agb ENVIRONMENTAL

Preliminary Ecological Appraisal

Coopersale Cricket Club, Epping, CM16 7QX

Client Name: The Chisenhale-Marsh Estate Company

Project Number: P2782.1.0

Date: 12 December 2016

ENABLING DEVELOPMENT

Client:	The Chisenhale-Marsh Estate Company
Agent	Carter Jonas LLP
Site:	Coopersale Cricket Club, Epping, CM16 7QX
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1 Summary

Site	Coopersale Cricket Club, Epping, CM16 7QX
Central OS Grid Reference	TL 47848 02732
Report Commissioned by	The Chisenhale-Marsh Estate Company
Date of Survey	18th November 2016

Considerations	Description	Comments
Ecological Value of the Site	The site comprised buildings, amenity grassland and scattered broadleaved trees. Broadleaved woodland and ancient semi natural woodland were present adjacent to the site boundary.	The site itself is considered to be of low importance due to the regular mowing of the habitat and poor plant diversity. The adjacent habitat beyond the eastern boundary is a SSSI and beyond the southern boundary is a Local Wildlife site.
Further Assessments / Surveys	Great crested newt survey	All suitably connected ponds within 500m of the site should be reassessed in the great crested newt *Triturus cristatus* breeding season (mid-March to mid-June). HSI and eDNA surveys should be carried out.
	Badger survey	A pre-construction badger survey six weeks before site clearance / construction commences.
	Bat survey of the on-site cricket clubhouse building.	Two bat emergence / re-entry surveys between May and August.
Avoidance and General Mitigation	Statutory and non-statutory sites	Design a Construction Method Statement that aims to avoid impacts to the SSSI and LWS during construction. Install fencing along the southern and eastern boundaries with a buffer of at least 5m and provide signage to encourage residents to use marked paths only and keep dogs on leads.
	Trees, broadleaved woodland	Protect these boundary features and replant any trees lost to development with native, locally sourced species.
	Birds	Clear any woody vegetation outside the nesting bird season, or after a nesting bird survey by an ecologist if clearance is scheduled between March and August (inclusive).
	Reptiles	Precautionary clearance of ruderal vegetation in the south western corner of the site.
	Hedgehog	Provide hedgehog links within any new fencing.

	Site measures	Cover trenches or provide planked escape routes to allow any animals that fall in to escape. Store materials off the ground and do not leave temporary standing water.
Enhancements	To increase the ecological value of the site.	Minimise artificial lighting, install wildlife boxes for birds, bats, insects and hedgehogs and create a log pile and grass / compost heap.

Contents

2 Introduction

2.1 Background

agb Environmental was commissioned by Carter Jonas LLP on behalf of The Chisenhale-Marsh Estate Company to undertake a Preliminary Ecological Appraisal (PEA) at Coopersale Cricket Club, Epping, CM16 7QX herein referred to as 'the site'. This report will support a planning application for residential units, open space and associated infrastructure.

2.2 Site Location and Description

The site is located to the east of Brickfield Road at central Ordnance Survey Grid Reference: TL 47843 02735. The site totals c. 1.17 ha, comprising predominantly amenity grassland.

The site is situated within a rural location to the south east of the village of Coopersale and surrounded by residential housing to the north, woodland to the south and east, with a school and playing fields to the west. The wider area comprised suburban settlement, agricultural land, hedgerows and large areas of deciduous woodland.

2.3 Scope of Survey

The PEA comprised a single visit to the application site. The study area was also extended to consider the following ecological features according to certain distances around the site boundary:

- 10km for statutory sites of international importance designated for nature conservation;
- 5km for statutory sites of national importance designated for nature conservation;
- 2km for non-statutory sites designated for nature conservation;
- 2km for protected and notable species and habitats.
- 500m for habitats and ponds (in relation to great crested newts); and
- 30m for badger setts.

2.4 Development Proposal

Cater Jonas LLP propose to develop the site to provide up to 30 residential units with associated open space and infrastructure. The existing cricket club house will be demolished and a small number of trees on the northern and western boundaries may need to be cut back or removed.

2.5 Objective

The objective of this PEA is to identify any further ecological surveys and / or mitigation required and potential enhancement opportunities in accordance with planning policy, and European and UK wildlife legislation (**Appendix 1**).

3 Methodology

The site was surveyed by Ecologist Owen Jones BSc (Hons) who is licensed by Natural England to survey for great crested newts (WML-CL08; Level 1, registration number 2016-20091-CLS-CLS).

3.1 Desk Study

The Multi-Agency Geographic Information for the Countryside (MAGIC) database was accessed on the 21st November 2016 for information on statutory sites designated for nature conservation within a 5km radius of the site. Consideration for Natura 2000 sites was extended to a 10km radius where the potential risk of impact to interest features of such sites may extend over a wider area. Such sites include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

The MAGIC Impact Risk Zones (IRZs) were used to consider whether the proposed development may impact on any Sites of Special Scientific Interest (SSSI). It also determines whether consultation with Natural England is needed to discuss how impacts might be avoided or mitigated.

Essex Wildlife Trust Biological Records Centre was also consulted on 18th November 2016 for the following information for a 2km radius around the application site:

- Non-statutory nature conservation designations, such as Local Wildlife Sites (LWS),
- Legally protected species, such as great crested newts, reptiles, birds and bats; and
- Notable species, such as those listed in the local Biodiversity Action Plan.

3.2 Habitat Survey

The survey involved a site visit on the 18th November 2016 to record and map habitat types and ecological features within the site. The survey was undertaken in accordance with *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2013), and the general principles and methods outlined in the *Handbook for Phase I Habitat Survey* (JNCC, 2010). Features of interest were identified as target notes on the Phase I Habitat Map (**Appendix 1**).

Hedgerows on site were also evaluated for their importance with reference to the *Hedgerows Regulations 1997*. Aerial photographs, maps and field observations were used to identify habitats in the wider landscape which could be impacted by development of the site.

Weather conditions during the survey: the temperature was 7°C; there was a light air (Beaufort scale 1), 80% cloud cover and dry.

3.3 Protected and Notable Species Assessment

The site was inspected for evidence of and assessed for potential to support protected and notable species. This included species listed under the *Conservation of Habitats and Species (Amendment) Regulations 2012*, the *Wildlife and Countryside Act 1981 (as amended) (WCA)*, and those given extra protection under the *Natural Environment and Rural Communities (NERC) Act 2006* and *Countryside and Rights of Way (CRoW) Act 2000*.

MAGIC was also accessed on the 21st November to identify any European Protected Species Mitigation Licences granted by Natural England within a 2km radius.

The following protected / notable species were considered within the assessment:

3.3.1 Amphibians

The site was assessed for suitability to support amphibians such as the legally protected great crested newt *Triturus cristatus* and the notable common toad *Bufo bufo.* The assessment was undertaken in accordance with the *Herpetofauna Workers' Manual* (JNCC, 2003) and the *Great Crested Newt Conservation Handbook* (Langton, Beckett and Foster, 2001). Consideration was given to waterbodies on and within 500 metres of the site using OS maps and aerial images.

3.3.2 Reptiles

The site was assessed for suitability to support reptiles with reference to the *Herpetofauna Workers' Manual* (Gent and Gibson 1998) and *Froglife Advice Sheet 10 An Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation* (Froglife, 1999).

3.3.3 Badgers

The site and a 30m zone around the site (where accessible), were surveyed for badger *Meles meles* evidence such as setts, latrines, pathways, footprints, snuffle holes and badger hairs. Any setts recorded were classified according to published criteria (Harris, Cresswell and Jefferies, 1989).

