

Appendix 5
Corylus Ecology Phase 1 Assessment





Stonards Hill, Epping

Extended Phase I Habitat Survey

For and on behalf of

CROUDACE

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CORYLUS ECOLOGY

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1.0 INTRODUCTION

- 1.1 Corylus Ecology has undertaken an extended Phase I Habitat Survey and Protected Species Assessment of land known as Stonards Hill, Epping, Essex, hereinafter referred to as the Site.
- 1.2 The proposals involve the construction of multiple residential properties.
- 1.3 The Site lies to the east of Epping and measures approximately 10.2ha. It is bordered to the south by a railway line and to the west by a minor road. Beyond the railway line there are arable fields, and grassland with hedges and small wooded areas are present between the minor road and Epping. To the north of the Site there are sports fields and residential areas. There are relatively large blocks of woodland to the north and east of the Site.
- 1.4 Ash Wood and High Woods, which were included in the survey, are both Local Wildlife Sites. Epping Forest Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) is just over two km to the south west of the Site and a further part of Epping Forest SSSI is less than 0.5km to the north. Common Flood Meadow and Roughtalleys Wood Local Nature Reserves are just less than 2km to the north and north east of the Site respectively.
- 1.5 The Phase I Habitat Survey provides information relating to the habitats within and around the Site and identifies potential for and, if apparent, evidence of use by protected species. The extended Phase I Survey highlights habitats that may have the potential to support protected species such as amphibians, bats, dormice, reptiles and badgers.

Scope of Survey

- 1.6 The aims of the Extended Phase I Habitat survey are to:
- classify the habitats within the Site according to those within the Phase 1 manual;
 - identify habitats of ecological interest suitable for further surveys and the potential to encounter protected species; and to
 - suggest appropriate mitigation where necessary.

2.0 METHODOLOGY

2.1 Desk Study

2.1.1 Records of protected species were sought from the 'Essex Field Club' from a 3km radius of the Site. Information regarding designated sites were also reviewed.

2.2 Extended Phase I Survey

2.2.1 The Site was subject to an extended Phase I Habitat Survey on 8th April 2013. The habitats present on the Site were mapped in accordance with the '*Handbook for Phase I Habitat Survey – a Technique for Environmental Audit*' (Joint Nature Conservation Committee, 2003). Habitat areas and features of topographical and/or ecological interest were described in the form of target notes (TN). These were later used to create botanical species lists by target note area and also to create a colour coded Phase I Habitat map, which is presented as Figure 1. All nomenclature follows Stace (1997). Non-native or invasive species were also identified and mapped where appropriate.

2.3 Hedgerows

2.3.1 Hedgerows within the Site were surveyed and evaluated for their importance in accordance with the criteria in the Hedgerows Regulations 1997. These require the following ecological and landscape characteristics to be recorded and used in the evaluation:

- The total hedgerow length;
- The number and location of 30m sections to be surveyed for woody species, using the formula set out in paragraph 7(3) of Schedule 1 to the Regulations;
- The number of different woody species present within the 30m sections, using the list in Schedule 3 to the Regulations;
- The presence of any of the four woody species listed in paragraph 7(1)(c) of Schedule 1 to the Regulations;
- The presence of a bank or wall which meets the specification set out in paragraph 7(4)(a) of Schedule 1 to the Regulations;
- The total length of all gaps in the hedgerow;
- The number of standard trees, as defined in Part I of Schedule 1 to the Regulations;
- The number of different woodland species present within 1m of the outermost edges of the hedgerow, using the list in Schedule 2 to the Regulations;
- The presence of a ditch along at least half of the length of the hedgerow;
- The number of connected hedgerows, ponds or areas of woodland (in which the majority of trees are broadleaved) within 10m of the hedgerow;
- The presence of a parallel hedge within 15m of the hedgerow;

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- Whether the hedgerow is adjacent to a bridleway, footpath, road used as a public path or byway open to all traffic; and,
 - The presence of any of the species of animals, birds or plants described in paragraph 6(3) of
 - Schedule 1 to the Regulations.

2.3.2 Hedgerows are considered important under the Hedgerow Regulations 1997 if they fulfill any of the following three criteria.

1. The hedgerow contains species listed in Part 1 Schedule 1 (birds), Schedule 5 (animals) or Schedule 8 (plants) of the Wildlife and Countryside Act, 1981 (as amended) or species listed in the British Red Data Books

2. The hedgerow includes;

- At least 7 woody species (listed in Schedule 3 of Hedgerows Regulations); or
- At least 6 woody species (listed in Schedule 3 of Hedgerows Regulations), and three
- features specified below; or
- At least 6 woody species (listed in Schedule 3 of Hedgerows Regulations), including a Black
- Poplar tree, a Large-leaved Lime, a small-leaved Lime or a Wild Service-tree; or
- At least 5 woody species (listed in Schedule 3 of Hedgerow Regulations), and four features
- specified below.

Where the number of woody species is calculated as set out in Paragraph 7(3) of Schedule 1, Part II of the Hedgerows Regulations.

