

Hopkins Ecology

Site: Land East of Bungay Road,
Poringland

Work Item: Ecological Appraisal

Client: ESCO Developments

Author: Dr GW Hopkins CEnv MCIEEM
Date: 29 May 2019

CONTENTS

SUMMARY	1
1. INTRODUCTION	2
Background	2
Site Context	2
Legislation and Planning Policy	2
2. METHODS	3
Personnel	3
Data Search	3
Field Survey	3
3. DESIGNATED SITES	4
Overview	4
Statutory Sites	4
Non-Statutory Sites	4
Green Infrastructure and Countryside Schemes	5
4. SITE DESCRIPTION	6
Overview	6
Site Description	6
5. SPECIES SURVEYS AND SCOPING	9
Great Crested Newts	9
Reptiles	9
Bats	9
Birds	10
Small Mammals	10
Invertebrates	10
6. DISCUSSION	11
Evaluation	11
Impacts	11
Mitigation of Construction Impacts	12
Enhancements and Opportunities	13
7. CONCLUSIONS	15
8. APPENDIX 1: PHOTOGRAPHS	16
9. APPENDIX 2: ADDITIONAL INFORMATION	18
10. APPENDIX 3: LEGISLATION SUMMARY	20

SUMMARY

Hopkins Ecology Ltd was appointed by Brown & Co on behalf of ESCO Developments to prepare a preliminary ecological appraisal of a site to the east of Bungay Road, Poringland. A residential scheme is proposed. The Site is ~4.9ha in area and comprises a grass field with boundary habitats and some scrub and pond.

The Site comprises a grass field with a stream running through it such that there is a distinct northern and southern part. The southern part of the Site is an improved sward. The northern part, in particular the northern end, is a damp, semi-improved sward including species such as meadow saxifrage and common spotted orchids. Based on the available information this semi-improved sward would qualify as the Lowland Meadow Habitat of Principal Importance.

Around the Site are two lengths of hedgerow and both qualify as Hedgerow Habitat of Principal Importance but not as Important Hedgerows.

There are a number of mature and over mature trees north of the stream and these have bat roost potential, with numerous cavities and splits being visible and at least two trees being rated to be of 'high' potential value for roosting bats.

Great crested newts are concluded to be absent based on direct surveys of the on-Site pond, unrelated previous surveys of a pond to the west of Bungay and lack of access to a pond 185m to the north-east.

Impacts on designated sites are not anticipated, by virtue of the distance to them being >1km.

The species of conservation concern that are scoped in are: roosting and foraging bats, nesting birds, grass snakes, hedgehogs and invertebrates including possible wetland specialists. For most of these groups the locations of greatest relevance are to the north of the stream.

The scheme masterplan shows development to the south of the stream only and not within the lower lying land adjacent to the stream. It is recommended that an ecological management plan is prepared to ensure the long-term value of the ecological features on the Site, in particular the semi-improved grassland. This would not necessarily preclude public access but would probably require measures to limit trampling and deterioration from recreational use, as well as an appropriate cutting regime. Access will require some hedgerow removal.

Mitigation of works should have regard for nesting birds, either through appropriate timing or the use of a watching brief. Works should also follow good practice with respect to avoiding water pollution.

As stated, it is recommended that an ecological management plan is prepared to ensure the long-term value of the ecological features on the Site, in particular the semi-improved grassland. This should also cover other aspects such as site landscaping, bird and bat boxes and measures to minimise light spill onto retained areas.

1. INTRODUCTION

BACKGROUND

- 1.1 Hopkins Ecology Ltd was appointed by Brown & Co on behalf of ESCO Developments to prepare a preliminary ecological appraisal of a site to the east of Bungay Road, Poringland. A residential scheme is proposed. The Site is ~4.9ha in area and comprises a grass field with boundary habitats and some scrub and pond.

SITE CONTEXT

- 1.2 The Site is located on the southern edge of the Poringland conurbation and within the South Norfolk and High Suffolk Claylands National Character Area¹, which is characterised as an agricultural landscape on a *'high and predominantly flat clay plateau'*.