3.3.4 Bats

Potential for the site to support roosting, foraging and commuting bats was assessed in line with the Bat Conservation Trust (BCT) *Bat Surveys for Professional Ecologists Good Practice Guidelines* (Collins *et al*., 2016).

3.3.4.1 Roosting

The buildings and trees on / adjacent to the site were assessed for suitability to support roosting bats according to the scales in **Tables 3.1** and **3.2**.

Table 3.1: Classifying the bat roosting suitability of buildings (Collins *et al*., 2016).

Low/ negligible roosting suitability	Buildings with few, if any, features suitable for roosting.
Moderate roosting suitability	Features with moderate roosting potential, with roosting features appearing less suitable.
High roosting suitability	With significant roosting potential, either because they contain a large number of suitable features or those features present appear optimal.
Confirmed roost	Evidence of bat occupation found.

Table 3.2: Classifying the bat roosting suitability of trees (Collins *et al.*, 2016).

Negligible roosting suitability	No potential to support roosting bats.
Low roosting suitability	No obvious potential or with roosting features that appear less suitable.
Moderate roosting suitability	Moderate roosting potential, either because they contain a large number of suitable features or those features present appear optimal.
High roosting suitability	Significant roosting potential, capable of supporting large bat roosts.

3.3.4.2 Foraging and Commuting

The site was assessed for its suitability to support foraging and commuting bats according to **Table 3.3** below:

Table 3.3: Classifying the suitability of bat foraging and commuting habitat (Collins *et al*, 2016).

Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated or poorly connected to habitat in the surrounding landscape. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in parkland) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that bats may use for commuting such as tree-lines and scrub or linked back gardens. Habitat that connects to the wider landscape that bats may use for foraging such as trees, scrub grassland and water.
High	Continuous, high quality habitat that is well connected to the wider landscape that is likely to used regularly by commuting bats such as river valleys, streams, hedgerows, tree-lines and woodland edge. High quality habitat that is well-connected to the wider landscape that is likely to be used regularly by commuting bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

3.3.5 Hazel Dormouse

The site was assessed for potential to support the hazel dormouse *Muscardinus avellanarius*, in accordance with the *Dormouse Conservation Handbook* (Bright, Morris and Mitchell-Jones, 2006). Dormice typically use connected woodland, hedgerows and scrub that contain suitable food plants. Aerial images were used to assess the connectivity of any suitable habitat on the site to woodland and hedgerows within the wider area.

3.3.6 Other Species

The site was assessed for suitability to support other protected and notable fauna species / assemblages including birds, invertebrates and mammals.

3.3.7 Invasive Species

The site was searched for invasive plants such as giant hogweed *Heracleum mantegazzianum,* and Japanese knotweed *Fallopia japonica*.

3.4 Evaluation

Designated sites, habitats and species (where presence has been identified) have been evaluated in accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial and Freshwater* (CIEEM, 2016). These guidelines aim to give consistency in evaluating the importance of the ecological features within and around a site, which help inform any effects or impacts a scheme will have upon them.

A value of the ecological features (sites, habitats or species) has been assigned according to their level of importance using the following terms:

- International and European
- National
- Regional
- Local
- Site
- Negligible

3.5 Limitations and Assumptions

The baseline conditions reported and assessed in this document represent those identified at the time of the survey. Access was available to the entire site and the survey dates fall outside the optimal season for botanical work. However, the habitat descriptions and evaluations are considered to be accurate due to the common and widespread habitats recorded and the vegetation being clearly visible at the time of survey.

This PEA is based on a single site survey, and provides an overview of the likelihood of protected species occurring on the site (negligible, low, moderate or high). Where no evidence is found, this does not mean that a species is not present, or using the site. Further surveys have been recommended where there is reasonable likelihood of that protected species being present and impacted by the development proposal. This is based on the suitability of the habitat and any direct evidence observed. This PEA does not constitute a full botanical survey or a Phase 2 pre-construction survey for Japanese knotweed.

The results of this assessment will remain valid for two years i.e. until November 2018, after which the assessment should be updated, if works have not yet commenced.

4 Results and Evaluation

The following sections present the results, evaluation and discussion of the designated sites, habitats and protected / notable species, which may be impacted by the proposed development.

4.1 Designated Sites

4.1.1 Statutory Sites

Statutory sites designated for nature conservation that are located within the vicinity of the site are provided in **Tables 4.1** and **4.2** below. Ramsar sites are of **international importance**, SACs are of **European importance**, SSSIs are of **national importance** and Local Nature Reserves (LNR) are of **local importance**.

The site is located adjacent to Epping Forest SSSI and is therefore within the Epping Forest SSSI IRZ. Consultation with Natural England is required for this SSSI for all developments, except householder applications. The Local Planning Authority will therefore need to consult with Natural England regarding the likely risks of the development on this SSSI.

There were no habitats or species within the site that serve as qualifying features of the statutory sites listed in **Table 4.1** below. The unfenced eastern boundary of the application site is directly adjacent to Epping Forest SSSI and is therefore ecologically linked. The existing residential housing to the north of the proposed development is also adjacent to the SSSI but separated by a close board fence.

Based on research (Murray *et al.*, 2010), it is estimated that c.26% of households in the UK have domestic cats. Assuming the proposed development is representative of the average, this implies that c. eight of the 30 new houses may be home to domestic cats upon completion. Given this small figure, the plans to incorporate garden spaces within the design, and the location of the development on the edge of an existing residential area to the west, predation of woodland wildlife by domesticated cats is not anticipated to have a significant impact.

The proposals of up to 30 new houses may result in a small increase in visitor pressure to the SSSI. This, particularly if combined with dog walking, may have an impact on the SSSI in the form of increased trampling and disturbance of wildlife. However, with some precautionary mitigation, as outlined in **Section 5**, it is expected that the likely impacts on the SSSI can be reduced to negligible. Further action is recommended in **Section 5** to prevent significant impacts to the Epping Forest SSSI. **No significant impacts on other statutory sites are expected.**

Table 4.1: Designated sites of international importance within 10km of the application site.

Site Name	Distance and Direction from Site	Area (ha)	Reasons for Designation
Epping Forest SAC	3.4km SW	1628.9	Representing an Atlantic acidophilous beech forest to the north-east of the UK habitat range. A site which has widespread and frequent records of stag beetle *Lucanus cervus*.

Table 4.2: Designated sites of national importance within 5km of the application site.

Site Name	Distance and Direction from Site	Area (ha)	Reasons for Designation
Epping Forest SSSI	Adjacent to the eastern boundary.	1787.9	One of the few remaining large-scale examples of ancient wood-pasture in lowland Britain. Habitats of high nature conservation value include old grassland plains, ancient semi-natural woodland and scattered wetland.
Roughtalleys Wood LNR	1.2km NE	3.4	A semi-natural ancient woodland hosting several bird species, orchids and also slow-worms and grass snakes.
Thornwood Common Flood Meadow LNR	1.8km NW	3.0	A flood storage reservoir with a diverse range of plant species. Species such as ragged robin *Lychnis flos-cuculi*, oxeye daisy *Leucanthemum vulgare* and knapweed *Centaurea* sp., support a diverse range of invertebrate species.
Weald Common Flood Meadow LNR	2.3km NE	1.9	Two wet meadows dominated by cowslips *Primula veris* in the spring and ragged robin in the summer. An important site for amphibians and reptiles.
Church Lane Flood Meadow LNR	2.4km NE	3.3	A wet meadow with a pond hosting a diverse range of plant species. Species include ragged robin, devil's bit scabious *Succisa pratensis,* bugleweed *Ajuga* sp., common spotted orchid *Dactylorhiza fuchsii*, bee orchid *Ophrys apifera* and marsh cinquefoil *Comarum palustre*.
Parndon Woods & Common LNR	4.8km NE	50.5	A hornbeam *Carpinus betulus* coppice woodland, including many mature oaks *Quercus robur*. The common itself is predominantly neutral grassland, including ancient hedgerows.
Harlow Woods SSSI	4.8km NE	45.2	Comprising three small woods dominated by oak and hornbeam.