3. The hedgerow is adjacent to a bridleway or footpath, a road used as a public path, or a byway open to all traffic and includes at least 4 woody species and has associated with it at least two of the features specified below.

The list of special features referred to in criteria 2 & 3 are;

- A bank or wall which supports the hedgerow along at least one half of its length;
- Gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- An average of one standard tree per 50m within hedgerow
- At least three ground flora species listed in Schedule 2 to the Hedgerow Regulations are present within 1m, in any direction from the outermost edges of the hedgerow;
- A ditch along at least half its length;

- Connections scoring 4 or more points, where a connection to another hedgerow counts as 1 and a connection to a woodland, in which the majority of the trees are broad-leaved, or a pond, counts as 2;
- A parallel hedge within 15m of the hedgerow.

2.4 Protected Species Assessment

2.4.1 The Phase I Habitat survey included an assessment of the potential for the Site and the surrounding area to support protected species such as reptiles, breeding birds, amphibians and dormice. This type of survey aims to assess the potential for protected species to occur due to the habitats present but does not include any species-specific survey methods designed to demonstrate whether the Site is in fact used by such species.

2.4.2 With regard to badgers *Meles meles*, any holes or scrapes likely to be used by or indicate the presence of badgers were searched for together with any other field signs associated with this species, including latrines, pushes and hairs.

Bat Tree Assessment

2.4.3 A ground level investigation of all trees within the Site boundary was carried out to identify bat potential. Bats may use any crack or hole (such as woodpecker holes), splits or flaking bark and ivy (JNCC, 2004). Bats will also use different roosts at different times of the year. It can therefore often be difficult to definitely locate bat roosts in trees. Field signs to look for include dark streaking below holes and crevices, droppings under access points. Chattering noises emitted by bats may also be audible, particularly during the summer, however, even where bats are known to occur, such signs are not always evident.

2.4.4 Trees were placed into one of three categories as described below in accordance with Table 8.4 page 60 of Bat Conservation Trust Good Practice Survey Guidelines 2nd Edition 2012:

- 1* Trees with multiple, highly suitable features capable of supporting larger roosts;
- 1 Trees with definite bat potential but supporting features suitable for use by singleton bats;
- 2 No obvious potential although the tree is of a size and age that elevated surveys may result in cracks or crevices being found or the tree supports some features which may have limited potential to support bats; and,
- 3 Trees with no potential.

2.4.5 Trees were also noted if they supported ivy. Ivy can do one of two things: very old, dense ivy can provide cavities for bats between the thick interwoven stems and the tree trunk or ivy, dense or thin can

cover cavities which have potential for bats that are otherwise not visible. The former would be classed as Category 1 whilst the latter would be Category 2.

2.5 Great Crested Newt HSI Survey Methodology

2.5.1 The HSI Assessment followed guidance published by the Amphibian and Reptile Groups (ARG) in 2010. This is a simple field and desk based assessment of waterbodies for their potential to support great crested newts. It involves examining ten “Factors” which are subsequently calculated and given a Suitability Index (SI). These ten factors are thought to affect great crested newts and include:

- Location (in Britain);
- Pond area;
- Desiccation rate (years out of ten that pond dries);
- Water quality (subjective assessment);
- Percentage of pond shaded;
- Number of waterfowl;
- Fish population (subjective assessment);
- Number of ponds within 1km;
- Terrestrial habitat quality; and
- Percentage macrophyte cover.

2.5.2 Once each factor and accompanying suitability indices were ascertained, a simple geometric mean was calculated. The resulting figure, the HSI, is a value between 0.00 and 1. The resulting value is then used against a categorical scale to establish the potential of encountering great crested newts. The categorical scale includes the following values and potential to encounter great crested newt:

- HSI value of <0.5 = Poor
- HSI value of 0.5 – 0.59 = Below Average
- HSI value of 0.6 – 0.69 = Average
- HSI value of 0.7 – 0.79 = Good
- HSI value of >0.8 = Excellent

2.5.3 In general, waterbodies/ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so. Therefore professional judgement and consideration of the surrounding habitat and location of the pond are all factors in deciding the suitability of the pond to support great crested newt, and potential impacts.

2.5.4 The location of ponds subject to survey has been provided in Figure 1 with annotated photographs of the pond provided within Figure 2.

3.0 RESULTS

3.1 Desk Study

Statutory designated sites

- 3.1.1 Epping Forest Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) is just over 2km to the south west of the Site and a further part of Epping Forest SSSI is less than 0.5km to the north. Common Flood Meadow and Roughtalleys Wood Local Nature Reserves are just less than 2km to the north and north east of the Site respectively.

Non-statutory sites

- 3.1.2 The nearest area of Ancient Woodland is Epping Plain which is located 650m to the north of the Site. The nearest Local Wildlife Sites are Ash Wood and High Woods, which are located within the Site boundary, are both Local Wildlife Sites.

Dormouse

- 3.1.3 There are no records of dormice within a 3km radius of the Site.