LEGISLATION AND PLANNING POLICY

- 1.3 The following key pieces of nature conservation legislation are relevant (with a more detailed description in Appendix 3):
- The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations). The relevant provision here is the listing of great crested newts and all bats as European Protected Species, with strict protection of individuals and occupied habitat or roosts respectively.
 - The Wildlife and Countryside Act, 1981 (as amended). This affords varying level of protection to some species, such as full protection for bats, protection of the active nests of all birds, and also protection from injury for reptiles.
 - Natural Environment and Rural Communities Act 2006. This lists Habitats and Species of Principal Importance, which is reinforced by the National Planning Policy Framework (NPPF) (MCLG, 2019²). For these habitats and species, local planning authorities are required to promote the *"protection and recovery"* via planning and development control. Examples include hedgerows and the widespread reptiles, house sparrows and soprano pipistrelle and noctule bats.
- 1.4 Although the NPPF has an overarching aim of minimising impacts to biodiversity, the majority of species of conservation concern are not specifically recognised by legislation or planning policy. The level of protection afforded to these is undefined and should be considered within this overall aim. Within this report such birds are referred to as Red and Amber-listed (birds) and others as rare or scarce. The collective term 'species of conservation concern' is used for protected species, Species of Principal Importance and those that are otherwise rare or scarce.
- 1.5 Also referred to are the Hedgerow Regulations, which identify higher value hedgerows as Important Hedgerows according to a range of possible criteria. The ecological assessment has been prepared with reference to best practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM) and as detailed in British Standard 42020:2013 Biodiversity - Code of Practice for Biodiversity and Development.

1 Natural England (2014) *Natural Character Area. South Norfolk and High Suffolk Claylands*, 83. Available from: <http://publications.naturalengland.org.uk/publication/6106120561098752>

2 MCLG (2019) *National Planning Policy Framework*. Ministry for Communities and Local Government, London.

2. METHODS

PERSONNEL

- 2.1 This ecological assessment was prepared by Dr Graham Hopkins CEnv MCIEEM FRES, who holds full survey licences for great crested newts and bats and has 15 years of consultancy experience.

DATA SEARCH

- 2.2 The desk study comprises a formal data search from the local records centre and review of relevant data and information from other sources (Table 1).

Table 1. Overview of desk study data sources.

Source	Information
Norfolk Biodiversity Information Service	Designated sites, species of conservation concern; 2km search radius.
MAGIC (https://magic.defra.gov.uk/)	Additional information on statutory sites, habitats of principal importance and wider countryside information.
Local planning applications, manual map-based searching of the South Norfolk DC website	Recent survey data for protected species locally, including negative data.
Various literature and web-based searches	Information on local projects and initiatives of potential relevance as well as some species-level data.
Historic maps Norfolk (http://www.historic-maps.norfolk.gov.uk/)	Aerial photographs from 1988 and 1946; OS maps from 1880s and earlier.

FIELD SURVEY

- 2.3 A scoping survey was undertaken on 06 May 2019. The description of habitats was based on the methods of JNCC (2010)³ and trees were surveyed from ground level for their potential suitability for roosting bats, looking for gaps, cracks and other voids (Collins, 2016⁴). Searches were also made for signs of badgers.
- 2.4 The locations of ponds locally were determined from OS maps and Google Earth. Appendix 2 provides details for the on-Site pond in terms of the Habitat Suitability Index score following ARG (2010)⁵, and direct surveys.

GUIDANCE

- 2.5 The ecological assessment has been prepared with reference to best practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM) and as detailed in British Standard 42020:2013 Biodiversity - Code of Practice for Biodiversity and Development.

CONSTRAINTS

- 2.6 It is not thought that there are any significant constraints to this survey as described.

³ JNCC (2010) *Handbook for Phase 1 Habitat Surveys*. Joint Nature Conservation Committee, Peterborough.

