Hatch Road, Pilgrims Hatch, Brentwood, Essex

Extended Phase 1 Habitat Survey Report

On Behalf of Wingfield Planning Consultancy

V1 November 2015

This report does not purport to provide legal advice. This report provides baseline ecological conditions for the aforementioned site and is considered relevant for a period of no more than 12 months.

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Ecological Risk Assessment

The following ecological risk assessment (Eco RA) provides an infographics summary of the recommendations made following an Extended Phase 1 Habitat Survey for land to rear of Hatch Road, Pilgrims Hatch, Essex. This Eco RA is not intended as a substitute for reading the full report as set out in the proceeding pages.

Risk Code Key		
	High Risk- Likely foreseen issue	Further survey work and mitigation recommended
	Moderate Risk- Some potential foreseen issue	Low level mitigation required, no further survey work recommended
	Low Risk- No foreseen issue	No further action required

Risk Code	Factor	Comments and Actions Required
	Badgers	Site to be re-inspected for any additional evidence of badgers after some light vegetation clearance. No works to take place within 30m of the badger sett (T2).
	Bats	Internal inspection of B1 and B2 to be undertaken as soon as permission and access to the buildings is granted. Aerial inspection of T3 to be carried out by licenced bat worker prior to felling. T4 to T16 to be ivy stripped and re-inspected for features suitable for roosting bats.
	Reptiles	Presence/absence surveys to be undertaken from March to June and from September to October.
	Dormice	Presence/absence surveys to be undertaken between April and October.

Risk Code	Factor	Comments and Actions Required
	Great Crested Newts	Habitat suitability index (HSI) assessment to be carried out on Ponds 5, 6, 7 and 8. eDNA survey to be carried out on Pond 3 (between mid-April and June). Presence/absence surveys to be carried out on Ponds 1 (if wet), 2 and 4 (between mid-March and mid-June).
	Invertebrates	Butterfly and day-flying moth surveys to be carried out between mid-April and September.
	Invasive Species	Further monitoring for invasive plants on site to be combined with other surveys for protected species.
	Protected Habitats	Tree and root protection measures (in line with the British Standard for trees in relation to construction BS 5837:2012) specified in Hayden's Tree Survey report to be put in place to protect retained trees and woodland. Defunct species-rich native hedge and trees to be retained, protected and enhanced.
	Birds	Clearance of any hedges, trees, scrub and woodland should all be undertaken outside of the nesting bird season (March to September inclusive).
	Otters, WCCF, Water Voles	No further recommendations required.
	Notable Species	No further recommendations required.
	Statutory Designated Wildlife Conservation Sites	No further recommendations required.
	Non-statutory Designated Wildlife Conservation Sites	No further recommendations required.

1 Introduction

Practical Ecology Ltd was commissioned by Wingfield Planning Consultancy to undertake an Extended Phase 1 Habitat Survey of a parcel of land to rear of Hatch Road, Pilgrims Hatch, Essex, herein referred to as 'the site'.

This report presents ecological information gathered during a desk study and an Extended Phase 1 Habitat Survey of the site undertaken in October 2015.

The purpose of this report is to provide ecological baseline information pertaining to the site along with recommendations for further surveys, mitigation and enhancement as deemed appropriate.

Ecological baseline information for the site is essential so that the impacts of the proposed development of the site upon flora and fauna can be suitably managed. Enhancement measures are recommended so that the biodiversity of the site can be preserved whilst taking into account legal requirements and best practice with regards to protected species and/or habitats.

1.1 The Site

1.1.1.1 The proposed development site is a 2.6ha parcel of land to rear of Hatch Road, Pilgrims Hatch, Essex (central OS grid reference: TQ 58658 95948). There are two main habitats within the site with the north and east aspects of the site dominated by broad-leaved woodland, while the western aspect is dominated by tall ruderal vegetation. Other habitats on site include scrub, bracken, species-rich hedge and trees, scattered trees and improved grassland. In the southern most aspect of the site there are three small commercial units including a butchers, a barbers and a convenience store, as well as a residential bungalow, several garages and associated hard standing. There is also a dry pond and ditch close to the northern site boundary.

1.1.1.2 In the wider landscape, to the north and east of the site are horse paddocks containing a network of hedgerows, small woodland blocks, ditches and ponds. To the south and west of the site is established residential area.

1.2 Proposals

1.2.1.1 The proposals are to clear the western aspect of the site for a mix of residential and commercial development. At this stage there are no proposal plans for the scheme but it is understood that an area of woodland in the eastern aspect of the site will be retained and enhanced to increase its biodiversity value. The ecological recommendations in this report will therefore be used in the design process for the scheme.

2 Methods of Assessment

2.1 Desk Study

2.1.1.1 A search for statutory sites of nature conservation importance within 1km of the site was undertaken using the Multi Agency Geographical Information for the Countryside (MAGIC) website (www.magic.gov.uk). Ordnance Survey maps were consulted to identify the presence of any water bodies within 500m of the site.

2.1.1.2 Protected and notable species records for within 500m of the site were requested from The Essex Field Club[1] as part of this desk based study. Records of non-statutory sites of nature conservation interest for within 1km of the site were also requested from Essex Wildlife Trust Biological Records Centre[2].

2.1.1.3 The Local Biodiversity Action Plan (LBAP)[3] website was consulted to determine whether species and habitats identified (by both the desk study and the field survey) on and around the site are subject to specific action plans. Although succeeded by The JNCC and Defra UK Post-2010 Biodiversity Framework in July 2012, the list of UK Biodiversity Action Plan (UK BAP)[4] species was also consulted as this still remains an important reference source.

2.2 Extended Phase 1 Habitat Survey

2.2.1.1 An ecological survey of the site was undertaken on 13th October 2015 following the methodology as set out in the Handbook for Phase 1 Habitat Survey (2010)[5]. This survey provides information on the habitats within the survey area and assesses their potential to support protected or notable species. The survey was carried out by Sam Mardell who has 2 years' survey experience and a BSc (Hons) in Ecology.

2.2.1.2 Notable species are those which are legally protected, are nationally or locally rare or endangered, or are identified as a Species of Principal Importance in England under Section 41 of the NERC Act and/or Local Biodiversity Action Plan (LBAP). Also worth noting is that these species are material considerations in local planning decisions.

2.2.1.3 The site survey sought to identify evidence of the presence of legally protected and notable species and make assessments of the habitats within the site to support them, in particular:

[1] http://www.essexfieldclub.org.uk/

[2] http://www.essexwtrecords.org.uk/

[3] http://www.essexbiodiversity.org.uk/biodiversity-action-plan

[4] http://jncc.defra.gov.uk/page-5717

- an appraisal of habitats on site for their suitability to support legally protected and notable species such as great crested newt (*Triturus cristatus*), bats (all species), badger (*Meles meles*), reptiles, dormouse (*Muscardinus avellanarius*), white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*), and water vole (*Arvicola amphibious*);
- an assessment of the potential value of trees and buildings as roosting sites for bats using the protocol set out in Hundt (2012) and a search from the ground for evidence of use by bats (including the use of torches and binoculars to allow for an external inspection of the trees and buildings searching for signs such as staining and/or droppings often found around roost entrances);
- a search for evidence of the presence of badgers on site (e.g. setts, paths, prints, foraging signs and latrines); and
- an assessment of the potential of habitats on site to support nesting birds.

2.2.1.4 A search was also made for evidence of the presence of invasive plant species listed on Schedule 9 of the Wildlife & Countryside Act 1981 as they are subject to strict legal control.

2.3 Limitations to Survey

2.3.1.1 Due to seasonal behaviour of animals and the seasonal growth patterns of plants, ecological surveys may be limited by the time of year in which they are undertaken. This survey was undertaken in October when some plants may have already died back this is also outside the main breeding season for many animal species. As such the survey may not provide a complete list of the plants and animals that may be present, or which may seasonally utilise the site.

2.3.1.2 There were also several other limitations to the survey on the day of the site visit;

2.3.1.3 The search for badger activity on site was limited by the presence of dense scrub, tall ruderal vegetation and leaf litter on the floor of the woodland. Likewise, this vegetation also limited the search for any invasive plants that might be present on the site.

