# GEO

# **GEOSPHERE ENVIRONMENTAL**

REPORT NUMBER:	4059,EC/PEA/GH,RF,KL/05-12-19/V3
SITE:	Land at North Hemel Hempstead, Hertfordshire, HP2 7HP
DATE:	05/12/2019



# **DOCUMENT CONTROL SHEET**

Report Number:	4059,EC/PEA/GH,RF,KL/05-12-19/V3
Client:	Pigeon (Hemel Hempstead) Ltd
Project Name:	Land at North Hemel Hempstead, Hertfordshire, HP2 7HP
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1000

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REVISION RECORD							
Revision	Date	Revision Details	Prepared By:	Admin			
V1	10/09/19	Original Report	GH	CJ			
V2	27/11/19	Changed site name, area and added in details about enhancement scheme	ТС	CJ			
V3	05/12/19	Amendments in accordance with Client Instructions	ТС	CJ			



# **Executive Summary**

Report	This Preliminary Ecological Appraisal Report has been prepared by Geosphere
Description	Environmental Limited for Pigeon (Hemel Hempstead) Ltd and relates to the
	proposed residential development of the site at Land at North Hemel Hempstead,
	Hertfordshire, HP2 7HP.
	The purpose of this report is to identify any potential ecological constraints to
	development, particularly in relation to potential legally protected species,
	confirm any requirements for further survey work to confirm all baseline
	ecological conditions, and highlight opportunities for ecological enhancement.
Summary of	The site comprises of mainly arable farm land, with semi-improved grassland
Main Findings	field margins, hedgerows and scattered trees.
	The findings of the extended Phase 1 Habitat Survey confirm that whilst much of
	the site comprises of arable farm land with low ecological potential, there are
	boundary habitats onsite which have the potential to support reptiles, birds,
	badgers, Hedgehog and foraging bats.
	The site is not considered suitable for Otter, Water Vole, Roosting Bats, Hazel
	Dormouse or Great Crested Newt.
Ecological	The Majority of the site is arable land, which provides low biodiversity benefits.
Constraints	The constraints to development will be the removal of habitats considered
	suitable for protected species, including trees and hedgerows suitable for foraging
	bats, breeding birds, reptiles, Hedgehog and badgers.
Avoidance	Retention of boundary vegetation within the proposed development will help
measures &	ensure that the connective foraging habitat for foraging bats, badgers, reptiles
Timings of	and hedgehogs are maintained. However, foraging surveys for bats and reptile
impact	surveys are recommended to facilitate the design process and assess impact
impact	should boundary features be removed.
	Any lighting used within the development should not overspill onto the site
	The removal of large areas of vegetation will require further bat activity surveys.
	to assess the potential impact. Any clearance of vegetation should be timed to
	avoid the breeding bird season (March-August inclusive). If this is not possible,
	these habitats can only be removed following confirmation by a suitable gualified
	ecologist that they are not in active use by nesting birds.
Further Survey	 The following are recommended at the appropriate time of year to establish an
Work Required	ecological baseline:
	<ul> <li>Bat foraging/activity surveys (May-September inclusive);</li> </ul>
	<ul> <li>Reptile presence/absence survey (mid-March-October).</li> </ul>
Biodiversity	 The proposed development has been designed to reduce any impacts to protected
Enhancement	species by retaining important hedgerow habitats within the design. The large
Opportunities	



Conclusions	The recommendations within Section 7 of this report should be adhered, to reduce the impact on protected species.
	<ul> <li>proposed houses;</li> <li>Hedgehog friendly fences will retain connectivity for this species.</li> </ul>
	<ul> <li>Plantation of native flora, incorporating night-scented plant species;</li> <li>Bat and bird bricks and boxes could be installed on mature trees or on any</li> </ul>
	biodiversity net gain and enhanced habitat for protected species. The following has been recommended for consideration within the final development scheme:
	country park to the east of the site provides ample opportunities to provide



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# **1. INTRODUCTION**

This Preliminary Ecological Appraisal Report has been prepared by Geosphere Environmental Limited for Pigeon (Hemel Hempstead) Ltd and relates to the proposed residential development of the Land at North Hemel Hempstead, Hertfordshire, HP2 7HP. Any limitations and conditions pertaining to the report are stated within Appendix 1, with a full list of technical references provided within Appendix 2.

The report relates to the proposed development of the 87.8 hectare (ha) site for residential use as shown in Drawing ref. 4059,EC/001/Rev0 included within Appendix 3. The site is located at National Grid reference TL 08410 10445.

The development boundary is shown on Figure 1 below:



Figure 1 – The area surveyed is outlined in red

# 1.1 Aims

This report provides baseline data for the assessment of the site's ecological features and identifies any potential constraints with regards to protected species. It also outlines recommendations for further surveys if necessary.



# 2. LEGISLATIVE AND POLICY CONTEXT

# 2.1 Current UK Legislation

The main legislation that applies to ecological issues within England and Wales is as follows:

- The Conservation of Habitat and Species Regulations 2017 transposes European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. Under the regulations, public bodies have a duty in exercising their functions to have regard to the EC Habitats Directive. The regulations provide for the protection of 'European Sites' and 'European Protected Species'.
- The Wildlife and Countryside Act 1981, (WCA) (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants. The level of protection depends upon which Schedule of the Act the species is listed on. Licences are available for specific purposes to permit actions that would otherwise constitute an offence in relation to species.
- The Natural Environment and Rural Communities, (NERC), Act 2006 imposes an obligation on all public bodies, including local authorities, to consider whether their activities can contribute to the protection of wildlife. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England and states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."

Species-specific legislation is detailed within Appendix 4.

# 2.2 Planning Policy

The recommendations of this report are in line with the key principles of the Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF) (ref. **R.1**) and Government Circular 05/06: Biodiversity and Geological Conservation – (ref. **R.2**).

Local planning policies relating to ecology are invariably based upon the conservation of species protected under the above legislation, including species and habitats of principal importance listed under Section 41 of the NERC Act 2006; and the protection of designated sites.

All of these features are considered within the scope of this Preliminary Ecological Appraisal and therefore any recommendations made herein, are likely to be in line with this policy.



# 3. METHODOLOGY

# **3.1 TECHNICAL APPROACH**

The PEA has been undertaken following guidelines provided by CIEEM's Guidelines for Preliminary Ecological Appraisal, (ref. **R.3**), and BS 42020: 2013 Biodiversity standards, (ref. **R.4**) to provide an indication of the ecological value of the site and the potential for the site to be used by protected species.

Scientific names and common names of plant species identified are as they appear in Stace, (ref. **R.5**).

The conclusions and recommendations for further works are in accordance with current legislation and guidance.

# 3.2 Ecological Desk Study

A data search was conducted of freely available biological records. The sources of information included:

- The Multi-Agency Geographic Information for the Countryside (MAGIC) online database (ref. **R.6**) was consulted to obtain geographic information on key statutory designated nature conservation sites of relevance to the site;
- The Herts Environmental Records Centre (HERC) was contacted to provide details of legally protected species and non-statutory designated conservation sites within 2km of the site. Only records of protected species from within the last ten years are considered within this report;
- Ordnance survey maps were used to identify ponds/ditches within 500m of the site to assess the potential for Great Crested Newt (GCN) within the immediate vicinity of the site.

All relevant desk study data obtained is attached in Appendix 5, except for detailed lists of species given the sensitive nature of the information.

# 3.3 Preliminary Ecological Appraisal

The surveys used to inform the Preliminary Ecological Appraisal comprise of a Phase 1 Habitat and Protected Species Scoping Survey, more often referred to as an extended Phase 1 Habitat Survey.

An extended Phase 1 Habitat Survey of the site was undertaken on 29 January 2019, by Louisa Theeman BSc (Hons) from Geosphere Environmental Ltd. A second walkover was undertaken on 7 August 2019 by Tom Cox, a suitably qualified ecologist. The weather conditions at the time of the most recent survey was dry and partly cloudy, with an approximate temperature of 21°C.

The Phase 1 Habitat Survey involved a walkover of the site in which the habitats are classified according to JNCC Phase 1 Habitat Survey guidelines, (ref. **R.7**). The frequency and cover of each species identified as they are distributed in each habitat is estimated using the DAFOR scale, (ref. **R.8**), as follows:



- Dominant >75% cover;
- Abundant 51-75% cover;
- Frequent 26-50% cover;
- Occasional 11-25% cover;
- Rare 1-10% cover;
- Locally dominant (LD), abundant (LA) and frequent (LF) is also used where the distribution is patchy.

The site was assessed for its suitability to support protected species and other species of conservation importance, which could pose a planning constraint. All signs and areas of habitat considered suitable for protected species or those of conservation interest, were recorded and photographed. These include burrows, droppings, footprints / paths, hairs, refuges and particular habitat types, such as ponds, known to be used by certain class of fauna. Any mammal paths found were noted down and followed where possible. Sites are taken in the context of their surroundings and so include the immediate environs outside of site boundaries, where appropriate.