⁴ Collins, J. (2016) *Bat Surveys for Professional Ecologists*. Bat Conservation Trust, London.

⁵ ARG (2010) *Great Crested Newt Habitat Suitability Index*. May 2010. ARG UK Advice Note 5. Available from: www.arguk.org

3. DESIGNATED SITES

OVERVIEW

3.1 The wider countryside has a low density of designated sites, with these distributed across the search radius (Figure 1).

Figure 1. Designated sites within 2km of the Site centre.



STATUTORY SITES

3.2 There are no statutory sites within 2km.

NON-STATUTORY SITES

3.3 There are five County Wildlife Sites (CWSs) within 2km of the Site (Table 2).

Table 2. County Wildlife Sites within 2km.

Site (CWS reference)	Location	Description
Atlas Gravel Workings (258)	1.1km south-east	The remains of mineral workings with a complex mosaic of scrub and grassland.
Land South-East of Burgate Lane Farm (2291)	1.2km east	A mosaic of grassland scrub and ditches.
Abbot's Plantation (259)	1.7km west	A mature plantation with some clearings.
Howe Grove (119)	2.0km south-west	A species-rich ancient woodland.
Framingham Hall Grounds (262)	1.7km north	Two large artificial lakes in the grounds of Framingham Hall.

GREEN INFRASTRUCTURE AND COUNTRYSIDE SCHEMES

3.4 Based on a review of local strategies and policies:

- The Site is not close to B-Line (bee-line) for pollinating insects.
- The Site straddles a local green infrastructure corridor that broadly connects the river valleys of the Tas and Chet. Green infrastructure is considered to be a key requirement for development in the Greater Norwich Area, with the policy requirements originating in the Joint Core Strategy⁶. The spatial vision for these corridors is informed by a Green Infrastructure Strategy (CBA, 2007⁷ ⁸) and associated studies (e.g. Green Networks, Norfolk Wildlife Trust, 2007⁹).
- The Site, in common with much of South Norfolk DC area, lies within the Norfolk Wildlife Trust's 'Claylands Living Landscape' project area¹⁰:

“The Claylands Living Landscape project aims to enhance the management of the area’s wildlife habitats and expand its area of grassland and woodland – thereby creating a more joined-up ecological network – as well as to encourage the more sensitive management of farmland. To achieve this aim, (Norfolk Wildlife Trust) will be working closely with community groups and landowners in South Norfolk to raise wildlife awareness, as well as encouraging their active participation in conserving and enjoying the area’s historic natural environment.”

⁶ Greater Norwich Development Partnership (2014) *Joint Core Strategy for Broadland, Norwich and South Norfolk*. Available from: <http://www.greaternorwichgrowth.org.uk/planning/joint-core-strategy/>

⁷ CBA (2007) *Greater Norwich Development Partnership. Green Infrastructure Strategy. A Proposed Vision for Connecting People, Places and Nature*. Available from: <http://www.greaternorwichgrowth.org.uk/dmsdocument/201>

⁸ <http://www.greaternorwichgrowth.org.uk/dmsdocument/1590>

⁹ Norfolk Wildlife Trust (2006) *Report of the Ecological Network Mapping Project for Norfolk*. Available from: http://www.norfolkdiversity.org/pdf/news/Final_report_of_indicative_map_July%202006.pdf