Bats

- 3.1.4 Eight species of bat have been recorded with 3km of Site, but none within the Site boundary. The nearest bat record to the Site is 380m to the north-east which is a common pipistrelle *Pipistrellus pipistrellus* from 2007, there was no record if the bat was flying or roosting.

Reptiles

- 3.1.5 Only 20 records of reptiles were provided within the search area. The closest records for grass snake *Natrix natrix* was recorded 1.6km north-east of site in 2002. The closest common lizard to the Site is 1.2km to the north-east in 2004. The closest slowworm record of the Site is 4.5km to the south-west from 2004. The closest adder record of the Site is 4.5km to the south-west from 2004.

Great Crested Newt

- 3.1.6 The data search revealed two recent amphibian records within three kilometres of the Site, a further two records date from the 1980's. The closest great crested newt record *Triturus cristatus* (GCN) is 655m to the west of the Site and is dated 2006.

Barn Owl

- 3.1.7 There are no records of barn owls within a 3km radius of the Site.

Badger

- 3.1.8 The data searched revealed only 3 records within 3km of the Site with the closest record being 1.2km to the east of the Site in 1997.

3.2 Extended Phase I Survey

- 3.2.1 The area surveyed is approximately 10.2ha and the Site comprises largely of broadleaved semi-natural woodland and improved grassland. There are species-rich hedges with trees on the northern and western boundaries and areas of tall ruderal vegetation with scattered scrub adjoining these and the woodlands. There are also three small ponds.

Broadleaved semi-natural woodland

- 3.2.2 There are two blocks of woodland, High Wood (TN1) to the north and Ash Wood (TN2) to the south. High Wood is largely overgrown hornbeam *Carpinus betulus* coppice with occasional ash *Fraxinus excelsior* and pedunculate oak *Quercus robur* standards. Sycamore *Acer pseudoplatanus* is locally abundant in the centre and on the edges of the Wood. Other trees species present include field maple *Acer campestre* and silver birch *Betula pendula*. The shrub layer is sparse with only rare holly *Ilex aquifolium* and hazel *Corylus avellana*. Blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra* and goat willow *Salix caprea* are also present around the edges of the wood. The field layer is also sparse, with large areas of bare ground and leaf litter. Ivy *Hedera helix*, bramble *Rubus fruticosus* and bracken *Pteridium aquilinum* are locally abundant, as is pendulous sedge *Carex pendula* in wetter areas, such as along the small streams that run through the wood. Other species recorded include the Ancient Woodland Indicator Species dog's mercury *Mercurialis perennis*, wood anemone *Anemone nemerosa*, goldilock buttercup *Ranunculus auricomis*, wood melick *Melica uniflora* and bluebell *Hyacinthoides non-scripta* as well as wood false brome *Brachypodium sylvaticum*, nettle, male fern *Dryopteris felix-mas*, wood avens *Geum urbanum* and celandine *Ranunculus ficaria*. In the northern part of the Wood are heavily trampled areas used as footpaths.
- 3.2.3 Ash wood is dominated by sycamore, with small amounts of standard and coppiced Hornbeam as well as Ash and Silver birch. The shrub layer is a little denser than in High Wood, species including Hazel, Holly, Elder, Hawthorn and one large bush of the invasive non-native Cherry Laurel *Prunus laurocerasus*. The field layer is also somewhat more extensive than in High Wood, although there are still large areas of bare ground and leaf litter. Nettle *Urtica dioica*, dog's mercury and bracken are locally abundant, as is Pendulous sedge beside the small stream. Other species recorded include The Ancient Woodland Indicator Species wood speedwell *Veronica montana* and three-nerved sandwort *Mohringia trinerva*, as well as Lord's-and-ladies *Arum maculatum*, enchanter's nightshade *Circea lutetiana* and broad buckler fern *Dryopteris dilatata*.

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- 3.2.4 Both woods include moderate quantities of fallen and standing dead wood.
- 3.2.5 The embankments of the railway line (TN3) to the south of the Site also support broadleaved semi-natural woodland, which includes mature oak trees, and this extends and connects the two areas of woodland.

Improved Grassland

- 3.2.6 Outside the woodlands, species poor improved grassland is the most abundant habitat (TN4). The sward is very strongly dominated by grasses, of which the most abundant are false oat-grass *Arrhenatherum elatius*, Yorkshire fog *Holcus lanatus*, rough meadow grass *Poa trivialis* and common bent *Agrostis capillaris*. Other grasses include smooth meadow grass *Poa pratensis*, meadow foxtail *Alopecurus pratensis* and cock's-foot *Dactylis glomerata*. Forbs are rare and include very scattered nettle, creeping buttercup *Ranunculus repens*, spear thistle *Cirsium vulgare* and germander speedwell *Veronica chamaedrys*.
- 3.2.7 Sward structure is variable. There are areas of tall grassland dominated by false oat-grass and rough meadow grass, especially in the vicinity of a number of seepages which are present within the grassland, and close the boundaries. Parts at least of the grassland are grazed by rabbits and these have a short sward, in which the most abundant grass is common bent. Areas of intermediate sward height and structure, with a number of the grass species identified above, also occur throughout.

