, coppice becomes less apparent and larger standard trees become dominant as the wood becomes more high forest in character, with Pedunculate Oaks and Ash (<i>Fraxinus excelsior</i>). The south-east section of the wood is on higher gravelly ground with some Scots Pine (<i>Pinus sylvestris</i>), Sweet Chestnut (<i>Castanea sativa</i>) and Wild Cherry (<i>Prunus avium</i>). Birch (<i>Betula</i> spp) is also common. The ground flora a moderately diverse community with numerous indicator species including Bluebell (<i>Hyacinthoides non-scripta</i>), Wood Anemone (<i>Anemone nemorosa</i>), Yellow Archangel (<i>Lamium galeobdolon</i>) and Wood Meadow-grass (<i>Poa nemoralis</i>) plus plants indicative of wetter conditions such as Pendulous Sedge (<i>Carex pendula</i>), Remote Sedge (<i>Carex remota</i>) and Bugle (<i>Ajuga reptans</i>). Bracken is present mainly below the conifer plantation and Bramble occurs throughout. There are remnant wood and hedge banks and streams runs through the wood. A pond is present in the north-west corner. Wildlife Site criteria: Ancient woodland with some semi-natural canopy and field evidence suggesting an</p>

				ancient origin; shown on Bryant's map (1822); woodland indicators.
Pond south of Blackfan Wood	CWS	TL309070	1.4km south	Pond surrounded by an area of unimproved grassland. Floating Club-rush (<i>Eleogiton fluitans</i>), a Herts Rare species, has been recorded from the pond. The surrounding grassland includes Tufted Hair-grass (<i>Deschampsia cespitosa</i>), Giant Fescue (<i>Festuca gigantea</i>), Common Bent (<i>Agrostis capillaris</i>), Meadow Vetchling (<i>Lathyrus pratensis</i>) and Common Fleabane (<i>Pulicaria dysenterica</i>). Wildlife Site criteria: Species.
Little Berkhamsted House Meadow	CWS	TL292082	1.4km west	A series of grasslands supporting a moderately diversity of grasses and herbs. The grassland is predominantly neutral in character but becomes more acidic on higher ground to the south. The sward is typically Red Fescue (<i>Festuca rubra</i>), Yorkshire Fog (<i>Holcus lanatus</i>), Meadow Foxtail (<i>Alopecurus pratensis</i>), Meadow Buttercup (<i>Ranunculus acris</i>), Common Sorrel (<i>Rumex acetosa</i>) and Meadow Vetchling (<i>Lathyrus pratensis</i>) with Sheep's Sorrel (<i>Rumex acetosella</i>) prominent in the acidic areas. Addition species recorded include Sweet Vernal-grass (<i>Anthoxanthum odoratum</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i>) and Field Wood-rush (<i>Luzula campestris</i>). Much of the site boundary is bordered by hedgerows or woodland. A spring-fed pond and associated ditches is present with an aquatic community that includes Brooklime (<i>Veronica beccabunga</i>), Bulrush (<i>Typha latifolia</i>), Soft Rush (<i>Juncus effusus</i>) and Floating Pondweed (<i>Potamogeton natans</i>). Wildlife Site criteria: Grassland indicators.
Claypits Meadow (Epping Green)	CWS	TL308069	1.4km south-west	Mosaic of habitats situated within a small stream valley. The main habitats are marshy and dry acidic grasslands with associated scrub and woodland. The grassland is very species-rich. Acid grassland occupies the drier slopes with a wide range of characteristic species such as Common Bent

				<p>(<i>Agrostis capillaris</i>), Heath-grass (<i>Danthonia decumbens</i>), Wavy Hair-grass (<i>Deschampsia flexuosa</i>), Upright Tormentil (<i>Potentilla erecta</i>), Common Cat's-ear (<i>Hypochaeris radicata</i>), Harebell (<i>Campanula rotundifolia</i>) and Common Centaury (<i>Centaureum erythraea</i>). Certain areas support a more localised flora including Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Mouse-ear Hawkweed (<i>Pilosella officinarum</i>), Heath Bedstraw (<i>Galium saxatile</i>) and Trailing St. John's-wort (<i>Hypericum humifusum</i>). In the hollows wetter marshy communities are present which are dominated by a wide variety of rushes (<i>Juncus</i> spp.) and Common Fleabane (<i>Pulicaria dysenterica</i>) with associated plants such as Ragged Robin (<i>Lychnis flos-cuculi</i>), Bog Stitchwort (<i>Stellaria alsine</i>), Marsh Bedstraw (<i>Galium palustre</i>), Fen Bedstraw (<i>G. uliginosum</i>), Betony (<i>Betonica officinalis</i>), Lesser Spearwort (<i>Ranunculus flammula</i>) and numerous sedges (<i>Carex</i> spp.). The most waterlogged areas alongside the stream support Water Forget-me-not (<i>Myosotis scorpioides</i>), Brooklime (<i>Veronica beccabunga</i>), Floating Sweet-grass (<i>Glyceria fluitans</i>) and Water-pepper (<i>Persicaria hydropiper</i>). In addition several county rarities have been recorded including Dyer's Greenweed (<i>Genista tinctoria</i>), Heath Spotted-orchid (<i>Dactylorhiza maculate</i>) and the semi-parasitic Lousewort (<i>Pedicularis sylvatica</i>); all of these species are associated with acidic grasslands. The mixed scrub and woodland at the eastern end of the site and along the stream sides consists principally of Hornbeam (<i>Carpinus betulus</i>) (including pollards) and Goat Willow (<i>Salix caprea</i>) with Aspen (<i>Populus tremula</i>), Hazel (<i>Corylus avellana</i>), Hazel (<i>Corylus avellana</i>) and Silver Birch (<i>Betula pendula</i>). Wildlife Site criteria: Grassland indicators.</p>
Wormley-Hoddesdo	SAC	TL320058	1.5km south-	Sessile and pedunculate oak <i>Quercus petraea</i> and <i>Q. robur</i> are the principal