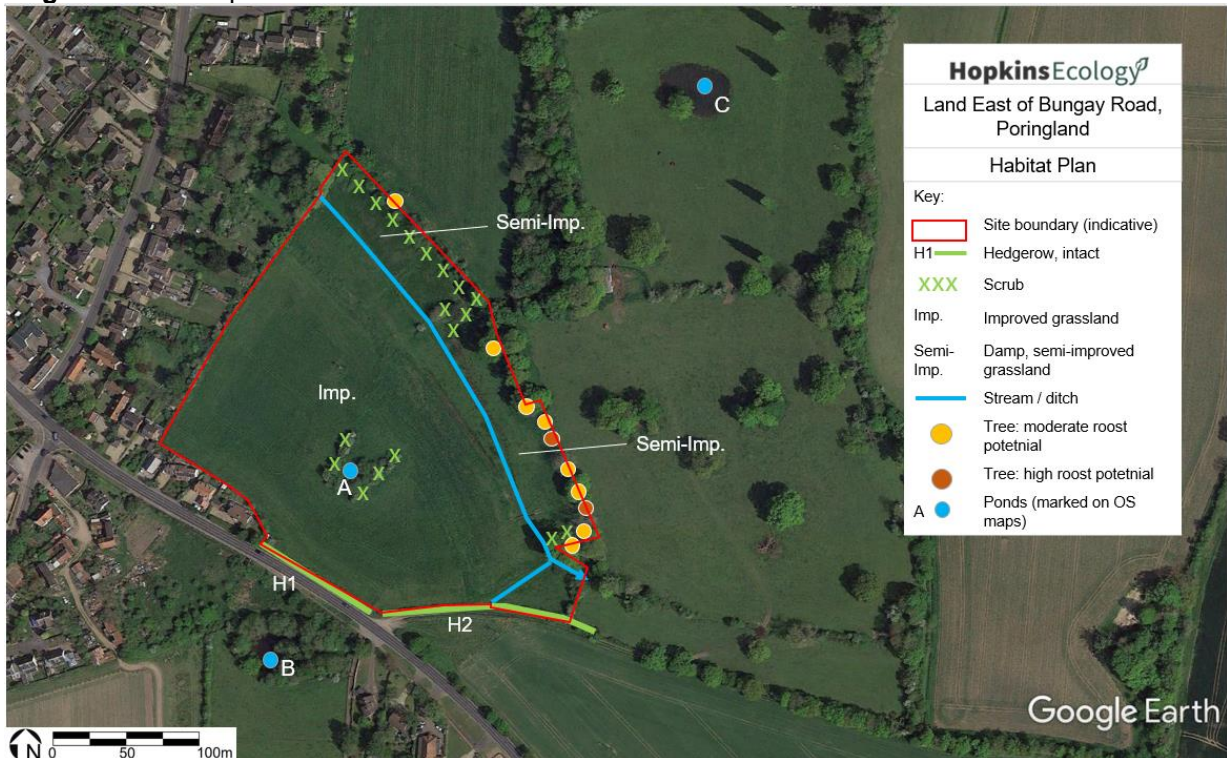
¹⁰ <https://www.norfolkwildlifetrust.org.uk/a-living-landscape/claylands>

4. SITE DESCRIPTION

OVERVIEW

- 4.1 The Site comprises a grass field with partial boundary hedgerows. Towards the north-east a small stream runs through the site, flowing southwards, and the Site slopes gently towards the stream (Figure 2). There is also a pond on the Site and scrub and trees.
- 4.2 The Site is not marked as priority habitat on MAGIC and the soil is a 'slightly acid loamy and clayey soils with impeded drainage'.

Figure 2. Habitat plan.



SITE DESCRIPTION

- 4.3 The phase 1 habitats are as follows:

- Hedgerows are present alongside the Bungay Road and a farm track running along the south boundary:
 - H1. Along the Bungay Road this hedgerow is trimmed to ~1.5m and is mainly hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*, with occasional small-leaved elm *Ulmus minor*. Bramble *Rubus fruticosus* agg and ivy *Hedera helix* are also present. Hop *Humulus lupulus* is present as a frequent component. The ground flora including the verge to the Bungay Road is rank grass and tall ruderals. The main components are false oat grass *Arrhenatherum elatius*, sterile brome *Anisantha sterilis*, cock's foot *Dactylis glomerata*, rye grass *Lolium* species with ruderals such as broad-leaved dock *Rumex obtusifolius*, cleavers *Galium aparine* and nettle *Urtica dioica*. Also noted were comfrey *Symphytum officinale*, creeping thistle *Cirsium arvense*, mallow *Malva sylvestris*, hedge mustard *Alliaria petiolata*, cow parsley *Anthriscus sylvestris*, hogweed *Heracelum sphondylium*, dove's foot cranesbill *Geranium molle*, and yarrow *Achillea millefolium*. At its south end the

sward is particularly sparse and annuals and ephemerals are present, such as squirrel tail fescue *Vulpia bromoides* and buckshorn plantain *Plantago coronopus*.