Tall Ruderal and Scattered Scrub

- 3.2.8 There are areas or belts of tall ruderal vegetation adjoining the boundaries of the Site (TN5) and the woodlands. Species include nettle, bramble, thistles *Cirsium* spp. and docks *Rumex* spp. as well as taller grasses such as false oat grass, cock's foot and rough meadow grass. Among the larger areas of such vegetation in the west of the Site (TN6) there is scattered scrub, including hawthorn, elder and goat willow as well as developing trees, especially sycamore as well as a large stand of Japanese knotweed (TN7).

Hedges

- 3.2.9 There are two species-rich hedges with trees along the northern and western boundaries of the Site. The hedge on the northern boundary (H1) comprises a mix of field maple, sycamore, hazel, dog rose *Rosa canina*, elder, blackthorn and hawthorn. There are mature trees of ash and pedunculate oak. The field layer includes dog's mercury, red campion *Silene dioica*, wood false-brome, cleavers *Galium aparine*, rough meadow grass, bramble and Lord's-and-Ladies. Probably originally restricted to a line beside the bank and ditch on the northern edge the hedge appears to have expanded southwards.

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- 3.2.10 The hedge on the western boundary (**H2**) now forms a tree line dominated by sycamore with occasional ash and a shrub layer dominated by hawthorn but also grey willow *Salix cinerea* and dog rose. Bramble, dog's mercury and nettle are the most abundant species in the field layer. Other species include cleavers, ground ivy *Glechoma hederacea*, rough meadow grass, Lord's-and-Ladies and pendunculous sedge.

Ponds

- 3.2.11 There are three small ponds within the Site. The largest of these is located towards the western end of the hedge on the northern boundary (**P1**). This held water at the time of the survey and is surrounded by trees and shrubs forming the hedge (described above). Greater reedmace *Typha latifolia* and reed sweet-grass *Glyceria maxima* are present throughout much of the pond, but open water comprises at least 80% of the pond surface.
- 3.2.12 Two small ponds are located next to each other at the western end of High Wood (**P2 and P3**). These were almost dry at the time of the survey and comprised depressions in the ground surface with no aquatic, emergent or marginal vegetation.

3.3 Protected Species

Reptiles

- 3.3.1 The tall ruderal field margins of the Site, especially the large area of tall ruderal and scrub in the north-west corner of the Site provide habitats that are suitable for common reptiles. The more scrubby areas of the tall ruderal provide good habitat and conditions for slow worms *Anguis fragilis*, whilst the more open areas of the tall ruderal provide good habitat for common lizards *Lacerta vivipara* and grass snakes *Natrix natrix*.

Bats Tree Assessment

- 3.3.2 All suitable trees within the Site boundary were reviewed for their potential to support bats. The majority of the trees within the Site especially in the woodland are semi-mature hornbeam or ash which has not developed features such as cracks, splits and wood pecker holes that could otherwise support bats.
- 3.3.3 However, within High Wood there is one tree with potential and within Ash Wood to the south of the Site there were two trees that held potential to be used by bats. Tree T1 is a large mature willow that has fallen down and become wedged approximately 2m above the ground. The tree is located deep within the woodland towards the eastern boundary. The tree has multiple woodpecker holes as well as split bark and cracks and is therefore classed as a category 1* tree for bat potential. Tree T2 is a large mature single stem hornbeam tree that is approximately 25m in height. The tree is located on the northern edge of the wood at grid reference TL4687702408. There were two woodpecker holes located

on the stem, one at 4m and the second at 12m. This tree is classed as a category 1* tree for bat potential. The T3) is a mature hornbeam tree that has died and the top half has snapped off leaving a 10m high stem behind. This tree is located on the northern edge of the woodland at grid reference TL4684302381. The tree has multiple woodpecker holes on all sides and elevations and is classed as a category 1* tree for bat potential.

- 3.3.4 The Site has been assessed for its potential to be used by foraging and commuting bats. The Site has no artificial lighting and is somewhat protected from light spillage from neighbouring developments by high boundary features. There is a sports pitch adjacent to the site, however, flood lights were not observed in the vicinity of the Site.

Habitat Suitability Assessment for Great Crested Newts

- 3.3.5 Pond 1 is located on the Site's northern boundary within an area of dense scrub and hedging. The pond is approximately 300m² and the level of water within the pond at the time of the survey suggests that it is likely to dry out sometimes. The water quality is moderate and the pond is 90% shaded. No fish or wild fowl were seen during the survey but the pond is suitable to be used by them. For all ponds, the wider pond density per km was greater than 3. The immediate terrestrial habitat surrounding the pond is considered to be "Moderate" suitability for great crested newts. A maximum macrophyte cover of 100% was recorded. The HSI Score of 0.67, results in P1 being considered "**Average**" in its suitability to support great crested newts.