2.3.1.4 The stems of several mature trees on site were also densely shrouded in ivy, which made it difficult to visually assess the trees suitability for roosting bats. Access restrictions also meant that the buildings on site could not be inspected internally for evidence of roosting bats. Access restrictions offsite to the north also prevented a search for further badger holes associated with the hole along the northern site boundary.

5 http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf

2.3.1.5 Recommendations with regards to these limitations are made in the appropriate sections below.

2.3.1.6 The information gathered for this ecological survey has facilitated an evaluation of the habitats on site and the likely use of the site by legally protected and notable species. This survey has also given appropriate baseline data for the determination of the requirement for further surveys and/or mitigation and enhancement works.

3 Existing Conditions and Evaluation

3.1 Designated Sites of Nature Conservation Value

3.1.1 Statutory Sites

3.1.1.1 No statutory sites of nature conservation were identified within 1km of the site. As such, no further mitigation is required.

3.1.2 Non-Statutory Sites

3.1.2.1 No non-statutory designated sites were identified within 1km of the site. As such, no further mitigation is required.

3.2 Habitats

3.2.1 Semi-natural Broad-leaved Woodland

3.2.1.1 The north and eastern aspects of the site are dominated by open oak (*Quercus robur*) woodland with occasional ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*) (see Photo 1 overleaf). The ground cover is unexceptional, dominated by nettle (*Urtica dioica*) and bramble (*Rubus fruticosus L.Agg*). There are two open 'glade' areas, located close to the middle of the site which are again dominated by nettles.

3.2.1.2 Semi-natural broad-leaved woodland (lowland mixed deciduous woodland) is recognised as a UK and Essex BAP habitat. It is a declining habitat nationally, providing good ecological value to variety of species including bats, birds, invertebrates, herpetofauna and terrestrial mammals. As it is understood that some areas of woodland will be cleared to facilitate the development, recommendations with regards to this habitat are provided in Section 4.

Photo 1 – Semi-natural Broad-leaved Woodland in Eastern Aspect of Site

3.2.2 Tall Ruderal

3.2.2.1 Tall ruderal vegetation was noted throughout the western aspect of the site as well as the open woodland glades (see Photo 2 below). This habitat was dominated by nettles although creeping thistle (*Cirsium arvense*), bramble, cleavers (*Galium aparine*) and field bindweed (*Convolvulus arvensis*) were recorded too. Tall ruderal vegetation supports a variety of species, providing cover and foraging opportunities to invertebrates, herpetofauna and small mammals. A large area of this habitat will be cleared to facilitate the development.

Photo 2 – Tall Ruderal Vegetation in Western Aspect of Site

3.2.3 Bracken

3.2.3.1 An area of dense bracken was noted in the north-west corner of the site (see Photo 3 below). This habitat comprised entirely of common bracken (*Pteridium aquilinum*). Although not recognised as a priority habitat by Essex BAP, bracken is listed as a UK BAP habitat for its ecological value to birds and invertebrate species. Given that only a very small area of this habitat will be removed and the habitat is not recognised locally as a priority habitat, no further recommendations are required.

Photo 3 –Bracken in North West Site Corner

3.2.4 Dense Scrub

3.2.4.1 Areas of dense scrub were noted in the middle portion of the site (see Photo 4 below). Species included; elder (*Sambucus nigra*), bullace (*Prunus insititia* var. *nigra)* and hawthorn. It is understood that this habitat will be cleared to facilitate the development. Dense scrub is valuable for birds and invertebrate species.

Photo 4 – Dense Scrub in Middle Portion of Site

3.2.5 Scattered Scrub

3.2.5.1 Some small areas of scattered elder were also noted in the western portion of the site. Scattered scrub has value to invertebrates, in particularly moths and butterflies, especially when part of an aggregate of habitats within woodland glades, such as this. This suitability is dealt with in the appropriate species sections below.

3.2.6 Scattered Broad-leaved Trees

3.2.6.1 Scattered trees were noted in the middle and western portion of the site. The specimens noted ranged from young to mature with species including; ash, oak and silver birch (*Betula pendula*). Some apple trees (*Malus domestica*) were also noted in the enclosed paddock near the southern site boundary. It is understood that a number of scattered trees will be cleared to facilitate the development. Scattered trees are valuable to a variety of species including bats and birds, with fruit and seed baring trees (such as apple and oak) being of value as a foraging resource to mammals and birds.

3.2.7 Defunct Native Species-rich Hedge and Trees

3.2.7.1 Defunct native species-rich hedges and trees were noted along the northern, eastern and western site boundaries (see Photo 5 below). The specimens noted ranged from early mature to veteran with species including; ash, oak, hawthorn, elder, blackthorn (*Prunus spinosa*), hornbeam (*Carpinus betulus*) hazel (*Corylus avellana*) and wild cherry (*Prunus avium*).

3.2.7.2 Given the age and species richness, the hedge and trees on site may meet the criteria to be considered 'Important' and, as such, protected under the Hedgerow Regulations (1997). Recommendations with regards to this habitat type are provided in Section 4.

Photo 5 – Defunct Native-rich Hedge and Trees along Northern Site Boundary

3.2.8 Improved Grassland

3.2.8.1 An enclosed paddock close to the southern site boundary comprised improved grassland (see Photo 6 below). The paddock was unable to be accessed during the survey which limited species identification. As such, the only species noted included; perennial ryegrass (*Lolium perenne*) and nettle. Improved grassland has limited ecological value and is a common habitat in gardens.

Photo 6 – Improved Grassland Enclosed Paddock

3.2.9 Dry Pond (Target note 1)

3.2.9.1 A dry pond was noted along the northern site boundary (See T1 on Habitat Plan in Appendix 2). Although the pond was dry at the time of survey, there was evidence to suggest that the pond holds water from time to time. This habitat is discussed in more detail in Section 4.

3.2.10 Dry Ditch

3.2.10.1 A dry ditch which connects to the dry pond was noted along the western portion of the northern boundary. The ditch was over shaded by neighbouring species-rich hedge and trees. The ditch was covered in leaf litter with no bank vegetation at the time of the survey.

3.2.11 Building

3.2.11.1 There are several commercial and residential buildings in the southern most aspect of the site, accessed from Hatch Road. It is anticipated that these buildings will be demolished to facilitate a new access for the proposal site. As these buildings have no habitat value in their own right, they dealt with in the relevant protected species sections below.

3.2.12 Hardstanding and Bare Ground

3.2.12.1 Hardstanding and bare ground was noted in the southern most aspect of the site, associated with the commercial and residential buildings. Hard standing and bare ground has no ecological value.

3.2.13 Ephemeral/short Perennial

3.2.13.1 Ephemeral/short perennial growth was noted growing from hardstanding and bare ground. Species included; ragwort (*Jacobaea vulgaris*), dandelion (*Taraxacum officinale*) and greater plantain (*Plantago major*). This habitat as a whole has limited ecological value, although ragwort is an important food plant for many invertebrate species.

3.1 Protected and Notable Species

3.1.1 Otter, Water Vole and White-Clawed Crayfish

Desk Study

3.1.1.1 No records of otter (*Lutra lutra*), water vole (*Arvicola amphibious*) and white clawed crayfish (*Austropotamobius pallipes*) were returned within 500m of the site.

Field Survey

3.1.1.2 The dry ditch along the northern site boundary has no suitability for otter, water vole or white-clawed crayfish. Although water voles have been found to inhabit dry ditches, the ditch on site does not have any bank vegetation or connectivity to any wet ditches or ponds making it unlikely that water voles would inhabit the site.

3.1.1.3 Although distant from any mainline river system, so unlikely to form part of any regular territory for otters, the woodland in the eastern portion of the site was assessed for its suitability as natal holt habitat for otters.