- H2. This hedgerow was formerly part of a double hedgerow along a farm track but the hedgerow to the south has been grubbed out historically. The hedgerow is 2m+ tall, mainly hawthorn with small-leaved elm, English elm *Ulmus procera* (or similar), hazel *Corylus avellana*, blackthorn, oak *Quercus robur*, holly *Ilex aquifolium*, dog rose *Rosa canina*, ivy and bramble. The ground flora is similar to the Bungay Road hedgerow, but in places it becomes less rank and greater stitchwort *Stellaria holostea* is also present.
- Improved grassland. The main part of the field is an improved sward, probably derived from an agricultural mix. This sward is considered to extent to the south bank of the stream and includes the lower lying terrain within which the stream lies. Meadow buttercup *Ranunculus acris* is a conspicuous component in this lower area but other herbs as described for the semi-improved swards are absent or very infrequent. The main grass species are soft brome *Bromus hordeaceus*, cock's foot, Timothy *Phleum pratense*, small cat's tail *Phleum bertolonii*, false oat grass and rye grass. The herb component is sparse and mainly meadow buttercup, chickweed *Stellaria media*, cow parsley and field forget-me-not *Myosotis arvensis*.
- Semi-improved grassland. North of the stream the sward is classed as semi-improved, damper towards the north and with a high herb component; the sward has a lower herb component and includes ranker grasses towards the south.
 - The northern part has a substantial component of specialist herbs of damp grassland, with meadowsweet dominant in some patches, and with ragged robin *Lychnis flos-cuculi*, meadow saxifrage *Saxifraga granulata*, cuckoo flower *Cardamine pratensis* and common spotted orchids *Dactylorhiza fuchsia* as occasional components. Other species recorded were: crested dog's tail *Cynosurus cristatus*, rough meadow grass *Poa trivialis* and smooth meadow grass *Poa pratensis*, soft rush *Juncus effusus*, meadow buttercup, sorrel *Rumex acetosa*, plantain *Plantago lanceolata*, marsh thistle *Cirsium palustre*, common vetch *Vicia sativa*, greater stitchwort, red clover *Trifolium pratense*, silverweed *Argentina anserina*, knapweed *Centaurea nigra*, and common horsetail *Equisetum arvense*.
 - Towards the south the herb component decreases and the sward develops a greater 'rank' character without the wetland species other than meadow buttercup and with ruderals such as nettle and broad-leaved dock becoming occasional components.
- Trees. Trees are present as a small group along the south-eastern boundary and the northern boundary. These are mature oak and ash *Fraxinus excelsior*, some of which are over mature but probably not veteran. Off-site there are additional trees close to the Site boundary.
- Scrub is present at three main locations:
 - Along the northern boundary and extending westwards towards the stream. This is mainly hawthorn and bramble but some stunted ash specimens are present and blackthorn is present as an occasional component. Goat and grey willow *Salix caprea* and *S. cinerea* are present towards the northern end of this boundary.
 - Along the northern and western boundary, mainly comprising bramble and hawthorn.

- In the central part of the improved field, as ash, hawthorn and goat and grey willow around and within the depression with the small pond.
- Ditch. The ditch runs north-west to south-east and has a small channel entering it at the eastern end. The ditch itself is ~1.5m and had a gradual 'trickle' of water at the time of survey. At the northern end the wider 'valley' within which the stream sits is up to 15m wide becoming narrow and only 2-3m wide at the southern end. The ditch channel is overtopped by fool's water cress *Apium nodiflorum*, but other semi-aquatic species were not noted.
- There is a small pond on the Site (see also Great Crested Newts), and this is clearly much smaller than it was historically and is now heavily shaded and scrubbed over with goat and grey willow.

