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March 18

Preliminary Ecological Appraisal

Land off Norwich Road, Hingham

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Report Version	Author	Reviewed By	Comments	Date
1.0	Christine Hipperson MCIEEM	Ben Jervis MCIEEM	First Issue for Comment	02/03/2018
1.1	Christine Hipperson MCIEEM	Ben Jervis MCIEEM	Minor Amendments to Conclusions	06/03/2018

This report has been prepared in accordance with British Standards 42020:2013 and the Chartered Institute of Ecology and Environmental Management's (CIEEM) 'Guidelines for Ecological Report Writing' and Code of Professional Conduct.

The authors and surveyors used to undertake our work are accredited CIEEM members and/or appropriately qualified for the tasks undertaken. Due care, skill and diligence has been taken in preparation of the information and views provided in this report, although no warranty is provided as to their accuracy.

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Contents

Figures

Appendices

Non-Technical Summary

Parker Planning Services were commissioned in February 2018 by Abel Homes to undertake a Preliminary Ecological Appraisal (PEA) at a parcel of land located off Norwich Road, Hingham, Norfolk. The appraisal comprised a desk-based study and Extended Phase 1 survey, a Habitat Suitability Index (HSI) assessment of two on-site ponds, along with an assessment of impacts on ecological features at the site.

The site comprised a large parcel and smaller parcel of arable land bisected by scattered trees. A small section of wet ditch was present along the south-western boundary. A small section of dry ditch was present along southern boundary and a small stretch bisected the two parcels of arable land. Scattered scrub and tall ruderal vegetation were also present on site. Two ponds were present within the north-east and south-west corners of the site.

Based on the habitat types present, it is considered that the site has potential to support the following protected species or groups of species in some capacity: amphibians (including great crested newts), breeding birds, terrestrial mammals, invertebrates and foraging/commuting bats. The ecological value of the site is **unknown** subject to further surveys.

The impact of the development on great crested newts and breeding birds are **unknown**, subject to further surveys.

The impact of the development on roosting bat is **unknown**, subject to further surveys upon trees to be impacted upon as a result of works.

The impact of the development upon Sites of National Importance are **unknown**. The Flood Risk Assessment should identify any impacts upon the hydrological features of Sea Mere SSSI, and the Local Planning Authority are required to consult with Natural England based on SSSI Impact Risk Zones.

In the absence of mitigation, the proposed development would give rise to:

- **Moderate-Minor Adverse** impacts upon Sites of County Importance and Sites of District Importance
- **Minor Adverse** impacts upon habitats, green infrastructure, invertebrates, provisionally amphibians (excluding great crested newts), terrestrial mammals (excluding badgers) and foraging/commuting bats;

Mitigation has been proposed which would reduce the overall impact to **minor adverse** *(excluding where further surveys are required)* including:

- **Avoidance and Mitigation**: Tree root protection zones; retention and strengthening of boundary hedgerows with native species; replacement and landscape planting with native species; excavations to be covered at night; gaps beneath fencing to provide links between gardens for use by small mammals, including hedgehogs; building materials to be stored on hardstanding or off the ground, e.g. upon pallets, if they are to be kept at the site overnight or for long periods of time; care should be taken to ensure any imported aggregate and soil onto the site is not contaminated with invasive plant material; 5m working buffer from retained habitats; any open or exposed pipe work to be capped to prevent animals from gaining access; oils, fuels and chemicals should be stored in sealed containers and not be left out overnight; adequate dust and noise suppression facilities will be used on site throughout construction; restricted overnight working; sensitive lighting scheme; care should be taken to avoid killing and/or injury to wild rabbits during the construction phase; no additional input into the ponds or boundary ditches during the construction or operational phases of the development; grassland and tall ruderal vegetation should be maintained at a short sward before and during construction; ***no vegetation should be removed until further surveys have been completed and mitigation has been recommended.***
- **Enhancements**: Installation of an insect hotel within the garden of each new dwelling, creation of artificial hibernation sites incorporated either within gardens or in public green space; installation of 25No. bat bricks built into the fabric of new dwellings across the site.

The overall impact assessment does not take into consideration those species for which further information is required. The following surveys are recommended:

- **Environmental DNA (eDNA) Survey** – Analysis of water samples from Ponds 1 and 2, to determine presence of great crested newt through detection of environmental DNA, e.g. skin cells, faeces, etc. Likely absence can be presumed in any ponds where a negative result is obtained. *If a positive result is returned, great crested newt presence/likely absence surveys would be required for these ponds and any others within 500m which are assessed as being of 'Average' suitability or higher*. *This would comprise 6 visits between mid-March and mid-June, with at least half of the visits undertaken between mid-April to mid-May.*
- **Breeding Bird Survey** – Three surveys to be carried out to establish use of the site by breeding birds, including skylark; one each in April, May and June.
- **Pre-Construction Badger Check –** One pre-construction check for badgers on the site and accessible areas within 30m of the site boundary should be undertaken no more than one month prior to construction. Optimal timing for surveys are March and October.
- **Preliminary Roost Assessment (PRA) –** If semi-mature/mature trees are likely to be impacted upon, i.e. where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the arboriculturist, a Preliminary Roost Assessment of the trees must be undertaken. *However, no further survey should be necessary if no trees are to be impacted upon as a result of the development.*

If construction work does not commence within two years of this survey an update Preliminary Ecological Appraisal (PEA) should be carried out to re-assess the status of the site for protected species.

The proposed development falls into the IRZ categories and therefore requires consultation with Natural England.

1 Introduction

1.1 Commission

1.1.1 Parker Planning Services were commissioned in February 2018 by Abel Homes to undertake a Preliminary Ecological Appraisal (PEA) at a parcel of land located off Norwich Road, Hingham, Norfolk. The appraisal comprised a desk-based study and Extended Phase 1 survey, a Habitat Suitability Index (HSI) assessment, along with an assessment of impacts on ecological features at the site.

1.2 Site Description

1.2.1 The site lies on the eastern outskirts of the village of Hingham, approximately 11km east of the town of Watton. Access to the site is via Norwich Road to the north of the site.

1.2.2 The surveyed site comprised a large parcel and smaller parcel of arable land bisected by scattered trees. A small section of wet ditch, running from a pond, was present along the south-western boundary, which ran dry towards its eastern extent. A Public Right of Way (PRoW) in the form of a narrow strip of bare ground/grass divided the two parcels of arable land. Scattered scrub and tall ruderal vegetation were also present on site. A second pond was present within the north-eastern corner of the site. Norwich Road bounds the site to the north.

1.2.3 A new residential development, which has not yet reached completion, lies adjacent to the west of the site. Arable fields lie adjacent to the east of the site. Residential properties bound the south and south-west corner of the site, in addition to a stand of deciduous woodland.

1.2.4 The village of Hingham and arable fields comprises the majority of the wider surroundings.

1.2.5 The proposed development area is approximately 13 hectares (ha) in size. The approximate centre of the site lies at grid reference TG 030 020. The site location is provided in Figure 01.

1.3 Proposed Development

1.3.1 The proposed development is in the early stages but is expected to include the construction of up to 250 dwellings with associated drives and garden areas. Access would likely be from Norwich Road to the north of the site.

1.3.2 This appraisal considers land within the planning application site boundary as shown in Figure 01 and is hereon referred to as 'the site'. The proposed development plans are provided in Appendix 1.

1.4 Relevant Planning Policy and Legislation

1.4.1 Legislation and policies set at local, national and international levels afford varying degrees of protection to sites of ecological value and species at risk due to declining populations.

1.4.2 The Local Planning Authority, South Norfolk District Council, includes policies within their Local Plan to help protect ecological features valuable at the local level.

1.4.3 A summary of relevant legislation and planning policy is provided in Appendix 2.

1.5 Report Objectives

1.5.1 The overall purpose for this report is to provide supporting information for a planning application for the proposed development, as detailed above. Specific objectives are to:

- Identify the presence or potential presence of important habitats and protected species at the proposed development site;
- Identify any ecological constraints to the development;
- Assess the impact of the proposed development upon nearby designated sites, important habitats and protected species;
- Assess the impact of the proposed development upon protected species;

- Provide advice on the measures required to avoid, reduce or compensate for impacts on protected species; and
- Propose enhancements to increase site value to wildlife and nature conservation post-development.

1.6 Acknowledgements

1.6.1 Work undertaken for this report was carried out by the following surveyors:

Survey(s)	Surveyor(s)	Experience (in years)	Licences Held
Report reviewer Phase 1 Habitat survey	Ben Jervis MCIEEM	8+	Bat Class Licence CL18 (Level 2) (2016-25752-CLS-CLS) Great Crested Newt Class Licence CL08 (Level 1) (2015-18768-CLS-CLS)
Report author	Christine Hipperson MCIEEM	9+	Bat Class Licence CL18 (Level 2) (2015-16077-CLS-CLS) Great Crested Newt Class Licence CL08 (Level 1) (2015-17826-CLS-CLS)

1.6.1 We acknowledge the contribution of:

- Norfolk Biodiversity Information Service (NBIS) for providing relevant designated site information and species records.

1.7 Previous Ecological Studies

1.7.1 An ecological survey including surveys for bats and great crested newts was carried out by Norfolk Wildlife Service in 2013-2014 for the residential development adjacent to the west of the site (Norfolk Wildlife Services, 2014).