3.1.1.4 Woodlands that are close to water with dense understorey vegetation, large bankside root systems, hollow trunks and log piles provide suitable natal holt habitat for otters. Although the woodland on site is well connected to ponds and ditches north of the site, the woodland is considered too open, lacking dense understorey vegetation and features suitable for natal holts. No evidence of otters such as spraint, prints or mammal paths were also noted on site during the survey and no trees with any suitability to act as natal holt features were noted. As such, no further recommendations for otters are made required.

3.1.2 Badgers

Desk Study

3.1.2.1 No records of badger (*Meles meles*) were returned within 500m of the site.

Field Survey

3.1.2.2 The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken provide suitable habitat for badger foraging and sett creation.

3.1.2.3 A badger sett, comprising one hole, was noted underneath an exposed tree root in the north east corner of the site along the northern boundary hedge and trees (see T2 on Habitat Plan in Appendix 2 and Photo 7 below). Scratch marks were noted on the exposed tree root and badger guard hairs were noted trapped in some barbed wire fencing that had fallen down in front of the hole (see Photo 7 below). No other evidence of badgers such as latrines, scratch posts and signs of digging was noted in the area and the base of the hole was covered by a layer of leaf litter, suggesting that this hole was only used occasionally as an outlier sett. However, given the holes location along the northern site boundary, it is likely that there are further holes associated with this sett present off site to the north which may show more signs of heavy use. This was not able to be determined during the time of the survey though as access restrictions prevented a survey of this offsite area.

3.1.2.4 No other badger setts were noted on site although the presence of dense scrub, tall ruderal vegetation and leaf litter on the floor of the woodland restricted this survey. Given the limitations presented at the time of the survey and the fact that a badger sett was noted on site, further recommendations with regards to badgers are provided in Section 4.

Photo 7 – Badger Hole

3.1.3 Bats

Desk Study

3.1.3.1 Records of common pipistrelle (*Pipistrellus pipistrellus*) were returned within 500m of the site.

Field Survey

Buildings 1 – External Assessment

3.1.3.2 Building 1 is a two storey brick building with a pitched concrete tiled roof and dormer windows currently used by Nisa local convenience store and Burt's quality butchers. There are also some residential apartments to the rear (see Photo 8 below and B1 on Habitat Plan in Appendix 2).

Photo 8 – Building 1

3.1.3.3 Large gaps were noted around the lead flashings supporting both stench pipes on the northern plain of the pitched roof (see Photo 9 and 10 below). This could allow bats access underneath the surrounding roofs tiles and into the loft space. In addition to these features, some cement supporting the western end central ridge tile was missing which could allow small numbers, or individual crevice dwelling bats, such as common pipistrelle, access underneath the ridge tiles (see Photo 10 below).

3.1.3.4 Given that Building 1 will be demolished to facilitate the development, further recommendations are provided in Section 4.

Photo 9 & 10 – Gaps under Lead Flashing and Central Ridge Tile on Building 1

Building 2 – External Assessment

3.1.3.5 Building 2 is one storey bungalow building with a pitched concrete tiled roof, currently used by Halibarber hairdressers and occupants of 148a Hatch Road (see Photo 11 below and B2 on Habitat Plan in Appendix 2).

Photo 11 – Building 2

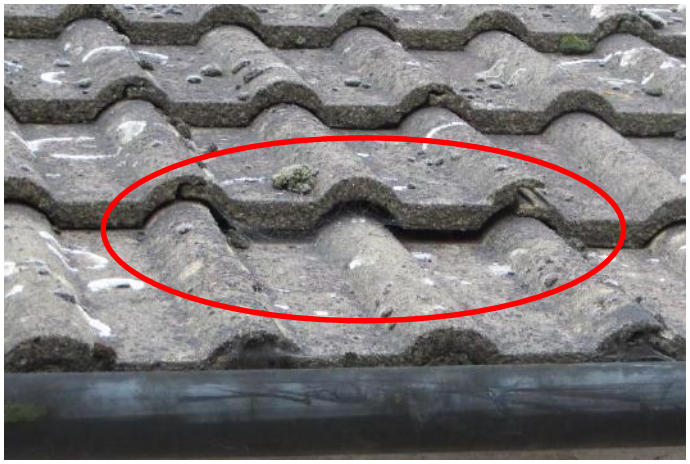
3.1.3.6 A missing tile was noted on the south east corner of Building 2 (see Photo 12 below). This could again allow bats access into the loft space.

Photo 12 – Missing Tile on Building 2

3.1.3.7 In addition to this, a lifted tile was also noted on the western roof plain (see Photo 13 below). Half of this feature was covered in cobwebs suggesting a lack of recent bat activity. However, there were no cobwebs present on the other half of the feature suggesting that bats could have been roosting here.

3.1.3.8 Given that Building 2 will be demolished to facilitate the development, further recommendations are provided in Section 4.

Photo 13 – Lifted Tile on Building 2



Buildings 3, 4 and 5 – External Assessment

3.1.3.9 Buildings 3, 4 and 5 are a series of single storied flat roofed garage buildings (see Photo 14 below). The garages contain no suitable roosting features for bats and therefore no further recommendations with regards to the buildings are required.

Photo 14 – Building 5

3.1.3.10 ***Trees-*** The trees on site were assessed for their potential to support roosting bats using the protocol set out in Hundt (2012) (see Table 1 overleaf).

Table 1- Protocol for Assessing Bat Potential of Trees

Tree Category	Description
High	Trees with multiple highly suitable features capable of supporting larger roosts. Features such as thick ivy covering, rot holes woodpecker holes, splits, loose bark or all the above with good habitat connectivity.
Moderate	Trees with definite bat potential, supporting fewer suitable features that category high trees or with potential for use by single bats. Features such as light ivy covering, rot holes but with good habitat connectivity.
Low	Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks and crevices being found; or the tree supports some features which may have limited potential to support bats. Light ivy covering or downward developing rot holes, poor habitat connectivity.
Negligible	Trees with no bat potential to support bats.

3.1.3.11 An over mature ash tree set within the hedge and trees along the western site boundary was noted to feature an entirely hollow stem offering roosting opportunities for bats (see T3 on Habitat Plan in Appendix 2 as well as T032 in Hayden's Tree Survey report for the site and Photo 15 below). Using Table 1 above, T3 is considered to have high potential to support roosting bats due to it having good habitat connectivity and capability of supporting larger roosts. Given that this tree is unsuitable for retention within a development, further recommendations are provided in Section 4.

Photo 15 – Over Mature Ash Tree with Hollow Stem

3.1.3.12 12 mature trees in the middle and western aspects of the site were unable to be assessed for features suitable for roosting bats due to dense ivy growth on stems (see T4 to T16 on Habitat Plan in Appendix 2). If proposals include the removal of any of these trees, further investigation is required prior to felling to ensure that no features exist within the tree that are suitable for roosting bats. Details of this are provided in Section 4.

3.1.3.13 ***Habitats-*** The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site provide suitable foraging and commuting habitat for bats, especially as the site is well connected to the wider landscape. Given that some of these areas will be cleared to facilitate the development, enhancement measures to compensate for loss of foraging and commuting habitat are provided in Section 5. Recommendations to reduce the impact on bats with regards to any proposed new lighting for the site is given in Section 4.

3.1.4 Reptiles

Desk Study

3.1.4.1 Records of slow worm (*Anguis fragilis*) were returned within 500m of the site.

Field Survey

3.1.4.2 The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site provides suitable habitat for foraging reptiles, in particular adder (*Vipera berus*), slow worm and grass snakes (*Natrix natrix*). Several features were also noted throughout the site that could provide suitable cover and hibernation habitat for reptiles. These included mammal burrows, fallen trees, piles of debris and garden waste fly tipped from neighbouring dwellings.

3.1.4.3 Given that some areas of suitable reptile habitat will be cleared to facilitate the development, recommendations for reptiles are provided in Section 4.

3.1.5 Dormice

Desk Study

3.1.5.1 No records of dormice (*Muscardinus avellanarius*) were provided within 500m of the site.

Field Survey

3.1.5.2 The woodland, scrub, hedge and trees on site are suitable for dormice. Around 20ha of suitable woodland, scrub and hedgerow habitat is required to support a viable population of dormice. Although the suitable habitats on site are only around 1.8ha in size they are well connected to an extensive network of hedgerows and woodland further north of the site that equates to just over 20ha.