4.1.2 Non-Statutory Sites

Non-statutory sites designated for nature conservation that are located within 2km of the application site are provided in **Table 4.3** below. LWS are of **local value**.

Gernon Bushes, West LWS is located immediately to the south of the site and is also directly contiguous with Gernon Bushes SSSI. The application site does not support the same habitat features as the LWS, nor is it likely to support the same species assemblages. However, given how close the LWS is to the boundary of the site, further action is recommended in **Section 5** to ensure that the development has no significant impact on the integrity of the LWS.

Impacts to other non-statutory designated sites are not expected due to the distance between them and the application site and the lack of similar habitat features.

Table 4.3: Non-statutory sites within 2km of the application site.

Site Name	Distance and Direction from Site	Area (ha)	Reasons for Designation
Gernon Bushes, West LWS	Adjacent to the southern site boundary.	1.0	This small woodland site is contiguous with Gernon Bushes SSSI, located on the western edge of the ancient woodland. Tree species include pedunculate oak, ash *Fraxinus excelsior* and willow *Salix* sp.
Birching Coppice Complex LWS	400m SE	138.2	The site comprises ten adjoining areas of woodland, the majority of which is ancient or ancient replanted woodland. Remnant blocks of coppiced hornbeam are present in several of the woodlands. Other species present include silver birch and oak with seven of the woodlands having large central blocks of Scots pine and silver birch plantation. Ancient woodland indicator species present include dog's mercury *Mercurialis perennis*, bluebell *Hyacinthoides non-scripta* and wood melick *Melica uniflora.*
Redyn's Wood LWS	480m S	2.9	Ancient woodland with almost pure hornbeam coppice and scattered oak standards.
Roughtalleys Wood LWS	620m NE	22.2	Ancient woodland dominated by conifers and sweet chestnut *Castanea sativa* coppice with pedunculate oak and sessile oak *Quercus petraea* standards. The ground flora reflects the acid nature of the soils. Species present include heath bedstraw *Galium saxatile* and purple moor-grass *Molinea caerulea.*
Ash Wood / High Wood, Stonnard's Hill LWS	720m W	4.0	High wood is hornbeam coppice with silver birch *Betula pendula,* sycamore *Acer pseudoplatanus* and pedunculate oak at the woodland edge. Several woodland streams, a pond and an earth bank are present. Ash wood is sycamore with coppiced and uncoppiced hornbeam. Indicator species include dog's mercury, bluebell, pendulous sedge and soft shield-fern *Polystichum setiferum*.
Stewards Green Lane LWS	990m SW	1.1	A narrow green lane consisting of a track bordered by species rich hedgerows and narrow strips of scrub. At least 13 woody species are present including spindle *Euonymus europaeus* and wild service-tree *Sorbus torminalis*. Ground flora consists of typical woodland species including dog's mercury.
Wintry Wood, Lindsey Street LWS	1.67 NW	2.2	The site primarily consists of pedunculate oak woodland with hornbeam coppice. There is also both mature and coppiced ash with a sparse understorey of hawthorn *Crataegus monogyna*, elder *Sambucus nigra* and blackthorn *Prunus spinosa.* Dog's mercury and soft shield-fern are also present.
Beachet Wood LWS	1.93 SE	51.2	A large ancient woodland with hornbeam coppice mixed with pedunculate oak and ash standards.

4.2 Habitats

The habitats below were recorded within and directly adjacent to the site during the survey. No protected, BAP, Species of Principal Importance (SPIE) or locally important floral species or habitats were recorded within the site during the survey. The adjacent broad-leaved and ancient woodland is classified as a BAP and SPIE habitat.

- Building
- Amenity grassland
- Scattered broadleaved trees
- Broadleaved woodland
- Ancient semi natural woodland

Habitat types are described below and shown on the Phase I Habitat Map (**Appendix 2**).

4.2.1 Building

One building was located within the proposed works area; a cricket club house (**Photos 1 and 2**), likely to be demolished as part of any development. A description of the building within the site is provided in relation to bat roosting suitability in **Section 4.3.6**.

Photo 1: Cricket club house – eastern elevation.

Photo 2: Cricket clubhouse – southern elevation.

4.2.2 Amenity Grassland

The majority of the site comprised mown amenity grassland (**Photo 3**). Species comprised annual meadow grass *Poa annua*, perennial ryegrass *Lolium perenne*, dandelion *Taraxacum officinale*, common daisy *Bellis perennis* and white clover *Trifolium repens*. The grassland

lacked species diversity and structure and is therefore considered to be of **negligible importance**.

Photo 3: Amenity grassland, facing north.

No further action is recommended.

4.2.3 Scattered Broadleaved Trees

A number of scattered broadleaved trees were present around the margins of the site, mainly on the northern and western boundaries. A group of trees (G1, **Photo 4**) was recorded on the north-western corner of the site boundary; species included hawthorn *Crataegus monogyna,* lime *Tilia* x *europaea,* hornbeam, elder *Sambucus nigra* and Norway maple *Acer platanoides*. Bramble *Rubus fruticosus*, ivy *Hedera helix* and Russian-vine *Fallopia baldschuanica* were also present. Two mature oak *Quercus robur* trees were also present on the northern site boundary (**Photo 5,** T1 and **Photo 6** T2). It is understood that the mature oak trees will not be affected by any proposed works. Overall, the scattered broadleaved trees were considered to be of local importance.

Photo 4: Group of trees, facing north-west.

Photo 5: Mature oak, facing north-west.

Photo 6: Mature oak, facing north-west**.**

4.2.4 Broadleaved Woodland

Adjacent to the southern site boundary was an area of broadleaved woodland which was part of Gernon Bushes West Local Wildlife Site (LWS) (**Photo 7**). The trees were a mix of mature and semi-mature, and species included oak, ash and elder. The ground flora comprised bramble, ivy and common nettle *Urtica dioica*. This section of woodland was not considered to be ancient as it lacked ancient woodland indicators species and is not listed on the Ancient Woodland Inventory (MAGIC, 2014). Broadleaved woodland is a BAP and SPIE habitat, which is relatively common and widespread in the local area. Therefore this feature is considered to be of **local importance**.

Photo 7: Broadleaved woodland on the southern boundary.

Further action has been recommended in **Section 5**.

4.2.5 Ancient Semi-natural Woodland

Adjacent to the eastern site boundary was an area of Ancient Woodland, which was part of Epping Forest SSSI (**Photo 8**). Tree species included pollarded hornbeam and oak with the ground flora dominated by holly *Ilex aquifolium*, and bramble. This section of woodland is listed on the Ancient Woodland Inventory (MAGIC, 2014). The ancient semi-natural woodland and Epping Forest is one of the few remaining large-scale examples of ancient wood-pasture in lowland Britain, and therefore this feature is considered to be of **national importance**.

Photo 8: Ancient semi-natural woodland adjacent to the eastern boundary.

4.3 Protected and Notable Species

Records of protected / notable species for the last ten years have been considered within the assessment below. None of the records pertain to the site.

4.3.1 Invertebrates

Essex Wildlife Trust Biological Records Centre returned no records of invertebrates listed on Schedule 5 of the WCA. A single, recent record of the Section 41 (NERC Act, 2006) cinnabar moth *Tyria jacobaeae* was returned from 1.7km to the north-west in 2012.

Habitats to be significantly impacted by the proposals (mown amenity grassland) are very unlikely to support rare or notable species. Limited nectaring opportunities were available for butterflies / moths and no deadwood or decaying log piles suitable for saproxylic invertebrates were present on the site.