Table 1 – Habitat Suitability Index for great crested newts – Pond 1

Pond 1	
SI1 - Location	1
SI2 - Pond area	0.6
SI3 - Pond drying	0.5
SI4 - Water quality	0.67
SI5 - Shade	0.6
SI6 - Fowl	0.67
SI7 - Fish	0.67
SI8 - Ponds	1
SI9 - Terr'l habitat	0.67
SI10 - Macrophytes	0.8
HSI	0.67

- 3.3.6 Pond 2 is located approximately 150m to the east of P1 within High Wood and is surrounded by woodland with very little ground cover. Shading occurs over approximately 100% of Pond 2. The water quality is considered to be poor and the pond is understood to dry out annually. No fish were seen

during the assessment and it seems unlikely that the pond could contain fish; there was no evidence of waterfowl during the survey but it could possibly be used. The surrounding terrestrial habitat is dense woodland with sparse ground cover but tall ruderal within 50m and is considered to be “moderate”. There was no macrophyte cover on the pond. The resulting HSI Score is 0.39, which falls into the “**Poor**” category in its suitability to support great crested newts.

Table 2 – Habitat Suitability Index for Great Crested Newts – Pond 2

Pond 2	
SI1 - Location	1
SI2 - Pond area	0.1
SI3 - Pond drying	0.1
SI4 - Water quality	0.33
SI5 - Shade	0.2
SI6 - Fowl	0.67
SI7 - Fish	1
SI8 - Ponds	1
SI9 - Terr'l habitat	0.67
SI10 - Macrophytes	0.3
HSI	0.39

3.3.7 Pond 3 is adjacent to P2 within High Wood but is separated by a high footpath. It is surrounded by dense woodland with sparse ground cover. Shading occurs over approximately 100% of the pond and the water quality is considered to be poor and the pond most likely dries out annually. No fish were seen during the assessment and it seems unlikely that the pond could contain fish; there was no evidence of waterfowl during the survey but it could possibly be used. The surrounding terrestrial habitat is dense woodland with sparse ground cover but tall ruderal within 50m and is considered to be “moderate”. There was no macrophyte cover on the pond. The HSI Score of 0.42, results in P2 being considered “**Poor**” in its suitability to support great crested newts.

Table 3 – Habitat Suitability Index for Great Crested Newts – Pond 3

Pond 3	
SI1 - Location	1
SI2 - Pond area	0.2
SI3 - Pond drying	0.1
SI4 - Water quality	0.33
SI5 - Shade	0.2
SI6 - Fowl	0.67
SI7 - Fish	0.67
SI8 - Ponds	1

SI9 - Terr'l habitat	0.67
SI10 - Macrophytes	0.3
HSI	0.42

Dormice

3.3.8 High Wood to the north of the Site provides poor habitat for dormice. The woodland is dominated by overgrown hornbeam coppice that has shaded the shrub layer and ground flora of the woodland out. The woodland is connected to surrounding habitats by a gappy, overgrown hedge that runs north to link to Epping Plain Wood and also south by a tree belt that abuts the train line also connecting to Epping Plain Wood. Ash Wood to the south of the Site is more isolated than High Wood with only the adjacent railway line providing linking habitat to High Wood. The woodland of Ash Wood has a more diverse canopy but the shrub layer and ground flora is still very sparse with little no cover or food providing species. Under the current proposals neither wood will be affected by the development. The hedgerows within the Site on the northern and southern boundary are species rich, the hedgerow on the northern boundary border amenity sports field and children's play park as well as a well used public foot path. Evidence within the hedge shows that it is frequently disturbed by members of the public with gaps created through and rubbish found. The hedgerow on the western boundary is quite gappy with Stonards Hill road adjacent; the hedge is connected to the woodland belt adjacent to the railway to the south, to the north the hedge ends at a dense residential area. A well used public footpath run through and along this feature in the southern corner. This hedge is too isolated and too disturbed and holds little potential to be used by dormice.

Breeding Birds

3.3.9 The hedgerows, woodland, scrub and trees within the Site provide suitable habitat for breeding birds. These habitats are limited to the site margins. The open field area within the centre of the Site has a short sward and is cut infrequently and kept short by grazing from deer and rabbits, the open field area is also bordered by high hedges and woodland which are not liked by ground nesting birds due to predation and the Site is regularly used by dog walkers and members of the public which use the open grass area to let the dogs off the leads again, these factors together make the Site unsuitable for ground nesting birds.

Mammals

3.3.10 Rabbit burrows and a fox earth were recorded within the woodlands within the Site. Signs of badgers were searched for and no field signs were found.

4.0 EVALUATION AND MITIGATION

4.1 General

4.1.1 The proposals for the Site are understood to involve the construction of a number of residential properties within the grassland areas of the Site with the woodland areas to be unaffected by the development. The survey area contains broadleaved semi-natural woodland, species-poor improved grassland, tall ruderal vegetation with scattered scrub, a species-rich hedge with trees and three ponds.