All established trees that could be accessed onsite were inspected and assessed in terms of their suitability (negligible, low, moderate or high) to support roosting bats, in line with the Bat Conservation Trust (BCT) survey guidelines (ref. **R.9**).

All ponds within 500m of the site were also assessed for their suitability for Great Crested Newt (*Triturus cristatus*) if the ponds were publicly accessible or if access had been granted prior to the survey. This includes a habitat suitability index (HSI) assessment (ref. **R.10**) which assesses the pond based upon a number of factors including the size, water quality, permanence, shading, presence of fish, the number of nearby ponds and macrophyte cover. A score between 0 and 1 is given; where 0 represents poor suitability and 1 represents excellent suitability.

# 3.4 Ecological Impact Assessment

The ecological evaluation and impact assessment detailed below is based upon CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom, (ref. **R.11**).

CIEEM Guidelines state that the value or potential value of an ecological resource or feature should be determined within a defined geographical context from an international to site scale as follows:

- On an International scale, e.g. Ramsar, SAC or SPA site;
- On a UK scale, for example a SSSI or a National Nature Reserve, (NNR);
- On a National scale, e.g. a reserve of importance to England/Northern Ireland/Scotland/Wales;
- On a Regional scale, e.g. a local site with important regional habitats or UKBAP species;
- On a County scale, e.g. a local site with a habitat that is characteristic of the County or rare on a County scale, or with LBAP species;
- On a District scale, e.g. a site with wildlife corridors likely to improve the biodiversity of the area;
- Local or Parish, e.g. areas of green space in a predominantly urban environment;
- On a Site scale, e.g. habitats with value within the zone of influence only.



The potential for protected species to use the habitats onsite can contribute significantly towards the potential value of the habitats onsite.



# 4. DESK STUDY RESULTS

# 4.1 Nature Conservation Sites

There are no designated sites within the site boundary.

No statutory designated nature conservation sites are located within 2km of the site.

Biological records have confirmed the presence of nine non-statutory designations within the 2km search radius. The closest of which is Nicky Way Dismanted Railway which is a Local Wildlife Site (LWS) located 125m to the south of the development site and comprises of a hedgerow, scrub and grassland. This LWS is separated from the development site by Hemel Hemstead Road.

Internationally protected sites (SPA, SAC and Ramsar) receive additional protection under The Conservation of Habitat and Species Regulations 2017, as such a wider search was undertaken for internationally protected sites. There was one protected site within 15km which is Chilterns Beechwood, a SAC located 7.7km to the west of the site.

# 4.2 Protected Species Records

There are 823 records of protected and notable species listed within 2km of the site returned from HERC. Absence of records should not be taken as confirmation that a species is absent from the search area.

Table 1 overleaf, provides a summary:



Table 1 – Selected Protected and Notable Species Records						
Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *		
Amphibian	Amphibian					
Common Frog	Rana temporaria	NO	-	WCA Sch 5 (Common. Documented decline up to 1970s, since then appears to have stabilised).		
Common Toad	Bufo bufo	NO	-	UKBAP, WCA Sch 5, NERC.		
Great Crested Newt	Triturus cristatus	NO	-	UKBAP, WCA Sch 5 + 6, HabsDir.		
Reptile						
Common Lizard	Zootoca vivipara	NO	-	UKBAP, WCA Sch 5, NERC.		
Slow Worm	Anguis fragilis	YES	2007	UKBAP, WCA Sch 5, NERC.		
Adder	Vipera berus	NO	-	UKBAP, WCA Sch 5, NERC.		
Grass Snake	Natrix natrix	NO	-	UKBAP, WCA Sch 5, NERC.		
Mammal						
Badger	Meles meles	YES	2017	PBA.		
Otter	Lutra lutra	NO	-	UKBAP, WCA Sch 5 + 6, HabsDir.		
Water Vole	Arvicola amphibius	NO	-	UKBAP, WCA Sch 5, HabsDir.		
Hedgehog	Erinaceus europaeus	YES	2015	NERC, UKBAP, WCA Sch 6.		
Barbestelle Bat	Barbastella barbastellus	NO	-	HabsDir, WCA Sch 5 + 6.		
Whiskered Bat	Myotis mystacinus	YES	1995	HabsDir, WCA Sch 5 + 6.		
Natterers Bat	Myotis nattereri	YES	2004	HabsDir, WCA Sch 5 + 6.		
Serotine Bat	Eptesicus serotinus	YES	2000	HabsDir, WCA Sch 5 + 6.		
Noctule Bat	Nyctalus noctula	YES	1996	HabsDir, WCA Sch 5 +6, NERC, UKBAP.		
Soprano Pipistrelle	Pipistrellus pygmaeus	NO	-	HabsDir, WCA Sch 5 + 6, NERC, UKBAP.		
Common Pipistrelle	Pipistrellus pipistrellus	YES	2011	HabsDir, WCA Sch 5 + 6.		



Table 1 – Selected Protected and Notable Species Records						
Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *		
Brown Long-eared Bat	Plecotus auritus	YES	2014	HabsDir, WCA Sch 5 + 6, NERC, UKBAP.		
Daubentons bat	Myotis daubentonii	NO	-	HabsDir, WCA Sch 5 + 6, NERC.		
Brown Hare	Lepus europaeus	YES	1997	UKBAP.		
Hazel Dormouse	Muscardinus avellanarius	NO		HabsDir, NERC, UKBAP, WCA Sch 5 + 6.		

#### Plants

There were 59 records of plants within the biological records including one Schedule 8 species, Bluebell (*Hyacinthoides non-scripta*). There is one UKBAP/NERC species, Red Hemp-nettle (*Galeopsis angustifolia*).

#### Invertebrates

There were 541 records of invertebrates returned by HERC, 299 of these were UKBAP/NERC species. Some of these species included: Stag Beetle (*Lucanus cervus*), Mouse Moth (*Amphipyra tragopoginis*) and Small Skipper Butterfly (*Thymelicus sylvestris*).

#### Birds

There were records of 4 Schedule 1 species, 4 UKBAP species and 5 NERC bird species returned by HERC. The Schedule 1 species included Barn Owl (*Tyto alba*), Peregrine (*Falco peregrinus*), Hobby (*Falco subbuteo*) and Red Kite (*Milvus milvus*). Song Thrush (*Turdus philomelos*) was also noted in the records which is a LBAP species.

# Notes:

\*WCA Sch 1 - Wildlife and Countryside Act (1981) Schedule 1. WCA Sch 5 - Wildlife and Countryside Act (1981) Schedule 5 (Killing, injuring and sale of certain species), WCA Sch 6 - Wildlife and Countryside Act (1981) Schedule 6 (Animals which may not be killed or taken by certain methods), WCA Sch 8 - Wildlife and Countryside Act (1981) Schedule 8 (Plants which are protected), UKBAP –UK Biodiversity Action Plan Species, NERC- Natural Environment and Rural Communities Act (2006) Section 41. Species and Habitats of Principal Importance. PBA - Protection of Badgers Act (1992). HabsDir- Conservation of Habitats and Species Directive (2010) Annex II, Annex IV. BoCC Red / Amber - Birds of Conservation Concern - Red or Amber listed.

# 4.3 Habitat Suitability Index Assessments

Two ponds/ditches were identified within 500m of the site however, these were found to be dry and as such no HSI assessment was undertaken.



# **5. FIELD SURVEY RESULTS**

The results of the Phase 1 Habitat Survey and Protected Species Scoping Survey are detailed below and annotated on Drawing ref. 4059,EC/001/Rev0, attached in Appendix 3. Descriptions of the target notes (TN) and relevant photographs are included in Appendix 6.

# 5.1 Phase 1 Habitat Survey

The following habitat types were recorded within the survey area:

- Arable;
- Dense scrub;
- Defunct Species Poor Hedgerow;
- Semi-improved grassland;
- Poor semi-improved grassland;
- Intact species-poor hedgerow;
- Scattered trees.

The habitats outlined above are discussed in more detail below.

The site predominantly consisted of arable land with semi-improved field margins (TN1), containing abundant occurrences of False Oat Grass (*Arrhenatherum elatius*) and Cocks Foot (*Dactylis glomerata*), with frequent occurrences Creeping Bent (*Agrostis stolonifera*). There were occasional occurrences of Wild Carrot (*Daucus carota*), Common Nettle (*Urtica dioica*), Creeping Thistle (*Cirsium arvense*), Curled Dock (*Rumex crispus*), Common Ragwort (*Jacobaea vulgaris*), Field Bindweed (*Convolvulus arvensis*), Ribwort Plantain (*Plantago lanceolate*), Dandelion (*Taraxacum officinale*), Yorkshire Fog (*Holcus lanatus*), Timothy (*Phleum pratense*) and Barren Brome (*Bromus sterilis*). There were also rare occurrences of Barley (*Hordeum vulgare*) and Cleavers (*Galium aparine*).