npark Woods			east	standard species over coppiced hornbeam <i>Carpinus betulus</i> . This type is represented, in the east, as high forest. Hoddesdonpark Wood is particularly well structured with a wide age range of oak, including mature standards and regenerating saplings, over a varied shrub layer including coppiced hornbeam and hazel <i>Corylus avellana</i> . Elsewhere dense well developed hornbeam coppice dominates.
Wormley-Hoddesdonpark Woods North	SSSI	TL343080	1.5km south-east	<p>Areas of more recent secondary woodland add variety with silver birch <i>Betula pendula</i>, downy birch <i>B. pubescens</i> and aspen <i>Populus tremula</i> all widespread. Wood sage <i>Teucrium scorodonia</i> and enchanter's nightshade <i>Circaea lutetiana</i> characterise path edges while damper areas support sedges such as pendulous sedge <i>Carex pendula</i>, remote sedge <i>C. remota</i> and wood sedge <i>C. sylvatica</i>, with hairy woodrush <i>Luzula pilosa</i> also present.</p> <p>More base-rich soils to the north are characterised by an increased presence of ash <i>Fraxinus excelsior</i> and the occurrence of wild service-tree <i>Sorbus torminalis</i>, an indicator of ancient woodland. The shrub layer is well developed with dogwood <i>Cornus sanguinea</i>, hawthorn <i>Crataegus monogyna</i> and holly <i>Ilex aquifolium</i> widespread. A diverse ground flora is dominated by dog's mercury <i>Mercurialis perennis</i> and grasses such as wood meadow-grass <i>Poa nemoralis</i> and wood millet <i>Milium effusum</i>, yellow archangel <i>Lamiastrum galeobdolon</i>, wood spurge <i>Euphorbi amygdaloides</i> and squarestalked St John's wort <i>Hypericum tetrapterum</i> are also present, with primrose <i>Primula vulgaris</i> more local in occurrence and common cowwheat <i>Melampyrum pratense</i> patchily distributed.</p>
Ashen Grove	ASNW	TL306068	1.5km south	Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) coppice woodland. The wood is

				<p>partly within the grounds of a house and incorporates a large ornamental pond and some planting. The wood is mainly Hornbeam coppice with standards of birch (<i>Betula</i> spp.) and Sycamore (<i>Acer pseudoplatanus</i>) plus some Ash (<i>Fraxinus excelsior</i>), including coppice, and oak (<i>Quercus</i> sp.). <i>Crataegus monogyna</i> is dominant in the shrub layer with <i>Rhododendron</i> prominent in the south. The ground flora includes woodland indicators, mainly Bluebell (<i>Hyacinthoides non-scripta</i>) plus species such as Enchanter's Nightshade (<i>Circaea lutetiana</i>), Foxglove (<i>Digitalis purpurea</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Wood Meadow-grass (<i>Poa nemoralis</i>), Wood Sorrel (<i>Oxalis acetosella</i>) and Dog's Mercury (<i>Mercurialis perennis</i>). A damp area beside the pond supports Tufted Hair-grass (<i>Deschampsia cespitosa</i>) and sedges (<i>Carex</i> spp.). Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.</p>
Culver Wood	CWS	TL293088	1.5km north-west	<p>Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) woodland composed of predominantly Hornbeam with some Pedunculate Oak and Silver Birch (<i>Betula pendula</i>). Within the western margin a stream lies in a narrow valley with adjacent wet areas and scrub of Elder (<i>Sambucus nigra</i>) plus Crack Willow (<i>Salix fragilis</i>) and Ash (<i>Fraxinus excelsior</i>). There are several ponds within the wood and some bordering Hornbeam and Hawthorn (<i>Crataegus monogyna</i>) hedges. The ground flora is typically sparse but a good number of woodland indicators have been recorded including Bluebell (<i>Hyacinthoides non-scripta</i>), Dog's Mercury (<i>Mercurialis perennis</i>), Remote Sedge (<i>Carex remota</i>), Yellow Archangel (<i>Lamium galeobdolon</i>), Giant Fescue (<i>Festuca gigantea</i>), Wood Meadow-grass (<i>Poa nemoralis</i>), Primrose</p>