1.7.2 Great crested newt surveys were carried out on both Ponds 1 and 2 in 2013, with no great crested newts recorded.

1.7.3 Bat emergence/re-entry surveys recorded low numbers of common pipistrelle roosting in four mature oak trees along Norwich Road.

2 Methodology

2.1 Desk-Based Study

2.1.1 The following information was reviewed to provide information on the location of statutory and non-statutory designated sites, legally protected species, Species and Habitats of Principal Importance and other notable species recorded within a 2km radius of the site boundary:

- Norfolk Biodiversity Information Service (NBIS) provided records of protected, rare and/or priority species and details of statutory and non-statutory designated sites.
- The MAGIC website (www.magic.gov.uk), the Government's online mapping service, was used to identify international and national sites, waterbodies and information on non-statutory sites.
- Publicly available aerial imagery (Google Maps) was used to consider the context of the site and its contribution to local green infrastructure.

2.1.2 The potential for protected, rare and/or priority species to be present on site has been assessed in this assessment, considering the nature of the site and the habitat requirements of the species in question. Absence of records does not constitute absence of a species. Habitats on-site may be suitable to support other protected species that have not previously been recorded within the search area. Records of alien species, non-localised records (e.g. tetrad records) and records dated pre-1997 have not been described in detail but are considered when assessing likely species presence or absence.

Limitations to survey

2.1.3 NBIS does not allow its species records to be made publicly available, for example through direct inclusion within this report. Therefore, whilst we can comment upon species recorded in the local area and take them into consideration for our impact assessment, any accurate locations are determined to be sensitive and cannot be revealed.

2.2 Phase 1 Habitat Survey

2.2.1 Habitats were described and mapped following the standard Phase 1 methodology (JNCC, 2010). Features of ecological interest within such habitats were recorded and mapped. The survey methodology enables a simple and rapid assessment of habitats and it is not necessary to identify every plant species on site.

2.2.2 The survey visit was also used to identify potential for protected, rare and/or priority species, for example, bats, mammals, amphibians and reptiles, to occur on, or in the vicinity of, the proposed development site. Although the survey methodology is not intended for species survey, any protected, rare and/or priority species which were incidentally seen during the survey were noted.

2.2.3 The survey was undertaken on 20th February 2018 in cool conditions with light rain and moderate wind.

Limitations to survey

2.2.4 The survey was undertaken outside of the flowering period for most plant species and therefore not all species present would have been recorded. However, as the site comprises largely of improved grassland, the risk of rare and/or scarce plants being present is minimal.

2.2.5 The survey was carried out in sub-optimal weather conditions which made it difficult to make clear notes whilst on site, though this is not considered to have had a significant effect on the outcome of the survey, the report or any of the recommendations made within.

2.3 Great Crested Newt Habitat Suitability Index (HSI) Assessment

Rationale

2.3.1 Great crested newts are protected by national and European legislation and are 'European Protected Species'.

2.3.2 Great crested newts are widespread across the UK, with varying degrees of abundancy in different localities. They spend large parts of the year on land using habitats such as grasslands, hedgerow bases and woodland, visiting ponds between March and June to breed. They are not usually found in fast-flowing water, though have been known to use slower-flowing waterbodies, such as drainage ditches and canals. Over winter, newts will usually hibernate in sheltered locations, such as log or rubble piles. The likelihood of finding great crested newt at a site depends largely upon the presence of nearby ponds supporting the species and of suitable habitat on site, with local abundancy also greatly affecting likely presence.

2.3.3 The Habitat Suitability Index (HSI) assessment is a standard measure of pond suitability for great crested and informs the requirement for further investigation.

2.3.4 HSI is a geometric mean of ten suitability indices relating to factors affecting the presence of great crested newt. Ponds with high HSI scores are generally more likely to support great crested newts than those with low scores. For example, one study found the presence of great crested newts in 93% of ponds categorised as 'Excellent', whilst only in 3% of ponds determined to be 'Poor' (ARG UK, 2010). A high score does not infer presence of great crested newts, just as a low HSI score does not completely rule out the possibility of great crested newt being present. However, it does provide scientific grounding for the requirement (or not) of further survey to be undertaken.

Methodology

2.3.5 The standard Habitat Suitably Index (HSI) methodology (ARG UK, 2010) was followed. A total of 13 ponds were identified within a 500m radius of the site. Two ponds were present on site and were surveyed.

2.3.6 The following measurements were made or estimated on site:

- Pond surface area, rounded to the nearest $50m^2$;
- How often the pond is likely to dry out (within a 10-year period);
- Water quality, based on the invertebrate community;
- Percentage of pond edge (within 1m) subject to shading;
- Presence/absence and impact of waterfowl;
- Presence/absence and density of fish populations;
- Quality of surrounding terrestrial habitat; and
- Percentage of pond surface occupied by macrophytes.

2.3.7 Two map-based estimates were made following the field survey:

- The location of the pond within the UK
- The number of ponds within a 1km radius, as seen on a 1:25, 000 Ordnance Survey map and using freely available aerial imagery.

2.3.8 Pond suitability for great crested newts was defined using a categorical scale, as follows:

HSI Score	< 0.5	0.5 – 0.59	0.6 – 0.69	0.7 – 0.79	> 0.8
Pond Suitability	Poor	Below Average	Average*	Good*	Excellent*

*pond usually requires further surveys

2.3.9 The surveys were undertaken on 20th February 2018 in cool conditions with light rain and moderate wind.

Limitations to survey

2.3.10 Only the two ponds on site were surveyed. Permission to access other ponds within a 500m radius of the site was not attempted at this stage.

2.4 Impact Assessment

2.4.1 The assessment was undertaken in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Professional Guidance Series 'Guidelines for Ecological Impact Assessment [EcIA] in the UK and Ireland' (Second Edition January 2016).

2.4.2 In summary, the impact assessment process involves:

- Assessing the value of ecological features at the site and those nearby that could be affected (i.e. designated sites, habitats, species);
- Identifying the unmitigated impacts of the development (magnitude, spatial extent, duration, timing/frequency, reversibility);
- Providing measures to avoid and mitigate for impacts;
- Assessing the significance of residual impacts after specified mitigation;
- Identifying appropriate compensation measures to offset significant residual effects; and
- Identifying enhancement opportunities to provide a net benefit for biodiversity.

Value/scale of ecological features

2.4.3 The value of ecological features uses conservation status (i.e. extent, relative abundance and distribution) to assign geographical levels at which the feature is considered to hold importance.

2.4.4 For habitats, this includes the structure and composition of plant communities, the species they may support, and over what distance the habitat may have influence over, e.g. wetlands may attract wintering birds from hundreds of miles away, whereas a small stand of woodland is likely to only support fauna within the local area.

2.4.5 For species, this includes the abundance and distribution within a given geographical area, e.g. a low population of great crested newts may be assessed to be of local importance in the south of England where populations are abundant, but of county importance in the north of England where they are scarcer.

2.4.6 In-depth details of geographic values of importance are summarised in Appendix 3.

Scale of Impact and confidence levels

2.4.7 Impacts on ecological features can occur either directly (e.g. loss of habitats, habitat fragmentation, noise/light disturbance) or indirectly (e.g. changes to local hydrology, nutrient levels, and water/air quality). The overall impact is difficult to quantify and therefore subjectively assessed taking into consideration a range of factors, including conservation status of an ecological feature, magnitude, spatial extent, duration, timing/frequency and reversibility. Impacts can be both positive and negative. The terminology used to quantify scale of impacts are:

Scale of Impact	Description	Examples (in relation to breeding birds)
Negligible	No conceivable impact upon ecological feature.	The habitats on site are unsuitable for supporting a species.
Neutral	No significant impacts which would impact upon occurrence or success of an ecological feature in the short- or long-term.	Temporary noise disturbance during construction would not affect breeding success of common and widespread bird species 20m from the site.

Minor	Likely to have a limited temporary impact upon an ecological feature at the site and/or a small long-term impact.	Temporary noise disturbance during construction might affect breeding success of birds within hedgerows along a site boundary, and the loss of a small area of scrub might reduce long-term foraging and breeding success at the site.
Moderate	Likely to have a significant temporary impact and/or moderate long-term impact upon an ecological feature. Possibly irreversible.	Removal of a high proportion (>50%) of suitable breeding and foraging habitat, such as scrub and hedgerows, which would have a sizeable, but recoverable, impact upon bird species at the site and the immediate adjacent habitats.
Major	Likely to have a huge impact upon an ecological feature, which is likely to be irreversible (if negative).	Removal of all suitable breeding and foraging habitat on a large site, such as scrub and hedgerows, which would dramatically reduce long-term success for the population of bird species, both on-site and in the wider area.

Confidence in impact assessment

2.4.8 Impacts on ecological features can occur either directly (e.g. loss of habitats, habitat fragmentation, noise/light disturbance) or indirectly (e.g. changes to local hydrology, nutrient levels, and water/air quality).

2.4.9 Our assessment of these impacts are predictions based on the available evidence and therefore may be inaccurate if predicted activities change. Therefore, we provide an indication of confidence levels for our assessments using the following criteria:

- Certain probability estimated at above 95%
- Likely probability estimated above 60% but below 95%
- Probable probability estimated above 40% but below 60%
- Possible probability estimated above 20% but below 40%
- Unlikely probability estimated as less than 20%.