The site is therefore considered to hold **negligible potential** for rare / notable invertebrates due to habitat unsuitability.

No further invertebrate surveys or mitigation are recommended.

4.3.2 Amphibians

Essex Wildlife Trust Biological Records Centre returned two records of great crested newt and no records of the common toad. The nearest great crested newt record was from 1.6km west and the most recent from 2014. Whilst not listed as qualifying features, the citation for the adjacent Epping Forest SSSI states that "significant" populations of all five native amphibians are present there, including great crested newts and common toads. No waterbodies were located within the site; however, eight water-bodies were located within 500m (OS, 2016). Water-body locations are shown in **Figure 1** and details of potential habitat connectivity to the site are provided in **Table 4.4**.

Figure 1: Water-bodies (shown in blue) within 500m of the site boundary (shown in red).

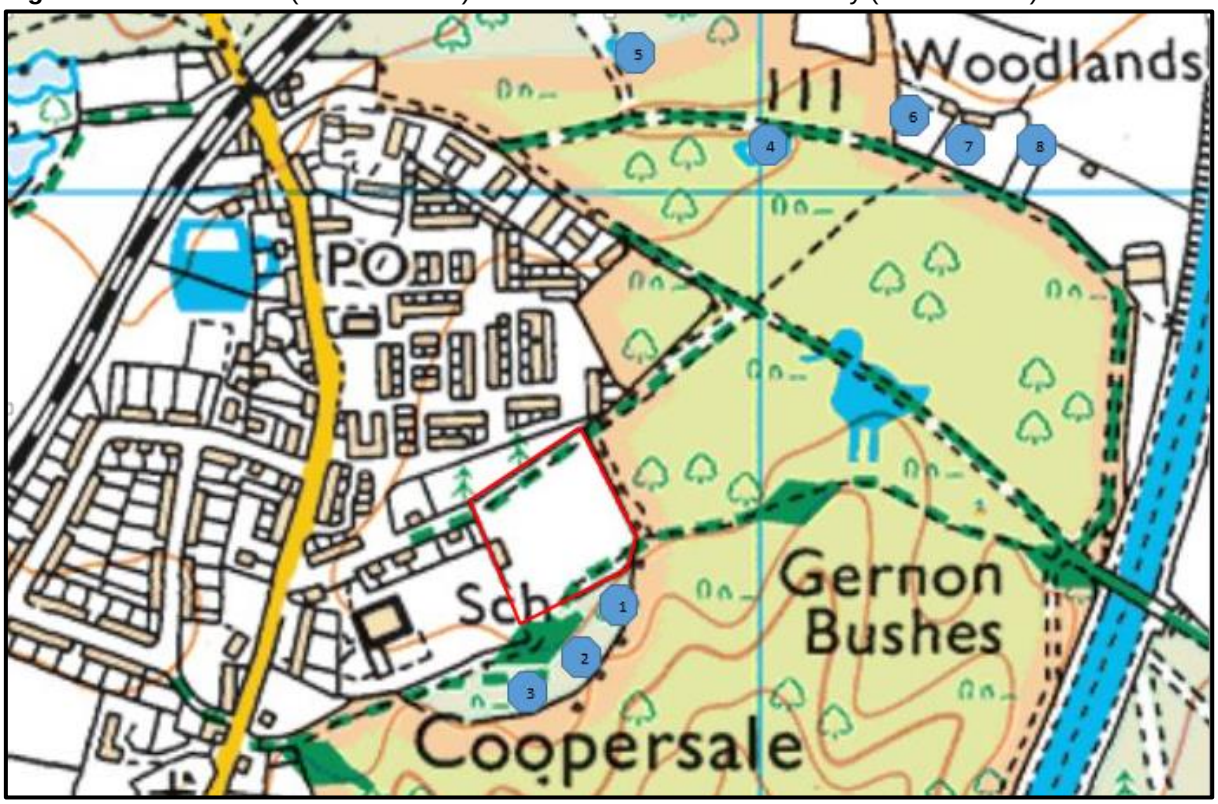

Table 4.4: Location and description of waterbodies within 500m of application site.

Waterbody Number	Distance & Direction from Site	Area (m²)	HSI Score	Connectivity to the Site	Further Surveys Required?
1	12.5m S	30	Dry	Directly connected to site.	**Yes**
2	35m S	75	Dry	Directly connected to site.	**Yes**
3	40m S	85	Dry	Directly connected to site.	**Yes**
4	240m NE	250	Dry	Great crested newts could disperse from the pond through woodland and onto the site.	**Yes**

Waterbody Number	Distance & Direction from Site	Area (m^2)	HSI Score	Connectivity to the Site	Further Surveys Required?
5	280m NE	275	Dry	Great crested newts could disperse from the pond through woodland and onto the site.	**Yes**
6	340m NE	35	No Access	Great crested newts could disperse from the pond through woodland and onto the site.	**Yes**
7	370m NE	45	No Access	Great crested newts could disperse from the pond through woodland and onto the site.	**Yes**
8	415m NE	50	No Access	Great crested newts could disperse from the pond through woodland and onto the site.	**Yes**

Suitable terrestrial habitat on site for sheltering and foraging newts and common toads is limited to small areas of ruderal vegetation on the southern and western site boundaries. If great crested newts or toads are present within the three ponds to the south of the site, they may also shelter or forage within the limited habitat on site. It is also a possible that great crested newts and/or toads, if present, migrate across the site between their breeding, foraging and hibernating grounds.

Overall, the site is considered to hold **low potential** for great crested newts and common toads during their terrestrial phase. However, the abundance of waterbodies to the north-east and the proximity of the three ponds to the south of the site mean that great crested newts and / or toads may commute across the site if present.

Ponds 1-5 were dry at the time of survey and ponds 6-8 were on private land and therefore inaccessible. It is recommended that the ponds are revisited during the great crested newt breeding season (mid-March to mid-June) and reassessed for their potential to support great crested newts.

Further surveys for great crested newts have therefore been recommended in **Section 5.**

Precautionary mitigation for the priority listed (NERC Act, 2006) common toad have been recommended in Section 5.

4.3.3 Reptiles

Essex Wildlife Trust Biological Records Centre returned no records of reptiles within 2km of the site. However, the Epping Forest SSSI citation states that the designated site supports slow-worms *Anguis fragilis*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and adder *Vipera berus*. The majority of the habitat on site was of low suitability for reptiles, being predominantly mown amenity grassland. Suitable terrestrial habitat on site for sheltering and foraging reptiles is limited to small areas of ruderal vegetation on the southern and western site boundaries. Overall, the site is considered to hold **low potential** to support reptiles.

Precautionary mitigation is recommended in Section 5 to take into account the low possibility of reptiles utilising the small area of ruderal habitat on the southern and western site boundaries.

4.3.4 Birds

Essex Wildlife Trust Biological Records Centre returned a small number of bird records within a 2km radius of the site. Records of one bird species listed under the Red List (Birds of Conservation Concern) was returned: grey wagtail *Motacilla cinereal,* recorded 1.87km north in 2010.

The following birds were also recorded during the survey: house sparrow *Passer domesticus*, goldfinch *Carduelis carduelis* and magpie *Pica pica.*

The scattered broad-leaved trees on the site boundary were considered to hold **moderate potential** for nesting and foraging common and widespread species of birds. However, the site did not comprise habitats to support significant bird species or assemblages.

Further action for nesting birds is recommended in **Section 5**.