				(<i>Primula vulgaris</i>) and Common Dog-violet (<i>Viola riviniana</i>). Wildlife Site criteria: Ancient Woodland Inventory site; indicator species.
Bayfordbury Lake	CWS	TL313102	1.6km north-east	Old ornamental lake and surrounding habitat. The lake supports narrow fringes of marginal vegetation, of mainly introduced species, including Bulrush (<i>Typha latifolia</i>), Sweet-flag (<i>Acorus calamus</i>), Marsh Marigold (<i>Caltha palustris</i>), White Butterbur (<i>Petasites albus</i>) and Stinking Flag (<i>Iris foetidissima</i>) with abundant Yellow Water-lily (<i>Nuphar lutea</i>) within the lake. Specimen trees are present around the lake. The neophyte Purple Toothwort (<i>Lathraea clandestine</i>) has been recorded on the roots of a poplar (<i>Populus</i> sp.) tree. The moderately steep banks support rough grassland with damp areas and scattered scrub. The semi-improved grassland to the north and east supports several indicator species including Oxeye Daisy (<i>Leucanthemum vulgare</i>) and Common Knapweed (<i>Centaurea nigra</i>) plus Cowslip (<i>Primula veris</i>) in the south-east corner. Grass Snakes (<i>Natrix natrix</i>) have been recorded and the lake is important for amphibians and dragonflies. Wildlife Site criteria: Mosaic habitat with several emergent/submerged or floating aquatic indicators, grassland indicators, fen indicators and woodland indicators.
Breach Lane and Stream Course	CWS	TL290085	1.6km north-west	Old green lane and a network of wooded streams with a good diversity of trees and shrubs. Some of the trees alongside the stream and part of the lane are ancient in character, including old contorted coppices, pollards and standards of Hornbeam. Of particular note is one extremely large fine ancient Hornbeam pollard just to the north-east of the confluence of the streams. The green lane is partly bordered by Hawthorn (<i>Crataegus monogyna</i>) hedges with some Pedunculate Oak (<i>Quercus robur</i>) and Ash

				(<i>Fraxinus excelsior</i>) and areas of scrub and tall ruderals. A small block of secondary Pedunculate Oak woodland is also present. The site supports a moderately diverse ground flora including a number of woodland indicators such as Dog's Mercury (<i>Mercurialis perennis</i>), Hairy-brome (<i>Bromopsis ramosa</i>), Bluebell (<i>Hyacinthoides non-scripta</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Giant Fescue (<i>Festuca gigantea</i>), Remote Sedge (<i>Carex remota</i>), Yellow Archangel (<i>Lamiastrum galeobdolon</i>) and Common Dog-violet (<i>Viola riviniana</i>). Wildlife Site criteria: Wooded green lane and linear woodland with features and structure indicative of ancient origins; woodland indicators.
Bush Farm Meadows	CWS	TL297073	1.6km south-west	Damp/marshy grassland partly bordered by scrub-lined streams and hedgerows. The grassland is dominated by rushes (<i>Juncus</i> spp.) and Tufted Hair-grass (<i>Deschampsia cespitosa</i>) with some areas of finer grasses. The herbs recorded include Betony (<i>Betonica officinalis</i>), Sneezewort (<i>Achillea ptarmica</i>), Lady's Smock (<i>Cardamine pratensis</i>), Marsh Bedstraw (<i>Galium palustre</i>), Marsh Thistle (<i>Cirsium palustre</i>), Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>), Meadow Vetchling (<i>Lathyrus pratensis</i>) and Hairy Sedge (<i>Carex hirta</i>). Wildlife Site criteria: Grassland indicators.
River Lea, Water Hall to Leaside Cottage	CWS	TL301099	1.6km north-west	Stretch of the River Lea with records of Water Vole (<i>Arvicola amphibius</i>). Wildlife Site criteria: Species.
Light's Wood	ASNW	TL326093	1.7km north-east	Two remnants of ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/Hornbeam (<i>Carpinus betulus</i>) woodland with much of the original wood felled. Light's Wood is mostly Hornbeam standards and coppice with a few Pedunculate Oak in the northern part. Further south the woodland has a

				<p>mixed canopy of secondary woodland with Sycamore (<i>Acer pseudoplatanus</i>), Ash (<i>Fraxinus excelsior</i>), Beech (<i>Fagus sylvatica</i>) and some conifers. Willow (<i>Salix</i> spp.) and Alder (<i>Alnus glutinosa</i>) are present in an area of wetter ground associated with small streams/ditches. The Grove is Pedunculate Oak with Hornbeam standards and coppice in the south becoming mixed secondary woodland and scrub to the north; including an area in the extreme north dominated by willow (<i>Salix</i> sp.). Some coppice of Field Maple (<i>Acer campestre</i>) and Hazel (<i>Corylus avellana</i>) is present. A good diversity of woodland indicators has been recorded in the ground flora, mainly Dog's Mercury (<i>Mercurialis perennis</i>) with other species such as Hairy-brome (<i>Bromopsis ramosa</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Wood Meadow-grass (<i>Poa nemoralis</i>), Enchanter's Nightshade (<i>Circaea lutetiana</i>), Pendulous Sedge (<i>Carex pendula</i>), Wood Millet (<i>Milium effusum</i>), Bugle (<i>Ajuga reptans</i>) and violets (<i>Viola</i> spp.). Wildlife Site criteria: Ancient woodland with a semi-natural canopy and field evidence suggesting an ancient origin; old secondary woodland with a semi-natural canopy and varied structure; part shown on Bryant's map (1822); woodland indicators.</p>
Devil's Lane	CWS	TL320069	1.7km south-east	<p>Ancient green lane bordered by hedgerows with laid remnants supporting Hornbeam (<i>Carpinus betulus</i>) with some Hazel (<i>Corylus avellana</i>) plus other woody species such as Holly (<i>Ilex aquifolium</i>), Hawthorn (<i>Crataegus monogyna</i>), Blackthorn (<i>Prunus spinosa</i>) and Dogwood (<i>Cornus sanguinea</i>). There is a diverse ground flora including woodland indicators such as Dog's Mercury (<i>Mercurialis perennis</i>), Wood Melick (<i>Melica uniflora</i>), Wood Meadow-grass (<i>Poa nemoralis</i>), Enchanter's Nightshade (<i>Circaea lutetiana</i>), Giant Fescue (<i>Festuca gigantea</i>), Hairy-brome (<i>Bromopsis ramosa</i>), Remote</p>