Tall ruderal is also present onsite, with dominant occurrences of Common Nettle (*Urtica dioica*), abundant occurrence of Bracken (*Pteridium*) and False Oat Grass (*Arrhenatherum elatius*), frequent occurrences of Cleavers (*Galium aparine*) and Creeping Thistle (*Cirsium arvense*), and occasional occurrences of Bramble (*Rubus*).

The species-poor hedgerows onsite (TN2) consisted of Oak (*Quercus Sp*), Ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*). Creeping Thistle (*Cirsium arvense*), Curled Dock (*Rumex crispus*) and Common Nettle (*Urtica dioica*) were noted in the understorey. Scattered trees were also present around the arable field margins which included abundant Oak, frequent Sycamore (*Acer pseudoplatanus*) Field Maple and Ash.



# 5.2 Outside the Development Zone

The south-west boundary is directly adjacent to a residential development, separated by 10m semi-improved field margins and Holtsmere End Lane. The northern edge is opposite from arable farm land, separated by a single-track road. The eastern boundary is bordered by arable fields, separated by field margins. Little Revel End Farm is also on the eastern boundary of the site. The southern boundary is bordered by Hemel Hempstead/Redbourn Road. Beyond the arable land to the south is a large industrial estate and the M1 is located 700m to the east of the development site.



# 6. SPECIES APPRAISAL

# 6.1 Plants

No records of rare plants were returned within biological records and no evidence of any rare plants was noted during the site survey.

# 6.2 Invertebrates

The scattered trees, hedgerows and grassland provide suitable habitat for a common assemblage of invertebrates. Whilst these habitats are of use to invertebrates, the fairly low diversity of common species means that these areas are unlikely to be utilised by a diverse assemblage of rare or nationally important invertebrates.

# 6.3 Amphibians

There are 2 ponds/ditches within 500m of the site, however both are dry, isolated and surrounded by intensive arable land. These ponds are referred to as Ponds 1 to 2 on Drawing ref. 4059,EC/002/Rev0 within Appendix 3. Due to the condition of the ponds and surrounding habitat it is considered unlikely Great Crested Newts would be present.

# 6.4 Bats

The hedgerows, grassland and scattered trees onsite provide suitable foraging and commuting habitats for bats. These habitats are also connected to woodland and hedgerows in the wider area, particularly to the west of the site. Suitable features for roosting bats were not observed within the site boundary.

# 6.5 Reptiles

The poor semi improved-field margins, hedgerows and grassland could provide suitable habitat for reptiles.

# 6.6 Birds

The hedgerows and scattered trees onsite offer value to breeding birds providing suitable nesting and foraging grounds. Table 2 overleaf, shows the species of bird sighed during the survey:



Table 2 – Birds Identified During the Survey						
Common Name	Scientific Name	Status	Location Notes			
Blackbird	Turdus merula	Common and widespread	Flying over site.			
Blue Tit	Parus caeruleus	Common and widespread	Within the trees.			
Chaffinch	Fringilla coelebs	Common and widespread	Within the hedgerows.			
Greenfinch	Carduelis chloris	Common and widespread	Within the hedgerows.			
Magpie	Pica pica	Common and widespread	Within the trees.			
Pheasant	Phasianus colchicus	Common and widespread	Within the grassland.			
Red Kite	Milvus milvus	Schedule 1 species	Roosting onsite, potentially breeding.			
Robin	Erithacus rubecula	Common and widespread	Within the hedgerows.			
Buzzard	Buteo buteo	Common and widespread	Roosting onsite, potentially breeding.			
Skylark	Alauda arvensis	Common and widespread	Roosting onsite, potentially breeding.			

# 6.7 Badger

The grassland field margins, arable land and hedgerows provide suitable secondary habitat for badgers. Several mammal paths and a badger footprint were identified in the north east of the site. No setts were identified onsite.

# 6.8 Hedgehog

The grassland field margins and hedgerows are suitable habitats for hedgehogs.

# 6.8.1 Other Fauna

The habitats present onsite during the survey were not deemed suitable for Otter, Water Vole, roosting Bats or Hazel Dormouse.



# 7. EVALUATION

# 7.1 Nature Conservation Sites

The desk study identified no nature conservation sites with statutory designation, and nine non-statutory designated nature conservation sites within 2km radius of the site. One internationally protected site, Chiltern Beechwood SPA was noted within 15km of the site. Public access/ disturbance is listed as a threat in the Site Improvement Plan for this site. As this development has the potential to increase visitor numbers to this site, the competent authority should take this into account when conducting an HRA. However, the incorporation of the proposed new Country Park at North and East Hemel Hempstead provide the opportunity to minimise any impacts of recreational disturbance to international sites in the area.

The development site does not contain any habitats which could support the important species associated with either the statutory or non-statutory sites, and there is no potential habitat connectivity between the site and the statutory sites.

It is considered unlikely, given the distance from the survey area and localised nature of the proposed development works, that the sites with statutory or non-statutory protection will be directly affected by any construction activity on the surveyed area.

# 7.2 Constraints, Recommendations and Enhancement Opportunities

# 7.2.1 Potential Habitats to be Impacted

The hedgerows onsite have intrinsic ecological value, acting as dispersal routes for local species of wildlife. Should development occur without appropriate mitigation, the loss of habitat could affect species on a local scale. Hedgerows should ideally be retained and enhanced. The loss of any sections of hedgerow should be compensated for by planting new hedgerows onsite to maintain habitat corridors across the site.

Mature trees provide valuable habitat to a wide range of species, as well as cultural value. The unmitigated loss would result in a site to local impact. It would be recommended that mature trees should be retained where possible. Any trees or hedgerows which are removed during development should be replaced within the landscaping of the final development using similar species to maintain habitat corridors. Protection measures should be implemented according to BS 5837: 2012 'trees in relation to design, demolition and construction' (ref. **R.12**).



# 7.2.2 Legally Protected and Notable Species

The ecological evaluation and impact assessment for protected species is detailed within Table 3 below:

Table 3 – F	Fable 3 – Protected Species - Ecological Constraints and Recommended Actions				
Ecological	Biological	Supporting Feature	Impact Should Development	Recommended Actions (Avoidance Measures or	Timing Restrictions
Constraint	Records		without Appropriate	Recommendations for Further Works)	
	Within		Mitigation Take Place		
	2km				
Bats	Yes	The foraging habitat onsite is considered to be of low- moderate value as it connects to wider suitable habitats within the landscape. Boundary vegetation offers suitable commuting routes for bats, particularly on the western and north-east edge of the site. It is considered likely that much of this habitat will be retained, apart from small sections to accommodate access roads.	Should bats be using the site for foraging and commuting, the removal of foraging habitat could result in an impact of site to district significance. The Proposed development is anticipated to retain much of the bat foraging habitat.	<ul> <li>The scattered trees and hedgerows should be retained within the final development scheme. Should any vegetation other than small sections of hedgerow require removal then further activity surveys will be required.</li> <li>During the construction phase, lighting should be directed away from the site boundaries and trees, to ensure light does not overspill onto these habitats. It would be best practice to have all lighting turned off overnight during the peak bat activity times, to avoid disturbance.</li> <li>Any new lighting, which may be installed, should avoid excessive light pollution on hedgerows and trees, which may disturb bats using the site to forage or using commuting routes across the site.</li> <li>Any lighting to be included within the proposed development, should ideally comprise of low-pressure sodium lights or alternatively high-pressure sodium lights with UV filters and louvers. Below are broad examples of what could be considered regarding lighting for the scheme to reduce impact:</li> <li>Power: lighting &lt; 2000 lumens, (150 W);</li> <li>Movement sensors for external lights on properties;</li> <li>Timers: adjusted to the minimum to reduce the amount of 'lit time';</li> <li>Aim of light: aimed to illuminate only the immediate area required by using as sharp a downward angle as</li> </ul>	May to September/Early October inclusive.



