

**PRELIMINARY ECOLOGICAL APPRAISAL  
FOR A PROPOSED MIXED-USE DEVELOPMENT AT  
MARRIOTT'S PARK, TAVERHAM, NORFOLK, NR8 6HL**

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## REVISION RECORD

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## AMENDMENT RECORD

Revision	Date	Amendments
V2	12-12-18	Provided more detail about protected sites

## EXECUTIVE SUMMARY

Ecological Survey Data Review	
Report Description	<p>Geosphere Environmental Limited was commissioned by M Scott Properties Ltd, to undertake a Preliminary Ecological Appraisal of the land at Marriott's Park, Taverham, Norfolk, NR8 6HL.</p> <p>The site is located at National Grid Reference (NGR) TG 16511 15419. The report relates to the proposed redevelopment of the site for proposed mixed-use development.</p> <p>The proposed development covers an area of approximately 80 hectares (ha). This and the immediate surrounding area were surveyed.</p>
Summary of Main Findings	<p>The site predominantly comprises of arable fields, with semi-improved grassland margins. Hedgerows are also present along some field boundaries and scattered trees, particularly along Marriott's Way which runs through the site.</p> <p>There are suitable features which may provide suitable habitat for the following:</p> <ul style="list-style-type: none"> <li>○ <b>Roosting Bats:</b> The buildings, brick bridge and a number of trees within with the site boundary that have suitable roosting features for bats;</li> <li>○ <b>Foraging Bats:</b> The hedgerows, trees and grassland provide moderate suitability foraging and commuting habitat for bats;</li> <li>○ <b>Great Crested Newt:</b> Pond 1 is considered suitable for breeding Great Crested Newts and is connected to the terrestrial habitats (tree lines and poor semi-improved grassland) on site;</li> <li>○ <b>Birds:</b> The hedgerows, scrub and scattered trees, as well as some field margins, provide suitable nesting habitat for breeding birds during the breeding season, and migratory/wintering birds during the winter;</li> <li>○ <b>Reptiles:</b> The tree lines, scrub and grassland on site could provide habitat for reptiles;</li> <li>○ <b>Badgers:</b> Mammal paths are located within the site boundary; however, the site is regularly used by dog walkers. No setts were found within the site boundary or surrounding area;</li> <li>○ <b>Protected Sites:</b> Marriott's Way CWS runs through the centre of the site. The closest statutory site is located 1.4km to the south.</li> </ul> <p>The site is not considered suitable for any other protected species.</p>
Ecological Constraints	<p>The constraints to development will be the removal or disturbance of the poor semi-improved grassland, scrub, trees, buildings and brick bridge which could impact roosting, foraging and commuting bats, breeding birds, reptiles or Great Crested Newts.</p>
Recommendations	<p><b>Further Surveys:</b></p> <ul style="list-style-type: none"> <li>○ <b>Bat roost survey:</b> Further surveys may be required to determine roosting levels should buildings, trees and brick bridge require works undertaken on them;</li> <li>○ <b>Bat activity survey:</b> Further surveys are required to determine the number of bats and species using the site. A minimum of three surveys should be undertaken from May to September;</li> </ul>

	<ul style="list-style-type: none"> <li>○ <b>Great Crested Newt Survey:</b> Pond 1, is considered suitable for GCN and as such should have an eDNA or traditional surveys carried out;</li> <li>○ <b>Reptiles survey:</b> A reptile survey is required to determine presence/absence (April to October);</li> <li>○ <b>Bird Surveys:</b> It is recommended that breeding and migratory/wintering bird assemblages should be assessed (March to July and November to February respectively);</li> <li>○ <b>Badger Survey:</b> Although no setts were found on or in the vicinity of the site, badgers can move sett locations at any time. A re-check should be made for setts prior to construction;</li> </ul> <p><b>Avoidance and Mitigation:</b></p> <ul style="list-style-type: none"> <li>○ Impact to Marriott's way should be avoided. To avoid an increase in recreational pressure to internationally protected sites (including Broadland (RAMSAR, SPA), River Wensum (SAC), Norfolk Valley Fens (SAC), The Broads (SAC)), the proposed development should include Suitable Alternative Natural Greenspace, including high quality, informal, semi-natural areas, and Circular Dog walking routes of 2.7km. A site-specific Habitats regulations assessment may be required to assess potential impacts of development on European protected sites.</li> <li>○ Any hedgerows or trees to be retained should be protected during the works, according to BS 5837: 2012 'trees in relation to design, demolition and construction' (ref. <b>R.11</b>).</li> <li>○ Vegetation clearance should be undertaken outside of the bird nesting season (from September to February) or under supervision of a suitably qualified ecologist.</li> </ul>
<p>Biodiversity Enhancement Opportunities</p>	<p>The following has been recommended for consideration within the final development Scheme:</p> <ul style="list-style-type: none"> <li>○ Any plants considered 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. Suitable species are included in Appendix 7;</li> <li>○ Log piles for invertebrates;</li> <li>○ Nest boxes or nest bricks for common passerine birds;</li> <li>○ Holes in the bottom of garden fences should be included to provide habitat connectivity for foraging hedgehogs.</li> </ul>
<p>Conclusions</p>	<p>The site has the potential to support roosting, foraging and commuting bats, GCN, breeding/migratory and wintering birds and reptiles. The recommendations within Section 6 of this report should be adhered to, in order to reduce the impact on protected species.</p>

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## 1. INTRODUCTION

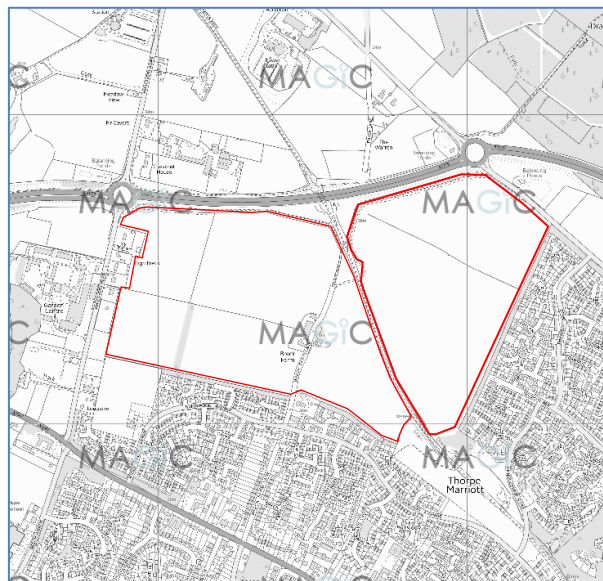
### 1.1 General

Geosphere Environmental Ltd was commissioned by M Scott Properties Ltd, to undertake a Preliminary Ecology Appraisal (PEA) of the site at Marriott's Park, Taverham, Norfolk, NR8 6HL.

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 approximately 80 hectare (ha) site for proposed mixed-use development. The site is located at National Grid reference (NGR) TG 16511 15419.

The development boundary is shown on Figure 1 below:



**Figure 1 – The proposed development boundary is outlined in red.**

### 1.2 Aims

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

### 1.3 Current UK Legislation

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

- The Conservation of Habitats and Species Regulations 2017, consolidating all amendments to the Conservation, (Natural Habitats etc.), Regulations 1994. This legislation implements the EU Habitats Directive and also contains new provisions designed to implement aspects of the Marine and Coastal Access Act 2009 for England and Wales. These regulations place a duty on the UK to designate sites of European Community importance as special areas of conservation (SACs) and to protect European species of conservation concern;

- The Wildlife and Countryside Act 1981 (WCA) was amended by the Wildlife and Countryside (Amendment) Act 1985 and the Countryside and Rights of Way Act 2000 (CRoW). The Act provides various levels of protection for wild birds, including species listed in Schedule 5 protected under Section 9, (animals which are protected). In addition, wild plant species listed under Schedule 8 are also protected from intentional or reckless picking, uprooting or destruction including any seed or spore of these plants;
- 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. There are 943 species of principal importance and fifty-six habitats of principal importance included on the S41 list;
- Badgers (*Meles meles*) are protected under the Protection of Badgers Act 1992, (PBA), making 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.