				Sedge (<i>Carex remota</i>) and Pendulous Sedge (<i>Carex pendula</i>). Wildlife Site criteria: Old green lane with features and structure indicative of an ancient origin; woody species; woodland indicators.
Hertfords hire University , Bayfordb ury	CWS	TL314103	1.7km north- east	Old semi-improved neutral grassland of reasonable quality with a small area of more calcareous grass to the east, which supports the most diverse flora. Part of the site supports an old orchard with scattered trees and moderately diverse grassland beneath. The sward supports a number of indicator species such as Common Knapweed (<i>Centaurea nigra</i>), Lady's Bedstraw (<i>Galium verum</i>), Cowslip (<i>Primula veris</i>), Quaking Grass (<i>Briza media</i>), Agrimony (<i>Agrimonia eupatoria</i>) and Oxeye Daisy (<i>Leucanthemum vulgare</i>). Meadow Barley (<i>Hordeum secalinum</i>) is occasional and Bee Orchid (<i>Ophrys apifera</i>) and Common Twayblade (<i>Neottia ovata</i>) have been recorded. Wildlife Site criteria: Grassland indicators.
Broxbour ne Woods	NNR	TL320058	1.8km south- east	A series of woodland blocks lying mainly on acid gravel deposits over London Clay. Parts have developed from ancient wood pasture and heaths and retain many large Oak and Hornbeam pollards along the boundaries and parts are coppice-with-standards. More basic conditions arise from prevalence of boulder clays to the north. This range of geological conditions and the variety of past management regimes has resulted in a varied woodland structure, wide habitat diversity and a correspondingly rich flora. Despite extensive clearance and replanting with conifers the remaining semi-natural woodland is of national importance as an example of lowland south-east Sessile Oak/Hornbeam type with the Pedunculate Oak/Hornbeam variant also present. Scrub areas, small ponds, streams, spring seepages, heathy grassland, bracken patches, rough grassland rides are all habitats present. Regeneration is good with

				<p>secondary woodland of Silver Birch, Downy Birch, and Aspen. The more acidic woodland areas have a flora dominated by Bracken and Tufted Hair-grass with damp patch edges supporting a range of sedges and rushes. Where the soils become more base-rich there is an increasing presence of Ash. Wild Service Tree can also be found. The woodland flora is diverse with ancient woodland indicators such as Dog's Mercury, Wood Meadow-grass, Wood Millet, Yellow Archangel with patches of Primroses and Common Cow-wheat. Several areas of neutral to acidic unimproved grassland provide additional interest with Tormentil, Sheep's Sorrel and Skullcap. The wide range of habitats supports a variety of invertebrate species, a good woodland bird community, a diverse range of mammals, reptiles, and amphibians. This site has been left because of removing SSSIs from Wildlife Sites. It will be reviewed once survey data and a site assessment have been carried out. Wildlife Site criteria: Buffers an SSSI.</p>
Calves Grove	ANSW	TL307065	1.8km south	<p>Ancient semi-natural Pedunculate Oak (<i>Quercus robur</i>)/ Hornbeam (<i>Carpinus betulus</i>) woodland and old secondary woodland composed of Ash (<i>Fraxinus excelsior</i>) with some Pedunculate Oak (<i>Quercus robur</i>) and Hazel (<i>Corylus avellana</i>) coppice plus invading Sycamore (<i>Acer pseudoplatanus</i>). Remnant Hornbeam coppice is present along the north (ancient) side where there is a long narrow pond/small lake. The ground flora supports woodland indicators and is most diverse in the north. Species recorded include Bluebell (<i>Hyacinthoides non-scripta</i>), Hairy-brome (<i>Bromopsis ramosa</i>), Wood Sedge (<i>Carex sylvatica</i>), Enchanter's Nightshade (<i>Circaea lutetiana</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>), Wood Sorrel (<i>Oxalis acetosella</i>) and Common Dog-violet (<i>Viola riviniana</i>). A line of Horse-chestnut (<i>Aesculus</i></p>