Table 3 – Protected Species - Ecological Constraints and Recommended Actions					
Ecological	Biological	Supporting Feature	Impact Should Development	Recommended Actions (Avoidance Measures or	Timing Restrictions
Constraint	Records		without Appropriate	Recommendations for Further Works)	
	Within		Mitigation Take Place		
	2km				
				possible. A shield or hood can be used to control or restrict the area to be lit.	
Badger	Yes	The grassland field margins, hedgerows and arable land provides suitable secondary habitat for badgers. Several mammal paths and a badger print were identified in the north east of the site. No badger setts were identified therefore, the site is likely being used for foraging purposes only.	The removal of secondary foraging habitat for badgers could result in an impact of site scale.	Maximum landscape connectivity should be ensured so that badgers can continue to utilise the site boundaries for foraging and commuting purposes. The retention of the hedgerows should ensure that this connectivity is maintained and therefore no further surveys will be required. Should any vegetation other than small sections of hedgerow require removal then further activity surveys will be required. As Badgers are nocturnal, during construction, any excavations on site should be covered if left open overnight to avoid injury.	N/A
Birds	Yes	The hedgerows and trees onsite offer value to breeding birds for common passerine birds and are considered important on a site scale.	Possible negative impact of site significance.	Breeding bird habitat (especially Trees and Hedgerows) should be retained within the proposed development. If these habitats are proposed to be removed, it is recommended that any vegetation clearance work or building demolition work is undertaken outside of the bird nesting season. The bird-nesting season is generally regarded to extend between March and August inclusive, (weather dependent).	Breeding bird survey March – August inclusive. Unsupervised clearance during September- February only.
				If it is not possible to undertake clearance works outside of the breeding bird season, a suitably qualified Ecologist should be employed to determine if nesting birds are using the site prior to works commencing, to avoid negative impact on protected species. Any active nests that are found would need to be provided with a 10m buffer which would have to be left until the young had fledged, (typically four weeks from eggs being laid for the garden and woodland species likely to be present). Clearance works within the area can recommence only once the nest is no longer in use.	
				A breeding bird survey should be undertaken prior to construction onsite, to determine if Schedule 1 birds are nesting onsite, as Schedule 1 birds require additional	



Table 3 – F	Table 3 – Protected Species - Ecological Constraints and Recommended Actions									
Ecological	Biological	Supporting Feature	Impact Should Development	Recommended Actions (Avoidance Measures or	Timing Restrictions					
Constraint	Records		without Appropriate	<b>Recommendations for Further Works)</b>						
	Within		Mitigation Take Place							
	2km									
				protection during construction (such as avoiding working near nests during the breeding season).						
Reptiles	Yes	The hedgerows and field margins within the site boundary, provide foraging and hibernation opportunities for reptiles. The site also provides good habitat connectivity with other fields.	Possible negative impact of site significance should direct harm occur.	A presence/absence survey should be undertaken targeting areas of suitable habitat. Following this, an appropriate mitigation strategy for reptiles will need to be produced should reptiles be confirmed using the site.	Survey and mitigation between March and October inclusive (weather dependent).					
Hedgehog	Yes	The hedgerows and field margins are suitable habitats for the species.	Possible impact of the site significance.	Retention of the boundary hedgerows will ensure that the habitat is maintained for the species.	N/A					



# 7.3 **Biodiversity Enhancement Opportunities**

The proposals include the creation of a country park. There are good opportunities to achieve an overall biodiversity net gain by including good quality habitats within the park. Recommended for inclusion are: wildflower meadows, species-rich hedgerows with ditches, tree and scrub planting, and wildlife ponds.

The following has been recommended for consideration within the final development Scheme to provide additional habitat for protected species:

- Planting within the final development should ideally be native and considered beneficial to wildlife. Fruit/berry producing trees could be considered in order to provide a local food source for birds. A list of species is provided in Appendix 7;
- Planting of night-scented plant species could attract moths in the evening, which could in turn attract foraging bats, a list of suitable species is attached as Appendix 8;
- Holes in the bottom of garden fences to ensure connectivity for hedgehogs;
- Bat and bird, bricks and boxes, could be installed upon mature trees or integrated into residential dwellings, examples are included within Appendix 9 and 10 respectively.



# 8. CONCLUSIONS

No designated sites are within the site boundary and no statutory designated sites within 2km of the site. None of the habitats that occur within the survey area were considered to have high ecological importance on an international, national, regional or county scale and are of district significance only.

Whilst the proposed development has the potential to indirectly affect the Chiltern Beechwood SPA, this is 15km from the site and the proposed Country Park and wider green infrastructure initiatives provides opportunity to minimise impacts of recreational disturbance. The proposed development will not adversely affect any other statutory or non-statutory designated nature conservation sites.

The findings of the extended Phase 1 Habitat Survey confirm that whilst much of the site comprises of arable farm land with low ecological potential, there are boundary habitats onsite which have the potential to support breeding birds, reptiles, foraging bats, badger and hedgehog. The recommendations within Section 7 of this report should be adhered, to avoid and/ or reduce the impact on protected species.

The results of the recommended survey work, and recommendations for mitigation, should be reported in standalone Phase 2 ecology reports for each survey and submitted to the Local Authority for approval. Recommendations for mitigation should be in-line with CIEEM guidance (ref. **R.11**) for ecological impact assessment.

There are good opportunities to achieve an overall biodiversity net gain by including good quality habitats within the proposed country park and other areas of public open space and the SUDs network. Opportunities exist for the provision of ecological enhancements within the development area in the form of integrated bat/bird bricks and boxes and the incorporation of locally- sourced native plant species, or those of known wildlife benefit, into the landscape strategy.

The proposed development has been designed to reduce any impacts to protected species by retaining important hedgerow habitats within the design. The large country park to the east of the site provides ample opportunities to provide biodiversity net gain and enhanced habitat for protected species.



# **APPENDICES**



# **Appendix 1 – Report Limitations and Conditions**

# **General Limitations and Exceptions**

This report was prepared solely for our Client for the stated purposes only and is not intended to be relied on by any other party or for any other use. No extended duty of care to any third party is implied or offered.

Geosphere Environmental Ltd does not purport to provide specialist legal advice.

The Executive Summary, Conclusions and Recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon until considered in the context of the whole report.

Interpretations and recommendations contained within the report represent our professional opinions, which were arrived at in accordance with currently accepted industry practices at the time of reporting and based upon current legislation in force at that time.

# **Ecology Limitations and Exceptions**

Any limitations associated with the report will be stated. The consequences of any limitations, findings and/or recommendations in the report are made clear in line with CIEEM (2013) 'Guidelines for Preliminary Ecological Appraisal' (GPEA) and BSI (2013) BS 42020:2013 Biodiversity – 'Code of practice for planning and development'.

This report is prepared and written in the context of the proposals stated in the introduction to this report and should not be used in a differing context.

The wildlife and habitats present on any site are subject to change over time. Surveys of this kind can have limited validity, with the possibility of behaviour patterns and territory boundaries varying over time, due to the dynamics of adjacent populations.

New information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to us for re-assessment and, if necessary, re-appraisal.

It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation of the natural environment.



The scoping survey does not assess the presence or absence of a species, but is used to assess the potential for habitat to support them. Additional surveys may be recommended if, on the basis of the preliminary assessment or during subsequent surveys, it is considered reasonably likely that protected species may be present.

This survey does not constitute an invasive species survey and should not be treated as such.

Owing to seasonal variances and prevailing weather, conditions may sometimes be sub-optimal for surveying and this may delay or disrupt planned survey programmes. If applicable, full details are given in the report.

Geosphere Environmental Ltd may not be aware of information that could be held by other organisations or individuals, and it is always possible for features of nature conservation interest to be unrecorded during surveys.

Scientific survey data will be shared with local biological records centre in accordance with the CIEEM professional code of conduct.



# **Appendix 2 – References**

- **R.1.** Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF).
- **R.2.** ODPM (2005) Government Circular: Biodiversity and Geological Conservation statutory obligations and their impact within the planning system.
- **R.3.** CIEEM (December 2017) Guidelines for Preliminary Ecological Appraisal, 2nd ed. Chartered Institute of Ecology and Environmental Management, Winchester.
- **R.4.** BSI (2013) BS 42020:2013 Biodiversity Code of practice for planning and development. BSI Standards Limited 2013.
- **R.5.** Stace, C. A. (2010).New Flora of the British Isles (third edition), Cambridge University Press.
- **R.6.** Magic (2019) Site Check Report. <u>www.magic.gov.uk</u>.
- **R.7.** JNCC, (2010). 'Handbook for Phase I Habitat Survey: A technique for environmental audit' (reprint). Joint Nature Conservation Committee, Peterborough.
- **R.8.** Goldsmith, B. (1991). Monitoring for Conservation and Ecology, Chapman & Hall.
- **R.9.** BCT (2016). 'Bat Surveys Good Practice Guidelines' Bat Conservation Trust, London, 3<sup>rd</sup> Edition.
- **R.10.** Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155.
- **R.11.** CIEEM, (2016). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (Second edition dated January 2016).
- R.12. BS 5837: (2012), 'Trees in Relation to Design, Demolition and Construction'.