Cumulative impacts

2.4.10 Consideration is also given to the potential for the development proposal to give rise to significant negative impact in combination with other proposed development in the local area.

Overall assessment

2.4.11 An overall assessment of value and impact is provided, and this is based upon the highest level of value of any of the features or species present or likely to be present on the site, and similarly the overall assessment of impact would be the impact of greatest significance.

2.5 Duration of Validity

2.5.1 The information provided within this report, including all assessments, conclusions and recommendations, are based on the studies and limitations to survey detailed herein. This appraisal is based on the development proposals described above and may need to be reviewed should there be any changes to the scheme. The assessments made assume that site habitats will continue to be used for their current purpose without significant change until development commences.

2.5.2 Changes in site habitats and the ability of the site to support protected species may alter over time. Our professional judgement and knowledge of the site and the species it may support can be used to determine the period for which the undertaken surveys and this appraisal remain valid. The table below states the sources of information used to form our assessments, conclusions and recommendations, and provides the timescale for when update surveys would be required should development be delayed.

Information Source	Date Undertaken	Valid Until	Comments
Desk-Based Study	February 2018	February 2020	Further records may be available within 1-2 years
Preliminary Ecological Appraisal (PEA)	February 2018	February 2020	Habitats on site may change dependent upon management regime
Great Crested Newt Habitat Suitability Index (HSI) Assessment	February 2018	February 2020	Pond conditions and suitability for great crested newt are unlikely to change within a 2-year period.

3 Results

3.1 Desk-Based Study

Designated Sites

3.1.1 Few designated sites were identified within the 2km search radius, the details of which are provided in the below table.

Site	Distance & Direction From Study Site	Reason For Designation / Key Features
Sites of International Importance		
There are no sites of international importance within 2km of the proposed development site.		
Sites of National Importance		
Sea Mere Hingham (SSSI)	470m south	This site contains a natural lake and an area of species-rich fen and grazing marsh. Deciduous plantations retain some elements of older woodland. The site has ornithological interest because of the diversity of habitats that it contains. The Mere has dense growths of phytoplanktonic algae probably as a result of excretal enrichment from wintering gulls and as a result water plants are restricted to a few patches of yellow water lily. The marginal vegetation is dominated by reed. Breeding birds include great crested grebe and kingfisher. The grazing marshes are generally very wet due to poor drainage and are dominated by tufted hair-grass and fen rush. The fen is species-rich and includes saw sedge marsh orchids Dactylorhiza spp., marsh pennywort, ragged robin, yellow loosestrife, yellow iris and the rare green figwort. Willow Salix sp. is abundant on parts of the marsh and is spreading. Breeding birds include snipe, reed bunting, sedge and grasshopper warblers. The mature plantations surrounding Sea Mere are mostly oak, ash and sycamore, although small areas of coppiced hazel under oak standards are present. The ground flora is dominated by dog's mercury with lords-and-ladies, common twayblade and nettle-leaved bellflower.
Sites of County Importance		
Moneyhill Meadow (CWS)	1km south	The site is a small grassland area bisected by a small stream and fence line. A thin strip of scrub occurs along the northern edge and one of tall ruderal herb vegetation to the south. The majority of the site consists of semi-improved grassland over a neutral soil with impeded drainage. The sward is dominated by Yorkshire fog and rough meadow-grass with false oat-grass, couch-grass and red fescue.

		Herbs include frequent cleavers, common nettle, great willowherb and great horsetail which is scarce in Norfolk. The east of the site is more species rich with frequent common fleabane, cow parsley, rough chervil and hogweed. Scrub areas are largely sloe but with sallow, crack willow, field maple, hawthorn and sycamore. Towards the edges and in areas of lighter shade fool's water-cress, marsh marigold, cuckooflower, hoary willowherb, hemp-agrimony and water-cress.
Gurney's Wood (CWS)	1.7km south-west	The site is a small block of oak and ash woodland situated in the centre of a large field. The canopy is generally loose and open and is dominated by oak although ash is abundant. Sycamore is occasional and there is a ring of spruce around the periphery. The understorey is coppiced hazel with some elder, dogwood and elm. The ground flora consists of rose, bramble, common nettle, dog's mercury, ivy and moss.
Sites of District Importance		
Deciduous Woodland (PHI)	340m north-east	50+ deciduous woodlands within a 2km radius of the site. The closest of which is located 340m north-east of the site. A small parcel of broadleaved woodland is present adjacent to the south of the site, although this is not officially designated as a PHI Deciduous Woodland habitat.
Lowland Fen (PHI)	535m south	Four lowland fen habitats within a 2km radius of the site. the closest of which is located 535m south of the site.
Reedbeds (PHI)	625m south	Seven reedbeds located within a 2km radius of the site. The closest of which is located 625m south of the site.
Traditional Orchard (PHI)	520m south-east	Two traditional orchards within a 2km radius of the site.
No main habitat but additional habitat exists (England) (PHI)	500m south	11 habitats within a 2km radius of the site. The closest of which is located 500m south of the site.

Designated Site Acronyms: SSSI - Site of Special Scientific Interest; CWS – County Wildlife Site; PHI – Priority Habitat Inventory

Biological Records

3.1.2 Several protected species have been recorded within 2km of the site, including:

- Rare and/or Scarce Plants: None.
- Veteran Trees: Three veteran trees (horse chestnut *Aesculus hippocastanum*, small-leaved lime *Tilia cordata* and oak *Quercus robur*). The closest of which is located approximately 540m west of the site.
- Invertebrates: 36 invertebrate species (butterflies, moths and Hymenoptera).
- Amphibians: None.
- Reptiles: None.

- Birds: 54 bird species, including buzzard, hobby, yellowhammer, barn owl, little owl, tawny owl, swift, skylark, swallow, house sparrow.
- Terrestrial Mammals: Hedgehog *Erinaceus europaeus* (8 record), brown hare *Lepus europaeus* (12 records).
- Bats: Records nine species of bat (barbastelle *Barbastella barbastellus*, serotine *Eptesicus serotinus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus,* noctule *Nyctalus noctule,* Nathusius's Pipistrelle *Pipistrellus nathusii,* brown long-eared bat *Plecotus auritus).* Records were also returned for an unidentified *Pipistrellus* species and an unidentified *Myotis* species. Four bat roosts records (common pipistrelle and brown-long-eared bat) were also returned from the same location.

3.1.3 The following invasive, non-native species have been recorded within the 2km search radius:

- Plants: Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum*
- Terrestrial Mammals: Chinese muntjac
- Birds: Egyptian goose
- Fish: Common carp

3.2 Phase 1 Habitat Survey

3.2.1 The Phase 1 habitat survey identified 11 different habitat types. Descriptions for each habitat are provided in the table below, and their locations within the site are shown in Figure 02. Site photos are provided in Appendix 4. Scientific names for plant species are only provided in their first instance.

Habitat Code	Habitat Name	Description	Species Recorded
A2.2	Scattered scrub	Scattered scrub was present in small sections along the arable field boundaries and Pond 2 in the north-east corner of the site. A small area of immature blackthorn was also present in the south-west of the site.	Dominant: bramble *Rubus fruticosus* agg., blackthorn *Prunus spinosa* Present: common nettle *Urtica dioica*
A3.1	Broadleaved scattered trees	Scattered trees were present around the arable field boundaries, with an almost continuous shelter belt present on the southern boundary.	Dominant: ash *Fraxinus excelsior* Present: hawthorn *Crataegus monogyna*, oak, common ivy *Hedera helix,* sycamore *Acer pseudoplatanus*, beech *Fagus sylvatica*, hazel *Corylus avellana*
C3.1	Tall ruderal	A large parcel of tall ruderal vegetation was recorded in the south-west corner of the site. A narrow strip was also present between the large arable field and the adjacent field to the east.	Present: spear thistle *Cirsium vulgare*, rosebay willowherb *Chamaenerion angustifolium*, creeping thistle *Cirsium arvense*, curled dock *Rumex crispus*, common nettle, bristly ox-tongue *Helminthotheca echioides*, groundsel *Senecio vulgaris*, red dead nettle *Lamium purpureum*, broadleaved plantain *Plantago major*, dove's-foot crane's-bill

			Geranium molle, cut-leaved crane's-bill *Geranium dissectum*, cleavers *Galium aparine*, lords-and-ladies *Arum maculatum*
G1	Standing water	Two ponds were present at the site; one in the south-west corner (Pond 1) and the other in the north-east corner (Pond 2). A wet ditch ran along the south-western site boundary into Pond 1.	
J1.1	Arable	A large arable field formed the majority of the site, with a smaller parcel of arable field also present in the south-west corner. The fields were mostly bare ground although they appeared to be sown with *Lolium perenne* ley.	Present: Perennial rye grass *Lolium perenne*
J2.1.1	Intact native species-rich hedge	A recently planted (2-3 years old) hedgerow ran alongside the Public Right of Way in the west of the site.	Dominant: hawthorn *Crataegus monogyna*, blackthorn Present: holly *Ilex aquifolium*, hazel *Corylus avellana*, beech *Fagus sylvatica*
J2.1.2	Intact species-poor hedge	Two small sections of hawthorn and blackthorn hedgerow were found along the northern site boundary. Two sections of garden hedgerow (one beech, the other blackthorn) bounded part of the south-west corner of the site.	Present: hawthorn, blackthorn, beech, bramble
J2.4	Fence	Heras fencing was present along the large sections of the western site boundary and the northern section of the south-west corner. Timber panel fencing was present along sections of adjacent gardens.	
J2.6	Dry ditch	The ditch leading from Pond 1 continued along the site boundary, with the eastern half being dry at the time of survey. Vegetative growth within the ditch suggests this part of the ditch remains dry throughout the year.	Present: grass species, snowdrop *Galanthus nivalis*

J4	Bare ground	A parcel of bare ground, outlined by Heras fencing, was present in the south-west corner of the site	
J5	Other habitat	A construction compound bounded by Heras fencing was present in the west of the site.	
Target Notes (TN) *Locations shown on Figure 02*		TN1 – Rabbit burrows TN2 – Skylark calling	

3.3 Great Crested Newt HSI Assessment

3.3.1 Two ponds were present onsite and were surveyed. Eleven other ponds were identified within a 500m radius of the site but were not surveyed at this stage. The detailed results of the HSI assessment are provided in the table below, with pond locations shown in Figure 02. Site photos are provided in Appendix 4.