3.1.5.3 The reliance of dormice on hazel as a food plant is acknowledges by both the animals latin name, *avellanarius*, which means hazel, and by the common colloquial name of hazel dormouse. Although hazel is an important, dormice require a variety of food plants to carry them through the seasons.

3.1.5.4 Hazel was noted fairly infrequently throughout the hedge and trees. The hedgerow habitat as well as the woodland have a good diversity of other tree and shrub species could provide a wide range of food for dormice if present on the site.

3.1.5.5 Other plant species present which are noted as being of value to dormice include (most valuable to dormice*); oak*, bramble*, ash, hornbeam, silver birch, blackthorn and hawthorn.

3.1.5.6 As proposals may include the loss of some suitable habitat for dormice, further recommendations are provided in Section 4.

3.1.6 Great Crested Newts

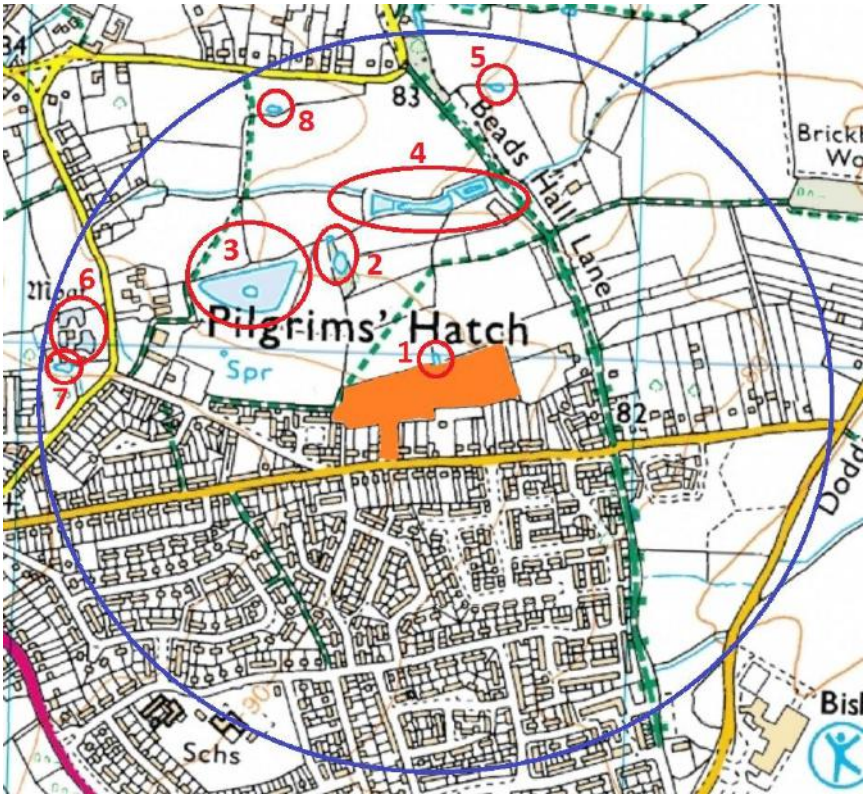
Desk Study

3.1.6.1 No records of great crested newts (*Triturus cristatus*) were provided within 500m of the site.

3.1.6.2 Eight ponds were identified by the desk study within 500m of the proposed development site. The ponds have been marked on Figure 1 overleaf to show where they lie in relation to the proposed development site. The blue circle represents a 500m radius of the proposed development site, the proposed development site is marked in orange and the red circles and numbers represents the ponds identified within this area.

3.1.6.3 Pond 1 was found to be dry during the time of survey although it has still been included, given that it is within the proposal site boundary and there is evidence to suggest that the pond holds water from time to time.

Figure 1 – Ponds and Proposed Development Site



Field Survey

3.1.6.4 Table 2 below gives the distance to each pond from the proposed development site, whether the pond was surveyed and whether or not any potential barriers to great crested newt dispersal exist between the pond and the site.

Table 2 – Ponds within 500m of the site

Pond number	Distance and direction from site	Surveyed?	Barriers?
1	On site	No - dry	NA
2	146m north	Yes	None – hedgerows, horse paddocks
3	159m north west	Yes	None – hedgerows, horse paddocks
4	230m north	No	None – hedgerows, horse paddocks
5	394m north	No	None – hedgerows, horse paddocks
6	393m west	No	None – hedgerows, horse paddocks, arable land
7	401m west	No	None – hedgerows, horse paddocks, arable land
8	455m north	No	None significant - hedgerows, horse paddocks, arable land, roads and buildings

3.1.6.5 During the site visit, a habitat suitability assessment was undertaken on Ponds 2, 3 and 4 using the Habitat Suitability Index (HSI) [6] scoring system which gives an indication of the suitability of a water body to support breeding great crested newts. A habitat suitability score of 0 indicates unsuitable habitat, 1 represents optimal habitat. The results are presented in Table 3 below.

Table 3 – HSI Results

Pond number	HSI	Suitability
2	0.80	Excellent
3	0.21	Poor
4	0.80	Excellent

3.1.6.6 **Pond 1** is a dry pond on site noted along the northern site boundary (See T1 on Habitat Plan in Appendix 2 and Photo 16 below). Although the pond was dry during the time of survey, a water line mark evident on an old rusty metal drum (see Photo 16 below) suggests that the pond does hold water from time to time. Ponds which dry out every so often have been found to support very good populations of great crested newts partly because periodic drying out reduces the abundance of newt predators such as fish and dragonfly larvae. Pond 1, in association with other local water bodies could therefore support a breeding population of great crested newts.

Photo 16 – Pond 1

[6]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

3.1.6.7 **Pond 2** is set within a small block of woodland to the north which is well connected to the site by hedgerow. The pond achieved an HSI score of 0.80 which suggests it has excellent suitability to support breeding great crested newts. This is due in part to the pond having good terrestrial habitat as well as an absence of fish and waterfowl (see Photo 17 below).

Photo 17 – Pond 2

3.1.6.8 **Pond 3** is a very large pond located within a horse paddock which is well connected to the site by hedgerows and woodland (see Photo 18 below). The pond achieved an HSI score of 0.21 which suggests it has poor suitability to support great crested newts. This is due to the pond having a large population of fish and waterfowl present. Fish and waterfowl are known to predate great crested newts and their larvae.

Photo 18 – Pond 3

3.1.6.9 **Pond 4** is a large pond set within a small woodland block that is connected to a ditch drainage system. The pond is again well connected to the site through hedgerows and woodland. From the OS map (see Figure 1), Pond 4 appears to be a series of three ponds, although access constraints meant that not all of the ponds could not be surveyed. The HSI score was therefore taken from the most western of the three ponds located next to the footpath (see Photo 19 below). The HSI score awarded to the pond was 0.80 which suggests it has excellent suitability to support great crested newts. This is due to the pond having good macrophyte cover and surrounding terrestrial habitat.

Photo 19 – Pond 4

3.1.6.10 ***Terrestrial habitats-*** The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site provide suitable habitat for great crested newt foraging. Mammal burrows, fallen trees, piles of debris and garden waste also provides suitable habitat for cover and hibernation.

3.1.6.11 Great crested newts can use suitable terrestrial habitat up to 500m from a breeding pond, although latest research from by Natural England suggests that newts are likely to travel no more than 250m when suitable habitats for foraging and hibernation exist within this radius of their pond.

3.1.6.12 Given that some areas of suitable great crested newt habitat will be cleared to facilitate the development and that there are several ponds within 500m of the site that are well connected to the site via hedges and woodland and that Pond 1 on site may hold water regularly enough to support breeding newts, further recommendations for great crested newts are provided in Section 4.