# Appendix 3 – Drawings

Phase 1 Habitat Survey Plan – Drawing ref. 4059,EC/001/Rev0 Pond Location Plan – Drawing ref. 4059,EC/002/Rev0





DATE

RF

09/08/2019 CHECKED BY

Phase One Habitat Plan
DRAWING NUMBER
4059,EC/001/Rev0

SCALE

GG

As marked

**DRAWN BY** 

GEO

ECO 111 / 10.03.18 / V3





# Survey Area 500m buffer Pond Pond 1 Accessed ponds and numbers

#### SOURCE

© OpenStreetMap contributors

# PROJECT

Land Adjacent to Holtsmere End Lane, Hemel Hempstead, Hertfordshire, HP2 7HP

TITLE

Pond Location Plan

**DRAWING NUMBER** 

# 4059,EC/002/Rev0



DATE 02/09/2019

RF

GH

**CHECKED BY** 



# **Appendix 4 – Species-Specific Legislation**

# Badger

The Protection of Badgers Act 1992 exists for welfare reasons, to protect badgers from cruelty. Under the act it a criminal offense to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so, or to intentionally or recklessly interfere with a sett.

# Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. It is illegal to kill or injure bats, cause disturbance at their resting places or to block access to, damage or destroy their roost sites.

# **Great Crested Newts**

Great Crested Newts are protected under the Wildlife and Countryside Act 1981 (as amended) Section 5 and the Conservation of Habitats and Species Regulations 2010. It is illegal to intentionally or deliberately kill, injure or capture Great Crested Newts or intentionally, deliberately or recklessly damage or destroy their breeding and resting places or obstruct access to their place of shelter or protection.

# **Hazel Dormouse**

Hazel Dormice are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5 and the Conservation of Habitats and Species Regulations 2010. It is illegal to intentionally or deliberately kill, injure or capture a Dormouse or intentionally, deliberately or recklessly disturb a Dormouse, or damage its breeding or resting place or obstruct its place of shelter or protection.

# **Otters and Water Voles**

Otters are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5 and the Conservation of Habitats and Species Regulations 2010. It illegal to take, injure, kill or sell an otter, it is also an offence to damage, destroy or obstruct access to a resting place or disturb or harm an Otter at any time.

Water Voles are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5. It is illegal to deliberately kill, injure, capture or disturb them or to destroy, damage or obstruct access to any places used for shelter or protection.

# White-clawed Crayfish

White-clawed Crayfish (*Austropotamobius pallipes*) are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5, Sections 9(1) & 9 (5). It is an offence to intentionally take White-clawed Crayfish from the wild or to sell them. It is also a qualifying Annex II species for some Special Areas of Conservation under the Habitats Directive.



# Birds

Wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). It is illegal to take or harm them, their nests (whilst in use or being built) or their eggs.

Additionally, for some species listed under Schedule 1 of the Act, it is an offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young.

# Reptiles

Common reptiles include Slow-worm, Adder, Grass Snake and Common Lizard. These are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5, Sections 9 (1) & 9 (5) only. It is illegal to kill or injure them.

It is not illegal to capture, disturb or to damage their habitats. However, the reptiles themselves are protected so any works to damage their habitat could risk causing harm to reptiles and hence could be illegal.

Rare reptiles which include Sand Lizard and Smooth Snake are restricted to a few locations in Britain and are fully protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9 and the Conservation of Habitats and Species Regulations 2010. It is illegal to kill, injure or intentionally disturb them whilst occupying a 'place used for shelter or protection' and destruction of these places.



# Appendix 5 – Desk Study Data



# Local Sites Map 1



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24/01/2019

#### 8/27/2019

Site Check Report Report generated on Tue Aug 27 2019 You selected the location: Centroid Grid Ref: TL08351056 The following features have been found in your search area:

Local Nature Reserves (England) - points No Features found

National Nature Reserves (England) - points No Features found

Ramsar Sites (England) - points No Features found

Proposed Ramsar Sites (England) - points No Features found

Sites of Special Scientific Interest Units (England) - points No Features found

Sites of Special Scientific Interest (England) - points No Features found

Special Areas of Conservation (England) - points No Features found

Potential Special Protection Areas (England) - points No Features found

**Biosphere Reserves (England) - points** No Features found



# Data Search Results 24/01/2019

# HERC Ref: 201901\_034

# RAMSAR

Ramsar sites are designated under the Convention on Wetlands of International Importance especially as Waterfowl Habitat. Wetlands are designated, protected and promoted in order to stem the progressive encroachment on and loss of wetlands, which are broadly defined to include marsh, fen, peatland and water.

# Special Areas of Conservation (SAC)

Special Areas of Conservation are sites designated by Member States under the EC Habitats Directive. The aim is to establish a European network of important high quality conservation sites that will make a significant contribution to conserving habitats and species considered to be most in need of conservation at a European level.

# **Special Protection Areas (SPA)**

Special Protection Areas are designated under the EC Birds Directive, to conserve the habitat of certain rare or vulnerable birds and regularly occurring migratory birds. Any significant pollution or disturbance to or deterioration of these sites has to be avoided.

# National Nature Reserves (NNR)

National Nature Reserves are statutory reserves established for the nation under the Wildlife and Countryside Act, 1981. NNRs may be owned by relevant national body (e.g. Natural England in England) or established by agreement; a few are owned and managed by non-statutory bodies. NNRs cover a selection of the most important sites for nature conservation in the UK.

# Sites of Special Scientific Interest (SSSI)

Sites of Special Scientific Interest are areas notified under the Wildlife and Countryside Act, 1981, as being of 'special interest for nature conservation'. They represent the finest sites for wildlife and natural features in Great Britain supporting many characteristic, rare and endangered species, habitats and natural features. Notification as a SSSI is primarily a legal mechanism organised by Natural England and selected according to specific criteria. The *Guidelines for the Selection of Biological SSSIs*, published in 1989 by the Joint Nature Conservancy Council, set down the selection criteria for both biological and geological SSSIs.

# Local Nature Reserves (LNR)

Land owned, leased or managed by Local Authorities and designated under the National Parks and Access to the Countryside Act. A site of some nature conservation value managed for educational objectives - no need for SSSI status. Some reserves are managed by a non-statutory body. Local authorities have the power to pass bylaws controlling (e.g.) access, special protection measures.

# **Statutory Sites**

Site Name	Status	Grid Reference	Area (ha)	Distance (m)
None				

# Ancient woodland

Ancient Woodland is land that has had a continuous woodland cover since at least 1600 AD and has only been cleared for underwood or timber production. It can be placed in two categories:

<u>Ancient Semi-natural Woodland (ASNW)</u> – woodland that retains a native tree and shrub cover that has not been planted, although it may have been managed by coppicing or felling and allowed to regenerate naturally. This covers all stands of ancient woodland which do not obviously originate from planting.

<u>Ancient replanted Woodland (AWS</u> - ancient woodland site or PAWS - plantation on ancient woodland site) – woodland where the original tree cover has been felled and replaced by planting, often with conifers and usually this century.

# Ancient Woodland Inventory Sites

Site Name (where known)	<b>Grid Reference</b>	Category	Area (ha)	Distance (m)
	TL074096	ASNW	2.22	1330
	TL077103	ASNW	0.98	830
	TL075103	ASNW	1.20	980
Bury Wood	TL094119	ASNW	4.01	1690
Hay Wood	TL073115	ASNW	5.37	1640
Widmore Wood	TL073085	ASNW	2.73	1990

# Herts and Middlesex Wildlife Trust Nature Reserves

File Code	Site Name	Area (ha)	Distance (m)
None			

# Local Wildlife Site / Wildlife Sites

Local Wildlife Sites are non-statutory sites designated at a county level as being of conservation importance and often recognised in Local authority development plans. The aim of this identification is to protect such sites from land management changes, which may lessen their nature conservation interest, and to encourage sensitive management to maintain and enhance their importance. Although WS have no statutory protection they need to be considered in the planning process through Planning Policy Guidance like PPG9 which refers to the Town & Country Planning Act 1990 Section 30. This states that nature conservation issues should be included in the surveys of local authority areas to ensure that the plans are based on fully adequate information about local species, habitats, geology and landform. Plans should be concerned not only with designated areas but also with other land of conservation value and the possible provision of new habitats.