4.3.5 Badgers

Essex Wildlife Trust Biological Records Centre returned one recent record of badger, approximately 230m north from 2008. No badger setts were recorded on or within 30m of the site boundary. Although the site is currently considered to hold **negligible value** for badgers, the site is adjacent to large areas of woodland and badgers in the local area are likely to pass through the site during nocturnal foraging activity. Badger setts may also appear at any time in the future, particularly along the southern and eastern site boundaries.

A pre-construction badger survey has therefore been recommended in **Section 5**.

4.3.6 Bats

Essex Wildlife Trust Biological Records Centre returned records for the following bat species:

Table 4.5: Bat records within 2km of the site for the last ten years.

Bat Species	Protection	Nearest and Most Recent Records
Serotine *Eptesicus serotinus*	CHSR, WCA	1 record, 1.87km S from 2015.
Noctule *Nyctalus noctula*	CHSR, WCA	1 record, 1.87km S from 2015.
Common pipistrelle *Pipistrellus pipistrellus*	CHSR, WCA	10 records, the nearest is 360m W and the most recent from 2015.
Soprano Pipistrelle *Pipistrellus pygmaeus*	CHSR, WCA	3 records, the nearest is 1.37km W and the most recent from 2015.
Brown long-eared bat *Plecotus auritus*	CHSR, WCA; SPIE	1 record, 1.87km S from 2015.

Table 4.6: European Protected Species licence applications within 2km of the site (MAGIC, 2016).

Species	County	Case reference	Timings	Distance and direction from site
Common pipistrelle	Essex	EPSM2009 - 691	30/03/2009 – 01/10/2010	880m north-west

4.3.6.1 Roosting (Trees)

The two mature oak trees (T1 and T2, **Appendix 2**) on the northern boundary of the site did not have features for roosting bats and were therefore of **negligible suitability**.

Two trees within the broadleaved woodland adjacent to the southern site boundary had a small number of features which could be utilised by roosting bats. A mature oak beyond the south-eastern corner of the site had a large branch with a horizontal crack present. A large, dead ash tree (T3, **Appendix 2**) was also present immediately outside the site boundary, which had several areas of peeling bark. These trees will not be affected by the proposed works and were of **low suitability**. Other trees surveyed within the site contained **negligible suitability** for roosting bats as they lack suitable features.

No further surveys for roosting bats (trees) are recommended.

4.3.6.2 Roosting (Buildings)

The single storey cricket clubhouse was c. 20m long, 6m tall and 8m wide. The building had a gable pitched roof and breezeblock rendered walls. The roof was felt-covered externally, with wooden fascia boards and soffits and had been recently replaced at the southern end.

A number of metal security doors and wooden boarded up windows were present on the eastern and southern elevations of the building. All doors and windows were securely locked, however a number of gaps were present (**Photo 9**) which bats may utilise to enter the building. Several gaps were also recorded particularly beneath the barge board on the southern gable end (**Photo 10**). Internal access to the building was not possible at the time of the PEA. Due to the location of the site and the condition of the building at the time of survey, it is considered to be of **moderate suitability** for roosting bats.

Further surveys for roosting bats (buildings) have therefore been recommended in **Section 5**.

Photo 9: Gap above door on the southern elevation.

Photo 10: Gap below barge board on the southern elevation.

4.3.6.3 Foraging and Commuting

Suitable habitat for foraging and commuting bats was recorded on the eastern and western site boundaries at the interface between the amenity grassland and woodland edge. The habitat on site was dominated by amenity grassland which is suboptimal for foraging bats, with similar habitat in the wider area. The habitat within the site is therefore considered to hold **low suitability** for foraging and commuting bats.

The woodland edge bounding the site may be of importance to foraging and commuting bats. Whilst not directly on the site, the proposed development may have significant impact on bats utilising this edge habitat, through a change in land use, direct disturbance and lighting.

Further surveys for foraging and commuting bats have therefore been recommended in **Section 5**.

4.3.7 Hazel Dormice

Essex Wildlife Trust Biological Records Centre did not return any records for dormice within 2km. The site itself is dominated by amenity grassland with scattered trees at the margin and woodland adjacent to the eastern and southern boundaries. The site is located within the dormouse natural range and a lack of records does not indicate a lack of dormouse present, particularly given the abundance of broad-leaved and ancient woodland within the wider locality. There is potential for the woodland adjacent to the site to support hazel dormice, although the application site itself lacks suitable habitat. The site is therefore considered to hold **negligible potential** for dormice, however, the adjacent woodland has **moderate potential** for dormice.

No further surveys for dormouse are recommended. However, measures outlined in **Section 5** to ensure no significant impacts to the adjacent SSSI and LWS woodland habitats, will also serve to reduce the risk of impacting dormice, if present within the woodland, to negligible.

4.3.8 Other BAP / Rare Species

Essex Wildlife Trust Biological Records Centre returned one record of hedgehog *Erinaceus europaeus* and no records of brown hare *Lepus europaeus*. Areas of habitat at the site boundary had potential to be used by hedgehogs for foraging and the margins of the adjacent woodland could also provide areas for shelter. Overall, habitat on site is considered to be of **low potential** for hedgehogs. However, as suitable habitat was present in the adjacent woodland and surrounding landscape it is likely that hedgehogs will move across the site.

Further action for hedgehogs has been recommended in **Section 5**.

Habitat on the site had **negligible potential** to be used by brown hares, and as the site was bordered by woodland and residential areas it was unlikely that brown hares would be present.

No further action for brown hares is recommended.

4.3.9 Invasive Plants

No invasive plant species listed under Schedule 9 of the *WCA* were noted on site during the survey.

However**,** a stand of Japanese knotweed *Fallopia japonica* was recorded at the location of pond 4 (**Figure 1**). This invasive plant species is listed under Schedule 9 of the *WCA 1981* (as amended). As this is situated approximately 240 metres north-east of the site boundary it will not affect the current proposals.

5 Further Surveys, Avoidance, General Mitigation and Enhancement Recommendations

This section discusses recommendations for further surveys, general mitigation and possible enhancements in accordance with relevant wildlife legislation and planning policy (refer to **Appendix 1**).

5.1 Further Surveys / Assessments

5.1.1 Statutory and Non-Statutory Sites: Epping Forest SSSI and Gernon Bushes, West LWS

In order to prevent significant impacts on the SSSI and LWS that lie immediately adjacent to the site, a Construction Method Statement should be compiled. This should aim to outline methods that will be employed throughout the construction process to minimise the risk of pollution, dust, light and noise on the woodland habitats and the flora and fauna it supports.

Additional measures should be put in place to ensure no significant, long-term impacts on the SSSI and LWS once the development is completed. This should include the following measures:

- Maintain a buffer of at least 5m from the woodland edge along the southern and eastern site boundaries, and ensure that this buffer area is suitably fenced to prevent direct access by the public to unmarked footpaths within the woodlands.
- Ensure that there is no light spill from the development on to the woodland edge.
- Offer to contribute to additional signage for the SSSI and LWS to encourage people to stick to marked footpaths and keep dogs on leads in order to minimise any impact of a small potential increase in visitor pressure.

5.1.2 Amphibians

It is recommended that ponds 1-8 identified within 500m of the site (**Figure 1**, **Section 4.3.2**) are revisited during the great crested newt breeding season (mid-March – mid-June) and subject to Habitat Suitability Index (HSI) assessment. Ponds which are considered suitable should be subject to further Environmental DNA eDNA surveys to determine great crested presence / likely absence. Only ponds which test positive for great crested newt eDNA will be subject to traditional survey techniques (using torchlight, bottle-trapping, egg searching and / or netting) depending on the individual requirements of the project, the suitability of each method for each pond and accessibility.

Traditional surveys require four nocturnal visits to each pond and must be carried out during mid-March to mid-June (with at least two surveys carried out between mid-April and mid-May). The survey window for eDNA sampling is mid-March to the end of June, with only one day-time visit required to each pond. The e-DNA method involves laboratory testing of the pond water samples for the recent presence of great crested newts.