				hippocastanum) is present alongside the eastern boundary. The woodland is surrounded by ditches and there are wood and hedge banks in places plus a small pond in the south-west corner. Wildlife Site criteria: Part Ancient Woodland Inventory site; part old secondary woodland with a semi-natural canopy and varied structure; woodland indicators.
Ditches in former Bayfordbury Meadow	CWS	TL307104	1.8km north-west	Ditches bordered by tall herbs and ruderals important for Water Vole (<i>Arvicola amphibius</i>). Wildlife Site criteria: Species.
Rough Hills Grasslands, Bayfordbury	CWS	TL319103	1.8km north-east	A series of rough neutral grasslands with a good diversity of grasses and herbs, surrounded by scrub. The sward is dominated by coarse grasses, mainly False Oat-grass (<i>Arrhenatherum elatius</i>), but with herbs, particularly Legumes such as Meadow Vetchling (<i>Lathyrus pratensis</i>), Grass Vetchling (<i>Lathyrus nissolia</i>), Smooth Tare (<i>Vicia tetrasperma</i>) and Tufted Vetch (<i>Vicia cracca</i>), prominent. Other species recorded include Agrimony (<i>Agrimonia eupatoria</i>), Lady's Smock (<i>Cardamine pratensis</i>), Common Knapweed (<i>Centaurea nigra</i>), Wild Basil (<i>Clinopodium vulgare</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Common Spotted-orchid (<i>Dactylorhiza fuchsii</i>) and Bee Orchid (<i>Ophrys apifera</i>). The scrub is composed of Crab Apple (<i>Malus sylvestris</i>), Blackthorn (<i>Prunus spinosa</i>), Hawthorn (<i>Crataegus monogyna</i>), Elder (<i>Sambucus nigra</i>), Pedunculate Oak (<i>Quercus robur</i>), Ash (<i>Fraxinus excelsior</i>), Wild Cherry (<i>Prunus avium</i>) and Field Maple (<i>Acer campestre</i>). The scrub areas include veteran Pedunculate Oaks of over 300 years of age. Wildlife Site criteria: Grassland indicators.
Roxford Area	CWS	TL303104	1.9km north-west	Building and environs important for protected species. Wildlife Site criteria: Species.

Meadow and Spring near the Rectory	CWS	TL290080	1.9km west	<p>Old neutral to slightly acidic grassland with a fine sward supporting a good diversity of grasses and herbs such as Bird’s-foot Trefoil (<i>Lotus corniculatus</i>), Yarrow (<i>Achillea millefolium</i>), Common Knapweed (<i>Centaurea nigra</i>), Meadow Buttercup (<i>Ranunculus acris</i>), Lesser Stitchwort (<i>Stellaria graminea</i>), Field Wood-rush (<i>Luzula campestris</i>), Common Sorrel (<i>Rumex acetosa</i>) and Sheep’s Sorrel (<i>Rumex acetosella</i>). There is a small spring-fed pond in the north-east corner with species recorded including Soft Rush (<i>Juncus effusus</i>), Greater Bird’s-foot Trefoil (<i>Lotus pedunculatus</i>), Water-cress (<i>Rorippa nasturtium-aquaticum</i>), Bulrush (<i>Typha latifolia</i>) and Water-starwort (<i>Callitriche</i> sp.). Wildlife Site criteria: Grassland indicators.</p>
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Appendix Six: eDNA Results



Folio No: E13964
Report No: 1
Purchase Order: BAYF001
Client: GREENWILLOWS
ASSOCIATES
Contact: Alice Burgess

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 07/06/2022
Date Reported: 14/06/2022
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3598	Pond 1 - BAYF001	TL 3098 0854	Pass	Pass	Pass	Negative	0
3599	Pond 7 - BAYF001	TL 3087 0828	Pass	Pass	Pass	Positive	2
3600	Pond 2 - BAYF001	TL 3104 0848	Pass	Pass	Pass	Positive	8
4824	Pond 6 - BAYF001	TL 3088 0828	Pass	Pass	Pass	Positive	9
4825	Pond 5 - BAYF001	TL 3121 0850	Pass	Pass	Pass	Negative	0
4829	Pond 4 - BAYF001	TL 31159 08662	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com



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Company Registration No. 08950940

Appendix Seven: Examples of Potential Site Compensation/Enhancement

Recommended Bird Boxes

Integrated boxes can be incorporated into building designs and can support a range of species depending on their design. Non-integrated options may be used and installed on trees or posts close to dense vegetation e.g., hedgerow or tree belt.

At least four boxes will be provided as compensation for loss of potential nesting habitat on site.. Box design can vary from those shown but the examples below are recommended as being suitable for those species that were using the site during the survey. They will be installed at a height of 2 m or above, facing between north and east. The boxes will have a clear flight path to them so avoid any overhanging branches/materials that could block the box entrance.



Schwegler Integrated brick box.

It is recommended that one Schwegler Integrated brick box will be included within the design of the site. The hole size can be changed to suit different species; recommend 25mm.



Schwegler 1SP Sparrow Terrace.

Sparrow terraces can be fixed on to the surface of a suitable wall or incorporated into the wall and will be installed at a height of 2 m or above. These boxes will be installed in a group side by side as sparrows are a communal nesting species. A minimum of two sparrow terraces are recommended for this scheme.