# Local Wildlife Sites

File Code	Site Name	Grid Reference	Area (ha)	Ratified	Description	Distance (m)
54/001	Great Revel End Farm	TL085112	3.94	1997	Site supporting a wide range of species characteristic of old and relatively undisturbed neutral grassland. Plants of particular note recorded include Sweet Vernal-grass (Anthoxanthum odoratum), Downy Oat-grass (Helictotrichon pubescens), Quaking Grass (Briza media), Pignut (Conopodium majus), Bird's-foot Trefoil (Lotus corniculatus), Common Sorrel (Rumex acetosa), Germander Speedwell (Veronica chamaedrys), Common Knapweed (Centaurea nigra), Meadow Vetchling (Lathyrus pratensis), Field Wood-rush (Luzula campestris) and Burnet-saxifrage (Pimpinella saxifraga). Lady's Smock (Cardamine pratensis) and Celery- leaved Buttercup (Ranunculus sceleratus) have been recorded in damper parts. Habitat diversity is increased by extensive and well preserved earthworks of medieval and post-medieval settlements, including ridge and furrow, boundary banks and enclosures. Wildlife Site criteria: Grassland indicators.	820

54/007	Hay Wood (Holtmere)	TL073115	5.96	1997	Ancient broadleaved woodland site with a semi-natural canopy consisting mainly of Beech (Fagus sylvatica), Pedunculate Oak (Quercus robur) and Wild Cherry (Prunus avium) with some Pedunculate Oak, Ash (Fraxinus excelsior) with Hazel (Corylus avellana) coppice to the southern corner. The ground flora supports numerous indicator species including Bluebell (Hyacinthoides non-scripta), Pignut (Conopodium majus), Woodruff (Galium odoratum), Wood Millet (Milium effusum), Wood Melick (Melica uniflora), Wood Sorrel (Oxalis acetosella) and Dog's Mercury (Mercurialis perennis). A clearing with Bracken (Pteridium aquilinum) and low banks with hedges to the boundary add habitat diversity. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.	1640
54/009	High Wood (Hemel Hempstead)	TL076104	2.29	1997	Ancient woodland remnant mainly of Ash (Fraxinus excelsior), Beech (Fagus sylvatica), Wild Cherry (Prunus avium) and Hybrid Black Poplar (Populus x canadensis) with some Pedunculate Oak (Quercus robur), Hornbeam (Carpinus betulus) and Sycamore (Acer pseudoplatanus) over Hazel (Corylus avellana) coppice. The ground flora includes Bluebell (Hyacinthoides non-scripta), Woodruff (Galium odoratum), Goldilocks Buttercup (Ranunculus auricomus), Broad Buckler-fern (Dryopteris dilatata), Wood Millet (Milium effusum) and Wood Meadow-grass (Poa nemoralis). Along the northern margin there is a hedge bank supporting Hazel coppice. Wildlife Site criteria: Ancient Woodland site with some semi-natural canopy and field evidence suggesting an ancient origin; shown on Bryant's map (1822) as two areas of woodland; woodland indicators.	830
54/011	Bury Wood (near Redbourn)	TL094119	3.88	1997	Ancient semi-natural woodland of Ash (Fraxinus excelsior)/Pedunculate Oak (Quercus robur)/Hazel (Corylus avellana) and Beech (Fagus sylvatica)/Ash (Fraxinus excelsior) stand types. Hazel and Field Maple (Acer campestre) are present as coppice and there are also some old Wild Cherry (Prunus avium) and a large, very old Apple (Malus domestica (pumila)) recorded. The ground flora is dominated by Bluebell	1690

					(Hyacinthoides non-scripta) and Wood Anemone (Anemone nemorosa) with other species noted including Broad Buckler-fern (Dryopteris dilatata), Yellow Archangel (Lamiastrum galeobdolon), Dog's Mercury (Mercurialis perennis), Wood Millet (Milium effusum) and Wood Melick (Melica uniflora). A large internal wood bank, boundary banks and occasionally dense hedges are present. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.	
54/018	Nicky Way Dismantled Railway	TL090102	4.07	1997	Disused railway bordered by areas of rough neutral grassland, tall herbs, wooded hedgerow and scrub. The hedgerow supports a range of woody species including Hawthorn (Crataegus monogyna), Hazel (Corylus avellana), Dogwood (Cornus sanguinea), Blackthorn (Prunus spinosa), Pedunculate Oak (Quercus robur) and Ash (Fraxinus excelsior). Several woodland indicator species have been recorded such as Bluebell (Hyacinthoides non-scripta), Giant Fescue (Festuca gigantea), Dog's Mercury (Mercurialis perennis), Common Dog-violet (Viola riviniana) and Early Dog-violet (V. reichenbachiana). Species noted within the grassland habitat include Agrimony (Agrimonia eupatoria), Common Knapweed (Centaurea nigra), Greater Knapweed (Centaurea scabiosa), Bird's-foot Trefoil (Lotus corniculatus), Common Sorrel (Rumex acetosa) and Meadow Vetchling (Lathyrus pratensis). Wildlife Site criteria: Mosaic; woodland and grassland indicators.	360
54/046	New Wood (W. of Redbourn)	TL082122	3.22	1997	Small area of ancient semi-natural Pedunculate Oak (Quercus robur)/Ash (Fraxinus excelsior) woodland. Pedunculate Oak is dominant within the canopy and Hazel (Corylus avellana) is most frequent in the understorey. The ground flora is reasonably diverse with Bluebell (Hyacinthoides non- scripta) frequent throughout. Other species recorded include Wood Anemone (Anemone nemorosa), Yellow Archangel (Lamiastrum galeobdolon), Woodruff (Galium odoratum), Goldilocks Buttercup (Ranunculus auricomus) and Dog's Mercury (Mercurialis perennis). A bank with a Hawthorn (Crataegus monogyna) hedge is present to the eastern	1930

					margin and a Hawthorn plus Blackthorn (Prunus spinosa) hedge occurs along the western edge. A small pit in the north-west corner adds to the habitat diversity. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.	
66/005	Widmore Wood	TL073085	3.55	1997	Ancient semi-natural Pedunculate Oak (Quercus robur)/Hornbeam (Carpinus betulus) coppice-with-standards woodland with frequent Wild Cherry (Prunus avium). Coppiced Hornbeam is present, but standards predominate, along with much old Hazel (Corylus avellana) coppice. Ash (Fraxinus excelsior) and Beech (Fagus sylvatica) are prominent in the canopy and there is also some Sycamore (Acer pseudoplatanus) and rarer Silver Birch (Betula pendula). Midland Hawthorn (Crataegus laevigata) and Holly (Ilex aquifolium) are present in the understorey. The ground flora is diverse with numerous woodland indicator species recorded including much Bluebell (Hyacinthoides non-scripta) with Woodruff (Galium odoratum) and other species such as Broad Buckler-fern (Dryopteris dilatata), Giant Fescue (Festuca gigantea), Wood Millet (Milium effusum), Wood Sorrel (Oxalis acetosella), Remote Sedge (Carex remota) and Common Dog-violet (Viola riviniana). A few large boundary coppiced/pollarded Hornbeams are present along the west edge. Old marl pits increase habitat diversity. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.	1990
66/015 /01	Disused Railway Line, Hemel Hempstead	TL064082	4.90	1997	Dismantled railway route with banks predominantly lined with old secondary woodland and scrub plus rare small areas of rough grassland and tall herbs where the canopy open out. The woodland comprises mainly Ash (Fraxinus excelsior), Pedunculate Oak (Quercus robur) and Beech (Fagus sylvatica), including some old coppiced or pollarded (Beech) specimens. Sycamore (Acer pseudoplatanus), Hybrid Black Poplar (Populus x canadensis) and Field Maple (Acer campestre) are locally prominent. The shrub layer varies in density and diversity through the site and is mainly of Hawthorn (Crataegus monogyna) and Elder (Sambucus nigra) with some	580

					Hazel (Corylus avellana), Holly (Ilex aquifolium) and scarce Dogwood (Cornus sanguinea). Species recorded within the grassier areas include Wild Carrot (Daucus carota), Perforate St John's-wort (Hypericum perforatum), Lesser Stitchwort (Stellaria graminea), Common Toadflax (Linaria vulgaris) and Wild Basil (Clinopodium vulgare). Wildlife Site criteria: Old secondary woodland with a semi-natural character and varied structure; woodland indicators.	
66/037 /01	Woodhall Wood	TL074096	2.33	1997	Ancient semi-natural woodland remnant dominated by a high canopy of Ash (Fraxinus excelsior) and Wild Cherry (Prunus avium) with occasional Pedunculate Oak (Quercus robur), Beech (Fagus sylvatica), Aspen (Populus tremula) and Hornbeam (Carpinus betulus), mainly around the western perimeter. The shrub layer is characterised by old Hazel (Corylus avellana) coppice with Hawthorn (Crataegus monogyna), Elder (Sambucus nigra) and Wild Cherry. The vegetation of the wood reflects the underlying acid gravels with species such as Bracken (Pteridium aquilinum), Woodruff (Galium odoratum) and Wood Sorrel (Oxalis acetosella). Other species recorded in the ground flora include Bluebell (Hyacinthoides non-scripta), Dog's Mercury (Mercurialis perennis), Wood Millet (Milium effusum), and Wood Sedge (Carex sylvatica). Remnant ancient laid hedges and banks mark the boundary of the original woodland support a wide range of tree and shrub species. Wildlife Site criteria: Ancient Woodland Inventory site; woodland indicators.	1330

# Regionally Important Geological / Geomorphological Site (RIGS)

Regionally Important Geological/Geomorphological Sites are non-statutory earth science sites. The RIGS networks are locally based voluntary groups drawing on both professional and interest groups identifying sites using a methodical and rational approach. RIGS are analogous to non-statutory biological sites - they are not a second tier but sites of regional or local importance in their own right.