Water-bodies that test positive for great crested newt, either by means of traditional survey methods or e-DNA sampling, and where planning permission is sought, will require a total of six aquatic surveys between mid-March and mid-June to estimate the population size. Half of the survey visits must be completed between mid-April and mid-May (Langton, Beckett and Foster, 2001). If traditional surveys were used to determine presence, then these four surveys

will be included in the total number required to determine population size, meaning that only two additional surveys are required.

A Natural England Mitigation Licence would be required if impacts to great crested newt breeding ponds or terrestrial habitat are considered likely.

5.1.3 Badgers: Setts

No badger setts were recorded within the site; however, badger setts can appear at any time where suitable habitat has been identified. A badger survey on and within 30 m around the site by an ecologist c. six weeks before clearance / construction begins is recommended. This will allow time for any mitigation / avoidance measures to be designed, and preparation of a Natural England Badger Development License application if required.

5.1.4 Bat Roosts (Buildings)

Building B1 was assessed as being of **moderate suitability** for roosting bats. Two bat emergence surveys between May and August is therefore recommended in line with current guidance (Collins *et al.*, 2016).

In the event that roosting bats are identified using the building and impacts are considered likely to cause a legal offence, two further appropriately spaced bat emergence/ re-entry surveys between May – September and a Mitigation Licence from Natural England would be required prior to works affecting a roost.

5.1.5 Bats: Foraging and Commuting

The site is considered to hold low suitability for foraging and commuting bats. Therefore, a bat activity survey comprising monthly walked transects and automated recording techniques between April and September is recommended. This type of survey will aim to identify bat species, numbers and habitat usage within the site in line with current guidance (Collins *et al*., 2016).

The results of the survey may highlight important foraging areas and commuting corridors to be retained within the development and inform a lighting plan that is sensitive to bats.

5.2 General Mitigation

5.2.1 Scattered Trees

The following measures should be incorporated within the development to minimise impacts to trees:

- Retain native trees where possible and protect during construction with Heras fencing in line with the British Standards Institute (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations BS5837:2012*;
- Replant any trees lost to the development with native locally sourced specimens (refer to **Appendix 3** for suitable species);

5.2.2 Birds

Clear any woody habitats between September and February (inclusive) to avoid the breeding bird season. Alternatively, an ecologist should check potential nesting habitat immediately before clearance that is scheduled during the breeding season (March to August inclusive). Any active nests identified must be retained *in situ* with a suitable buffer until the ecologist has confirmed that the chicks have fledged and the nest is no longer active.

5.2.3 Badgers: Foraging and Commuting

Although no badger setts or activity were recorded, badgers may forage within or commute across the site from the surrounding woodland. The following measures are therefore recommended;

- Cover excavations at night, or leave an earth / wooden ramp to allow any animals that fall in to escape; and check work areas daily to ensure no animals are trapped;
- Cap any pipes over-night on site to avoid animals becoming trapped; and
- Plant native fruit trees within green open space to provide an additional foraging resource (see **Appendix 3** for suitable species).

5.2.4 Bats

Minimise any external lighting to reduce the risk of disturbance to any foraging and roosting bats in in the local area (both during and post development), as follows:

- Direct any task lighting used during construction away from the mature boundary trees and woodland.
- Set any necessary security lighting on short timers with a sensitivity to large moving objects only.
- Use hoods, cowls or directional lighting to avoid light being directed at the sky or towards the boundary vegetation.
- Limit lighting times to provide dark periods.
- Low pressure sodium security lights with glass glazing are recommended, as these produce the least amount of UV light. Avoid white and blue wavelengths of the light spectrum. Keep the brightness of the lamps as low as feasibly possible (ILE/BCT, 2007; BCT interim guidance 2014).

Note that additional requirements for foraging and commuting bats may be recommended following the results of the activity surveys outlined in **Section 5.1** above.

5.2.5 Reptiles

Due to the low possibility of reptiles utilising the small area of ruderal habitat on the southern and western site boundaries, directional strimming of these habitats should be carried out during the active season (directional towards the woodland). Ground level vegetation should also be cleared over winter when reptiles are not likely to be moving across the site.

Clearance of this area should not occur until great crested newt surveys have been carried out and it has been established that these recommendations will not conflict with any necessary mitigation for great crested newts.

5.2.6 Hedgehog

Install garden / boundary fences with either a 15cm tall gap along the base or provide hedgehog links (15cm x 15cm holes at the base) at 10m intervals to allow hedgehogs to move freely between gardens and adjacent habitats.

5.2.7 General Site Measures

The following precautionary measures are recommended to avoid / reduce impacts to wildlife:

- Cover any trenches, holes or deep pits overnight, or use secured planks to allow any animals that fall in to escape during the construction phase. A member of staff should check the site at the end of each working day to ensure that these provisions to protect nocturnal species (such as hedgehog and badger) have been made.
- Store materials off the ground on pallets to prevent amphibians or reptiles from taking refuge under them. No temporary standing water should be left on the site, which could be used by amphibians.

5.3 Enhancements

The additional recommendations below are designed to enhance the value of the site for wildlife, as encouraged through the NPPF, and help achieve Essex BAP targets.

1) Install no.2 Schwegler 2F General Bird Boxes and/or Sparrow Terraces onto retained suitably mature trees and/or new buildings at least 3m above the ground, avoiding direct sunlight (not directly south-facing) and prevailing wind.
2) Install no.2 IFF and/or 2F Bat Boxes onto retained suitably mature trees and/or new buildings. Install the bat boxes at least 5m above the ground and face in a southerly direction, so that they receive sun for part of the day. Place boxes clear of any obstructions to allow access for bats (e.g. over-hanging branches). Note that further enhancement measure for bats may be recommended following completion of the roosting and activity surveys.
3) Provide no.1 insect house in a sheltered, warm location e.g. within any new flower beds within the public open space to provide over-wintering sites for beneficial insects such as lady birds and lacewings, which typically prey on pest species.
4) Provide a hedgehog house within a sheltered location e.g. at the base of the woodland edge or at the base of retained trees, preferably a distance away from estate roads.
5) Create an additional log pile and/or hibernacula, by filling a hole (c. 2 m by 1 m in extent and up to 50 cm deep) with rubble and wood from native hardwood species to provide reptile and amphibian refuge and hibernation opportunities. These should be located on the site boundary, in an area which will be minimally disturbed on completion. Dead wood habitats provide important egg laying and larval habitat for invertebrates and refugia/ foraging for small mammals and amphibians.
6) Avoid use of slug pellets and use environmentally safe wood preservatives (for sheds and fences etc.).
7) Create a dedicated grass heap and compost heap on the development's southern boundary.

6 Conclusion

Further surveys are recommended for great crested newts and bats to provide a baseline of ecological conditions to inform the planning application, and to enable mitigation and precautions or avoidance of impact to be designed, should these protected species be using the site. A construction method statement should be produced to outline measures that will minimise impacts to the adjacent SSSI and LWS during construction.

The development can proceed with minimal impact to habitats and protected / notable species if the survey, avoidance and mitigation measures outlined within **Section 5** are implemented. There is also the opportunity to significantly enhance the development for local wildlife in the long-term by implementing the enhancement measures.

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Appendix 1 Legislation & Planning Policy

National Legislation

Conservation of Habitat and Species Regulations

The Conservation of Habitats and Species Regulations transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law, making it an offence to deliberately capture, kill or disturb wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

Wildlife & Countryside Act

The *Wildlife and Countryside Act 1981*, as amended by the *Countryside and Rights of Way Act (CRoW) 2000* and the *Natural Environment and Rural Communities Act (NERC) 2006*, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;
- Pick or uproot any wild plant listed under Schedule 8 of the Act.