Habitat Suitability Index (HSI) Assessment – Suitability Scores

Pond Number	Individual Suitability Indices										Overall Score
	Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Pond Count	Terrestrial Habitat	Macrophytes	
1	1	0.3	0.9	0.33	0.6	0.67	0.67	1	0.67	0.6	0.62
2	1	0.5	0.9	0.33	0.4	0.67	0.67	1	0.33	0.3	0.55

3.3.1 A summary table of HSI results, location related to the site and requirement for further survey is provided below.

Habitat Suitability Index (HSI) Assessment - Summary of Results

Pond Number	HSI Score	HSI Category	Distance & Direction From Site	Comments	Further Survey Required?
1	0.62	Average	Onsite	Pond within the south-western corner of the site lying adjacent to a small woodland area.	Yes
2	0.55	Below Average	Onsite	Pond within arable field in north-eastern corner of the site.	Yes

3.3.1 Pond 1 was categorised as 'Average' and will require further survey to determine presence/likely absence of great crested newt. Pond 2 was categorised as 'Below Average'. However, as this pond is on site, further surveys should still be undertaken to determine presence/likely absence of great crested newt.

4 Assessment

4.1 Designated Sites

4.1.1 An assessment of impacts for each of the designated sites within the search radius of the proposed development is provided in the table below. Those sites where an impact is determined likely are discussed.

Site	Distance & Direction From Study Site	Likely Impact	Reason
Sites of International Importance			
There are no sites of international importance within 2km of the proposed development site.			
Sites of National Importance			
Sea Mere Hingham (SSSI)	470m south	**Unknown** *until Flood Risk Assessment confirms no hydrological impact*	The development footprint will remain within the site boundary. Noise and air pollution which may be created during the construction phase are unlikely to affect sites over 200m from the site, assuming air pollution is controlled using standard best practice throughout the construction period. Sea Mere SSSI lies approximately 470m south of the proposed development site. It is assumed that any surface and waste water at the proposed development would run into the mains system. A flood risk engineer will need to be consulted as part of the planning application, e.g. to assess flood risk potential and design SuDS features. If the flood risk engineer determines the proposed development would affect the hydrology around Sea Mere SSSI, then a Habitat Regulation Assessment (HRA) would be required. Although Sea Mere SSSI is accessible for educational and group visits, access is only permitted through bookings. As such, an increase in recreational use of the site by residents of the proposed development is highly unlikely to be significant in the long-term. The proposed development site lies within the Impact Risk Zones (IRZ) of the SSSI. As such, consultation with Natural England is required (see below).

Sites of County Importance			
Moneyhill Meadow (CWS)	1km south	**Moderate-Minor Adverse**	Noise and air pollution which may be created during the construction phase are unlikely to affect sites over 200m from the site, assuming air pollution is controlled using standard best practice throughout the construction period. The development footprint will remain within the site boundary. An increase in the level of disturbance, e.g. through recreational use may take place at publicly accessible sites during the operational phase. Use by dog walkers could cause localised nutrient enrichment.
Gurney's Wood (CWS)	1.7km south-west		
Sites of District Importance			
Deciduous Woodland (PHI)	340m north-east	**Moderate - Minor Adverse**	Noise and air pollution, during construction and operational phases, are unlikely to affect sites over 200m from the development, assuming air pollution is controlled using standard best practice throughout the construction period. An increase in the level of disturbance, e.g. through recreational use, may take place at publicly accessible sites during the operational phase if these habitats are accessible to the public. This is highly unlikely to be significant in the long-term. Use by dog walkers could cause localised nutrient enrichment. A small parcel of broadleaved woodland is present adjacent to the south of the site. This is not designated as a PHI Deciduous Woodland habitat. However, the woodland is separated from the site by a wet ditch and so an increase in the level of disturbance, e.g. through recreational use, is unlikely to be significant. However, it is possible there may be an ongoing predation risk from resident cats towards small mammal/bird species within the woodland.
Lowland Fen (PHI)	535m south		
Reedbeds (PHI)	625m south		
Traditional Orchard (PHI)	520m south-east		
No main habitat but additional habitat exists (England) (PHI)	500m south		

Designated Site Acronyms: SSSI - Site of Special Scientific Interest; PHI – Priority Habitat Inventory; CWS – County Wildlife Site

4.1.2 Natural England has provided guidance in the form of Impact Risk Zones (IRZ) to aid with determining impacts upon Sites of Special Scientific Interest and the need for consultation with planning applications. These Impact Risk Zones consider the type of development proposed and the distance of the development site from a SSSI.

4.1.3 In accordance with the SSSI Impact Risk Zones User Guidance (Natural England, March 2018, from www.magic.gov.uk), website consultation with Natural England would be required for the proposed development site for:

- Any residential development of 50 or more houses outside existing settlements/urban areas.

4.1.1 The proposed development falls into this IRZ category and therefore requires the Local Planning Authority to consult with Natural England.

4.2 Habitats and Green Infrastructure

Habitats

4.2.1 The site comprised two parcels of arable land, bisected by scattered trees. Scattered scrub, tall ruderal, species-rich and species-poor hedgerows, dry and wet ditches were also present at the site. Two ponds were present on site.

4.2.2 A small parcel of broadleaved woodland existed adjacent to the south-western corner of the site. This is separated from the site by a partially wet ditch.

4.2.3 Species recorded at the site were typical of habitats within the wider area, although habitats present are likely to provide suitable foraging and nesting resource for a range of species, including breeding and foraging birds, bats, terrestrial mammals, amphibians and invertebrates.

4.2.4 The habitats on site are considered to only be of importance at the **parish** scale. The unmitigated impact is provisionally assessed as being **minor adverse** due to the loss of foraging and breeding habitat for a variety of species. However, the impacts would be reduced to **minor adverse-neutral** with the recommended mitigation as detailed in Section 5.2, to include the protection and strengthening of boundary habitats.

Green Infrastructure

4.2.5 Garden habitats adjoin the site boundary along the south and part of the west boundary. However, arable land and residential developments lie adjacent to the site and isolates the site from habitats of high ecological value within the wider surroundings. Scattered trees, small sections of hedgerow and a partially wet ditch along the southern boundary provide limited connectivity to the wider area.

4.2.6 The site is considered to contribute to local green infrastructure at the **parish** scale. The unmitigated impact of the proposed development is assessed as being **minor adverse**. This would be reduced to **neutral** with the recommended mitigation, including sensitive lighting design, detailed in Section 5.2.

4.3 Great Crested Newts

4.3.1 No records for great crested newts were returned in the data search.

4.3.2 The boundary ditches and hedgerows provide connectivity to surrounding suitable habitats (gardens, woodland, tall ruderal vegetation, ponds) for terrestrial great crested newts. Thirteen ponds lie within 500m of the site.

4.3.3 Two ponds were present on site. The dry and wet ditches along the southern boundary of the site. Pond 1 was categorised as 'Average' and therefore assessed as having potential to support great crested newts. Pond 2 was categorised as 'Below Average'. However, as this pond is on site, further surveys will be required to determine presence/likely absence of great crested newt.

4.3.4 Great crested newt surveys were carried out on both ponds in 2013 by Norfolk Wildlife Trust for the adjacent residential development. Although, no great crested newts were found during the surveys in either pond, survey data is now over two years old and therefore up-to-date information is required.

4.3.5 The value of the site for great crested newts is **unknown** until further surveys have been undertaken.

4.4 Other Protected Species

Rare and/or Scarce Plants

4.4.1 The plant species on site were common, widespread and typical of the habitats present within the local area.

4.4.2 The value of the site to rare and/or scarce plants is therefore considered to be **negligible**.

Veteran Trees

4.4.3 A total of three veteran trees were returned in the data search, the closest of which was located 540m west of the site. No veteran trees were recorded at the site.