Schwegler 16 S Swift Box

The Schwegler 16 S Swift Box can be bricked in or installed in the facade. Flush mounting is also possible. If the wall includes insulation the box can also be built into the layer of insulation. In such cases a Fixing Bracket is required. Will be installed at 5m or above, with unobstructed access. It is recommended that one swift box is included in the final design of this scheme.

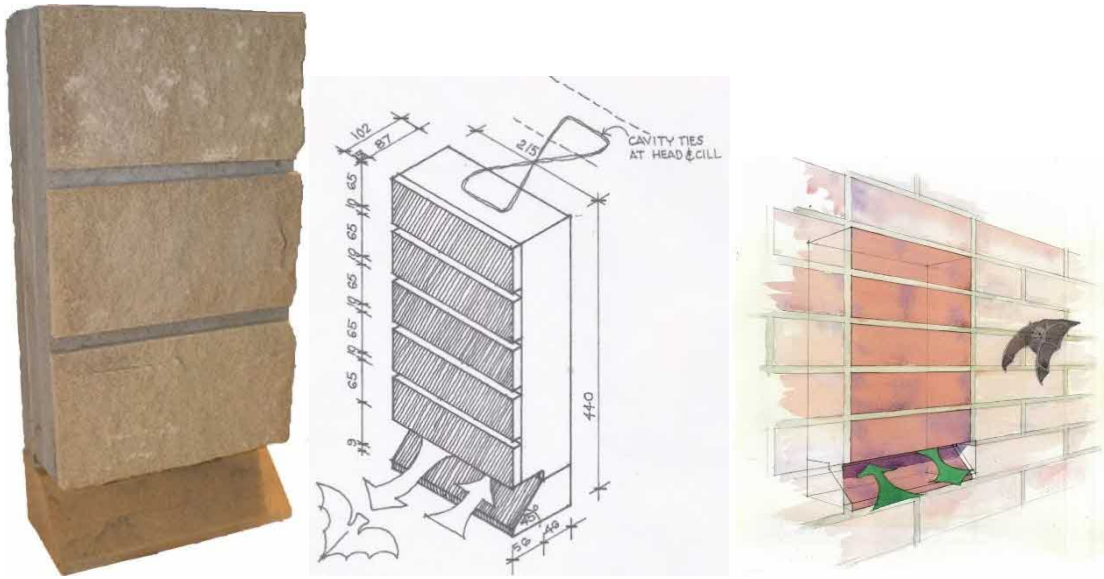
Recommended Integrated Bat Boxes

Integrated boxes will be placed in a south-to- south-westerly orientation at a height of 4-6m above ground level, with all lighting angled away to avoid direct illumination of the box. Branches (if present) will be cleared to provide an unrestricted flight path to and from the box. Box design can vary from those shown but the below boxes are recommended and considered appropriate for this site.

A minimum of one bat box is to be included as mitigation for this site. Non-integrated boxes are also available if it is not possible to included integrated boxes within the design of the site.



Ibstock Enclosed Bat Box 'C'



Habat Bat Box – Custom Stone Facing

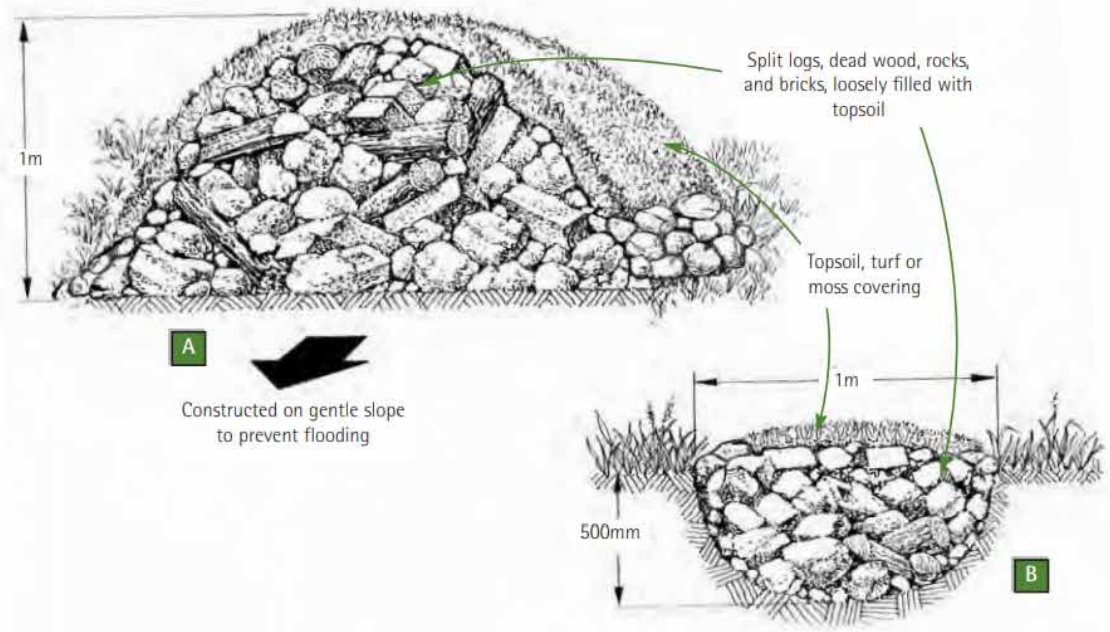
Hedgehog



Example of access provision for hedgehogs into site (13 x 13cm). At least two of these will be provided in total, allowing access into the fields and large gardens surrounding the site.