Sites of Special Scientific Interest (SSSI) are designated under this Act.

Special Protection Areas (SPA) are strictly protected sites, designated under the Birds Directive, for rare and vulnerable birds and for regularly occurring migratory species.

Natural Environment & Rural Communities Act

The *NERC Act* amends the *CRoW Act*, by further extending the requirement to have regard for biodiversity to all public authorities, which includes local authorities and local planning authorities and requires that the Secretary of State consults Natural England (NE) in the publication of the list of living organisms and habitat types deemed to be of principal importance in conserving biodiversity.

National Planning Policy Framework (NPPF)

The NPPF sets out current government policy on biodiversity and nature conservation and places a duty on planners to make material consideration to the effect of a development on legally protected species when considering planning applications. NPPF also promotes sustainable development by ensuring that developments take account of the role and value of biodiversity and that it is conserved and enhanced within a development

NPPF replaced PPS9 in April 2012. NPFF works is considered in conjunction with Government Circular 06/2005 'Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System.'

National Planning Policy

Biodiversity Action Plans

The UK Biodiversity Action Plan (UKBAP) (Anon, 1995) was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. As a result of new drivers and requirements, the 'UK Post-2010 Biodiversity Framework', published in July 2012, has succeeded the UK BAP. In particular, due to devolution and the creation of country-level biodiversity strategies, much of the work previously carried out under the UK BAP is now focussed at a country level.

The UK BAP lists of priority species and habitats are still valuable reference sources. Notably, they have been used to help draw up statutory lists of priority species and habitats as required under Section 41 of the *NERC act*.

UK Post-2010 Biodiversity Framework

The UK Post-2010 Biodiversity Framework (2012) was produced in response to a change in strategic thinking following the publication of the Convention of Biological Diversity's Strategic Plan for Biodiversity 2011–2020. The Strategic Plan consists of 20 new biodiversity targets for 2020, termed the 'Aichi biodiversity targets' and the launch of the new EU Biodiversity Strategy in May 2011.

The framework sets a structure for action across the UK between now and 2020, including a shared vision and priorities for UK-scale activities to help deliver the Aichi targets and the EU Biodiversity Strategy. A major commitment by Parties to the Convention of Biological Diversity is to produce a National Biodiversity Strategy and/or Action Plan (NBSAP).

Natural England Standing Advice

Natural England has adopted national standing advice for protected species. It provides a consistent level of basic advice which can be applied to any planning application that could affect protected species. It replaces some of the individual comments that Natural England has provided in the past to local authorities.

Regional and Local Planning Policy

Essex Biodiversity Action Plan

The Local Habitat and Species Action Plans were first produced in 1999, and reviewed in 2003 and 2008. A complete review of all the BAPS nationally took place in 2007, and local BAPs are now monitored in a nationwide database, the Biodiversity Action Reporting System. A list of all species occurring in Essex which have BAP status from the 2007 are listed online at http://www.essexbiodiversity.org.uk/biodiversity-action-plan

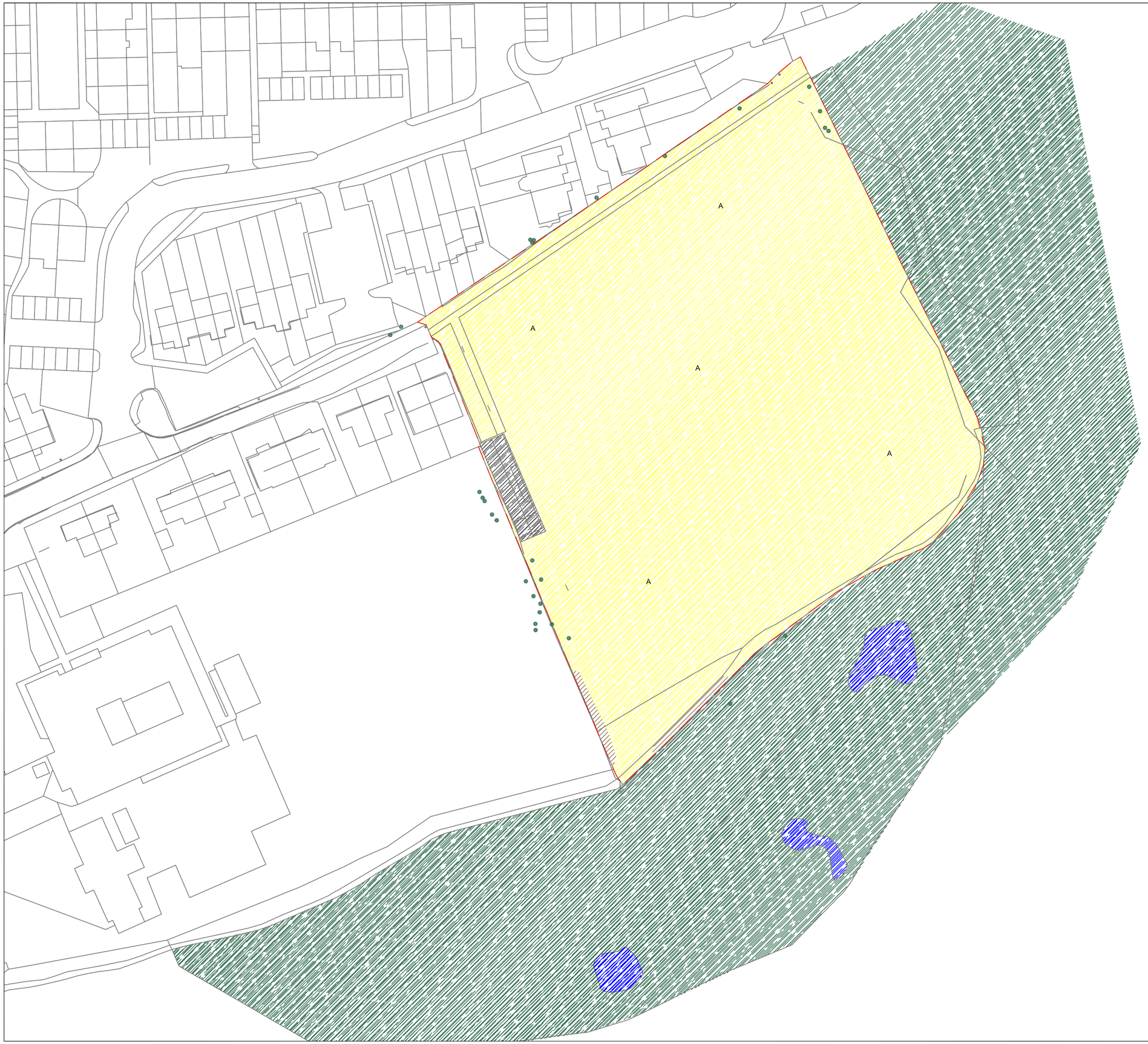
Local Structure Plans

County, District and Local Councils have Structure Plans and other policy documents that include targets and policies which aim to maintain and enhance biodiversity. These are used by Planning Authorities to inform planning decisions.