# RIGS

File Code	Site Name	Grid Reference	Area (ha)	Distance (m)
None				

# Veteran & Mature Trees from HERC database

Record No	Survey Date	Tree Species	Girth (cm)	Site Name	Site Address	Context	Eastings	Northings	Distance (m)
1437	2002/11/ 16	Cedar of Lebanon	426	St Mary's Church	Redbourn	CH, Churchyard	510100	211600	1940



# Appendix 6 – Target Notes

Target Note 1



Target Note 2





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### NOTES

**Target Note 1** The semi-improved field margins, looking to the south of the site.

**Target Note 2** The hedgerows and scattered trees, looking south of the site, along the farm track.

#### PROJECT

Land Adjacent to Holtsmere End Lane, Hemel Hempstead, Hertfordshire, HP2 7HP

#### **PROJECT NUMBER**

4059,EC

# TITLE

Ecological Target Notes Relating to Extended Phase 1 Habitat Survey

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# **Appendix 7 – Native Species**

# **GENERAL PLANTS CONSIDERED BENEFICIAL TO WILDLIFE**

The lists of plants below are taken from current Natural England guidance (ref. 1), a web-based data based managed on behalf of the RHS and the Wildlife Trusts (ref. 2) and professional judgement. When buying native plants, ensure they are from a reputable source, as many wildflowers are illegally taken from the wild.

# **Large Trees**

Common Name	Latin Name	Common Name	Latin Name
Beech	Fagus sylvatica	Pedunculate Oak	Quercus robur
Wild Cherry	Prunus avium	White Willow	Salix alba
Bird Cherry	Prunus padus	Small-leaved Lime	Tilia cordata
Sessile Oak	Quercus petraea		

# **Medium/Small Trees**

Common Name	Latin Name	Common Name	Latin Name
Field Maple	Acer campestre	Apples	Malus spp.
Alder	Alnus glutinosa	Pears	<i>Pyrus</i> spp.
Silver Birch	Betula pendula	Rowan	Sorbus aucuparia
Holly	Ilex aquifolium		

# **Other Shrubs for Nectar, Pollen or Fruits**

Common Name	Latin Name	Common Name	Latin Name
Serviceberry	Amelanchier canadensis	Himalayan Honeysuckle	Leycesteria formosa
June Berry	Amelanchier lamarckii	Mahonia	Mohonia spp.
Californian lilac	Ceanothus spp.	Mock Orange	Philadelphus spp.
Japanese quince	Chaenomeles japonica	Firethorn	Pyracantha spp
Creeping Cotoneaster	Cotoneaster frigidus	Lilac	Syringa vulgaris
Daphne	Daphne mezereum	Laurustinus	Viburnum tinus
Hebes	Hebe spp.	Bodant Viburnum	Viburnum x bodnantense
Lavenders	Lavandula spp.		

# **Native Wildflowers for Borders**

Common Name	Latin Name	Common Name	Latin Name
Yarrow	Achillea millefolium	Toadflax	Linaria vulgaris
Agrimony	Agrimonia eupatoria	Yellow loosestrife	Lysimachia vulgaris
Corncockle	Agrostemma githago	Common mallow	Malva sylvestris
Chives	Allium schoenoprasum	Marjoram	Origanum vulgare
Harebell	Campanula rotundifolia	Common poppy	Papaver rhoeas
Cornflower	Centaurea cyanus	Cowslip	Primula veris
Greater knapweed	Centaurea scabiosa	Primrose	Primula vulgaris
Chicory	Chichorium intybus	White campion	Silene alba
Foxglove	Digitalis purpurea	Red campion	Silene dioica
Teasel	Dipsacus fullonum	Goldenrod	Solidago virgaurea

# REFERENCE

- 1. Natural England (2007). Plants for Wildlife-friendly Gardens: NE29.
- 2. RHS and the Wildlife Trusts (2015). Gardening with Wildlife in Mind. <u>http://www.joyofplants.com/</u> <u>wildlife/</u>.

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**General Plants Considered Beneficial To Wildlife** 

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Sea hollies	Eryngium spp.	Devil's-bit scabious	Succisa pratensis
Lady's bedstraw	Galium verum	Tansy	Tanacetum vulgare
Meadow crane's-bill	Geranium pratense	Dandelion	Taraxacum officinale
Herb-robert	Geranium robertianum	Wild thyme	Thymus drucei
Dame's-violet	Hesperis matronalis	Great mullein	Verbascum thapsus
Field Scabious	Knautia arvensis	Germander speedwell	Veronica chamaedrys
Oxeye daisy	Leucanthemum vulgare	Spiked speedwell	Veronica spicata



# **Cultivated Plants for Borders**

Common Name	Latin Name	Common Name	Latin Name
Alliums	Allium spp.	California poppy	Eschscholzia californica
Hollyhock	Althaea rosea	Snowdrop	Galanthus nivalis
Yellow alyssum	Alyssum saxatile	Sunflowers	Helianthus spp.
Grecian windflower	Anemone blanda	Christmas rose	Helleborus niger
Angelica	Angelica archangelica	Lenten rose	Helleborus orientalis
Snapdragon	Antirrhinum majus	Candytuft	Iberis sempervirens
Alpine rock-cress	Arabis alpina	Poached-egg plant	Limnanthes douglasii
Michaelmas daisies	Aster spp.	Hybrids sweet alyssum	Lobularia maritime
Lilacbush	Aubrieta deltoidea	Honesty	Lunaria rediviva or annua
Borage	Borago officinalis	Sweet bergamot	Monarda didyma
Pot marigold	Calendula offinialis	Grape hyacinth	Muscari botryoides
Red valerian	Centranthus ruber	Forget-me-not	<i>Myosotis</i> spp.
Wallflower	Cheiranthus cheiri	Tobacco plant	Nicotiana sylvestris
Corn marigold	Chrysanthemum segetum	Evening primrose	Oenothera biennis
Cosmos	Cosmos bipinnatus	Phlox	Phlox paniculata
Spring crocus	Crocus chrysanthus	Black-eyed Susan	Rudbeckia fulgida
Sweet William	Dianthus barbatus	Scabious	Scabiosa spp.
Purple coneflower	Echinacea purpurea	Ice plant	Sedum spectabile
Globe thistle	Echinops ritro	French marigold	Tagetes spp.
Winter aconite	Eranthis hyemalis	Mulleins	Verbascum spp.
Fleabane	Erigeron spp.		

# **Plants for Shady Areas**

Common Name	Latin Name	Common Name	Latin Name
Bugle	Ajuga reptans	Bluebell	Hyacinthoides non-scripta
Lords and Ladies/ Cuckoopint	Arum maculatum	Yellow archangel	Lamiastrum galeobdolon
Lilly of the Valley	Convallaria majalis	Daffodils	Narcissus pseudonarcissus
Foxglove	Digitalis purpurea	Primrose	Primula vulgaris
Wood avens	Geum urbanum	Sweet Violet	Viola odorata

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General Plants Considered Beneficial to Wildlife

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# **Appendix 8 – Plants Beneficial to Bats**

# **PLANTS CONSIDERED BENEFICIAL TO BATS**

The lists of plants below are considered suitable species for foraging bats. When buying native plants, ensure they are from a reputable source, as many wildflowers are illegally taken from the wild.

### Trees

Common Name	Latin Name	Common Name	Latin Name
Apple	Malus domestica	Plum	Prunus domestica
Bird Cherry	Prunus padus	Rowan	Sorbus aucuparia
Crab Apple	Malus baccata	Sugar Maple	Acer saccharum
Medlar	Mespilus germanica	Sycamore	Acer pseudoplatanus
Norway Maple	Acer platanoides	Whitebeam	Sorbus aria
Pear	Pyrus communis	Wild Cherry	Prunus avium

### shrubs

Common Name	Latin Name	Common Name	Latin Name
Field Maple	Acer campestre	Butterfly Bush	Buddleja davidii
Hazel	Corylus avellana	Golden Ball Buddleia	Buddleja globose
Hawthorn	Crataegus monogyna	Hebe	Hebe spp.
Heather	Erica vagans	Privet	Ligustrum ovalifolium
Cherry Laurel	Prunus laurocerasus	Wayfaring	Viburnum lantana

# **Climbers**

Common Name	Latin Name	Common Name	Latin Name
Dog Rose	Rosa canina	Ivy	Hedera helix
Guelder Rose	Viburnum opulus	Jasmine (night scented)	Cestrum nocturnum
Honeysuckle	Lonicera periclymenum		

# **Herbaceous Plants**

Common Name	Latin Name	Common Name	Latin Name
Angelica	Angelica sylvestris	Lemon Balm	Melissa officinalis
Aubretia	Aubretia deltoidea	Marjoram	Origanum majorana
Candytuft	Iberis sempervirens	Knapweed	Centaurea nigra
Corn Cockle	Agrostemma githago	Mallow	Malva sylvestris
Cornflower	Centaurea cyanus	Ox-eye Daisy	Leucanthemum vulgare
Corn Marigold	Glebionis segetum	Primrose	Primula vulgaris
Borage	Borago officinalis	Yarrow	Achillea millefolium
English Marigolds	Calendula officinalis	Rosemary	Rosmarinus officinalis
Lavender	Lavandula spp.	Sweet Cicely	Myrrhis odorata
Musk Mallow	Malva moschata		

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#### REFERENCES

ECO130 / 03-10-18 / V1



# Appendix 9 – Bat Bricks and Boxes

# **EXAMPLE BAT BRICKS AND BOXES**

# Integrated Bat Box: Ibstock Enclosed Bat Box 'B'



SOURCE http://www.nhbs.com/title/16055





The Ibstock Enclosed Bat Box 'B' is designed for integration into the wall of new buildings or conservation projects and is intended to provide summer roosting space for pipistrelles specifically. It provides a discrete home for bats, with several roosting chambers to provide zones of differing temperatures within the box. The bats are contained within the box itself and the entrance at the bottom allows droppings to fall out, meaning that the box is maintenance free.