Off-Site ponds

- 4.4 There are two waterbodies shown on Ordnance Survey maps within 250m: one west of the B1332 Bungay Road and another 185m to the north-east.

5. SPECIES SURVEYS AND SCOPING

GREAT CRESTED NEWTS

- 5.1 The only records for great crested newts within 2km are from a pond ~850m to the north-west on the edge of the residential area of Poringland.
- 5.2 The direct surveys of the on-Site pond did not record any amphibians.
- 5.3 The scoping for ponds identified two within 250m of the Site:
 - The pond to the north-east (185m distant, Pond C) could not be accessed for survey. As described by an unrelated scheme¹¹ this is heavily poached and would probably achieve a 'good' Habitat Suitability Index rating. Even if present within this pond the likelihood of individuals dispersing to the Site is relatively low given the distance.
 - The pond to the west (Pond B) was surveyed for an unrelated scheme¹² using e-DNA methods in 2018 with negative result.
- 5.4 It is concluded that great crested newts are absent from the Site.

REPTILES

- 5.5 No reptile records were returned from within 2km.
- 5.6 The extent of potential reptile habitat is limited to the south of the stream but to the north the grassland is suitable for grass snakes, with some moderately dense cover and some scrub. It is considered that grass snakes could be present, but south of the stream they would only be present as occasional transitory individuals.

BATS

Data Search

- 5.7 Field records for a number of species are known from within 2km: barbastelle, serotine, Natterer's, Leisler's, noctule, common pipistrelle, soprano pipistrelle and brown long-eared. Most of the records are from the Norfolk Bat Survey¹³ project. There are no roost records from within 500m.

Trees

- 5.8 There are several trees with roost potential long the north-eastern boundary, comprising both mature oak and ash with various splits and cavities. Two are rated as having 'high' potential suitability.
- 5.9 The field margins are likely to be used by foraging bats in low numbers. The improved swards are likely to be of relatively low value for foraging bats, with few herbs and little damp soil to generate an abundance of moths and flies as prey. The stream and the grassland to the north is of high potential value for foraging bats.

¹¹ 2017/2652 | Outline application for the erection of up to 165 dwellings ...

¹² 2019/0667 | Demolition of existing buildings and construction of 60 bed care home, 56 extra care apartments and 31 extra care bungalows ...

¹³ <http://www.batsurvey.org/>

BIRDS

5.10 The records returned numerous records for species unlikely to be present on the Site, such as snow goose. Species potentially relevant are farmland species, woodland generalists and those of the wider countryside:

- Grey partridge, turtle dove, song thrush, spotted flycatcher, house sparrow and bullfinch.

5.11 The Site south of the stream lacks 'specialist' features relevant to many scarcer birds, such as dense scrub or mature trees, and the hedgerows and associated scrub are likely to be used for nesting by common birds and also some declining but widespread species such as dunnocks. The main grass swards are probably too tall for skylarks and none were noted during visits. The scrub and mature trees north of the stream may support a larger assemblage of species, including species with requirements for tree cavities.

SMALL MAMMALS

5.12 Small mammals are assessed as follows:

- Badgers. The only records of badgers are from >1.5km. There is no evidence of badgers on the Site and they are considered absent.
- Hedgehogs. Numerous records of hedgehogs were returned from across much of the search radius. Hedgehogs may be present as part of larger local populations, foraging on the Site and possibly using hedgerows and denser vegetation as shelter.

INVERTEBRATES

5.13 The only invertebrate records returned were several cinnabar *Tyria jacobaea* (Lepidoptera: Arctiidae) records, which is one of a number of widespread moths that are afforded the status of Species of Principal Importance by virtue of recent declines while remaining widespread (Butterfly Conservation, 2007¹⁴).

5.14 The drier grassland and hedgerow areas are likely to support a small assemblage of widespread but declining moths. The extent of the damp grassland is relatively small but wetland specialist species may be present, including some species of conservation concern.