## 1.4 Site Specific Legislation

### 1.4.1 Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. 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.

### 1.4.2 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 2017. 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.

### 1.4.3 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.

### 1.4.4 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.

## 2. TECHNICAL APPROACH

The PEA has been undertaken following guidelines provided by CIEEM's Guidelines for Preliminary Ecological Appraisal, (ref. **R.1**), and BS 42020: 2013 Biodiversity standards, (ref. **R.2**).

A desk study and ecological site walkover has been undertaken in accordance the key principles of the Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF) (ref.**R.3**), and Government Circular 05/06: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system, (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.

The habitat survey was undertaken in general accordance with JNCC methodology, (ref. **R.5**). Scientific names and common names of plant species identified are as they appear in Stace, (ref. **R.6**).

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

### 2.1 Ecological Desk Study

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

- Natural England Magic website for geographic information on key statutory designated nature conservation sites within 2km of the site (ref. **R.7**);
- Norfolk Biodiversity Information Service (NBIS) was contacted to provide details of legally protected species and non-statutory designated conservation sites within 5km of NGR TG 16511 15419;
- 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 4.

### 2.2 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.

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.5**). 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.

### 2.3 Habitat Suitability Index

All ponds/ditches identified within 500m of the Site were assessed for their suitability to support GCN, where access was possible. A Habitat Suitability Index (HSI) (ref. **R.9**) can be used to assess the suitability of a pond for GCN, 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.

### 2.4 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.10**).

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 on site contributes significantly towards the potential value of the habitats on site.

### 3. DESK STUDY RESULTS

All relevant desk study data obtained is attached in Appendix 4, except for detailed lists of species given the sensitive nature of the information.

#### 3.1 Statutory Designated Nature Conservation Sites

The River Wensum is located 1.4km west and south of the site. The River is designated as a Site of Special Scientific Interest (SSSI), as well as a Special Area of Conservation (SAC). This 393 hectares (ha) site comprises of one of the best examples of an enriched, calcareous lowland river, with over 100 species of plants. This SSSI is separated from site by residential development and roads.

Within the wider area, the following sites with European protection were identified within a 13km radius: Broadland (RAMSAR, SPA), River Wensum (SAC), Norfolk Valley Fens (SAC), The Broads (SAC).

#### 3.2 Non-Statutory Designated Nature Conservation Sites

43 non-statutory designated nature conservation sites are located within 5km of NGR TG16511 15419, all of which are County Wildlife Sites (CWS). The closest of these is Marriott's Way which runs through the centre of the site along a disused railway line and is now a regularly used walking route covering 35km. Badger setts are known to occur along the route, as well as bats roosting under bridges and foraging and commuting along the route.

#### 3.3 Protected Species Records

There are 5787 records of protected and notable species listed within 5km of NGR TG16511 15419 returned from NBIS. Absence of records should not be taken as confirmation that a species is absent from the search area.

Table 1 provides a summary below:

Table 1 – Selected Protected and Notable Species Records				
Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *
<b>Amphibian</b>				
Common Frog	<i>Rana temporaria</i>	YES	2013	WCA Sch 5 (Common. Documented decline up to 1970s, since then appears to have stabilized.)
Common Toad	<i>Bufo bufo</i>	YES	2016	UKBAP, WCA Sch 5, NERC
Great Crested Newt	<i>Triturus cristatus</i>	YES	2015	UKBAP, WCA Sch 5 + 6, HabsDir
<b>Reptile</b>				
Common Lizard	<i>Zootoca vivipara</i>	YES	2011	UKBAP, WCA Sch 5, NERC
Slow Worm	<i>Anguis fragilis</i>	YES	2015	UKBAP, WCA Sch 5, NERC
Adder	<i>Vipera berus</i>	YES	2011	UKBAP, WCA Sch 5, NERC
Grass Snake	<i>Natrix</i>	YES	2015	UKBAP, WCA Sch 5, NERC

Table 1 – Selected Protected and Notable Species Records				
Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *
<b>Mammal</b>				
Badger	<i>Meles meles</i>	YES	2017	PBA
Otter	<i>Lutra lutra</i>	YES	2016	UKBAP, WCA Sch 5 + 6, HabsDir
Water Vole	<i>Arvicola amphibius</i>	YES	2007	UKBAP, WCA Sch 5, HabsDir
Hedgehog	<i>Erinaceus europaeus</i>	YES	2016	NERC, UKBAP, WCA Sch 6
Barbastelle Bat	<i>Barbastella barbastellus</i>	YES	2017	HabsDir, WCA Sch 5 + 6
Whiskered Bat	<i>Myotis mystacinus</i>	YES	2008	HabsDir, WCA Sch 5 + 6
Natterers Bat	<i>Myotis nattereri</i>	YES	2017	HabsDir, WCA Sch 5 + 6
Serotine Bat	<i>Eptesicus serotinus</i>	YES	2016	HabsDir, WCA Sch 5 + 6
Noctule Bat	<i>Nyctalus noctula</i>	YES	2017	HabsDir, WCA Sch 5 +6, NERC, UKBAP
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	YES	2017	HabsDir, WCA Sch 5 + 6, NERC, UKBAP
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	YES	2011	HabsDir, WCA Sch 5 + 6
Brown Long-eared Bat	<i>Plecotus auritus</i>	YES	2017	HabsDir, WCA Sch 5 + 6, NERC, UKBAP
Daubentons bat	<i>Myotis daubentonii</i>	YES	2017	HabsDir, WCA Sch 5 + 6, NERC
Brown Hare	<i>Lepus europaeus</i>	YES	2016	UKBAP
Hazel Dormouse	<i>Muscardinus avellanarius</i>	NO	-	HabsDir, NERC, UKBAP, WCA Sch 5 + 6
<b>Plants</b>				
In total 17 records (11 species) of notable plants were provided from NBIS. This includes WCA Sch 8, species Bluebell ( <i>Hyacinthoides non-scripta</i> ) within 2km of the site.				
Other plant species include Clustered Clover ( <i>Trifolium glomeratum</i> ), Hoary Cinquefoil ( <i>Potentilla argentea</i> ) and Hoary Mullein ( <i>Verbascum pulverulentum</i> ).				
<b>Invertebrates</b>				
In total 1796 records (79 species) of invertebrate were provided from NBIS. Species include White Ermine ( <i>Spilosoma lubricipeda</i> ) and Small Heath butterfly ( <i>Coenonympha pamphilus</i> ) both UKBAP species.				
<b>Birds</b>				
In total 2085 species of bird (149 species) were provided from NBIS. A number of Schedule 1, species have been noted including: Common Kingfisher ( <i>Alcedo atthis</i> ), Fieldfare ( <i>Turdus pilaris</i> ), Red Kite ( <i>Milvus milvus</i> ), and Barn Owl ( <i>Tyto alba</i> ).				
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. FIELD SURVEY RESULTS

An experienced surveyor from Geosphere Environmental Ltd, carried out an initial appraisal of the site for protected species and habitats on the 14 November 2018. The weather conditions at the time of the survey were sunny and an approximate temperature of 14°C.

The results of the Phase 1 Habitat Survey and protected species scoping survey are detailed below and annotated on Drawing ref. 3551,EC,AR,DS/008/Rev 0, attached in Appendix 3. A list of species recorded during the survey is shown in Appendix 5. Descriptions of the target notes (TN) and relevant photographs are included in Appendix 6.

### 4.1 Phase 1 Habitat Survey

The following habitat types were recorded within the survey area:

- Arable;
- Buildings and hardstanding;
- Defunct species-poor hedgerow;
- Dense scrub;
- Fence line;
- Hardstanding;
- Improved Grassland;
- Poor semi-improved grassland;
- Plantation Woodland;
- Scattered trees;
- Tall Ruderal.