# **Integrated Bat Box: Standard bat Box**



Bat boxes can be supplied in brick fronted, half bond and quarter bond brickwork or alternatively with a stainless-steel mesh fitted to the front. The mesh is designed for optimum adhesion in render and stonework applications. A basic version can be fitted directly behind weatherboarding or into studwork.

These bat boxes are best positioned in sunlit clusters, at a height of 3-6 metres and ideally facing a variety of aspects as bats will move around a building as the seasons change.

This product makes an ideal bat house for most of the UK's bat species, including Pipistrelles, who will use it for roosting, hibernating and (in maternity roosts) bringing up their young. The entrance hole and internal design can be tailored to suit different species of bat e.g. Bechstein's and Serotine.

The box is self-cleaning. The bat boxes are supplied with a non-removable **Example Bat Bricks and Boxes** front as standard.

#### SOURCE http://www.birdbrickhouses.co.uk /brick-nesting-boxes/bat-box/

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http://www.nhbs.com/title/16055

# **External Bat Box: Schwegler 1FQ bat box**



The structure of the 1FQ has been designed with bat behaviour in mind. For example, the outside of the front panel has been roughened to enable the animals to land and hang onto it securely. Access is via a step-like recess which enables even young and inexperienced bats, to safely access the box. The inside of the box has rough pieces of wood incorporated which provide good insulation and are also used by the bats as perches. The internal layout provides three different areas from which bats can hang and which offer different levels of light and temperature. There are also non-slip areas, gaps ranging from 1.5 to 3.5cm in width and various places for individuals to hide.

Installation of the 1FQ is achieved using the four screws and plugs provided. The back panel is initially screwed onto the wall (using four screws) and then the front panel is attached to this. It can easily be attached to most types of external brick, timber or concrete and can also be placed inside a roof space. (If fixing to timber then the gaps between the wall and the box should be sealed with silicone to prevent moisture being trapped here). The box should be positioned a minimum of three metres above the ground and where there is a clear flight path for bats entering and leaving. If desired, the front panel can be painted to match your building using an air-permeable paint.

# **External Bat Box: 1FF Schwegler Bat Box with Built-in Wooden Rear Panel**



The Schwegler 1FF bat box is spacious enough for bats to use as a summer roost or nursery site and is open at the bottom, allowing droppings to fall out so it does not need cleaning. The 1FF is, therefore, especially suitable for hanging in inaccessible places such as high in trees, or on steep slopes and house walls.

The 1FF is manufactured from long-lasting Woodcrete, which is a blend of wood, concrete and clay which will not rot, leak, crack or warp, and will last for at least 20 - 25 years, making it suitable for long-term mitigation projects.

The inner dimensions of the 1FF have a reducing width making it ideal for bat species which inhabit crevices such as pipistrelle and noctule bats. For conservation projects and studies, the entire front of the box can be easily swung open for inspection purposes.

The 1FF bat box can be sited in trees or on buildings and is best positioned at a height of between 4 to 6 metres.

#### SOURCE

SOURCE

https://www.nhbs.com/1ffschwegler-bat-box-with-built-inwooden-rear-panel

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**Example Bat Bricks & Boxes** 

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# External Bat Box: 2F Schwegler Bat Box with Double Front Panel

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This box has a front panel and a second inner wooden panel fitted to it to create a cavity wall. This provides ideal quarters for bats that inhabit crevices, such as Nathusius' Pipistrelle (Pipistrellus nathusii), Daubenton`s Bat (Myotis daubetonii) and the Common Pipistrelle (Pipistrellus pipistrellus).

It has been designed as a summer roosting space for bats and has a simple entrance hole at the front. The Schwegler 2F double front panel is removable and can be converted in to a bird nest box using a replacement 1B front panel if there is no evidence of bat activity after a couple of years. The 2F Double Front Panel is manufactured from longlasting Woodcrete, which is a blend of wood, concrete and clay which will not rot, leak, crack or warp, and will last for at least 20 - 25 years, making it suitable for long-term mitigation projects. Woodcrete is breathable and maintains a stable temperature inside the box and the 2F is painted black to absorb warmth. It also provides a good rough surface for bats to cling on to and climb.

The 2F Double Front Panel bat box can be sited in trees or on buildings and is best positioned at a height of between 3 to 6 metres.

SOURCE https://www.nhbs.com/vincentpro-bat-box

# External Bat Box: Vincent Pro Bat Box



This attractive bat box has been designed by leading bat researcher, Collin Morris, based on a tried and tested design from the Vincent Wildlife Trust.

The box features three vertical chambers of different sizes, providing ideal roosting space for a variety of species. Beneath the crevice entrances is a ladder which provides a rough surface for bats to land.

Proven with seven UK species: Barbastelle, Leisler's, common pipistrelle, soprano pipistrelle, brown long-eared, Natterer's and whiskered bat.

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Please note that once bats have inhabited a roost (integrated or external box) they may only be disturbed by licensed bat workers.

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# Appendix 10 – Bird Bricks and Boxes

# **EXAMPLE BIRD BRICKS & BOXES**

# **Integrated Bird Brick House: The Standard Box**



This standard nesting box is suitable for House Sparrows and members of the Tit family. The single entrance hole allows the entire internal area to be available for nesting and roosting. The aperture size will vary according to the target species. For example, a 48 mm entrance hole can be produced to accommodate Starlings. The ideal internal depth is 140 mm, however if cavity width is limited, boxes can be manufactured with a reduced depth (minimum 100 mm).

# GEOSPHERE ENVIRONMENTAL

# SOURCE

http://www.birdbrickhouses.co. uk/brick-nesting-boxes/nestingboxes/

# **Integrated Bird Brick House: Sparrow terrace box**



This has the same external dimensions as the standard box but has two entrance holes and two separate compartments – ideal for the sociable nature of house sparrows. The terrace box is also suitable for Redstarts, Black Redstarts and Wagtails.

#### SOURCE

http://www.birdbrickhouses.co. uk/brick-nesting-boxes/nestingboxes/

#### TITLE

Example Bird Bricks and Boxes

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# External Bird House: 1B Schwegler Bird Nest Box (General)



These Woodcrete nest boxes last for at least 20-25 years. Woodcrete is a breathable blend of wood, concrete and clay which will not rot, leak, crack or warp, whilst preventing condensation and maintaining more constant temperatures inside than wooden boxes.

Schwegler bird boxes are backed by conservation organisations, government agencies and forestry experts and experiments have shown that the highest density if bird populations (i.e. breeding pairs per hectare) is achieved with Schwegler nest boxes.

They are carefully designed to provide a stable environment and to mimic natural nest and roost sites with internal brood chamber dimensions that are similar to natural woodpecker cavities. Schwegler have a patented method of installation on trees that prevents the tree trunk from growing over the hanger from which the box is suspended.

# External Bird House: 1ZA Schwegler Wren Roundhouse



The nest box is designed to encourage Wrens as they like to nest near the ground, in undergrowth. They are not particularly good flyers, preferring to hop about in the undergrowth. They like shady places - in hedges, thickets, heavily overgrown areas and bushes as well as balconies.

Hang the nest box in undergrowth, in a shady place. It can also be placed upon a pile of brushwood or garden clippings, for example. If hung in a totally unobstructed place it will also attract other types of birds that nest in holes and cavities, including Blue-, Coal- and Great Tits, as well as Tree and House Sparrows.

These Woodcrete nest boxes last for at least 20-25 years.

SOURCE https://www.nhbs.com/1zaschwegler-wren-roundhouse

GEO

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https://www.nhbs.com/1b-

schwegler-nest-box

SOURCE

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