3.1.7 Birds

Desk Study

3.1.7.1 No records of birds were returned within 500m of the site.

Field Survey

3.1.7.2 Blue tit (*Cyanistes caeruleus*), great tit (*Parus major*), long tailed tit (*Aegithalos caudatus*), wren (*Troglodytes troglodytes*), chaffinch (*Fringilla coelebs*), green finch (*Chloris chloris*), robin (*Erithacus rubecula*), wood pigeon (*Columba palumbus*), carrion crow (*Corvus corone*) were all noted on the site during the survey.

3.1.7.3 The species-rich hedge and trees, woodland and scrub within the site all have potential to support a range of passerine bird species, such as those recorded during the site visit.

3.1.7.4 Given that some areas of suitable nesting habitat will be cleared to facilitate the development, further recommendations for birds are given in Section 4.

3.1.8 Invertebrates

Desk Study

3.1.8.1 Recent records of UKBAP listed moth species; brindled beauty (*Lycia hirtaria*), small emerald (*Hemistola chrysoprasaria*), dusky thorn (*Ennomos fuscantaria*), dusky brocade (*Apamea remissa*) were all returned within 500m of the site. Records of Essex BAP moth species; small ranunculus (*Hecatera dysodea*) and marbled green (*Nyctobrya muralis*) were also returned within 500m.

Field Survey

3.1.8.2 The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site have suitability to support a diverse assemblage of invertebrate species. Most notably, the woodland has suitability to support a range of deadwood invertebrates such as stag beetle, as well as moth species, such as those returned by the desk study. The woodland glades also have suitability to support a diverse range of butterfly species. Given that some of these habitats will be cleared to facilitate the development, further recommendations for invertebrates are provided in Section 4.

3.1.9 Invasive Species

Desk Study

3.1.9.1 No records of invasive species were returned within 500m of the site.

Field Survey

3.1.9.2 Although the survey was carried out at the optimal time of year to survey for invasive plants (between April and October), the presence of dense scrub and tall ruderal vegetation on site limited this search. No invasive species were noted on or adjacent to the site during the site visit though further survey should be carried out due to the limitations encountered. Further details are provided in Section 4.

3.1.10 Other Species

Desk Study

3.1.10.1 Records of common frog (*Rana temporaria*) were returned within 500m of the site.

Field Survey

3.1.10.2 A common rabbit (*Oryctolagus* cuniculus) was noted on site during the survey.

3.1.10.3 The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site provide suitable habitat for terrestrial mammals and common amphibians.

3.1.10.4 No specific mitigation is recommended with regards to small mammals but enhancement to benefit them is set out in Section 5.

4 Mitigation and Further Survey

4.1 Habitats

4.1.1.1 If proposals include the removal of any areas of semi-natural broad-leaved woodland, precautions with regards to this habitat are recommended. These include minimising tree removal within this area and employing tree and root protection measures (in line with the British Standard for trees in relation to construction BS 5837:2012)[7] specified in Hayden's Tree Survey and Arboricultural Impact Assessment Report[8] to protect retained trees and woodland.

[7] BS 5837:2012 can be purchased from the British Standards Institute online shop at http://shop.bsigroup.com/en/ProductDetail/?pid=000000000030139494

[8] Hayden's Arboricultural Consultants, Tree Survey and Arboricultural Impact Assessment Report, Land to rear of Hatch Road, Brentwood, Essex. November 2015.

4.1.1.2 The defunct native species-rich hedge and trees along the north, east and west site boundaries should be retained and protected using tree and root protection measures as specified above. If this is not possible, a Hedgerow Regulations assessment will be required to determine whether the hedgerow is protected under these regulation prior to any removal or management works.

4.1.1.3 Recommendations for enhancement measures to 'gap up' the hedgerow are also provided in Section 5.

4.1.1.4 In line with recommendations put forth in the Government's National Planning Policy Framework 2012[9] to promote biodiversity, habitat enhancement is recommended for this site. Details are provided in Section 5.

4.2 Species

4.2.1 Badgers

4.2.1.1 Badgers are protected under the Protection of Badgers Act 1992, making it an offence to wilfully kill, injure or take a badger, or attempt to do so. It is also an offence to intentionally or recklessly interfere with a badger sett by (a) damaging a sett or any part of one; (b) destroying a sett; (c) obstructing access to or any entrance of a sett; (d) causing a dog to enter a sett; or (e) disturbing a badger when it is occupying a sett.

4.2.1.2 The Act defines the term "badger sett" as "any structure or place which displays signs indicating current use by a badger". Disturbance to, or exclusion of badgers from the sett, is not legally permitted except under licence from Natural England.

4.2.1.3 As the site is suitable for badgers and a sett was noted on site, a precautionary approach with regards to badgers should be adopted.

4.2.1.4 Given that the presence of dense scrub, tall ruderal vegetation and leaf litter on the floor of the woodland limited the search for other evidence of badgers on site, it is recommended that further surveys for badgers are undertaken after some light vegetation clearance. This is to be carried out under supervision of a suitably qualified ecologist so not to conflict with other recommendations for other protected species). If any additional setts are identified within 30m of proposed areas of developed within the site, further monitoring will be required to determine whether the setts are active. If a sett is identified within 30m of proposed works and proposals cannot be revised to accommodate retention of the sett, further surveys will be required to determine the size and status of the sett. This data would then be used to prepare a Natural England badger license application and mitigation strategy to permit the works.

[7] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

4.2.1.5 No works including excavations or tree removal should take place within 30m of the badger sett noted in the north east corner of the site along the northern boundary hedge and trees (see T2 on Habitat Plan in Appendix 2). Given that this sett is located well within the proposed area of retained woodland, this should not conflict with any proposals. If this is not possible then the sett should be monitored to determine whether it is currently active.

4.2.2 Bats

4.2.2.1 All species of bat and their breeding sites or resting places (roosts) are protected under Regulation 41 of The Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981. It is an offence to intentionally kill, injure or handle a bat, to possess a bat (whether live or dead), disturb a roosting bat, or sell or offer a bat for sale without a licence. It is also an offence to damage, destroy or obstruct access to any place used by bats for shelter, whether they are present or not.

4.2.2.2 A roost is defined as 'any structure or place which (a bat) uses for shelter or protection'. As bats tend to reuse the same roosts, legal opinion is that a roost is protected whether or not bats are present at the time of survey.

4.2.2.3 ***Buildings-*** Buildings 1 and 2 contained features such as gaps and missing tiles which are considered suitable for roosting bats. As the buildings are currently commercially and privately owned, an internal inspection could not be carried out. As the buildings will be demolished to facilitate the development, it is recommended that internal assessment of the buildings are carried out to search for any evidence of roosting bats, as soon as permission and access to the buildings is granted. Building inspections can be carried out all year round (see Survey Timetable in Appendix 3).

4.2.2.4 If any evidence of bats is found during the internal inspection, this will then trigger the requirement for further dusk emergence and dawn re-entry surveys to determine the size and status of the roost. This data would then be used to prepare a Natural England bat license application and mitigation strategy to permit the demolition of the building.

4.2.2.5 ***Trees-*** T3 (see Habitat Plan in Appendix 2 and T032 in Hayden's Tree Report) has high potential to support roosting bats. The feature is also considered to be suitable for hibernating bats. Given that this tree is unsuitable for retention within a development, further inspection is required. The feature should be inspected by a licensed bat worker prior to felling to identify any evidence of former bat roost activity (i.e. droppings, feeding remains or bat corpses). This aerial inspection survey should be conducted using a mobile elevated working platform (MEWP) outside of the bat hibernation season which extends from mid-October to the beginning of March, depending on weather. If no evidence of bats is found during the inspection, the tree must be felled on the same day. If this is not possible, the hollow stem must be filled and packed with hay or straw to prevent any bats from accessing the feature before the tree is eventually felled.

4.2.2.6 If evidence of bats is found in or around the feature during the aerial inspection, this would again trigger the requirement for further dusk/dawn emergence and re-entry surveys to determine the size and status of the roost.

4.2.2.7 Two 2FN Schwegler Bat Boxes (details provided in Section 5) should be installed on retained trees to mitigate for the loss of this potential bat roosting habitat.