These habitats outlined above and are discussed in more detail below.

#### 4.1.1 Within Development Zone

The site predominantly comprises of arable fields (TN1). The field margins are species-poor semi-improved grassland, approximately 2m wide in areas (TN2). These margins comprise of abundant Cock's-foot (*Dactylis glomerata*), Perennial Rye-grass, Red Fescue and False Oat-grass (*Arrhenatherum elatius*) with occasional Yorkshire Fog and rare occurrences of Cows Parsley, Autumn Hawkbit (*Scorzoneroidea autumnalis*), Dandelion, White Clover, Cleavers (*Galium aparine*), Spear Thistle, Common Nettle, Bristly Ox-tongue (*Helminthotheca echioides*), Smooth Sow-thistle (*Sonchus oleraceus*) and Bracken (*Pteridium aquilinum*).

There are two fields of improved grassland to the west of the site (TN3). The sward was species-poor, dominated by perennial rye-grass (*Lolium perenne*), Red Fescue (*Festuca rubra*) and White Clover (*Trifolium repens*), with Yorkshire Fog (*Holcus lanatus*), Creeping Buttercup (*Ranunculus repens*), Greater Plantain (*Plantago major*) and Dandelion (*Taraxacum officinale* agg.) but these were rare in the sward.

Areas of tall ruderal are present along some boundaries of the site, and also in a large area in one of the central fields (TN4) between Marriotts Way and Breck Farm Lane. Species within the tall ruderal comprise of frequent Common Nettle (*Urtica dioica*) and Great Willowherb (*Epilobium hirsutum*), with occasional occurrences of Cow Parsley (*Anthriscus sylvestris*), Creeping Thistle (*Cirsium arvense*) and Spear Thistle (*Cirsium vulgare*).

Along some of the boundaries are scattered trees (TN5), with defunct hedgerow. Tree species include Turkey Oak (*Quercus cerris*), Pedunculate Oak (*Quercus robur*), Scot's Pine (*Pinus sylvestris*) and Sycamore (*Acer pseudoplatanus*). The small areas of defunct hedgerow include Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), English Elm (*Ulmus procera*). Scattered trees are also present along the Marriott's Way footpath, running north to south, through the site.

Areas of hardstanding (TN6) are present making up Marriott's Way, Breck Farm Lane, and a track running around the boundary of the north eastern and north western field (TN7).

Breck Farm is present on Breck Farm Lane, comprising of two houses, two barns with flint and brick walls and terracotta tiles, barns constructed of corrugated concrete panels, and a small number of outbuildings (TN8). A brick bridge is present over Marriott's Way (TN9).

Plantation woodland comprising of Scotts Pine, Silver Birch (*Betulus Pendula*), Hawthorn and Pedunculate Oak are located around the southern and eastern boundaries, and between fields to the east (TN10).

Around some field boundaries are post and wire fences.

## 4.2 Outside the Development Zone

Close-grazed improved grassland is located directly west of the site, with residential development located to the south and east. To the north is the busy A1270 with further grazing and arable fields to the north.

## 4.3 Protected Species Appraisal

### 4.3.1 Bats

There are a number of trees on the site with suitable features that could support roosting bats, particularly along Marriott's Way.

The buildings on site could not be accessed internally and as such, the potential for roosting bats is based upon external inspection only. The concrete sheeting barns are unlikely to have potential to support roosting bats, however cannot be ruled out. The brick and tile barns, houses, and outbuildings on site are considered to have high potential for roosting bats, due to the loose tiles and gaps in the walls.

A brick bridge is present over Marriott's Way (TN9). There are features present including missing bricks and gaps in mortar that could provide moderate suitability for roosting bats.

The hedgerows, tree lines and woodlands provide moderate suitability commuting and foraging habitat for bats.

### 4.3.2 Great Crested Newts

There are 11 ponds within 500m of the site. These ponds are referred to as Ponds 1 to 11, on Drawing ref. 3551,EC,AR,DS/009/Rev 0 within Appendix 3. Ponds 3 to 11 were not accessible.

The habitats on site comprise of arable fields with species-poor semi-improved grassland margins, and tree- line boundaries.

A Habitat Suitability Index (HSI) was undertaken to assess their suitability to support Great Crested Newts. A score between 0 and 1 is given; where 0 represents poor suitability and 1 represent excellent suitability. The results are provided in Appendix 6 and summarised in Table 2 below:

Table 2 – HSI Scores of Ponds					
Pond	Distance from Site	Connected or Separated from Site	Pond Size (m <sup>2</sup> )	HSI Score	Pond Suitability for Great Crested Newts
1	27m West	Connected	60	0.75	Good
2	On site	Pond no longer present			

Pond 1, located 27m west of the site on private property. The pond was located within grassland, with connectivity to the site. The pond has an HSI score of 0.75, which is **Good** suitability to support GCN.

Pond 2, is located on site at Breck Farm. The pond is located within an area of trees and was not present. There were no wetland plants species within the area. It is likely the trees present have dried the pond, and also filled the area with leaf litter and soil.

Pond 3, is located within an area of woodland 485m from the site boundary. It is considered unlikely for GCN to travel in excess of 250m through habitat considered suitable foraging grounds for this species. Therefore, any Great Crested Newts which may be using this pond are unlikely to be found on site.

Ponds P4 to P11, are separated from the development site by busy main roads (A1270, A1067 and Reephams Road). Therefore, any Great Crested Newts which may be using these ponds are unlikely to be found on site.

#### 4.3.3 Reptiles

The habitats on site comprise of arable fields with species-poor semi-improved grass margins, with tree-line field boundaries and some areas of dense scrub. Although limited to the boundaries, there is connectivity to the wider area and as such there is potential for reptiles to be present on site.

#### 4.3.4 Birds

Table 3 below, shows the species of birds that were noted during the survey:

Table 3 – Birds Identified During the Survey		
Common Name	Scientific Name	Location Notes
Blackbird	<i>Turdus merula</i>	Seen within the boundary trees
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Seen within the field
Blackcap	<i>Sylvia atricapilla</i>	Heard within the woodland
Blue Tit	<i>Parus caeruleus</i>	Seen within the woodland
Rook	<i>Corvus frugilegus</i>	Seen within the field
Woodpigeon	<i>Columba palumbus</i>	Seen within the woodland

Habitats on site suitable for birds include buildings, scattered trees and field boundaries.

#### 4.3.5 Other Fauna

Feeding signs, droppings and warrens of Rabbit (*Oryctolagus cuniculus*) were noted along some boundaries. No signs of any other species were noted during the Phase 1 Habitat Survey.

## 5. ECOLOGICAL EVALUATION, IMPACT ASSESSMENT

### 5.1 Nature Conservation Sites

There are two statutory designated nature conservation sites within 2km radius of the site. There are 43 non-statutory sites designated nature conservation sites identified by the desk study.

Marriott's Way CWS runs through the centre of the site. This CWS will be protected and enhanced during the development.

Significant impacts to statutory designated nature conservation sites are not anticipated from construction works on the site, due to the distance of the development from any protected sites. However, due to the size of the site, there is potential for a large number of residential/commercial dwellings to be constructed. There is also a potential source of impact from an increase in recreational disturbance to international protected sites, such as Broadland (RAMSAR, SPA), River Wensum (SAC), Norfolk Valley Fens (SAC), The Broads (SAC) which are located within 13km of the site.

There is potential to mitigate for the increase in recreational pressure by providing Suitable Alternative Natural Greenspace (SANG) (ref. R.12). Provision of well-designed green infrastructure and access to the wider countryside are likely to be successful in reducing the number of visitors and mitigating the potential increase in recreational pressure to Broadland (RAMSAR, SPA), River Wensum (SAC), Norfolk Valley Fens (SAC), The Broads (SAC). The SANG should be designed to include:

- High quality, informal, semi-natural areas;
- Circular Dog walking routes of 2.7km;
- Links with surrounding public rights of way;
- Dedicated "dogs-off-lead" areas;
- Signage/leaflets to householders to promote these areas for recreation;
- Dog waste bins etc.