4.2 Habitats

4.2.1 High Wood and Ash wood are designated as a Local Wildlife Site and are therefore of County Importance.

4.2.2 The grassland and tall ruderal vegetation with scattered scrub are considered to be of negligible importance.

4.2.3 Both the hedgerows surveyed meet the criteria for classification as Important Hedgerows under the Hedgerows Regulations 1997. **Table 4** summarises the findings of the hedgerow survey and evaluation.

Table 4 Results of hedgerow survey and evaluation. (Number of Woody Species, Associated Features and Important Hedgerows are as set out in Paragraph 7(3), 7(4) and 7(1) respectively of Schedule 1, Part II of the Hedgerows Regulations. Refer to Section 2.1).

Hedge no.	Hedgerow length (m)	No. Woody spp.	Adjacent to a bridleway/footpath /road/byway	Number of Associated Features	Important Hedgerow
H1	170	5.3	Yes	3	Yes
H2	160	4	Yes	3	Yes

4.3 Species

4.3.1 No notable plant species (i.e. Essex Red Data Book, including Nationally and Essex rare and scarce species) were identified. However, one large bush of cherry laurel, an invasive, non-native plant species was identified in Ash Wood and a large stand of over 5m by 5m of Japanese knotweed was found on the Sites western boundary (TN7).

4.3.2 Potential impacts upon protected species from the above proposals have been assessed in relation to bats, reptiles and dormice.

Reptiles

- 4.3.3 The areas of suitable habitat for reptiles include the tall ruderal field margins to the Site TN5 and the area of tall ruderal and scrub in the Sites western corner TN6. Surveys are recommended to assess the presence/likely absence of reptiles on the Site.
- 4.3.4 The reptile survey would entail setting out heat traps (squares of roofing felt) which the reptiles use to thermo-regulate. Froglife (1999) recommend that a minimum of 10 heat traps are set out per hectare. The Site is approximately 10.2 hectares in total size but the area suitable for reptiles and to be surveyed is estimated to be in the region of 1 hectare so only 10 heat traps would be required. However, the density may be increased in areas where more suitable habitat is present and to cover all the suitable habitat areas. Once set, the heat traps are left to bed in for a few days and are then checked on seven occasions in suitable conditions. The number and species of reptile and breeding conditions would be recorded. The optimal survey period for reptiles is March – July, and September – October. The month of August is not considered an ideal period to survey as the ambient air temperature is often too high for reptiles to need to use heat traps. If reptiles are identified on Site then a mitigation plan would need to be drawn up in combination with details for the proposed works.

Bats

- 4.3.5 All trees within the Site boundary were reviewed for their potential to support bats. A single fallen willow tree deep within High Wood and two mature hornbeam standards were identified on the northern edge of Ash Wood as having potential to support roosting bats.
- 4.3.6 Under the current proposals both High Wood and Ash Wood will be retained and unaffected by the development as such T1 within High Wood does not require any further surveys due to its distance from the woodland edge. However T2 and T3 on located on the very north edge of Ash Wood and are open to the field, as such any development work that takes place here may disturb these trees if they are used as a bat roost, especially lighting. Evening emergence surveys will need to be carried out during the main active period for bats between May and September.
- 4.3.7 The Site holds suitable habitat to be used by both foraging and commuting bats and habitats, the key areas are the woodland areas and species rich hedgerows. However, it is considered that the diversity within the Site is relatively limited for bats. The structure of the woodland is fairly poor with few trees supporting potential for bats. The remainder of the site is improved grassland although the boundary hedge features provided good commuting features into the wider landscape. Under the current proposals the woodland and the hedgerows will be retained but the proposed development will increase the artificially light levels as well as disturbance from residents to these areas. Bat activity surveys would be required to determine the diversity of species using the Site. The methods would follow the Bat

Survey Guidelines 2012. The guidance suggests that with a Site with low quality should be subject to three transect surveys during the summer season with static detectors such as Anabats set out for a minimum of three consecutive nights for three occasions. The surveys would need to be timed to sample the bat active season from March to September.

Great Crested Newts

- 4.3.8 Within the Site three ponds were recorded. Both Pond 2 and 3 were recorded as having 'low' potential to be used by GCN and due to their likelihood of drying out annually can be ruled out from requiring any further surveys. Pond 1 to the north of the Site is classed as 'Average' under the HSI assessment and is suitable to be used by GCN.
- 4.3.9 In the wider landscape, there are approximately two ponds within 500m of the site which are located to the south of the Site beyond the railway line. The landscape is suitably vegetated for newt migration around the Site, with the tall ruderal margins and hedgerows providing suitable habitat corridors and the open grassland suitable at night for newt movements. The woodlands within the Site are also good habitat for newts to use to hibernate over winter in and as such the habitats between Pond 1 and these woodlands would be used as a migrating route for GCN if they are present.
- 4.3.10 As there is a possibility that suitable GCN terrestrial habitat will be affected by the proposals with the loss of tall ruderal and scrubby field margins as well as obstruction of GCN migration routes between the woodland that provide hibernation sites and P1. As such a survey to determine the presence/likely absence for GCN is required.
- 4.3.11 The surveys need to be undertaken in the spring/summer and should follow the methodology described within Natural England's Great Crested Newt Mitigation Guidelines (Natural England, 2001). However, due to concerns relating to the topography and instability of the ground torch surveys would be the only option for surveyors. A minimum of four surveys must be undertaken, with at least two between mid-April and mid-May. If no GCN are recorded, then no further surveys would be required. If GCN are recorded, and to enable a population size class assessment to be made, an additional two surveys must be undertaken, with another visit undertaken between mid March – mid April. If GCN are recorded then a European Protected Species licence from Natural England may be required to continue with the project. However this will be determined on the size of the population and the risk of encountering animals during the development.
- 4.3.12 The guidelines recommend the use of at least three of the following four survey methods wherever possible:

-
- bottle trapping;
 - torchlight searches;
 - egg searches; and/or
 - hand netting

Dormice

- 4.3.13 The woodland areas and the hedgerows were considered to be of low quality for dormice to use. The structure and diversity of the woodland is poor for dormice. Links to the wider countryside are limited in quality and this coupled with these areas are to be retained and unaffected by the proposals, it is considered that no further surveys are required for dormice.

Breeding Birds

- 4.3.14 The hedgerows and woodland within the Site provides suitable habitat for breeding birds. All nesting birds are protected by the Wildlife and Countryside Act (as amended) 1981, against intentional or reckless disturbance whilst the nest is being built or is occupied. With regard to the potential for breeding birds, the removal of vegetation would be best timed to avoid the period from 1st March to 1st September when birds are likely to be breeding. If any vegetation removal is necessary within that period, it would be recommended to be carried out under ecological supervision. Works attempted during that period could be disrupted as any breeding birds present would need to be left undisturbed until such time as the chicks have fledged.

Mammals

- 4.3.15 No field signs were found of badgers. Rabbit burrows and a fox earth were found. No further surveys are required

Biodiversity Enhancements

- 4.3.16 The proposals need to take into account the effects of the National Planning Policy Framework which sets out planning policies on protection of biodiversity and geological conservation through the planning system. It is Section 11 of the National Planning Policy Framework (NPPF) which sets out the Government's current planning policy in relation to conserving and enhancing the natural environment. The NPPF states that "the planning system should contribute to and enhance the natural and local environment by:

- Protecting and enhancing valued landscapes, geological conservation interests and soils;
- Recognising wider benefits of ecosystem services;

-
- Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

4.3.17 In short, the NPPF places an obligation on planning authorities to ensure that any proposal does not impact on protected species and also that any proposal incorporates features for biodiversity gain.

4.3.18 Any new hedgerows and well as the existing boundary features would be planted with native species and be species rich to promote biodiversity and provide food and shelter for a range of wildlife. The species planted should complement the retained woodland areas. Examples of suitable tree species that should be planted include oak *Quercus robur*, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, and field maple *Acer campestre*. Dog rose *Rosa canina* and traveller's joy *Clematis vitalba* should be planted at regular intervals to help thicken vegetation and provide additional nest building opportunities and food sources for small mammals, birds and invertebrates. Native evergreen species yew *Taxus baccata* and holly *Ilex aquifolium* would be useful additions in the hedgerow planting mix as they will provide year-round foliage.

4.3.19 It is recommended that any garden areas within the development are designed with nectar rich species to enhance the biodiversity value of the gardens for invertebrates. Insect hibernating opportunities, specifically for bumblebees such as early bumblebee *Bombus pratorum* should also be provided.

5.0 CONCLUSIONS

- 5.1 The land at Stonards Hill, Epping has been subject to an extended Phase I Habitat survey.
- 5.2 Surveys have been recommended for reptiles, bats and GCN.
- 5.3 Recommendations regarding breeding birds in hedgerows and scrub have been given, including the option of undertaking work during 1st September – 1st March to avoid the breeding season.
- 5.4 As part of NPPF, recommendations have been give to improve biodiversity on Site. This includes planting of native species within the Sites and the inclusion of nectar rich plant species in the garden design for invertebrates. Further recommendations may be made once the detailed surveys have been completed and during the more detailed design of the Site

REFERENCES

Altringham, J. 2003. *British Bats*. New Naturalist.

Amphibian and Reptile Conservation (2011). *Amphibian Habitat Management Handbook*. ARC UK

Beebee T & Griffiths, R. 2000. *Amphibians and Reptiles*. Harper Collins Publishers, Hammersmith, London.

Joint Nature Conservation Committee. 2003. *Handbook for Phase I Habitat Survey. A Technique for Environmental Audit*. JNCC, Peterborough.

Stace, C. 1997. *New Flora of the British Isles. 2nd Edition*. Cambridge University Press.