4.2.2.8 12 mature trees on site were unable to be assessed for features suitable for roosting bats due to dense ivy growth on stems. If proposals include the removal of any of these trees, further investigation is required. The ivy should be stripped in line with recommendations in Hayden's tree survey report and the tree re-inspected by an ecologist to identify any features with suitability for roosting bats. This can be carried out all year round (see Survey Timetable in Appendix 3). Where required, any cavities found may then need to be accessed and inspected by a licensed bat worker to identify evidence of roosting bats. The trees that require ivy strip and re-inspection are set out in Table 4 below.

Table 4 – Trees Requiring Ivy Strip and Re-inspection

Tree code in Habitat Plan (Appendix 2)	Tree code in Hayden's Report
T4	T001
T5	T007
T6	T023
T7	T024
T8	T025
T9	T026
T10	T031
T11	T033
T12	T034
T13	T035
T14	T036
T15	T039
T16	T041

4.2.2.9 ***Habitats-*** Recommendations provided in Section 4.1 (Habitats) including woodland management and 'gapping up' of hedge and trees will help mitigate for the loss of suitable bat foraging and commuting habitat. Any new lighting associated with proposals to develop the site should also be tailored through provision of LED lights and hoods/baffles, to reduce any light spill on to retained woodland, hedge and trees. This recommendation is not in relation to the protection afforded to bats or their roost under the legislation cited above but rather to safeguard bat corridors and foraging habitat as part of ecological best practice.

4.2.2.10 Further recommendations to enhance the site for bats are provided in Section 5.

4.2.3 Reptiles

4.2.3.1 All six of the UK's reptile species are protected under the Wildlife and Countryside Act 1981 (as amended). Of the more common reptiles it is illegal to intentionally kill or injure common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*).

4.2.3.2 The species-rich hedge and trees, woodland, tall ruderal vegetation, scrub and bracken within the site provides suitable habitat for foraging reptiles. Several features throughout the site were also noted to suitable for hibernating reptiles. Given that some of these habitats will be lost, a precautionary approach to site clearance with regards to reptiles does not seem appropriate to mitigate risk to reptiles if present. Loss of areas of habitats with such suitability for reptiles (if present) could have an effect on the local population, through loss of foraging resource. As such presence/absence surveys are recommended to ascertain if reptiles are present within the site and relative abundance. This information can then be used to devise appropriate mitigation. The methodology for presence/absence surveys is set out below.

4.2.3.3 **Reptile Presence/absence Survey Methodology**- surveys normally take place over a period of seven days in suitable weather conditions at a suitable time of year, the optimum time being April –June and then September using a combination of half metre squared tiles as artificial refugia and corrugated metal tins. Surveys can be carried out from March to June and from September to October depending on local conditions (see Survey Timetable in Appendix 3). If reptiles are found to be present then it may be necessary to undertake further surveys to determine relative abundance of reptiles. In this instance an additional eight survey visits at suitable times of year and weather conditions will be required.

4.2.3.4 Should reptiles be found then suitable mitigation measures would have to be put in place following the abundance survey and liaison with Natural England. Habitat creation and enhancement, as proposed, will also benefit reptiles but may the details of these areas may need to be tailored following further survey for reptiles.

4.2.3.5 Current recommendations for enhancement provided in Section 5 would provide some suitability for reptiles but would need to be updated in line with the findings of the surveys.

4.2.4 Dormice

4.2.4.1 Dormice are protected under the Wildlife & Countryside Act 1981 (as amended). The deliberate capturing, disturbing, injuring and killing of dormice is prohibited, as is damaging or destroying their breeding sites and resting places.

4.2.4.2 Even though no records of dormice were provided, dormice are often under recorded, meaning the lack of records cannot be interpreted that dormice are absent from the area.

4.2.4.3 The woodland, scrub, hedge and trees on site are suitable for dormice. As is it is anticipated that some areas of woodland and scrub will be cleared to facilitate the development, further surveys to determine presence/absence of dormice is recommended.

4.2.4.4 **Dormice Presence/absence Survey Methodology-** To detect the presence/absence of dormice on or adjacent to the development site, nest tube surveys are conducted by a licensed ecologist. Nest tube surveys can only take place when Dormice are active between April and October (see Survey Timetable in Appendix 3). Nest tubes are small plastic tubes with wooden trays that dormice will use to build their summer nests in. Wooden nest boxes may also be used as they are more appropriate in woodland habitats. At least 50 nest tubes are usually deployed in suitable habitat and left for several months over the survey season. An adequate 'thoroughness' score must be achieved, which is dependent on how many tubes are used and over how many months they are deployed. Best practice is to set out nest tubes before the survey season and check them every month between April and October, as dormouse nests may be destroyed by other small mammals, such as wood mice.

4.2.4.5 Nut searches can be undertaken in the autumn and winter to look for hazelnuts that have been eaten by dormice, which chew into the nuts by forming a neat and smooth hole unique to this species. Nut searches however can only be used as an indication of presence and are not commonly used as evidence of likely absence unless deemed suitable by an experienced ecologist.

4.2.5 Great Crested Newts

4.2.5.1 Great crested newts are afforded full protection under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulation 2010.

4.2.5.2 Under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 it is illegal to:

- Deliberately capture, injure or kill a great crested newt
- Deliberately disturb great crested newts (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, breed or reproduce, or to rear or nurture their young.
- Deliberately disturb great crested newts impairing ability to hibernate or affecting their local distribution and abundance and
- Damage or destroy a breeding site or resting place of a great crested newt.

4.2.5.3 Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:

- Recklessly or intentionally kill, injure or take any great crested newts.
- Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which great crested newts use for shelter or protection.
- Recklessly or intentionally disturb great crested newts while occupying a structure or place which it uses for shelter or protection.

4.2.5.4 No records of great crested newts were provided but great crested newts are often under recorded, so the lack of records cannot be interpreted that great crested newts are absent from the area.

4.2.5.5 Given that a large area of habitat suitable for great crested foraging and hibernation will be cleared and there are several ponds well connected to the site within 500m, it is not considered appropriate to mitigate the risk to great crested newts by limiting the timing of work without first carrying out surveys. As such, further surveys on all ponds within 500m of the site should be carried out to determine presence/absence of great crested newts in the area.

4.2.5.6 Given that Pond 3 is considered to have poor suitability to support breeding great crested newts, it is recommended that a great crested newt eDNA survey is carried out on this pond to confirm the likely absence of great crested newts.

4.2.5.7 As Ponds 2 and 3 are considered to have excellent suitability to support breeding great crested newts, the more traditional great crested newt presence/absence surveys should be carried out on the ponds to determine great crested newt presence/absence. These surveys must also be carried out on Pond 1 within the site if the pond is found to be holding water.

4.2.5.8 A habitat suitability index (HSI) assessment should also be carried out on all other ponds within 500m of site (Ponds 5, 6, 7 and 8) to determine their suitability to support breeding great crested newts. eDNA or Presence/absence surveys (depending the suitability) should then be carried out on the ponds that are suitable.

4.2.5.9 The methodology for both great crested newt eDNA and presence/absence surveys is set out below;

4.2.5.10 **eDNA Survey Methodology-** This involves collecting water samples from the pond and sending them off to a lab for testing for great crested newt eDNA. Samples from the target pond should be taken between mid-April and the end of June, during the newt breeding season by a suitably trained and experienced great crested newt surveyor (see Survey Timetable in Appendix 3).

4.2.5.11 If great crested newt eDNA is confirmed to be present within Pond 3 then six additional presence/absence surveys (with two of the surveys to be conducted between mid-April and mid-May) would then be needed to be carried out to determine the size of the great crested newt population within the pond. Once the size of the population is established, a suitable mitigation strategy can be put in place before habitat clearance/management works onsite proceed.

4.2.5.12 **Great Crested Newt Survey Methodology** - Great crested newt presence/absence surveys must be carried out by a licensed individual in accordance with the Natural England Great Crested Newt Mitigation Guidelines (August 2001) which stipulate that a range of survey techniques must be employed over a minimum of four visits to detect presence/absence.