Relevant Protected Species Legislation

Species	Relevant Legislation	Level of Protection
Great crested newt	• Full protection under the *Wildlife and Countryside Act* (1981) (Listed on Schedule 5) - as amended. • European protected species under the *Conservation of Habitats and Species (Amendment) Regulations 2012*.	It is an offence to: • intentionally kill, injure, or take great crested newts intentionally or recklessly disturb great crested newts. • intentionally or recklessly disturb great crested newts. • intentionally or recklessly damage destroy or obstruct access to any place used by the animal for shelter or protection.
Birds	• Protection under the *Wildlife and Countryside Act (1981)* as amended.	It is an offence to: • intentionally kill, injure or take any wild bird. • intentionally take, damage or destroy nests in use or being built (including ground nesting birds). • intentionally take, damage or destroy eggs. Species listed on Schedule 1 of the WCA or their dependant young are afforded additional protection from disturbance whilst they are at their nests.
Badger	• *Protection of Badgers Act, 1992*.	It is an offence to: • wilfully kill, injure, take, possess, or cruelly ill-treat a badger, or to attempt to do so. • intentionally or recklessly interfere with a sett.
Bats	• European protected species under the *Conservation of Habitats and Species (Amendment) Regulations 2012*. • Full protection under the *Wildlife and Countryside Act (1981)* (Listed on Schedule 5) - as amended. • Protected by the *Wild Mammals (Protection) Act 1996*.	It is an offence to: • intentionally kill, injure, or take any species of bat. • intentionally or recklessly disturb bats. • intentionally or recklessly damage destroy or obstruct access to bat roosts.

Appendix 2 Phase I Habitat Map



REV	DATE	DESCRIPTION

LEGEND

- Site boundary
- Semi-natural broad-leaved woodland
- Broad-leaved tree
- Tall ruderal vegetation
- Water body
- A — Amenity grassland
- Building

LOCATIONS ARE APPROXIMATE.

PROJECT

COOPERSALE CRICKET CLUB,
EPPING, CM16 7QX

TITLE

PHASE 1 HABITAT SURVEY

CLIENT

THE CHISENHALE-MARSH
ESTATE COMPANY

agb ENVIRONMENTAL

agb Environmental Ltd

Newmarket Business Centre, 341 Exning Road,
Newmarket, CB8 0AT
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Web: www.agbenvironmental.co.uk

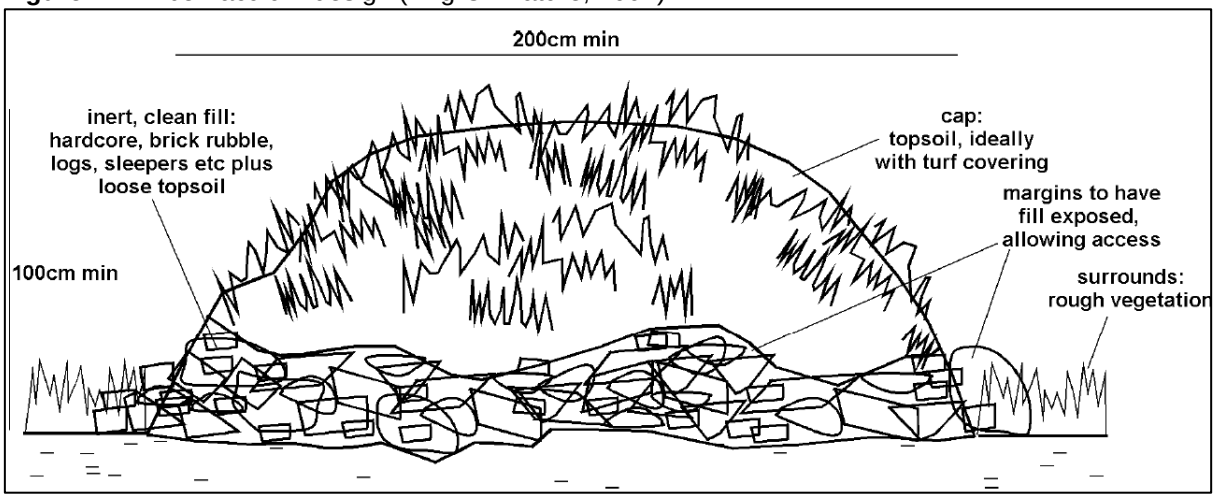
DATE 08/12/16
SCALE 1:600

PROJECT NUMBER . DRAWING NUMBER

P2782.1 . 001

Appendix 3 – Habitat Specifications

Figure A1: Hibernaculum design (English Nature, 2001).



Appendix 4 – Wildlife-Friendly Planting

Table A4.1: Native and Wildlife-Friendly Shrubs (Source: *'Gardening with wildlife in mind'*, Natural England, 2008).

Common Name	Scientific Name
Hazel	*Corylus avellana*
Elder	*Sambucus nigra*
Goat willow	*Salix caprea*
Hawthorn	*Crataegus monogyna*
Dog rose	*Rosa canina*
Guelder rose	*Viburnum opulus*
Gorse	*Ulex europaeus*
Broom	*Cytisus scoparius*
Wayfaring tree	*Viburnum lantana*
Shrubby cinquefoil	*Potentilla fruticosa*
Raspberry	*Rubus idaeus*
Alder buckthorn	*Frangula alnus*
Wild privet	*Ligustrum vulgare*
Barberry	*Berberis × stenophylla*
Barberry	*Berberis vulgaris*
Bell heather	*Erica cinerea*
Bilberry	*Vaccinium myrtillus*
Black currant	*Ribes nigrum*
Blackthorn	*Prunus spinosa*
Buckthorn	*Rhamnus catharticus*
Butcher's-broom	*Ruscus aculeatus*
Cowberry	*Vaccinium vitis-idaea*
Cross-leaved heath	*Erica tetralix*
New Zealand holly	*Olearia macrodonta*
Daphne	*Daphne odora*
Dogwood	*Cornus sanguinea*
Field rose	*Rosa arvensis*
Firethorn	*Pyracanthus angustifolia*
Flowering Currant	*Ribes sanguineum*
Gooseberry	*Ribes uva-crispa*
Hebe 'Midsummer Beauty'	*Hebe* sp.
Himalayan honeysuckle	*Leycesteria formosa*
Holly	*Ilex aquifolium*
Japanese quince	*Chaenomeles japonica*
Lilac	*Syringa vulgaris*
Mexican orange	*Choisya ternata*
Mezereon	*Daphne mezereum*
Midland hawthorn	*Crataegus laevigata*

Common Name	Scientific Name
Oregon grape	*Mahonia aquifolium*
Osier	*Salix viminalis*
Portugal laurel	*Prunus lusitanica*
Privet	*Ligustrum ovalifolium*
Purple willow	*Salix purpurea*
Snowy mespilus	*Amelanchier canadensis, Amelanchier lamarckii*
Spindle	*Euonymus europaeus*
Spurge laurel	*Daphne laureola*
Sweet briar	*Rosa rubiginosa*
Wild privet	*Ligustrum vulgare*

Table A4.2: Native and wildlife-friendly trees (Source: '*Gardening with wildlife in mind'*, Natural England, 2008).

Common Name	Scientific Name
Pedunculate oak	*Quercus robur*
Ash	*Fraxinus excelsior*
Wych elm	*Ulmus glabra*
Whitebeam	*Sorbus aria agg.*
Rowan	*Sorbus aucuparia*
Aspen	*Populus tremula*
Apple	*Malus domestica*
Bird cherry	*Prunus pardus*
Common alder	*Alnus glutinosa*
Crab apple	*Malus sylvestris*
Crack willow	*Salix fragilis*
Downy birch	*Betula pubescens*
False acacia	*Robinia pseudoacacia*
Field maple	*Acer campestre*
Hornbeam	*Carpinus betulus*
Juniper	*Juniperus communis*
Large-leaved lime	*Tilia platyphyllos*
Small-leaved lime	*Tilia cordata*
Pear	*Pyrus communis*
Scots pine	*Pinus sylvestris*
Sessile oak	*Quercus petraea*
Silver birch	*Betula pendula*
Sweet chestnut	*Castanea sativa*
Wild cherry	*Prunus avium*
Wild service-tree	*Sorbus torminalis*
Yew	*Taxus baccata*