### 5.2 Legally Protected and Notable Species

The ecological evaluation and impact assessment for protected species is detailed within Table 4 below:

Table 4 – Protected Species - Ecological Impact Assessment				
Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
Bats (Roosting)	YES	YES - Buildings, trees and a brick bridge within the site boundary appeared to have features suitable for roosting bats. Currently, it is unclear what buildings and trees may be affected by the proposed development, however it is believed that all will be retained and protected within the final development.	Should bats be using the site for roosting, the removal or disturbance of this habitat could result in an impact of site to district significance.	Further surveys may be required for buildings and trees, should they require works or removal as part of the development.

Table 4 – Protected Species - Ecological Impact Assessment				
Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
Bats (Foraging)	YES	YES - The hedgerows, trees and grassland are of moderate suitability for foraging and commuting bats. It is considered likely that much of these habitats will be retained and potentially enhanced within the proposed development.	Should bats be using the site for foraging and commuting, the removal or disturbance of foraging habitat could result in an impact of site to district significance.	YES – Further surveys are required to determine the number of bats and species using the site, in order to assess the potential indirect impacts of development and potential enhancement features to incorporate into development design.
Great Crested Newt	YES	YES - Pond 1, is located to the west of the site and is considered to be of good suitability for breeding Great Crested Newts.  Pond 2, is located within the site boundary however does not appear to be present. The other ponds within 500m are separated from site by busy main roads and development.	Should Great Crested Newts be using the site then the development could cause an impact of site to district significance.	YES – Further surveys required
Otter & Water Vole	YES	NO - no riparian habitats are present on site.	N/A	NONE
Hazel Dormouse	NO	NO - habitats on site are not suitable for hazel dormouse.	N/A	NONE
Badger	YES	YES - The grassland could be considered suitable foraging habitat for this species; however, no Badger setts or foraging signs were identified within the site during the habitat survey.	N/A	NONE
Birds	YES	YES - The site offers value to breeding and wintering birds, providing suitable nesting and foraging grounds for birds within the buildings, scattered trees and fields.	Possible negative impact of site to local significance.	YES – It is recommended that breeding and migratory/wintering bird assemblages should be assessed.
Reptiles	YES	YES - The grassland and field boundaries on site could provide habitat for reptiles. There is connectivity to further field margins to the west of the site, and as such there is potential for reptiles to be present on site.	Possible negative impact of local significance.	YES – Further surveys required

**Table 4 – Protected Species - Ecological Impact Assessment**

Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
Hedgehog	YES	YES - The hedgerows and grassland are considered suitable for hedgehogs.	The majority of the hedgerows will be retained within the proposed development. This habitat along with the additional planting and public open space will benefit hedgehogs.	NONE
Invertebrates	YES	YES - The site is only considered suitable for common species of invertebrate.	N/A	NONE
Notable Plants	YES	NO - No notable plant species were noted within the phase 1 habitat survey.	N/A	NONE

### 5.3 Habitats on Site

Habitats that may be affected by the proposed works include those which may support legally protected species, particularly the buildings, poor semi-improved grassland, hedgerows, trees and ponds off site. Depending on the results of further protected species surveys, the value of these habitats may increase further. These habitats have variable significance and can be confirmed through further specific surveys.

## 6. ECOLOGICAL CONSTRAINTS AND RECOMMENDATIONS FOR MITIGATION AND ENHANCEMENT OPPORTUNITIES

### 6.1 Ecological Constraints

The constraints to development will be the removal or disturbance of the buildings, poor semi-improved grassland, scrub, hedgerows and trees which could impact roosting, foraging and commuting bats, breeding birds, reptiles or Great Crested Newts.

### 6.2 Recommendations

In general, if a habitat survey indicates potential habitat for legally protected species on the site which will be affected by the development, further species-specific surveys should be undertaken to determine if these species are present. If they are not carried out, the developer and/or subcontractors could be found liable for intentional, deliberate or reckless offenses with respect to wildlife.

#### 6.2.1 Protected Sites

A Habitat Regulations Assessment should be undertaken to inform the potential impacts to protected sites. The local authority may be able to undertake this as part of the planning process however, the Local Authority may require that a site-specific Habitat Regulations Assessment (HRA) is submitted with the planning application.

Marriotts' Way CWS should be protected during development. Protection measures for the trees (following BS 5837: 2012 (ref. **R.11**)) should provide a suitable buffer from impacts of development. The proposals should ensure that the CWS remains unlit at night.

To minimize the potential impact of recreational pressure on international protected sites, Suitable Alternative Natural Greenspace (SANG) should be included within the scheme (ref. **R.12**). Circular walking routes of >2.7km and access to public rights of way within the wider area should be included within the proposed development. Signs, information boards, rubbish and dog waste bins should be provided to improve awareness and the functionality of the site and public rights of way for recreation use and dog walking. Recreation areas and rights of way will need to be managed throughout the life of the development, such as maintaining footpaths, emptying litter bins and landscape gardening etc. The recreational areas should be designed to be of a sufficient size and quality to provide an alternative to visiting the international sites.

#### 6.2.2 Habitats

Any hedgerows or trees to be retained should be protected during the works. These protection measures should be implemented according to BS 5837: 2012 'trees in relation to design, demolition and construction' (ref. **R.11**).

#### 6.2.3 Bats: Roosting

Some bat roost features were noted within trees located throughout the site, particularly along Marriott's Way. The trees are believed to be retained within the final development and a dark corridor should be maintained.

An internal inspection of the buildings located on site was not undertaken however, based upon an external inspection, a number of the buildings are considered suitable for roosting bats. A bridge located over Marriott's way was also considered suitable for roosting bats.

Finalised plans are not available however, it is anticipated the trees, buildings and bridge can be retained within the proposed development and lighting be designed to avoid impact on these structures.

Should the trees and buildings on site require works or removal, it is recommended that a bat scoping survey is undertaken to further ascertain the bat roost potential of the trees, bridge and buildings. This survey can be undertaken at any time or year.

Based upon the results of the bat scoping survey, activity surveys may be required. Activity surveys can only be carried out between May and September.

#### **6.2.4 Bat: Foraging**

The hedgerows, grassland and treelines on site were identified to provide foraging and commuting habitat of moderate suitability for bats. If most of the hedgerows and trees were to be removed, survey effort would need to comprise of an activity survey once per month between April and October. However as most of these habitats will be retained and a large amount of additional planting will be incorporated into the proposed development, a reduced survey effort is justified.

Based upon the proposed development it is recommended that three surveys be undertaken from May to September. Depending upon the findings more surveys may be required.

These surveys may also highlight features used by bats to roost within or on the boundary of the site, and as such may highlight the need for further surveys.

#### **6.2.5 Great Crested Newts**

Pond 1, is considered suitable for breeding Great Crested Newts and is connected to the terrestrial habitats (hedgerows and poor semi-improved grassland) on site, therefore further surveys are required.

The survey of the ponds can be undertaken using eDNA techniques where water samples are analysed to show presence or absence or by using traditional methods of survey, which include bottle trapping, torch light survey and egg searching of marginal vegetation.

Sampling of eDNA can only be undertaken between 15 April and 30 June. It should be noted that, where an eDNA sample is taken, and the results indicate presence of GCN, then this must be followed by the more traditional survey effort involving six survey visits to be undertaken between mid-March and mid-June.

Sampling of eDNA should be taken as early in the season as possible in order to accommodate the traditional surveys visits if required.

#### **6.2.6 Reptiles**

The poor semi-improved grassland and trees on site are considered suitable for reptiles. There is connectivity to surrounding fields via field margins and as such there is potential for reptiles to be present on site. Therefore, a survey is required to determine presence. Surveys for reptiles can only be undertaken between April and October under suitable weather conditions.