4.2.5.13 Two of these visits must be conducted between mid-April and mid-May which is the peak breeding period for great crested newt activity within ponds (see Survey Timetable in Appendix 3). If great crested newts are identified during the four survey visits, an additional two survey visits must be undertaken for a population size class assessment. If after four visits no great crested newts are identified, then it is considered unlikely that they will occur in the local area.

4.2.5.14 If great crested newts were confirmed to be breeding within 500m then further mitigation with regards to this species would need to be developed, to allow habitat clearance/management works onsite to proceed.

4.2.5.15 This may include applying for a European Protected Species Mitigation (EPSM) licence from Natural England, along with a mitigation package for this species. Enhancement measures set out in Section 5 would also need to be amended to take into account the presence of great crested newts which could include appropriate planting to enhance the suitability of the site for great crested newts. No intrusive habitat works should be undertaken until the results of the great crested newt surveys are gathered.

4.2.6 Birds

4.2.6.1 The Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. [Special penalties are liable for these offences involving birds on Schedule 1].

4.2.6.2 The removal of any hedges, trees, scrub and woodland should all be undertaken outside of the nesting bird season which extends from the beginning of March until the end of September (see Survey Timetable in Appendix 3). If this is not possible then a nesting bird survey should be carried out by an experienced ecologist 24-48 hours prior to clearance.

4.2.6.3 If at any point an active nest is identified it should be left in-situ with sufficient attendant vegetation so as to afford a screen against works. The nest must be left in-situ until the young have fledged and the nest has been abandoned.

4.2.6.4 Five small (passerine) bird boxes should be installed on retained trees to mitigate for the loss of suitable nesting habitat. Recommendations also provided in Section 4.1 (Habitats) including woodland management and 'gapping up' of hedge and trees will also help mitigate for loss of nesting habitat.

4.2.6.5 Further measures to enhance the site for birds are also provided in Section 5.

4.2.7 Invertebrates

4.2.7.1 Many invertebrate species are classed as UK Biodiversity Action Plan (UK BAP) priority species and therefore of principal importance under the NERC Act. This places a duty on planning authorities "to have regard" for those species when determining planning permission.

4.2.7.2 The woodland, scrub, bracken, tall ruderal vegetation, hedge and trees all have suitably to support a diverse assemblage of invertebrate species, most notably butterflies and day-flying moths. As such, further surveys for these species are recommended to determine if the site supports any rare or notable invertebrates that require specific mitigation. Surveys should be carried out by an experienced entomologist between April and September (see Survey Timetable in Appendix 3).

4.2.7.3 **Butterfly and Day-flying Moth Survey Methodology** – Surveys are usually carried out by walking a set number of transects using methods which form the basis of the UK's Butterfly Monitoring Scheme (BMS). This involves the surveyor counting the numbers of each species of butterfly or moth seen 2.5m either side and 5m in front whilst walking at a steady pace along the transect in weather suitable for butterfly and moth activity. This has been shown to be an accurate method of assessing change in butterfly distributions and population size over time.

4.2.8 Invasive Species

4.2.8.1 Around 39 plant species are listed in Schedule 9, Section 14(2) of the Wildlife and Countryside Act 1981, making it an offence to plant or otherwise cause the species to grow in the wild. Most notable species include; giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed (*Fallopia japonica*).

4.2.8.2 Given that dense vegetation limited the search for any invasive plants that might be present on the site, further monitoring for invasive plants should be carried out during the spring and summer. This can be combined with surveys recommended for badgers, invertebrates, reptiles and dormice.

4.2.9 Other Species

4.2.9.1 Any small mammals or common amphibians encountered during site clearance works should either be allowed to flee the area naturally or be safely translocated to the perimeter of the site to reduce the risk of killing or injury.

4.2.9.2 All works should follow advice given in the Environment Agency's Pollution Prevention Guidelines (PPGs), with particular reference to the following:

- PPG01 General guide to the prevention of pollution;
- PPG06 Working on construction and demolition sites;
- PPG21 Pollution incident response planning; and
- PPG22 Dealing with spills.

4.2.9.3 All of these are available at:
(http://www.sepa.org.uk/about_us/publications/guidance/ppgs.aspx)

5 Enhancement measures

5.1.1.1 For ease of application the recommended biodiversity enhancement measures are presented as a table (below). List A represents essential enhancement measures, of which all should be implemented; whilst List B represents additional desirable enhancement measure, of which the uptake of at least two is recommended.

List A	List B
Create a wildlife pond within retained woodland[1]	Install 2 bat tubes to new buildings[8]
Create 5 log piles within retained woodland[2]	Plant species rich hedgerow along southern boundary[9]
Install 5 more small (passerine) bird boxes[3]	Plant species rich lawn turf in turfed areas[10]
Install 5 more bat boxes to retained trees[4]	Plant wildlife attracting plants[11]
'Gapping up' of hedge and trees with native bare root whips[5]	
Plant 20 native broad-leaved trees[6]	
Install 5 insect boxes[7]	

1. A pond should be created within the retained woodland. To make the pond particularly good for wildlife, the pond should have varying levels of depths and gently sloping sides. Pond margins should be planted with plant species such as water mint (*Mentha aquatica*), water forget-me-not (*Myosotis scorpiodies*), water plantain (*Alisma plantago-aquatica*) and marsh marigold (*Caltha palustris*). This will provide a good range of native aquatic plants to benefit local wildlife. The pond should NOT be stocked with fish.

2. Logs generated from onsite tree clearance should be used to create log piles.

3. **This is in addition to the five boxes recommended in Section 4.** Bird boxes should be erected so that they are sheltered from wind, rain and strong sunlight. If they are in full sun, the chicks could overheat and die, position boxes 1.5-5m above ground for safety from predators and to replicate natural nesting habit.

4. **This is in addition to the two 2F Schwegler bat boxes recommended in Section 4, which can be found at:** https://www.nhbs.com/title/158634/2fn-schwegler-bat-box**.** Other bat box examples include: https://www.nhbs.com/title/195745/nhbs-kent-bat-box and https://www.nhbs.com/title/176914.

5. Suggested species include; hawthorn, blackthorn, dogwood, field rose, hazel, field maple, beech and wild cherry.

6. Suggested species include; ash, silver birch, beech, oak, hornbeam, field maple, rowan, lime and wild cherry.

7. Insect boxes recommended;
http://www.nhbs.com/schwegler_insect_nesting_aid_wood_concrete_tefno_173135.html

8. Bat tube suggested: https://www.nhbs.com/title/161276/1fr-schwegler-bat-tube.

9. Native species of local provenance should be planted with a minimum of 5 species. Suggested species include; hawthorn, blackthorn, field rose, hazel, field maple, beech and wild cherry.

10. Species rich lawn turf recommended; http://www.wildflowerturf.co.uk/Products/species-rich-lawn-turf.aspx

11. As part of the planting scheme, native wildlife attracting plants should be used wherever possible. Suggested species include; honeysuckle (*Lonicera periclymenum*), lavender (*Lavandula angustifolia*), ivy (*Hedera helix*), guelder rose (*Viburnum opulus*), wild thyme (*Thymus polytrichus*), fox glove (*Digitalis purpurea*), dogwood (*Cornus sanguine and Cornus alba)* and Spindleberry (*Euonymus europaeus*).

6 Summary

This section provides a summary of all the proposed mitigation and recommendations for the habitat clearance during the construction of the proposed development site. For a comprehensive list please refer to each section in turn in the preceding report.