Amphibians

Fig. 8 Great crested newt refuges on (A) impermeable and (B) free-draining soils



Example refuge. 1 Refugia pile will be created on the site. The refugia will be 1m high x 1m long x 1m wide and be made of the materials shown in the diagram above.

Bat Friendly Planting Suggestions	
Bedding Plants	
Nottingham catchfly	<i>Silene nutans</i>
Night-scented catchfly	<i>S. noctiflora</i>
Bladder campion	<i>S. vulgaris</i>
Night-scented stock	<i>Matthiola bicornis</i>
Sweet rocket	<i>Hesperis matronalis</i>
Evening primrose	<i>Oenothera biennis</i>
Tobacco plant	<i>Nicotiana glauca</i>
Cherry pie	<i>Heliotropium arborescens</i>
Soapwort	<i>Saponaria officinalis</i>
Climbers	
European honeysuckle	<i>Lonicera caprifolium</i>
Italian honeysuckle	<i>L. etrusca superba</i>
Japanese honeysuckle	<i>L. japonica halliana</i>
Honeysuckle (native)	<i>L. periclymenum.</i>
White jasmine	<i>Jasminium officinale</i>
Dog rose	<i>Rosa canina</i>
Sweetbriar	<i>R. rubiginosa</i>
Field rose	<i>R. arvensis</i>
Ivy	<i>Hedera helix</i>
Bramble	- many species
Large trees, small trees and shrubs	
Oak	<i>Quercus robur & Q. petraea</i>
Ash	<i>Fraxinus excelsior</i>
Silver birch	<i>Betula pendula</i>
Field maple	<i>Acer campestre</i>
Hawthorn	<i>Crataegus monogyna</i>
Alder	<i>Alnus glutinosa</i>
Goat willow	<i>Salix caprea</i>
Guelder rose	<i>Viburnum opulus</i>
Hazel	<i>Corylus avellana</i>
Blackthorn	<i>Prunus spinosa</i>
Elder	<i>Sambucus nigra</i>
Buddleia	<i>Buddleja davidii</i>
Rock plants for walls	
Ivy-leaved toadflax	<i>Cymbana muralis</i>
Wall pennywort	<i>Umbilicus rupestris</i>
Stoncrop	<i>Sedum acre</i>

Appendix Seven: Flora and Fauna Referred to in the Report (Common and Latin Names)

Flora	
Common name	Latin name
Elm ssp.	Ulmus L.
Perennial rye-grass	Lolium perenne
Red fescue	Festuca rubra
Selfheal	Prunella vulgaris
Leyland cypress	Cupressus x leylandii
English oak	Quercus robur
Copper beech	Fagus sylvatica 'Purpurea'
Norway maple	Acer platanoides
Silver birch	Betula pendula
Cherry	Prunus cerasifera
Dogrose	Rosa canina
Privet	Ligustrum ovalifolium
Cherry laurel	Prunus laurocerasus
Garlic mustard	Alliaria petiolata
Hawthorn	Crataegus monogyna
Climbing ivy	Hedera helix
Cocksfoot	Dactylis glomerata
Cow parsley	Anthriscus sylvestris
Garden speedwell	Veronica longifolia
Ground ivy	Glechoma hederacea
Lords and ladies	Arum alpinum
Daffodil ssp.	Narcissus ssp.
Green alkanet	Pentaglottis sempervirens
Timothy grass	Phleum pratense
Dock ssp.	Rumex ssp.
Fauna	
Common name	Latin name
[REDACTED]	[REDACTED]
Barbastelle	Barbastella barbastellus
Brown long-eared bat	Plecotus auritus
Common frog	Rana temporaria
Common lizard	Zootoca vivipara
Common pipistrelle	Pipistrellus pipistrellus
Common toad	Bufo bufo
Daubenton's bat	Myotis daubentonii
Great crested newt	Triturus cristatus
Hedgehog	Erinaceus europaeus
Lesser noctule	Nyctalus leisleri
Nathusius's pipistrelle	Pipistrellus nathusii

Natterer's bat	<i>Myotis nattereri</i>
Noctule bat	<i>Nyctalus noctula</i>
Serotine	<i>Eptesicus serotinus</i>
Slow worm	<i>Anguis fragilis</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>

ANNEX ONE

Standard Survey Methodologies

A site walkover is undertaken to identify potential habitats suitable for protected species and/or evidence of field signs indicating presence of protected species and invasive plants.

Species Specific Methodologies

Great Crested Newts: A habitat suitability assessment for newts is undertaken taking due note of the presence of water bodies within 250 metres of the site (based on English Nature (2001) now Natural England) guidelines and potentially suitable terrestrial resting and shelter habitat.

At certain times of the year and/or in some years but not others, ponds may be seasonally dry but these are not necessarily ruled out as ephemeral ponds can be important ‘stepping stones’ from one pond to another and/or refuges from the ravages of fish populations that can build up in permanent ponds.