¹⁴ Butterfly Conservation (2007) *Biodiversity Action Plan – Moths*. Available from: <http://butterfly-conservation.org/files/uk-bap-species-moths-research-only.pdf>

6. DISCUSSION

EVALUATION

Habitats

6.1 Two Habitats of Principal Importance (cf Maddock, 2011¹⁵) are present:

- Hedgerows. The two lengths of hedgerows qualify as the *Hedgerow Habitat of Principal Importance*. Neither qualifies as Important Hedgerows under the Hedgerow Regulations, with too few woody species within the survey lengths and insufficient associated features.
- Lowland Meadow. The grassland north of the stream, in particular the northern end is classed as this priority habitat type on the basis that it includes a number of specialist species such as meadow saxifrage. The definition of the habitat is generally based on a more detailed vegetation survey to define the plant communities and also the presence of uncommon and specialist species. Its management is not known, but aerial photographs do not show any occasions of ploughing. Based on the available survey information it is considered that the vegetation is likely to qualify as the priority habitat. The vegetation to the south of the stream does not qualify as the priority habitat, including the lower lying areas of vegetation.

Species

6.2 Several species are scoped out on the basis of the extent of habitat across the Site. In particular the grassland south of the stream is improved and of lower ecological value. Great crested newts are scoped out on the basis of surveys from other schemes, the lack of access to one pond and direct surveys of the on-Site pond.

6.3 The other species scoped in as present or potentially present are:

- Roosting bats in the trees along the boundary north of the stream, foraging bats in low numbers south of the stream and greater numbers of foraging bats north of the stream.
- Reptiles, as grass snakes north of the stream.
- Nesting birds, common and declining but widespread nesting birds south of the stream but possibly species which require cavities in the trees to the north of the stream.
- Hedgehogs.
- Invertebrates, comprising widespread but declining moths and possibly a small assemblage of wetland specialists.

IMPACTS

Designated Sites

6.4 The project Site itself is relatively distant from the nearest County Wildlife Site (>1km) and as such direct impacts are very unlikely. These local CWSs likewise lack public access and indirect impacts are unlikely, such as from recreational disturbance.

Habitats

¹⁵ Maddock, A. (2011) *UK Biodiversity Action Plan Priority Habitat Descriptions*. Available from: http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf

- 6.5 The scheme is for housing located on the improved sward areas to the south of the stream only (Figure 3). Access would be via an existing access but there would probably be some hedgerow removal for this and also for a pedestrian access. The existing pond and scrub would be retained, and development is not proposed along the lower land adjacent to the stream and the area of damp, semi-improved grassland.

Figure 3. Scheme design.



MITIGATION OF CONSTRUCTION IMPACTS

- 6.6 The direct development footprints do not extend over the lower terrain adjacent to the stream and the grassland north of the stream. As noted however, this grassland probably qualifies as a priority habitat and the area of highest quality is to the north. It is specifically recommended that an ecological management plan is prepared to ensure the long-term value of this grassland and associated area. This would not necessarily preclude public access but would probably require measures to limit trampling and deterioration from recreational use, as well as an appropriate cutting regime.
- 6.7 New soft landscaping is proposed as mitigation for the loss of grassland and the hedgerow length (see below).
- 6.8 Lighting should aim to minimise spill onto boundary areas, and especially the northern part of the Site, to reduce impacts on bats¹⁶ and moths.
- 6.9 As additional recommendations during construction:

¹⁶ Bat Conservation Trust (2018) *Guidance Note 08/18. Bats and Artificial Lighting in the UK*. Available from: <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

- Nesting birds. Vegetation clearance should avoid the nesting bird season (of March to August) or otherwise be under a watching brief. It would also need to have regard to great crested newts (see above).
- During works appropriate guidance should be followed to prevent the pollution of the stream¹⁷ from soil run-off and incidents.