Amongst reptiles, there is only a licensing system for Smooth Snake and Sand Lizard. However, it is strongly recommended that surveys and the specification of any mitigation measures, if necessary, are carried out by a suitably qualified ecologist.

### 6.2.7 Badgers

Badgers often move into new areas and dig new setts, although no field signs were noted during the Phase 1 Habitat Survey, a re-check should be made prior to construction commencing to re-confirm absence.

### 6.2.8 Birds

The trees, hedgerows and grassland on site offer value to breeding birds, providing suitable nesting and foraging grounds for common passerine birds.

It is recommended that breeding and migratory/wintering bird assemblages should be assessed (March to July and November to February respectively). The aim of these surveys is to assess which bird species use the site during the breeding and migratory/wintering seasons, their status, distribution and density on the site. This baseline information can be used to assess the potential direct and indirect impacts the development may have on the breeding and wintering birds.

#### 6.2.8.1 Future timings of Work

To ensure that no offences occur under the WCA, 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).

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 10-metre 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.

### 6.3 Biodiversity Enhancement Opportunities

The following has been recommended for consideration within the final development scheme:

- Any plants considered 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. Suitable species are included in Appendix 7;
- Log piles for invertebrates;
- Nest boxes or nest bricks for common passerine birds;
- Holes in the bottom of garden fences should be included to provide habitat connectivity for foraging hedgehogs.

Further recommendations for appropriate mitigation and enhancement opportunities will be made based upon the findings of the Phase 2 Surveys.

## 7. CONCLUSIONS

The proposed development will not adversely affect any statutory or non-statutory designated nature conservation sites, providing Marriott's Way CWS is protected during the works. To minimize the potential impact of recreational pressure on international protected sites, Suitable Alternative Natural Greenspace (SANG) should be included within the scheme.

No habitats that occur within the survey area were considered to have high ecological importance on an international, national, regional or county scale. The habitats on site are of site to local significance only.

The site is not considered suitable for Otters, Water Voles, Hazel Dormice, or notable plants or invertebrates.

There are suitable features, within the area to be affected by the proposed development, which may provide roosting, foraging and breeding habitat for bats, GCN, badgers, birds and reptiles. In particular:

- **Roosting Bats:** The buildings, brick bridge and a number of trees within with the site boundary that have suitable roosting features for bats;
- **Foraging Bats:** The hedgerows, trees and grassland provide moderate suitability foraging and commuting habitat for bats;
- **GCN:** Pond 1, is considered suitable for breeding Great Crested Newts and is connected to the terrestrial habitats (tree lines, woodland and poor semi-improved grassland) on site;
- **Birds:** The scrub and scattered trees, as well as some field margins, provide suitable nesting habitat for breeding birds during the breeding season;
- **Reptiles:** The tree lines, scrub and grassland on site could provide habitat for reptiles;
- **Badgers:** Mammal paths are located within the site boundary; however, the site is regularly used by dog walkers. No setts were found within the site boundary or surrounding area.

The constraints to development will be the removal of habitats suitable for protected species. The recommendations within Section 6 of this report should be adhered to, in order to reduce the impact on protected species.

# APPENDICES

## APPENDIX 1 – REPORT LIMITATIONS AND CONDITIONS

This report was prepared only for our client and is not intended to be relied on by any other party.

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 professional conduct guidelines and British industry standards, (refs. **R.1** and **R.2**).

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 in 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.

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. Furthermore, 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.

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

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.

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

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.

Due to the time of year, some plant species are not identifiable. However, this does not affect classification of habitats present.

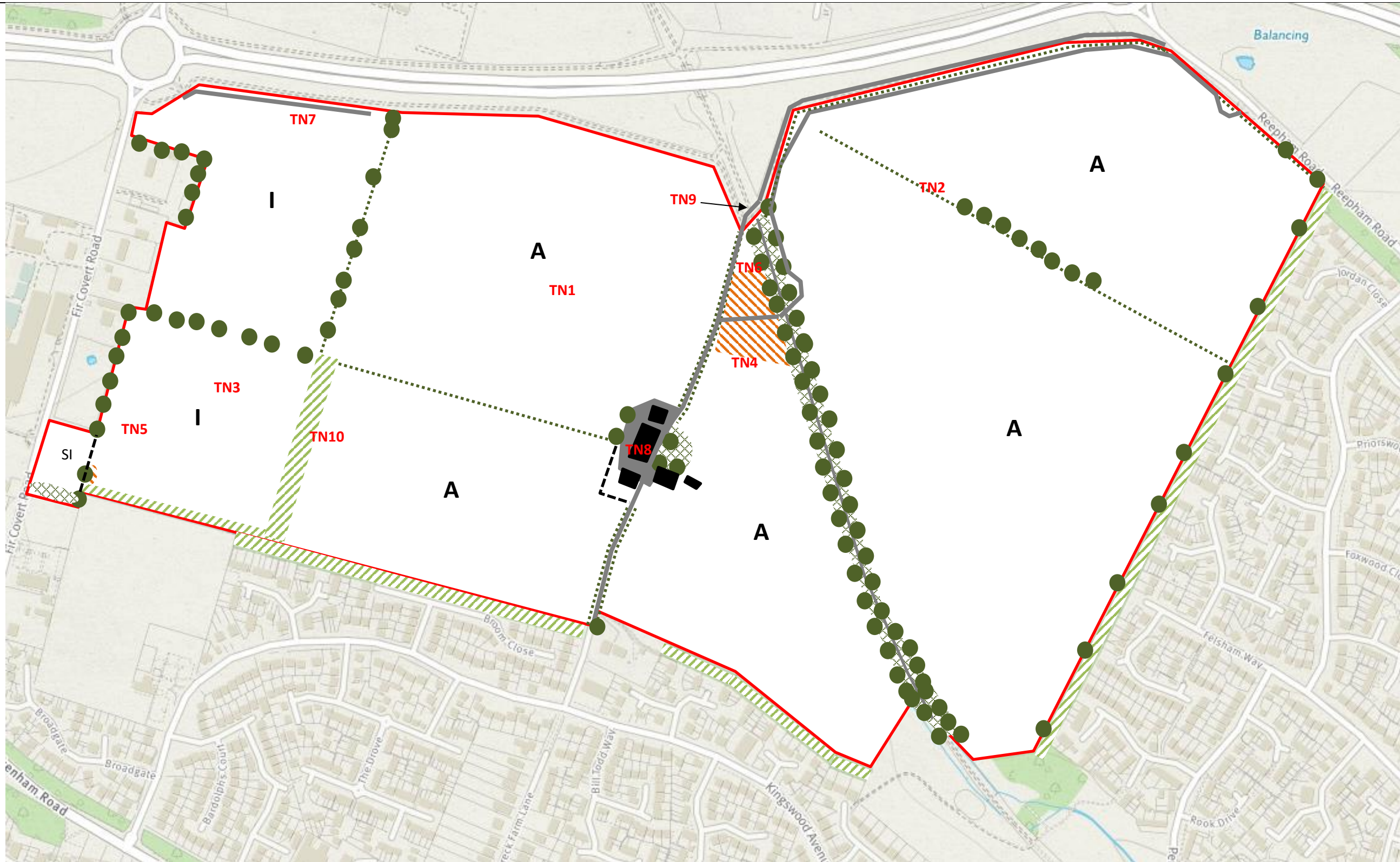
## APPENDIX 2 – REFERENCES

- R.1.** CIEEM (2013) Guidelines for Preliminary Ecological Appraisal (GPEA).
- R.2.** BSI (2013) BS 42020:2013 Biodiversity – Code of practice for planning and development. BSI Standards Limited 2013.
- R.3.** Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF).
- R.4.** ODPM (2005) Government Circular: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system.
- R.5.** JNCC, (2010). 'Handbook for Phase I Habitat Survey: A technique for environmental audit' (reprint). Joint Nature Conservation Committee, Peterborough.
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- R.7.** Magic (accessed November 2018). Site Check Report. [www.magic.gov.uk](http://www.magic.gov.uk).
- R.8.** Goldsmith, B. (1991). Monitoring for Conservation and Ecology, Chapman & Hall.
- R.9.** 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.10.** CIEEM, (2016). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (Second edition dated January 2016).
- R.11.** BS 5837: (2012), 'Trees in Relation to Design, Demolition and Construction'.
- R.12.** Halcrow Group Limited (2008). Three Rivers District Council, Core Strategy Issues and Options Paper, Study to Inform Appropriate Assessment, (Screening Report), February 2008, Appendix 4 Natural England SANGS Guidance. (Accessed online 03-12-18) website: <https://www.threerivers.gov.uk/download?id=23189>.