4.4.4 The value of the site for veteran trees is therefore assessed as being **negligible**.

Invertebrates

4.4.5 Several species of moth, butterfly and Hymenoptera were returned in the data search. The habitats recorded on site provide suitable habitat for foraging invertebrates, although only common and widespread species are considered likely to use the site.

4.4.6 The site is considered to be of value at a **parish** scale for invertebrates, with a **minor adverse** impact foreseen as a result of the proposed development. The impact would be reduced to **neutral** with implementation of the mitigation recommended in Section 5.2.

Amphibians (excluding Great Crested Newts)

4.4.7 No records for amphibians were returned in the data search.

4.4.8 Two ponds were present on site. The boundary ditches and hedgerows provide connectivity to surrounding habitats suitable habitat for great crested newts. Garden habitats adjacent to the south and west of the site provide suitable foraging habitat.

4.4.9 The value of the site to amphibians, excluding great crested newts, is provisionally assessed as being at the **parish** scale. The impact of the proposed development is provisionally assessed as being **minor adverse**. Impacts would be reduced to **minor adverse-neutral** with implementation of the recommendations set out in Section 5.2.

Reptiles

4.4.10 No records for reptiles were returned in the data search.

4.4.11 The scrub habitat along the northern boundary was isolated from other suitable habitats. Hedgerow bases were poorly vegetated and unlikely to support commuting reptiles, and there was generally poor connectivity to habitats within the wider surroundings. The site is therefore considered to be isolated from areas of suitable habitat for reptiles.

4.4.12 The site is assessed as being of **site only** value to reptiles. The impact of the proposed development is assessed as being **neutral**, assuming the grassland and tall ruderal vegetation is maintained to a short sward before and during construction. *No vegetation should be removed until further surveys have been completed and mitigation has been recommended.*

Birds

Breeding Birds

4.4.13 Fifty-four species of bird were returned in the data search, and skylark was heard calling at height above the large arable field at the site.

4.4.14 The hedgerows, trees and scattered scrub on site provide suitable nesting and foraging habitats for birds. The arable field provides suitable foraging and breeding habitat for birds.

4.4.15 The value of the site to breeding birds is **unknown** subject to further surveys.

Wintering Birds

4.4.16 The habitats on site are sub-optimal for wintering birds and the site is therefore considered to be of **negligible** value.

Badgers

4.4.17 No records for badger were returned in the data search.

4.4.18 Although no signs of badgers were recorded whilst on site, badgers use a wide variety of habitats, including arable fields for foraging and woodland for breeding. The woodland habitat adjacent to the southern boundary of the site is provides suitable habitat for badgers. The onsite arable field and surrounding arable fields provide suitable habitat for badgers.

4.4.19 Badgers are a mobile species and could potentially forage at the site infrequently.

4.4.20 Badgers are protected from killing and injury under The Protection of Badgers Act 1992. Under this act it is also an offence to intentionally or recklessly damage, destroy or obstruct access to a badger sett or any part. See Appendix 2 for a summary of the relevant legislation.

4.4.21 The site is considered to be of **site only** value for badgers, with the unmitigated impact assessed as being **neutral**. However, *a pre-construction badger check should be carried out no more than one month prior to works commencing to ensure that no setts have been created at the site, or within 10m of the site boundary.*

Terrestrial Mammals (excluding Badgers)

4.4.22 Records were returned for brown hare and hedgehog.

4.4.23 The hedgerow bases, scrub and tall ruderal vegetation provide suitable foraging habitat for hedgehogs. Garden habitats lie adjacent to the south and west of the site which the species may also frequent. The presence of hedgehogs using the site cannot be ruled out, although this would be restricted to the habitats mentioned above and not the arable fields.

4.4.24 The arable habitats are suitable for brown hare. Arable habitats are present within the wider area. It should be assumed that brown hare may occasionally use the site.

4.4.25 No records for water vole or otter were returned in the data search. The two ponds present on site were not well-vegetated and were isolated from habitats suitable for water vole or otter. The dry and wet ditches do not provide suitable connectivity to other waterbodies in the area.

4.4.26 Rabbit burrows were recorded along the north and south boundaries of the large arable field. Precautionary measures should be implemented so as to avoid unnecessary injury to rabbits during works.

4.4.27 The site is considered to be of **parish** value for terrestrial mammals with the unmitigated impact assessed as being **minor adverse**. However, should the recommended mitigation detailed in Section 5.2 be implemented, the impact would be reduced to **neutral.**

Bats

Roosting

4.4.28 The scattered trees present on site could have the potential to support roosting bats. The value of the trees for roosting bats is **unknown** subject to further survey. However, no further survey should be necessary if no trees are to be impacted upon as a result of the development, which will be determined by the Arboricultural Impact Assessment.

Foraging/Commuting

4.4.29 The ditches, scattered trees and hedgerow habitats provide suitable foraging and commuting habitat for bats of common and widespread species. However, connectivity to the wider surroundings is relatively poor.

4.4.30 The site is assessed as being of value at the **parish** scale for foraging and commuting bats. The unmitigated impact of the proposed development is provisionally assessed as being **minor adverse.** This would be reduced to **minor adverse-neutral** with the recommended mitigation, to include sensitive lighting design.

4.5 Invasive species

4.5.1 The data search returned records for Japanese knotweed, giant hogweed, Chinese muntjac, Egyptian goose and common carp.

4.5.2 Chinese muntjac are widespread and may graze at the site sporadically.

4.5.3 Common carp are unlikely to be present in either of the two onsite ponds. These are an ornamental species which would only be present if introduced.

4.5.4 The two ponds on site provide potential habitat for Egyptian geese. However, the site is highly unlikely to provide a stronghold for these species.

4.5.5 No invasive plant species were recorded on site. However, if invasive plant species are found on the site at a later date, advice should be sought from an invasive species specialist and measures taken to prevent their spread.

4.6 Cumulative Impacts

4.6.1 There are no known cumulative impacts of the proposed development. Although the proposed development would continue encroachment into the greenbelt area east of Hingham, arable fields are generally of low ecological value.

5 Conclusions and Recommendations

5.1 Ecological Value and Impacts

5.1.1 The Site is considered to be typical of an intensive arable landscape, dominated by relatively large fields with hedgerows and small areas of other habitats (two ponds, scattered scrub and tall ruderal vegetation). A number of protected and/or priority species may potentially use the site in some capacity. Further surveys to inform the baseline position would be undertaken to inform any future planning application.

5.1.2 Habitat loss is considered to be the main adverse impact at this stage, with mitigation possible for some species via appropriate soft landscaping and scheme masterplanning. Although, mitigation of impacts on some species associated with arable fields will not be possible on-site, e.g. skylark, it is expected the scheme could deliver an overall net biodiversity gain for some species through an increase in habitats of higher ecological value and creation/strengthening of green infrastructure, e.g. hedgerows.

5.1.3 However, whilst as detailed above further survey work is required to clarify the full impact on certain species, it is envisaged that the impact of the proposed development could be mitigated via appropriate landscaping and scheme design, with the potential for ecological enhancement.

5.1.4 The table below provides a summary for levels of value for ecological features, the expected unmitigated impact and residual impact with the recommended mitigation. *All assessments are based upon the site layouts provided in Appendix 1.*

Ecological Feature	Scale of Value	Unmitigated Impact	Confidence Level	Residual or Long-Term Impact
Sites of International Importance	International	N/A	-	-
Sites of National Importance	National	**Unknown**	Likely	-
Sites of County Importance	County	Moderate-Minor Adverse	Likely	Minor Adverse
Sites of District Importance	District	Moderate-Minor Adverse	Likely	Minor Adverse
Habitats	Parish	Minor Adverse	Likely	Minor Adverse-Neutral
Green Infrastructure	Parish	Minor Adverse	Likely	Neutral
Great Crested Newts	**Unknown**	**Unknown**	Likely	-
Rare and/or Scarce Plants	Negligible	Negligible	Likely	-
Veteran Trees	Negligible	Negligible	Certain	-
Invertebrates	Parish	Minor Adverse	Likely	Neutral
Amphibians (including Great Crested Newts)	Parish	Minor Adverse	Likely	Minor Adverse-Neutral
Reptiles	Site Only	Neutral	Likely	-
Breeding Birds	**Unknown**	**Unknown**	Likely	-

Wintering Birds	Negligible	Negligible	Certain	-
Badgers	Site Only	Neutral	Likely	Neutral
Terrestrial Mammals	Parish	Minor Adverse	Likely	Neutral
Roosting Bats	**Unknown**	**Unknown**	Likely	-
Foraging/Commuting Bats	Parish	Minor Adverse	Likely	Minor Adverse-Neutral

5.2 Mitigation

Avoidance and Mitigation

5.2.1 The following mitigation is proposed to avoid and/or reduce the impacts of the development upon site features to acceptable levels. All mitigation recommendations are provisional and should be reviewed once further surveys have been completed.