Ponds are assessed using a combination of professional judgment and applying the nationally accepted Habitat Suitability Index (HSI) for Great Crested Newts based on Oldham et al 2001 which uses nationally accepted formulae based on a number of factors which are assigned a score ranging from 0 to 1 with a score of <0.5 assessed as poor, 0.5 to 0.59 below average, 0.6 to 0.69 average, 0.7 to 0.79 good and >0.8 excellent.

If appropriate, follow-up pond surveys are undertaken in the spring to cover all ponds within 250 metres (or further where professional judgment dictates) of the construction footprint to determine presence/absence of this species. Night-torch surveys, egg searching, netting and funnel trapping are the main methods employed where practicable

Bats: A habitat suitability assessment for bats is undertaken by identifying buildings and trees likely to be affected by the proposed construction works.

The tree assessments involve looking for the following signs:

- Holes
- Fissures
- Broken Limbs
- Loose Bark
- Urine Staining
- Fur Rubbing
- Dense Ivy

A scoring system is applied to the buildings and trees using the following criteria:

- Low/Negligible probability of bat interest. Buildings in this category fall into two main types: Generally well maintained without cracks and crevices, no gaps between bargeboard or soffit and wall or without an attic space. Or those which contain some or all of the above features, but are both draughty and thick in cobwebs or contain strong odours such as solvents, diesel etc.

It must be borne in mind that a building from this latter group can become suitable for bats due to refurbishment. This often happens to houses once the attic space has been cleaned and under-felted prior to timber treatment.

Trees with low bat interest are usually young trees without any deadwood or holes. Most conifers fall into this category as they are usually planted as a crop and are then felled prior to becoming old, although once maturity is attained as in a landscape tree, suitable bat roosts may develop.

- Moderate probability of bat interest. The buildings in this category contain many sites suitable for roosting bats although no obvious signs were recorded during the survey. In exposed conditions on large buildings the signs of bat usage such as droppings and urine marks can be obliterated by heavy rain.

Occasionally a light scattering of droppings will be recorded in an attic or a semi-derelict building, which is considered by the surveyor unsuitable for use as a bat roost. The moderate probability of bat interest category can be used based on the surveyor's experience.

Trees in this category will have holes, cracks and crevices and loose bark suitable for roosting bats but no obvious roost signs such as staining and droppings at entrances.

- High probability of bat interest. This group includes buildings with known roosts or signs of bat occupancy such as droppings and staining at a roost entrance. The description of high probability buildings will also contain an indication as to the time of the year when it will be occupied by bats i.e. Summer – nursery roost, Winter – hibernation.

A licence is normally required for development to a building classified as High probability of bat interest.

Trees within this category will contain all the obvious roost features such as holes, cracks and crevices and loose bark and will also contain staining and droppings at the roost entrance or have been identified as a roost via a visual sighting of an existing bat.

If appropriate, follow-up surveys are undertaken incorporating detailed inspections of the buildings/trees by a licensed bat worker and where necessary bat activity surveys are also undertaken to determine presence/absence of this group of species.

Reptiles: A habitat suitability assessment for reptiles is undertaken looking for, inter alia,

areas of rough scrub, tussocky/rank grassland, areas of structural diversity offering short open areas of grassland and bare soil for basking with taller vegetation and habitat edges offering shelter and rapid escape routes, natural refugia such as brash piles and rubble heaps.

Where appropriate, follow-up surveys are undertaken utilizing artificial refugia to determine presence/absence of this species.

[REDACTED]

Otters: Field signs are searched for including holts, prints, spraints, haul out points and feeding signs.

Water Voles: A habitat suitability assessment for water voles is undertaken within riparian habitat assessment factors including, inter alia, water levels and seasonal longevity of water table, seasonal flash floods, bank profiles and substrates, vegetation for cover and suitable food sources, over shading, and evidence of the presence of mink. Where appropriate, follow-up surveys are undertaken where field signs are searched for including burrows, prints, runs, droppings, latrines and feeding signs.

White-Clawed Native Crayfish: A habitat suitability assessment for crayfish is undertaken within riparian habitat assessment factors including, inter alia, water levels and quality and seasonal longevity of water table, water flow, underlying geology, bank and watercourse substrates, suitable submerged refugia and known presence of signal crayfish. Where appropriate, follow-up surveys are undertaken to search for presence of this species by stone turning in the stream bed, netting and searching for burrows in the stream banks. Humane trapping may also be employed.

Harvest Mice: A habitat suitability assessment for harvest mice is undertaken within rough grassland and tall ruderal vegetation. Harvest mice build breeding nests in dense vegetation by weaving a nest out of leaves which will be at the top of a tussock of grass or around halfway up the stem of cereals. To search for these nests surveyors walk transects of the target habitat checking within tussocks of grass and on stems. All areas of suitable vegetation are checked.

Notable Flora and Invasive Weeds: A habitat suitability assessment for notable flora (rare and protected) is undertaken and species are recorded. Evidence of the presence of invasive weeds included within Schedule 9 of the Wildlife and Countryside Act 1981 as amended is searched for.