## APPENDIX 3 – DRAWINGS

Phase 1 Habitat Survey Plan – Drawing ref. 3551,EC/008/Rev 0

Pond Location Plan – Drawing ref. 3551,EC/009/Rev 0



**Legend:**

Site Boundary	Fence Line	Plantation Woodland
Arable	Species-poor Semi-improved Grassland	Dense Scrub
Buildings	Scattered Trees	
Hardstanding	Tall Ruderal	
Defunct Species-poor Hedgerow	Target Notes	

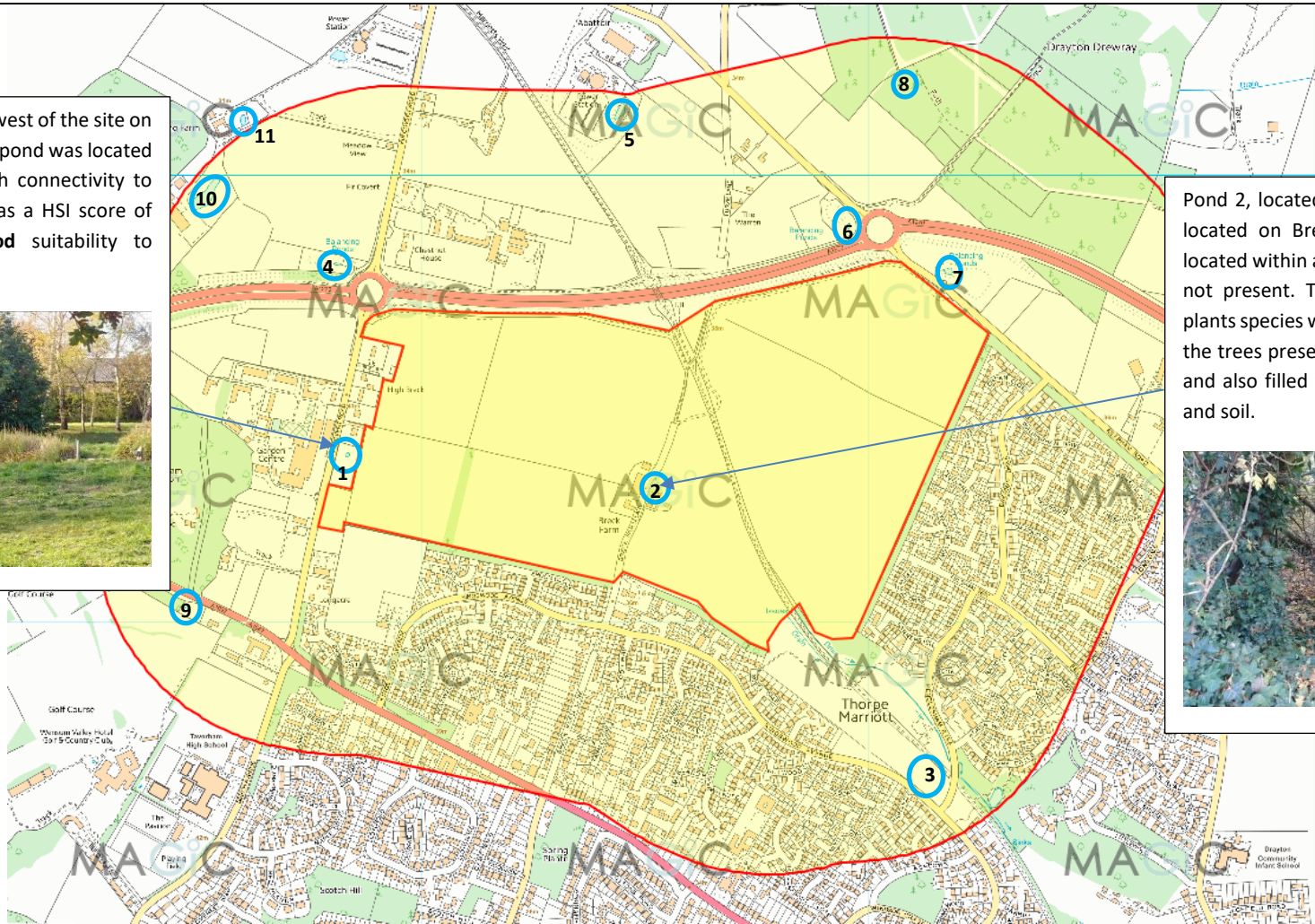
**geosphere environmental ltd**  
 Brightwell Barns, Ipswich Road, Brightwell, Suffolk, IP10 0BJ  
 T 01603 298 076 E info@geosphere-environmental.co.uk

<b>SITE</b> Marriott's Park, Taverham, Norfolk, NR8 6HL	<b>TITLE</b> Phase 1 Habitat Survey	<b>PROJECT NO.</b> 3551,EC,AR,DS	<b>DRAWING NO.</b> 008/Rev 0	<b>DATE</b> December 2018
	<b>CLIENT</b> M Scott Properties Ltd	<b>DRAWN BY</b> LS	<b>CHECKED</b> RF	<b>SCALE</b> Not to scale




Pond 1, located 27m west of the site on private property. The pond was located within grassland, with connectivity to the site. The pond has a HSI score of 0.75, which is **Good** suitability to support GCN.



Pond 2, located 330 east of the site is located on Breck Farm. The pond is located within an area of trees and was not present. There were no wetland plants species within the area. It is likely the trees present have dried the pond, and also filled the area with leaf litter and soil.



**Legend**

-  Site Location
-  500m buffer
-  Ponds within 500m

**geosphere environmental ltd**

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 T 01603 298 076 E info@geosphere-environmental.co.uk

**SITE**  
 Marriott's Park, Taverham, Norfolk,  
 NR8 6HL

**TITLE**  
 Pond Location Plan  
**CLIENT**  
 M Scott Properties Ltd

**PROJECT NO.**  
 3551,EC,AR,DS  
**DRAWN BY**  
 LS

**DRAWING NO.**  
 009 / Rev 0  
**CHECKED**  
 RF

**DATE**  
 December 2018  
**SCALE**  
 Not to scale

**APPENDIX 4 – DESK STUDY DATA**

Site Check Report Report generated on Tue Dec 11 2018

**You selected the location:** Centroid Grid Ref: TG16511537

The following features have been found in your search area:

**Sites of Special Scientific Interest (England)**

<b>Name</b>	River Wensum SSSI
<b>Reference</b>	1001954
<b>Natural England Contact</b>	Nikolas Bertholdt
<b>Natural England Phone Number</b>	0845 600 3078
<b>Hectares</b>	385.96
<b>Citation</b>	1006328
<b>Hyperlink</b>	<a href="http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1006328">http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1006328</a>

**Special Areas of Conservation (England)**

<b>Name</b>	RIVER WENSUM
<b>Reference</b>	UK0012647
<b>Hectares</b>	383.42
<b>Hyperlink</b>	<a href="http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?euocode=UK0012647">http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?euocode=UK0012647</a>

**Areas of Outstanding Natural Beauty (England)**

No Features found

**Local Nature Reserves (England)**

No Features found

**National Nature Reserves (England)**

No Features found

**Ramsar Sites (England)**





No Features found

**Special Protection Areas (England)**

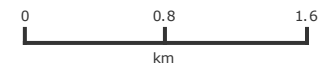
No Features found



### Legend

-  Local Nature Reserves (England)
-  National Nature Reserves (England)
-  Ramsar Sites (England)
-  Sites of Special Scientific Interest (England)
-  Special Areas of Conservation (England)
-  Special Protection Areas (England)

Projection = OSGB36  
 xmin = 606000  
 ymin = 310500  
 xmax = 627600  
 ymax = 321500



Map produced by MAGiC on 11 December, 2018.  
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**APPENDIX 5 – TARGET NOTES**

## ECOLOGICAL TARGET NOTES RELATING TO EXTENDED PHASE I HABITAT SURVEY

**Target Note 1** The site predominantly comprises of arable fields.



**Target Note 2** The field margins comprise of species-poor semi-improved grassland up to 2m in width in places. Areas of grassland is also present within one of the central fields, between Marriott's Way and Breck Farm Lane.