- **Habitats –** Tree and root protection measures (in line with the British Standard for trees in relation to construction BS 5837:2012) specified in Hayden's Tree Survey and Arboricultural Impact Assessment Report to be put in place to protect retained trees and woodland. Defunct native species-rich hedge and trees on site to be retained, protected and enhanced.
- **Badgers –** Site to be re-inspected for any additional evidence of badgers after some light vegetation clearance, supervised by a suitably qualified ecologist. No works including excavations or tree removal should take place within 30m of the badger sett (T2). If this is not possible then the sett will require further monitoring to determine whether it is active.
- **Bats –** Internal inspection of B1 and B2 to search for evidence of bat activity to be undertaken as soon as permission and access to the buildings is granted. Aerial inspection of hollow trunk in T3 to be carried out by a licenced bat worker prior to felling. This should be undertaken outside of the hibernation season for bats (mid-October to beginning of March). T4 to T16 to be ivy stripped and re-inspected for features suitable for roosting bats.
- **Reptiles** – Presence/absence surveys to be undertaken from March to June and from September to October depending on local conditions, prior to site clearance.
- **Dormice –** Presence/absence surveys to be undertaken between April and October.
- **Great Crested Newts –** A habitat suitability index (HSI) assessment should be carried out on Ponds 5, 6, 7 and 8 to determine their suitability for great crested newts and requirement for further survey. eDNA survey to be carried out on Pond 3 between mid-April and June prior to site clearance. Presence/absence surveys to be carried out on Ponds 2 and 4 between mid-March and mid-June (two of which must be between mid-April to mid-May) prior to site clearance. If the surveys confirm the presence of great crested newts in the area, then a suitable mitigation strategy will need to be developed to permit the development.
- **Nesting Birds –** Clearance of any hedges, trees, scrub and woodland should all be undertaken outside of the nesting bird season which extends from the beginning of March until the end of September (only following further surveys and mitigation for other protected species). If this is not possible then a nesting bird survey should be carried out by an experienced ecologist 24-48 hours prior to clearance.

- **Invertebrates –** Butterfly and day-flying moth surveys to be carried out between mid-April and September.
- **Invasive Species** - Further monitoring for invasive plants on site to be combined with other surveys for protected species.
- **Other species-** Any small mammals or common amphibians encountered during site clearance works should either be allowed to flee the area naturally or be safely translocated to the perimeter of the site to reduce the risk of killing or injury;
- **General –** All works should follow advice given in the Environment Agency's Pollution Prevention Guidelines (PPGs).

6.1.1.1 It is recommended that all enhancement measures from List A (please refer to the table in Section 5) are implemented, along with at least two enhancement measures from List B. If you require any further information about sourcing or installing these enhancement measures, undertaking further surveys, or implementing mitigation please contact Practical Ecology Ltd.

7 References

Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man (2009).

English Nature (2001) Great crested newt mitigation guidelines. English Nature, Peterborough.

Hayden's Arboricultural Consultants, Tree Survey and Arboricultural Impact Assessment Report, Engineer Arms, Leiston, Suffolk, October 2015.

Hundt L (2012). Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust.

JNCC (2010). Handbook for Phase 1 habitat survey: a technique for environmental audit (revised reprint). JNCC, Peterborough.

JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012.

National Planning Policy Framework 2012.

Appendix 1- Site Location Plan

Scale: 1:2500, paper size: A4

Appendix 2- Extended Phase 1 Habitat Plan

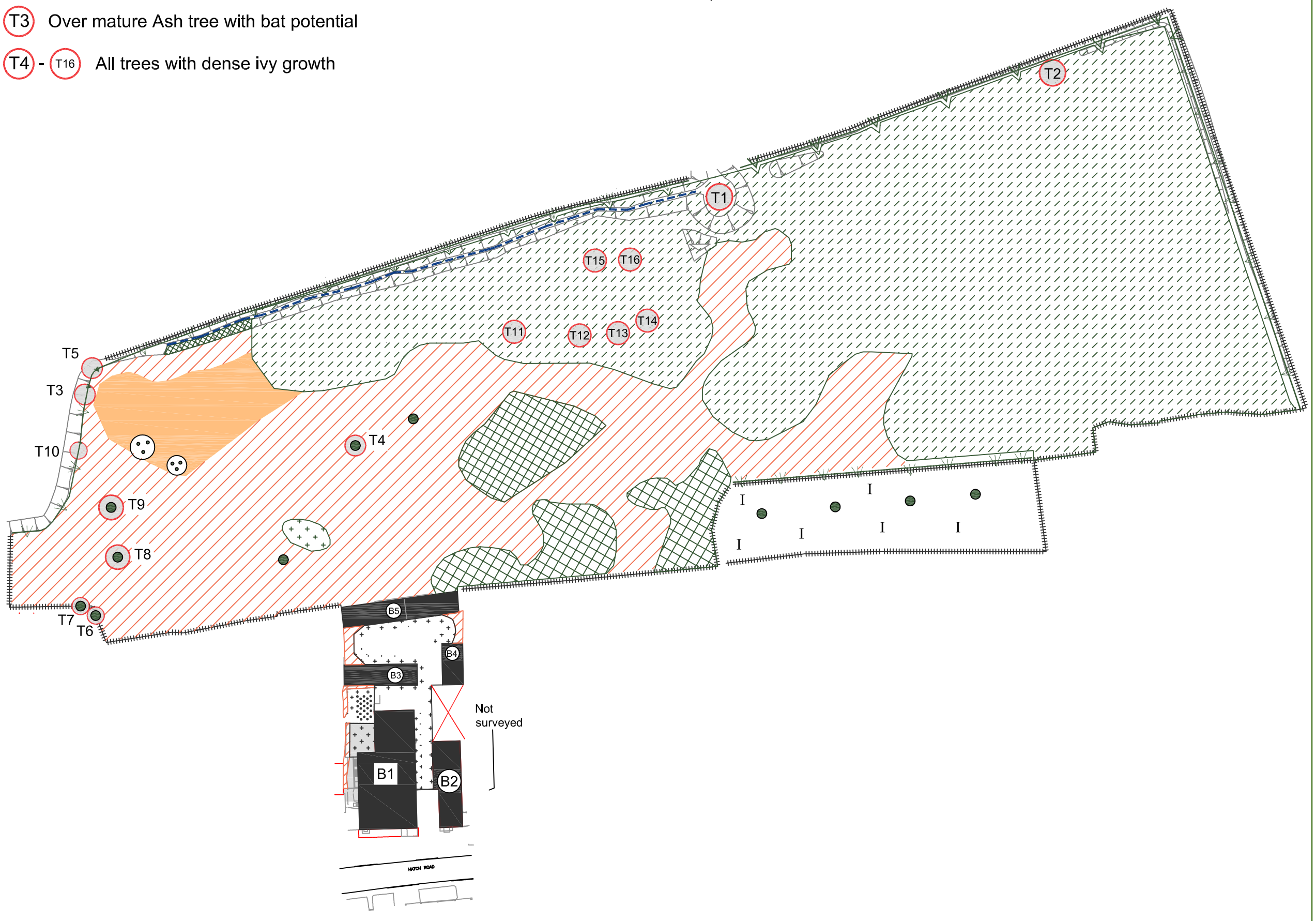
T1 Dry pond

T2 Badger sett (1 hole)

T3 Over mature Ash tree with bat potential

T4 - T16 All trees with dense ivy growth

North (Indicative)



KEY

- Broad-Leaved Semi-Natural Woodland
- Scattered Broad-Leaved Trees
- Hardstanding/Surfaced Area
- Bare ground
- Fence
- B1 Building
- Dense/Continuous Scrub
- Scattered Scrub
- Tall Ruderal
- Native species-rich hedge and trees
- Ephemeral/Short Perennial Growth
- I Improved grassland
- Target note
- Bracken
- Dry ditch

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Client: Wingfield Planning

Project: Hatch Road, Pilgrims Hatch

Title: EXTENDED PHASE 1 HABITAT DRAWING

Drawing No:	Date:	Sheet Size:
PE-11-15-01	02/11/15	A3

Appendix 3- Survey Timetable

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Badgers												
Bats	Building and tree inspections*											
					Activity surveys							
Dormice												
Reptiles						°C				°C		
Great crested newts												
				e	D	N	A					
Invasive plants												
Invertebrates												

°C - Surveys limited by temperature

Optimum survey period

Surveys can be undertaken (although not optimum period)

No survey

*NB: Although bat tree inspections can be undertaken all year round, it is recommended that T3 on site is inspected outside of the hibernation season (mid-October to the beginning of March), due to the trees suitability for hibernating bats.