- Key
-  Tree
 -  Broad-leaved Woodland
 -  Ancient Woodland Boundary
 -  Improved Grassland
 -  Semi-Improved Grassland
 -  Waterbody
 -  Wet Ditch
 -  Species Poor Hedge
 -  Fence
 -  Building
 -  Hard Standing
 -  Target Note 1

revision	description	date	checked by

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Project:
Stonard Hill, Epping

Title:
Phase 1 Habitat Plan

status	drawing no.			
	Figure 1			
scale	size	date	drawn	checked
NTS	A3	01-08-2013	APW	HL

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 Figure_1.dwg

Figure 2 - Annotated Photographs



Looking at the Sites south corner over TN4 & H2



Sites western corner TN6



Looking east over TN4 at TN3



Internal structure of High Wood



Internal structure of Ash Wood



Pond One



Pond Two



Pond Three



Japanese knotweed stand on western boundary



Tree One



Tree Two



Tree Three

Appendix 1 – Bat Legislation

All British bat species receive legal protection in the United Kingdom. The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was recently amended by the Countryside and Rights of Way (CROW) Act 2000 and the more recent Habitats Regulations amendments (2010). All British bat species are listed under Schedule 5 of the 1981 Act, and is therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a bat [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a bat [Section 9(2)]
- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection [Section 9(4)(b)];
- Intentionally or recklessly obstructs access to any structure or place which a bat uses for shelter or protection [Section 9(4)(c)]
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a bat [section 9(5)]

Bats are also included on Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). As a result of the UK ratifying this directive, all British bats are protected under The Conservation of Habitats and Species Regulations 2010 (The Conservation Regulations). Annex IV of the Habitats Directive requires member states to construct a system of protection as outlined in Article 12, this is done through Part 3 of the Regulations whereby Regulation 41 makes it an offence to:

- Deliberately capture, kill or injure a bat [Regulation 41(1)(a)];
- Deliberately disturb bats in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young, OR ii) the local distribution of that species. [Regulation 41(1)(b) and 41(2)];
- Damage or destroy a breeding site or resting place of a bat [Regulation 41(1)(d)].

Under the law, a roost is any structure or place used for shelter or protection. This could be any structure, for example, any building or mature tree. Bats use many roost sites and feeding areas throughout the year. These vary according to bat age, condition, gender and species, as well as season and weather. Since bats tend to re-use the same roosts for generations, the roost is protected whether the bats are present or not.

In addition, four species, the two horseshoes, barbastelle and Bechstein's are included within Annex II of the Habitats Directive for which Member States are required to designate Special Areas for Conservation (SAC's) for their protection.

The UK is a signatory to the Agreement on the Conservation of Bats in Europe, established under the Bonn Convention. The Fundamental Obligations of Article III of this Agreement require the protection of all bats and their habitats, including the identification and protection from damage or disturbance of important feeding areas for bats.

Appendix 2 – Reptile Legislation

All British reptiles are afforded legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) largely as a consequence of a national decline in numbers due to habitat loss. Under the terms of the Act, it is an offence to intentionally kill or injure a reptile and accordingly in order to avoid committing an offence under the Act, appropriate mitigation techniques need to be incorporated for reptiles occurring within development sites. Mitigation methods for reptiles may include trapping and relocation of animals to a suitable receptor site, combined with the exclusion of the development site through the use of reptile fencing. Measures to enhance habitats for reptiles include the provision of hibernacula and appropriate management to improve foraging areas may also be required.

Mitigation for the more common British reptiles and amphibians does not require a licence from Natural England but would typically be agreed in consultation with the local planning authority.

Despite the range of their distribution and the diversity of habitats in which they may be found, the national status of the slow worm is not considered favourable. The slow worm is considered to have undergone a long term decline since the 1930's. Currently the largest threat has been identified as loss of habitat, in particular, due to a shift in planning policy towards the development of brown field sites (English Nature, 2004).

Appendix 3 – Amphibian Legislation

All British amphibian species receive legal protection in the United Kingdom though the degree to which different species are protected varies. The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was recently amended by the Countryside and Rights of Way (CROW) Act 2000 and the more recent Conservation Regulations (2007). The great crested newt is listed under Schedule 5 of the 1981 Act, and is therefore subject to the provisions of Section 9, which make it an offence to:

- Intentionally kill, injure or take a great crested newt [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a great crested newt [Section 9(2)]
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for shelter or protection [Section 9(4)(b)];
- Intentionally or recklessly obstruct access to any structure or place which a great crested newt uses for shelter or protection [Section 9(4)(c)] Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a great crested newt [section 9(5)]

The other more common amphibian species are protected against sale (Section 9(5)) only. In all cases, the legislation applies to all life stages including spawn, eggs, juveniles and adults.

The great crested newt is also included on Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). As a result of the UK ratifying this directive, the great crested newt is protected under The Conservation of Habitats and Species Regulations 2010 (The Conservation Regulations). Annex IV of the Habitats Directive requires member states to construct a system of protection as outlined in Article 12, this is done through Part 3 of the Regulations whereby Regulation 41 makes it an offence to:

- Deliberately capture or kill a great crested newt [Regulation 41(1)(a)];
- Deliberately disturb great crested newts in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young, OR ii) the local distribution of that species. [Regulation 41(1)(b) and 41(2)];
- Damage or destroy a breeding site or resting place of a great crested newt [Regulation 41(1)(d)].