## ECOLOGICAL TARGET NOTES RELATING TO EXTENDED PHASE I HABITAT SURVEY

**Target Note 3** Photo showing close-grazed improved grassland.



**Target Note 4** Areas of tall ruderal are present within one of the central fields, between Marriott's Way and Breck Farm Lane, and alongside field boundaries.



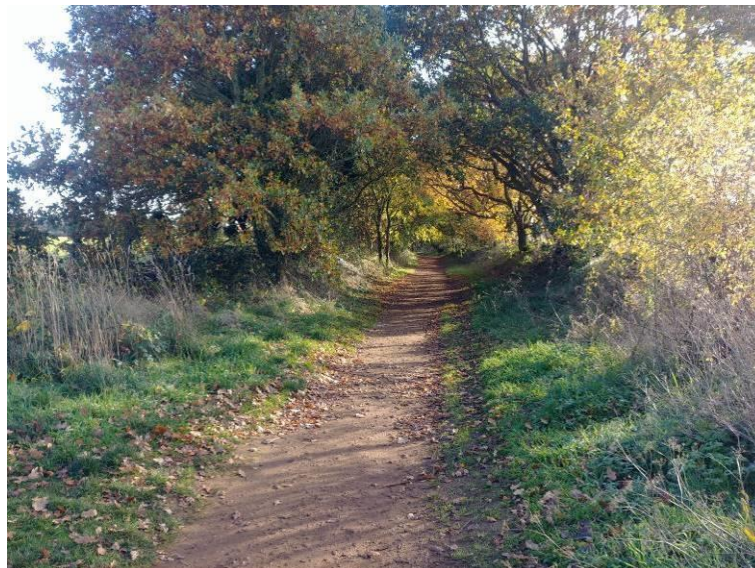
## ECOLOGICAL TARGET NOTES RELATING TO EXTENDED PHASE I HABITAT SURVEY

**Target Note 5** Scattered trees are located along the field boundaries, believed to be remnants of old hedgerows.



**Target Note 6** Areas of hardstanding are present, comprising of Marriott's Way footpath, Breck Farm Lane, and a track through the north eastern arable field.

Marriott's Way  
footpath



**ECOLOGICAL TARGET NOTES  
RELATING TO EXTENDED PHASE I HABITAT SURVEY**

Breck Farm Lane



**Target Note 7**

An area of hardstanding is present, comprising of a track through the northern improved grassland field.



## ECOLOGICAL TARGET NOTES RELATING TO EXTENDED PHASE I HABITAT SURVEY

### Target Note 8

Buildings are present comprising of Breck Farm and associated outbuildings, and a further residential property. No internal inspections were undertaken and as such suitability could not be ruled out. It is assumed the buildings have high suitability for roosting bats due to features present.



### Target Note 9

A brick bridge over Marriott's Way is present to the north of the site. It appears to have moderate suitability for bats.



**ECOLOGICAL TARGET NOTES  
RELATING TO EXTENDED PHASE I HABITAT SURVEY**

**Target Note 10** Scattered trees located along the field boundaries, believed to be remnants of old hedgerows.



**Target Note 11** A Scot's Pine plantation is present to the west of the site, with further rows of Scot's Pine planted along the southern boundary.



**APPENDIX 6 – HABITAT SUITABILITY INDEX**

## HABITAT SUITABILITY INDEX: ASSESSING A PONDS SUITABILITY TO SUPPORT GREAT CRESTED NEWTS

<b>Project No:</b>	3551,EC,AR,DS
<b>Project Name:</b>	Marriotts Park, Taverham, Norfolk, NR8 6HL
<b>Surveyor:</b>	Luci Spencer
<b>Date:</b>	14-Nov-18
<b>Weather:</b>	Sunny

Pond Ref:	SI1	SI2	SI3	SI4	SI5	SI6	SI7	SI8	SI9	SI10	HSI	Suitability
	Location	Pond Area	Pond Drying	Water quality	Shade	Fowl	Fish	Ponds	Terr'l Habitat	Macrophytes		
1	1	0.2	0.9	0.67	1	1	0.67	1	0.67	1	0.75	Good

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

**APPENDIX 7 – EXAMPLE PLANT 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	<i>Fagus sylvatica</i>	Pedunculate Oak	<i>Quercus robur</i>
Wild Cherry	<i>Prunus avium</i>	White Willow	<i>Salix alba</i>
Bird Cherry	<i>Prunus padus</i>	Small-leaved Lime	<i>Tilia cordata</i>
Sessile Oak	<i>Quercus petraea</i>		

### Medium/Small Trees

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

### Other Shrubs for Nectar, Pollen or Fruits

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

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## GENERAL PLANTS CONSIDERED BENEFICIAL TO WILDLIFE

### Drought-Tolerant Herbaceous Plants

Common Name	Latin Name	Common Name	Latin Name
Onion	<i>Allium christophii</i>	Giant dead-nettle	<i>Lamium orvala</i>
False dittany	<i>Ballota acetabulosa</i>	Lavender	<i>Lavandula augustifolia</i>
Calamint	<i>Calamintha nepeta</i>	Myrtle	<i>Myrtus communis</i>
Giant scabious	<i>Cephalaria gigantean</i>	Honey garlic	<i>Nectaroscordum siculum</i>
Honeywort	<i>Cerithe major</i> and <i>C. purpurascens</i>	Golden drops	<i>Onosma</i> spp.
Sun-roses	<i>Cistus</i> spp.	Marjoram	<i>Origanum vulgare</i>
Large-flowered Tickseed	<i>Coreopsis grandiflora</i>	Jerusalem sage	<i>Phlomis russeliana</i>
Crocus	<i>Crocus tommasinianus</i>	Rosemary	<i>Rosmarinus officinalis</i>
Cardoon	<i>Cynara cardunculus</i>	Winter savoury	<i>Satureja montana</i>
Teasel	<i>Dipsacus fullonum</i>	Chile black scabious	<i>Scabious atropurpurea</i>
Coneflower	<i>Echinacea purpurea</i>	Stonecrops	<i>Sedum acre</i> , <i>S. anglicum</i> , <i>S. forsterianum</i> and <i>S. album</i>
Giant Echium	<i>Echium pininana</i>	Lamb's lung/ears	<i>Stachys olympica</i> and <i>S. lanata</i>
Sea-hollies	<i>Eryngium</i> spp.	Thyme	<i>Thymus vulgaris</i>
Escallonia	<i>Escallonia</i> spp.	Crimson clover	<i>Trifolium incarnatum</i>
Hebe	<i>Hebe</i> sp.	Tulip	<i>Tulipa</i> sp.
Rock-roses	<i>Helianthemum</i> spp.		