General Precautionary Measures

- No groundworks or mobile plant movement within the root protection zone of trees. Any retained trees should be protected in accordance with British Standards Institution (2012) guidelines.
- Any construction materials stored at the site overnight or for long periods of time should be kept on hardstanding or raised off the ground, e.g. on pallets, to reduce the risk of being used by animals for shelter.
- Care should be taken to ensure any imported aggregate and soil onto the site is not contaminated with invasive plant material, e.g. Japanese knotweed and giant hogweed.
- Any trenches or excavations should be covered overnight or provide a ramp (no greater than 45 degrees in angle) to allow animals to escape. They should also be checked for animals prior to the continuation of works each morning or infilling.
- Any open or exposed pipe work should be capped to prevent animals from gaining access.
- Adequate dust and noise suppression facilities should be used on site throughout construction.
- Overnight working should be avoided to minimise noise and disturbance to nocturnal fauna, such as badgers, bats and breeding birds.
- Oils, fuels and chemicals should be stored in sealed containers and not be left out overnight.
- Care should be taken to avoid killing and/or injury to wild rabbits during the construction phase.

Habitats and Green Infrastructure

- Retention and strengthening of boundary hedgerows with native species, to preserve the site's existing contribution to local green infrastructure and allow continued use by breeding and foraging birds, foraging and commuting bats, amphibians and small mammals.
- To mitigate for the loss of vegetation and foraging opportunities, replacement or landscape planting should include native fruit and berry-bearing trees and shrubs, and plants which provide a good nectar source, to improve foraging resources available for a range of invertebrate species. Planting should be structurally diverse, i.e. comprise of trees, shrubs and ground layer planting, to benefit a wider variety of species.
- No additional input into the ponds or boundary ditches during the construction or operational phases of the development.
- Ensure a minimum 5m working buffer from retained habitats.
- The grassland and tall ruderal vegetation should be maintained at a short sward before and during construction.

- *No vegetation should be removed until further surveys have been completed and mitigation has been recommended.*

Bats - Foraging

- No external lighting of boundary features to allow continued use by commuting bats.
- Any external lighting should be designed in accordance with Bat Conservation Trust guidelines (Appendix 5).

Other Protected Species

- New fencing installed should be made permeable to wildlife (e.g. hedgehogs) by providing 15cm x 15cm gaps or tunnels in the bottom of panels or gravel boards, and gates. This will provide connectivity between gardens for a range of species (see Appendix 6).

Compensation

5.2.2 No compensatory habitat creation or management can be recommended until further surveys have been completed.

Enhancement

5.2.3 Whilst avoidance and mitigation measures are required to reduce the impacts of the proposed development upon ecological features, site enhancements can be made to improve the quality of the site for native flora and fauna post-development. These enhancements can often be employed within other aspects of the development, such as the provision of SuDS features or public green space.

5.2.4 Habitat enhancements are of most benefit to wildlife, whilst small-scale enhancements generally target individual species or a set of species. Potential opportunities specific to the proposed development site are provided below.

Enhancement	Species Benefitted
Creation of artificial hibernation sites to be created using log piles and heaps of stone, brick rubble and soil, and located in areas that are likely to be free from future disturbance. Log piles should be stacked adjacent to retained areas of cover such as scrub, tall ruderal vegetation or hedgerow, and be approximately 1m in height. These could be incorporated into a garden feature or public open space, such as a rockery.	Reptiles, terrestrial mammals, amphibians
Installation of 1No. insect hotel, e.g. Schwegler Clay and Reed Insect Nest, or solitary beehive within the garden of the new dwelling.	Invertebrates
Installation of 25No. bat bricks, e.g. Free Access Bat Box A, or Enclosed Bat Box B or C, within new dwellings at the site to vastly increase the number of roosting opportunities.	Bats

5.2.5 Implementation of the above enhancements would lead to a long term **moderate beneficial** impact upon the stated species.

5.3 Further Studies

Recommended Surveys

5.3.1 Further information is required to fully assess the impact of the proposed development upon some protected species prior to planning permission being obtained. The recommended further surveys include:

- **Environmental DNA (eDNA) Survey** – Analysis of water samples from Ponds 1 and 2, to determine presence of great crested newt through detection of environmental DNA, e.g. skin cells, faeces, etc. Likely absence can be presumed in any ponds where a negative result is obtained. *If a positive result is returned, great crested newt presence/likely absence surveys would be required for these ponds and any others within 500m which are assessed as being of 'Average' suitability or higher. This would comprise 6 visits between mid-March and mid-June, with at least half of the visits undertaken between mid-April to mid-May.*
- **Breeding Bird Survey** – Three surveys to be carried out to establish use of the site by breeding birds, including skylark; one each in April, May and June.
- **Pre-Construction Badger Check** – One pre-construction check for badgers on the site and areas within 30m of the site boundary should be undertaken no more than one month prior to construction. Optimal timing for surveys are March and October.
- **Preliminary Roost Assessment (PRA) –** If semi-mature/mature trees are likely to be impacted upon, i.e. where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the arboriculturist, a Preliminary Roost Assessment of the trees must be undertaken. *However, no further survey should be necessary if no trees are to be impacted upon as a result of the development.*

5.3.2 If construction work does not commence within two years of this survey an update Preliminary Ecological Appraisal (PEA) should be carried out to re-assess the status of the site for protected species.

5.3.3 The proposed development falls into the IRZ categories and therefore requires the Local Planning Authority to consult with Natural England.

5.4 Species Licencing

5.4.1 A European Protected Species Mitigation (EPSM) licence would be needed to implement any impacts upon bats and great crested newts such as damaging or destroying a breeding or resting place or obstructing access to any place of shelter or protection (deliberately or recklessly).

6 References

ARG UK (2010) *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index*. Amphibian and Reptile Groups of the United Kingdom.

CIEEM (2017) *Guidelines for Ecological Report Writing, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal,* 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

DEFRA (2018) Magic Map Application. Available from: http://magic.defra.gov.uk/MagicMap.aspx [Accessed 27th February 2018].

Google Maps (2018). Available from: https://www.google.co.uk/maps/place/Hingham+NR20 [Accessed 13th February 2018]

Hill D, Fasham M, Tucker G, Shewry M, Shaw P (eds.) (2005) *Handbook of Biodiversity Methods*: Survey, Evaluation and Monitoring. Cambridge University Press

JNCC (2010) *Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit*. Reprinted by JNCC, Peterborough.

Norfolk Wildlife Service (2014) *Ecological Surveys (including Bat Surveys and Great Crested Newt Surveys) - Land off Norwich Road, Hingham*

Figures

Appendices

Appendix 1

Proposed Site Layout (as provided by client)

(AWAITING LAYOUT FROM CLIENT)

Appendix 2

Relevant Legislation

Please note: This section contains key details of legislation and planning policy applicable in England and Wales only (i.e. not including the Isle of Man, Scotland, Northern Ireland, the Republic of Ireland or the Channel Islands) and does not provide full details. It is provided for general guidance only. While every effort has been made to ensure accuracy, this section should not be relied upon as a definitive statement of the law. Further information can be obtained from the relevant authorities.

International Legislation: Species

EC Habitats Directive

The aim of the EC Habitats Directive is to protect various species of flora and fauna which are considered rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2017 (as amended) (formerly The Conservation of Habitats and Species Regulations 2010 (as amended), The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

National Legislation: Species

The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) is a fundamental piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the conservation of wild birds (EC Birds Directive) in Great Britain. Various amendments have been made to the Wildlife & Countryside Act 1981 including the Countryside and Rights of Way (CRoW) Act (2000).

Other Legislation

Other legislative Acts affording protection to wildlife and their habitats include:

- Deer Act 1991
- Countryside and Rights of Way (CRoW) Act 2000
- Natural Environment & Rural Communities (NERC) Act 2006
- Protection of Badgers Act 1992
- Wild Mammals (Protection) Act 1996.

Species and species groups that are protected or otherwise regulated under the aforementioned domestic and European legislation, and that are most likely to be affected by development activities, include herpetofauna (amphibians and reptiles), badger, bats, birds, dormouse, invasive plant species, otter, plants, red squirrel, water vole and white clawed crayfish.

Conservation of Habitats and Species Regulations 2017 in relation to species

The Conservation of Habitats and Species Regulations 2017 (as amended) interpret the Birds Directive and Habitats Directive into English and Welsh law.

Explanatory notes relating to species protected under The Conservation of Habitats and Species Regulations 2017 (as amended) (which includes smooth snake, sand lizard, great crested newt and natterjack toad), all bat species, otter, dormouse and some plant species) are given below and consider the case in England only, with Natural England given as the appropriate nature conservation body. **These should be read in conjunction with the relevant species sections that follow.**

- In the Directive, the term 'deliberate' is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.

- The Conservation of Habitats and Species Regulations 2017 (as amended) does not define the act of 'migration' and therefore, as a precaution, it is recommended that short distance movement of animals for e.g. foraging, breeding or dispersal purposes, are also considered.
- In order to obtain a European Protected Species Mitigation (EPSM) licence, the application must demonstrate that it meets the following three 'tests':
    (i) the action(s) is(are) necessary for the purpose of preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment;
    (ii) that there is no satisfactory alternative; and
    (iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

Wild Mammals (Protection) Act 1996

Under the Wild Mammals (Protection) Act 1996 all wild mammals are protected against intentional acts of cruelty under the above legislation. It is an offence to:

- Mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

To avoid possible contravention, due care and attention should be taken when carrying out works (for example, operations near nests or burrows) with the potential to affect any wild mammal in this way, regardless of whether they are legally protected through other conservation legislation or not.

Bats

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats)
- Deliberate disturbance of bat species as:
    a) to impair their ability:
        (i) to survive, breed, or reproduce, or to rear or nurture young;
        (ii) to hibernate or migrate
    b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Implication for development works

For works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate), a European Protected Species Mitigation (EPSM) Licence, issued by the relevant countryside agency (e.g. Natural England), will be required. The licence is to allow derogation from the relevant legislation and to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Though there is no current case law the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded de facto protection, for example, where it can be proven that removal of such features may have a major impact to maintaining the viability of a bat roost[1].

Birds

- With certain exceptions, all wild birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). Among other things, this makes it an offence to:
- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- Intentionally take or destroy an egg of any wild bird:
- Sell, offer or expose for sale, have in his possession or transport for the purpose of sale any wild bird (dead or alive) or bird egg or part thereof.

Certain species of bird, for example the barn owl, black redstart, hobby, bittern and kingfisher receive additional special protection under Schedule 1 of the Act and Annex 1 of the European Community Directive on the Conservation of Wild Birds (2009/147/EC). This affords them protection against:

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young;
- Intentional or reckless disturbance of dependent young of such a bird.

Implication for development works

Works should be planned to avoid the possibility of killing or injuring any wild bird, or damaging or destroying their nests, in order to avoid breaching the Wildlife and Countryside Act 1981 (as amended). To reduce the likelihood of nest destruction in particular, work should be undertaken outside the main bird breeding season (March to September[2]). Where this is not achievable any areas of habitat suitable for birds must be thoroughly checked for nests prior to vegetation clearance.

Species of bird listed on Schedule 1 are additionally protected against disturbance during the breeding season. It will therefore be necessary to ensure that no potentially disturbing works are undertaken in the vicinity of the nest. The most effective way to avoid disturbance is to postpone works until the young have fledged. If this is not achievable, it may be possible to maintain an appropriate buffer zone or standoff around the nest.

Herpetofauna (Amphibians and Reptiles)

Through their inclusion on Schedule 2 under The Conservation of Habitats and Species Regulations 2017 (as amended), the sand lizard *Lacerta agilis*, smooth snake *Coronella austriaca*, natterjack toad *Epidalea calamita* and great crested newt *Triturus cristatus* receive full protection. The pool frog *Pelophylax lessonae* is also afforded full protection under the same legislation. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of species listed on Schedule 2
- Deliberate disturbance of any Schedule 2 species as:
    a) to impair their ability:
        (i) to survive, breed, or reproduce, or to rear or nurture young;

1 Garland & Markham (2008) Is important bat foraging and commuting habitat legally protected? Mammal News, No. 150. The Mammal Society, Southampton.

2 It should be noted that this is the main breeding period. Breeding activity may occur out of this period (depending on the particular species and geographical location of the site) and as such due care and attention should be given when undertaking potentially disturbing works at any time of year.

- (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate
- b) to affect significantly the local distribution or abundance of the species

- Deliberate taking or destroying of the eggs of a Schedule 2 species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

With the exception of the pool frog, these species are also currently listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Other native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Species such as the adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow-worm *Anguis fragilis* are listed in respect to Section 9(1) & (5). For these species, it is prohibited to:

- Intentionally (or recklessly in Scotland) kill or injure these species
- Sell, offer or expose for sale, possess or transport for purpose of sale these species, or any part thereof.

Common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and palmate newt *L. helveticus* are listed in respect to Section 9(5) only which affords them protection against:

- Sale, offering or exposing for sale, possession or transport for the purpose of sale.

Implication for development works

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect the breeding sites or resting places of those amphibian and reptile species protected under The Conservation Habitats and Species Regulations 2017 (as amended) (sand lizard, smooth snake, natterjack toad, great crested newt and pool frog). A licence will also be required for operations liable to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licences are to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Although not licensable, appropriate mitigation measures may also be required to prevent the intentional killing or injury of adder, grass snake, common lizard and slow worm, thus avoiding contravention of the Wildlife and Countryside Act 1981 (as amended).

Badger

Badgers *Meles meles* receive protection under The Protection of Badgers Act 1992 which consolidates the previous Badger Acts of 1973 and 1991. Under the Act it an offence to:

- Wilfully kill, injure, take, or, in England and Wales only, attempt to kill, injure or take a badger
- Cruelly ill-treat a badger, including use of tongs and digging
- Possess or control a dead badger or any part thereof
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett or any part thereof
- Intentionally or recklessly disturb a badger when it is occupying a badger sett
- Intentionally or recklessly cause a dog to enter a badger sett
- Sell or offers for sale, possesses or has under his control, a live badger

Implication for development works

A Development Licence is required from the relevant countryside agency (e.g. Natural England, Natural Resources Wales or Scottish Natural Heritage) for any development works liable to affect an active badger sett, or to disturb badgers whilst in the sett. In Wales, the Welsh Government is responsible for issuing licences in relation to agricultural and forestry operations or works to maintain or

improve any existing watercourse or drainage works, or to construct new works required for the drainage of land, including works of defence against seawater or tidal water.

Depending on the nature of the works and the specifics of the sett and its environment, badgers could be disturbed by work near the sett even if there is no direct interference or damage to the sett itself. The countryside agencies have issued guidelines on what constitutes a licensable activity. N.B. there is no provision in law for the capture of badgers for development purposes and therefore it is not possible to obtain a licence to translocate badgers from one area to another.

Water vole

Water voles *Arvicola amphibious* receive protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the Act it an offence to:

- Intentionally capture, kill or injure water voles
- Damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care)
- Disturb them in a place of shelter or protection (on purpose or by not taking enough care)
- Possess, sell, control or transport live or dead water voles or parts of them (not water voles bred in captivity)

It is generally agreed that a place of shelter or protection used by water voles includes a network of active burrows and/or any nests that have been constructed within the burrow system or above ground amongst dense vegetation.

Implication for development works

Licences can't be issued for the specific purpose of development. A Displacement Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works where intentional damage or destruction of water vole burrows, and/or disturbance to water voles occupying burrows, is caused, by use of the 'displacement' mitigation method prior to carrying out lawful development works.

For the purposes of this licence, 'displacement' means removal of vegetation followed, where appropriate, by a destructive search of the burrows, where the intention is to displace water voles from their burrows. Water draw-down or removal may be used in parallel with vegetation removal, where appropriate.

In some circumstances Natural England will consider issuing a licence in relation to a development proposal if the licensed action is going to provide a conservation benefit for water voles. If you need planning permission, this must be obtained prior to submitting a licence application.

Invasive Plant Species

Certain species of plant, including Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum* and Himalayan balsam *Impatiens glandulifera* are listed on Part II of Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) in respect to Section 14(2). Such species are generally non-natives whose establishment or spread in the wild may be detrimental to native wildlife. Inclusion on Part II of Schedule 9 therefore makes it an offence to plant or otherwise cause these species to grow in the wild.

Implication for development works

Although it is not an offence to have these plants on your, it is an offence to cause these species to grow in the wild. Therefore, if they are present on site and development activities (for example movement of spoil, disposal of cut waste or vehicular movements) have the potential to cause the further spread of these species to new areas, it will be necessary to ensure appropriate measures to prevent this prior to the commencement of works.

International and National Legislation: Habitats

Statutory Designations: International

Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)

Special Protection Areas (SPAs), together with Special Areas of Conservation (SACs) form the Natura 2000 network. The Government is obliged to identify and classify SPAs under the EC Birds Directive (Council Directive 2009/147/EC (formerly 79/409/EEC)) on the Conservation of Wild Birds).

- ***Special Protection Areas*** are areas of the most important habitat for rare (listed on Annex I of the Directive) and migratory birds within the European Union. Protection afforded SPAs in terrestrial areas and territorial marine waters out to 12 nautical miles (nm) is given by The Conservation of Habitats & Species Regulations 2017 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SPAs in UK offshore waters (from 12-200 nm).
- ***Special Areas of Conservation*** are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive within the European Union. The Government is obliged to identify and designate SACs under the EC Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora). SACs in terrestrial areas and territorial marine waters out to 12 nm are protected under The Conservation of Habitats & Species Regulations 2017 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SACs in UK offshore waters (from 12-200 nm).

Ramsar

Ramsar sites are designated under the Convention on Wetlands of International Importance. The Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources, in particular it recognises wetlands as ecosystems that are globally important for biodiversity conservation. Wetlands can include areas of marsh, fen, peatland or water and may be natural or artificial, permanent or temporary. Wetlands may also incorporate riparian and coastal zones adjacent to the wetlands. Ramsar sites are underpinned through prior notification as Sites of Special Scientific Interest (SSSIs) and as such receive statutory protection under the Wildlife & Countryside Act 1981 (as amended) with further protection provided by the Countryside and Rights of Way (CRoW) Act 2000. Policy statements have been issued by the Government in England and Wales highlighting the special status of Ramsar sites. This effectively extends the level of protection to that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the Natura 2000 network (e.g. SACs & SPAs).

Statutory Designations: National

Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNR)

Sites of Special Scientific Interest are nationally important areas of special scientific interest, designated for their flora, fauna, or geological or physiographical features, under the National Sites and Access to the Countryside Act 1949 and latterly the Wildlife & Countryside Act 1981 (as amended). National Nature Reserves are declared by the countryside agencies under the same legislation. As well as underpinning other national designations the system also provides statutory protection for terrestrial and coastal sites which are important within a European context (Natura 2000 network) and globally (such as Wetlands of International Importance). See subsequent sections for details of these designations. Improved provisions for the protection and management of SSSIs have been introduced by the Countryside and Rights of Way Act 2000 (in England and Wales).