### Native Wildflowers for Borders

Common Name	Latin Name	Common Name	Latin Name
Yarrow	<i>Achillea millefolium</i>	Toadflax	<i>Linaria vulgaris</i>
Agrimony	<i>Agrimonia eupatoria</i>	Yellow loosestrife	<i>Lysimachia vulgaris</i>
Corncockle	<i>Agrostemma githago</i>	Common mallow	<i>Malva sylvestris</i>
Chives	<i>Allium schoenoprasum</i>	Marjoram	<i>Origanum vulgare</i>
Harebell	<i>Campanula rotundifolia</i>	Common poppy	<i>Papaver rhoeas</i>
Cornflower	<i>Centaurea cyanus</i>	Cowslip	<i>Primula veris</i>
Greater knapweed	<i>Centaurea scabiosa</i>	Primrose	<i>Primula vulgaris</i>
Chicory	<i>Chichorium intybus</i>	White campion	<i>Silene alba</i>
Foxglove	<i>Digitalis purpurea</i>	Red campion	<i>Silene dioica</i>
Teasel	<i>Dipsacus fullonum</i>	Goldenrod	<i>Solidago virgaurea</i>
Sea hollies	<i>Eryngium</i> spp.	Devil's-bit scabious	<i>Succisa pratensis</i>
Lady's bedstraw	<i>Galium verum</i>	Tansy	<i>Tanacetum vulgare</i>
Meadow crane's-bill	<i>Geranium pratense</i>	Dandelion	<i>Taraxacum officinale</i>
Herb-robert	<i>Geranium robertianum</i>	Wild thyme	<i>Thymus drucei</i>
Dame's-violet	<i>Hesperis matronalis</i>	Great mullein	<i>Verbascum thapsus</i>
Field Scabious	<i>Knautia arvensis</i>	Germander speedwell	<i>Veronica chamaedrys</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>	Spiked speedwell	<i>Veronica spicata</i>

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## GENERAL PLANTS CONSIDERED BENEFICIAL TO WILDLIFE

### Cultivated Plants for Borders

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

### Plants for Shady Areas

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

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## GENERAL PLANTS CONSIDERED BENEFICIAL TO WILDLIFE

### Plants for Wildflower Meadows/Intensive Green Roofs

Common Name	Latin Name	Common Name	Latin Name
Yarrow	<i>Achillea millefolium</i>	Poached-egg plant	<i>Limnanthes douglasii</i>
Corncockle	<i>Agrostemma githago</i>	Toadflaxes	<i>Linaria</i> spp.
Chives	<i>Allium schoenoprasum</i>	Flax	<i>Linum usitatissimum</i>
Yellow alyssum	<i>Alyssum saxatile</i>	Hybrids sweet alyssum	<i>Lobularia maritima</i>
Grecian windflower	<i>Anemone blanda</i>	Bird's-foot Trefoils	<i>Lotus</i> spp.
Snapdragon	<i>Antirrhinum majus</i>	Honesty	<i>Lunaria rediviva</i>
Alpine rock-cress	<i>Arabis alpina</i>	Yellow loosestrife	<i>Lysimachia vulgaris</i>
Michaelmas daisy	<i>Aster</i> spp.	Scentless Mayweed	<i>Matricaria recutita</i>
Red Orache	<i>Atriplex hortensis</i>	Black Medick	<i>Medicago lupulina</i>
Purpletop vervain	<i>Berbenia bonariensis</i>	Forget-me-not	<i>Myosotis</i> spp.
Fingered Sedge	<i>Carex digitata</i>	Tobacco plant	<i>Nicotiana affinis</i>
Glaucous Sedge	<i>Carex flacca</i>	Love-in-a-mist	<i>Nigella damascena</i>
Cornflower	<i>Centaurea cyanus</i>	Oreganos	<i>Oreganum</i> spp.
Common Knapweed	<i>Centaurea nigra</i>	Common poppy	<i>Papaver rhoeas</i>
Greater knapweed	<i>Centaurea scabiosa</i>	Poppies	<i>Papaver</i> spp.
Red valerian	<i>Centranthus ruber</i>	Tunicflower	<i>Petrorhagia saxifraga</i>
Wallflower	<i>Erysimum cheiri</i>	Phlox	<i>Phlox paniculata</i>
Chicory	<i>Cichorium intybus</i>	Meadow-grasses	<i>Poa</i> sp.
Rock-roses	<i>Cistus</i> spp.	Cowslip	<i>Primula veris</i>
Larkspur	<i>Consolida</i> spp.	Yellow Rattle	<i>Rhinanthus minor</i>
Tickseed	<i>Coreopsis</i> spp.	Black-eyed Susan	<i>Rudbeckia hirta</i>
Cosmos	<i>Cosmos bipinnatus</i>	Common Sorrel	<i>Rumex acetosa</i>
Heath-grass	<i>Danthonia decumbens</i>	Sheep's Sorrel	<i>Rumex acetosella</i>
Teasel	<i>Dipsacus fullonum</i>	Ice plant	<i>Sedum spectabile</i>
Fleabane	<i>Erigeron</i> spp.	Stonecrops	<i>Sedum</i> spp.
Stork's-bills	<i>Erodium</i> spp.	White campion	<i>Silene alba</i>
Wallflowers	<i>Erysimum</i> spp.	Red campion	<i>Silene dioica</i>
California poppy	<i>Eschscholzia californica</i>	Goldenrod	<i>Solidago virgaurea</i>
Spiky Fescue	<i>Festuca gautieri</i>	Devil's-bit scabious	<i>Succisa pratensis</i>
Lady's bedstraw	<i>Galium verum</i>	French marigold	<i>Tagetes</i> spp.
Dove's-foot Crane's-bill	<i>Geranium molle</i>	Tansy	<i>Tanacetum vulgare</i>
Meadow crane's-bill	<i>Geranium pratense</i>	Dandelion	<i>Taraxacum officinale</i>
Herb-robert	<i>Geranium robertianum</i>	Wild thyme	<i>Thymus drucei</i>
Heliotrope	<i>Heliotropium arborescens</i>	Red Clover	<i>Trifolium pratense</i>
Horseshoe Vetch	<i>Hippocrepis comosa</i>	Great mullein	<i>Verbascum thapsus</i>
Candytuft	<i>Iberis sempervirens</i>	Germander speedwell	<i>Veronica chamaedrys</i>
Field Scabious	<i>Knautia arvensis</i>	Spiked speedwell	<i>Veronica spicata</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>		

### Marshy Areas

Common Name	Latin Name	Common Name	Latin Name
Marsh marigold	<i>Caltha palustris</i>	Bogbean	<i>Menyanthes trifoliata</i>
Cuckooflower	<i>Cardamine pratensis</i>	Water forget-me-not	<i>Myosotis scorpioides</i>
Water avens	<i>Geum rivale</i>	Alisma	<i>Plantago-aquatica</i>
Water violet	<i>Hottonia palustris</i>	Lesser spearwort	<i>Ranunculus flammula</i>
Ragged robin	<i>Lychnis flos-cuculi</i>	Marsh woundwort	<i>Stachys palustris</i>
Water mint	<i>Mentha aquatica</i>	Brooklime	<i>Veronica beccabunga</i>

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## GENERAL PLANTS CONSIDERED BENEFICIAL TO WILDLIFE

### Submerged Plants

Common Name	Latin Name	Common Name	Latin Name
Water starwort	<i>Callitriche</i>	Curled pondweed	<i>Potamogeton crispus</i>
Hornwort	<i>Ceratophyllum demersum</i>	Other pondweeds	<i>Potamogeton</i> spp.
Spiked water milfoil	<i>Myriophyllum spicatum</i>		

### Floating Plants

Common Name	Latin Name	Common Name	Latin Name
Frogbit	<i>Hydrocharis morsus-ranae</i>	Broad-leaved pondweed	<i>Potamogeton natans</i>
Fringed water-lily	<i>Nymphoides peltata</i>	Water crowfoot	<i>Ranunculus aquatilis</i>
Amphibious bistort	<i>Persicaria amphibian</i>		

### References:

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

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