Statutory Designations: County

Local Nature Reserves (LNRs)

LNRs are statutory sites of lower conservation value designated under national legislation. LNR designation is declared for sites holding special wildlife or geological interest at a local level and are managed for nature conservation, and provide opportunities for research and education and enjoyment of nature.

Non-Statutory Designations

Non-statutory sites designated under local legislation are areas considered to be of local conservation interest. These may be designated by local authorities as ***Local Wildlife Sites (LWS)***, also known as ***County Wildlife Sites (CWS), Local Nature Conservation Sites (LNCS), Sites of Biological Importance (SBIs)*** or ***Sites of Importance for Nature Conservation (SINCs)***. may vary between counties.

Together with the statutory designations, these are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined. The criteria for designation and the level of protection afforded to these sites through local planning policies and development frameworks may vary between counties.

National Planning Policy

The National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) replaced Planning Policy Statement (PPS9) in April 2012 as the key national planning policy concerning nature conservation. The NPPF emphasises the need for suitable development and specifies the need for protection of designated sites and priority habitats and priority species. An emphasis is also made for the need for ecological networks via preservation, restoration and re-creation. The protection and recovery of priority species – those listed as UK Biodiversity Action Plan priority species – is also listed as a requirement of planning policy.

In determining a planning application, planning authorities should aim to conserve and enhance biodiversity by ensuring that:

- Designated sites are protected from adverse harm;
- Planning permission is refused where significant harm from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for;
- Opportunities to incorporate biodiversity in and around developments are encouraged;
- Planning permission is refused for development resulting in the loss or deterioration of irreplaceable habitats including aged or veteran trees and also ancient woodland; and
- Protection should be given to biodiversity within areas designated for their landscape value to include National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty.

The Natural Environment and Rural Communities (NERC) Act 2006, (as amended)

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 40 of the Act requires all public bodies to have regard to biodiversity conservation when carrying out their functions. The Act includes a list of habitats and species of 'principal importance for the conservation of biodiversity' in England. They are referred to in this report as ***Species of Principal Importance and Habitats*** or ***Principal Importance***. Local Authorities are required to consider the needs of these habitats and species when making decisions such as on planning application A developer must show that their protection has been adequately addressed within a development proposal.

Local Planning Authority's planning policy

The Local Planning Authority has policies relating to biodiversity conservation. For details, please see the planning website for the relevant authority.

Regional and Local BAPs

Many local authorities in the UK have also produced a local Biodiversity Action Plan (LBAP) at the County or District level. For details, please see the planning website for the relevant authority.

The Hedgerow Regulations 1997

The Hedgerow Regulations 1997 are intended to protect 'important' countryside hedgerows from destruction or damage by controlling their removal through a system of notification. A hedgerow is considered important if it:

- has existed for 30 years or more; and
- satisfies at least one of the criteria listed in Part II of Schedule 1 of the Regulations.

Schedule 1 criteria are related to the presence of protected plants and animals, or a high diversity of woody species and other qualifying features, e.g. connectivity to other hedgerows, woodlands or ponds, and the presence of standard trees.

Under the Regulations, it is a criminal offence to remove or destroy certain hedgerows without permission from the local planning authority. Countryside hedgerows are defined as those on or adjoining:

- common land;
- village greens;
- SSSIs (including all NNRs, SPAs and SACs);
- LNRs, and;
- land used for agriculture, forestry or the breeding or keeping of horses, ponies or donkeys are covered by these regulations.

Garden hedgerows, e.g. within or marking the boundary of the curtilage of a dwelling-house, are exempt from The Hedgerow Regulations.

Species Legislation

The following table provides an overview of legislation regarding species.

Protected Species	Legislation			
	Wildlife & Countryside Act, 1981	The Conservation of Habitats and Species Regulations, 2010	Natural Environment & Rural Communities (NERC) Act, 2006	Protection of Badgers Act, 1992
Plants (certain 'rare' species)	✓	✓[3]	✓	
Invertebrates (certain 'rare' species)	✓	✓[4]	✓	
White-clawed Crayfish	✓		✓	
Great Crested Newt, Natterjack Toad, Pool Frog	✓	✓	✓	
Other amphibians	✓[5]		✓	
Sand Lizard, Smooth Snake	✓	✓[6]	✓	
Other reptiles	✓[7]		✓	
Barn Owl	✓[8]	✓	✓	
Breeding Birds	✓	✓	✓	
Wintering Birds (certain 'rare' species)	✓	✓	✓	
Bats	✓	✓	✓	
Dormouse	✓	✓	✓	
Water Vole	✓		✓	
Otter	✓	✓	✓	
Badger				✓

3 Nine species present in the UK with very specialised habitat requirements are European Protected Species
4 Fisher's Estuarine Moth, Large Blue Butterfly and Lesser Whirlpool Ram's-horn Snail are European Protected Species
5 The four other native amphibian species (smooth and palmate newts, common frog and common toad) are protected against trade only under this act.
6 Smooth Snake and Sand Lizard are European Protected Species
7 The four other native reptile species (common lizard, slow worm, grass snake and adder) are protected against intentional killing, injuring and trade under this act.
8 Barn owl are a Schedule 1 species and afforded greater protection than provided as standard under the WCA 1981.

Appendix 3

Valuing Ecological Receptors: scale of value (based on Hill et al, 2005)

Value	Examples
International	Statutory sites designated under international conventions or related national legislation, for example: ▪ Wetlands of International Importance (Ramsar sites) ▪ Special Areas of Conservation (SAC) ▪ Special Protection Areas (SPA)
National	Statutory sites designated under national legislation, for example: ▪ Sites of Special Scientific Interest (SSSI) (England, Wales, Scotland) ▪ National Nature Reserves (NNR) (UK) Significant viable areas of habitats, or populations or assemblages of species of principal importance for the conservation of biodiversity: England and Wales (Section 41 species and habitats) of such size and quality as might qualify for SSSI designation. Populations or assemblage of Red Listed, Rare or Legally Protected Species, as might qualify for SSSI designation, for example: ▪ Species of conservation concern, ▪ Red Data Book (RDB) species ▪ Birds of Conservation Concern (Red List species) ▪ Nationally rare and nationally scarce species ▪ Legally protected species
County	Statutory sites of lower conservation value designated under national legislation, for example: ▪ Local Nature Reserves (LNR) (UK) Non-statutory sites designated under local legislation, for example: ▪ County Wildlife Sites (CWS) ▪ Local Wildlife Sites (LWS) ▪ Roadside Nature Reserves/protected roadside verges (RNR) Viable areas of habitat or populations of species of principal importance for the conservation of biodiversity: England and Wales (Section 41 species and habitats) of such size and quality as might qualify for designation at the county level. Other non-designated sites which meet the criteria for designation at this level.
District/ Borough	Sites or features not meeting criteria for County designation, but that are considered to appreciably enhance the habitat resource within the context of the local District or Borough, for example:

	▪ Ancient woodland ▪ Diverse/ecological valuable and cohesive hedgerow network ▪ Significant cluster or group of ponds ▪ Veteran/Ancient trees Viable areas of habitat or populations of species of principal importance for the conservation of biodiversity: England and Wales (Section 41 species and habitats) but not qualifying for designation at the county level.
Parish	Areas of habitat considered to appreciably enhance the ecological resource within the context of the local parish, e.g. species-rich hedgerows. Small areas of habitat or populations of species of principal importance for the conservation of biodiversity: England and Wales (Section 41 species and habitats)
Site only	Ecological feature or resource not meeting any of the above criteria.

Note: there is much overlap in designations and lists of important species, and many sites, habitats and species appear on several. Where a site, habitat or species has multiple designations or levels of protection, normally the highest level would be the level at which impacts are assessed.

Appendix 4

Site Photos

Photograph 1 – Scrub habitat along the western boundary. The newly planted species-rich hedgerow can be seen. Photo looking north.

Photograph 2 – Parcel of arable land at the west of the site.

Photograph 3 – Tall ruderal vegetation at the west of the site. Heras fencing separates the proposed development site from the compound for the adjacent development.

Photograph 4 – Pond 1 along the southern boundary of the site. The pond was categorised as 'Average' in the HSI assessment. Further surveys are required.

Photograph 5 – Tall ruderal vegetation at the south of the site.

Photograph 6 – Section of wet ditch along the southern boundary of the site. The broadleaved woodland adjacent to the site can be seen.

Photograph 7 – Wet ditch along the southern boundary of the site.

Photograph 8 – Dry ditch bisecting the two parcels of arable land.

Photograph 9 – Large parcel of arable land at the east of the site. photo looking north.

Photograph 10 – Pond 2 at the north eastern corner of the site. The pond was categorised as 'Below Average' in the HSI assessment. Further surveys are required.

Photograph 11 – Scattered scrub along the northern boundary. Photo looking west.

Appendix 5

Artificial Lighting and Wildlife (Bat Conservation Trust)

Appendix 6

Link Your Garden (Hedgehog Street)