ENHANCEMENTS AND OPPORTUNITIES

- 6.10 A strategic context for enhancement measures is provided by the Site's location along a local green infrastructure corridor and within the 'Claylands Living landscape'. The long-term security of the damp, semi-improved grassland would be of particular merit and accord with the expectations of the NERC Act in relation to priority habitats.
- 6.11 Thus, it is specifically recommended that an ecological management plan is prepared to ensure the long-term management of the damp, semi-improved grassland and related features.
- 6.12 For the wider scheme landscaping, key points are that native species should be used within planting schemes or otherwise species of recognised wildlife value:
- Suitable species for structural planting include trees and shrubs that are present locally (Norfolk County Council, undated¹⁸), such as, field maple *Acer campestre*, oak and holly *Ilex aquifolium*, and occasional hazel *Corylus avellana*, crab apple *Malus sylvestris*, guelder rose *Viburnum opulus*, native privet *Ligustrum vulgare*, and buckthorn *Rhamnus cathartica*.
 - Where smaller trees are required then appropriate species include field maple, silver birch, rowan, whitebeams *Sorbus* species, and fastigate forms of hornbeam. If space allows then oak and beech are particularly valuable when planted as well-spaced specimen trees and allowed to develop open growth forms.
 - Within areas of grassland a number of wildflower seed mixes are available from commercial suppliers for different contexts, including wetland planting (e.g. Emorsgate EM8 'meadow mixture for wetlands'), longer wildflower swards (e.g. EM4 'meadow mixture' and EM10 'tussock mixture') and flowering lawns for areas with more intensive use and management (e.g. EL1 'flowering lawn' mixture). Underneath orchard and tree canopies a suitable seed mix is EW1 'woodland mixture' or similar.
 - Ornamental planting should use species of recognised wildlife value and avoid non-native evergreens such as evergreen honeysuckle and cherry laurel.
- 6.13 Additional suggested measures include:
- Bird boxes on buildings, with house sparrow 'terraces' and swift boxes being particularly suitable (Figure 4). Sparrow terraces should be out of direct sunlight and at least 2m above ground. Swift boxes need to be >5m above ground, on high open walls or under eaves.

¹⁷ SEPA (2017) *Guidance for Pollution Prevention Works and maintenance in or near water: GPP 5 January 2017*. Available from: <http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf>

¹⁸ Norfolk County Council (undated) *Planting Hedges in Norfolk – Maintaining Regional Character*. Available from: <http://www.norfolkbiodiversity.org/pdf/reportsandpublications/HedgeBookletPROOF4.pdf>

- Bat boxes can also be erected on buildings, either as externally-mounted boxes or as in-built 'tubes' (Figure 5). Bat boxes need to be high, and can face different aspects but away from direct sunlight and with ready access to trees or other cover.
- The scheme should allow for the continued movements of hedgehogs, with any garden gates raised to allow them to pass under and holes within gravel boards to allow them to pass through (Figure 6)¹⁹.
- Cleared timber and woody material should be retained on the Site, to create log piles within areas of more naturalistic greenspaces which will substantially increase local habitat diversity and resources. Such piles should comprise a base of larger timbers covered by chipped material.

¹⁹ <https://www.jacksons-fencing.co.uk/News/outdoor-living/new-hedgehog-friendly-gravel-boards-winter-news-topical-treats-and-more-6511.aspx>

7. CONCLUSIONS

- 7.1 The Site comprises a grass field with a stream running through the Site such that there is a distinct northern and southern part. The southern part of the Site is an improved sward. The northern part, in particular the northern end, is a damp, semi-improved sward. Based on the available information this semi-improved sward would qualify as the Lowland Meadow Habitat of Principal Importance.
- 7.2 Around the Site are two lengths of hedgerow and both qualify as Hedgerow Habitat of Principal Importance but not as Important Hedgerows.
- 7.3 There are a number of mature and over mature trees north of the stream and these have bat roost potential, with numerous vacities and splits being visible and at least two trees being rated to be of 'high' potential value for roosting bats.
- 7.4 Great crested newts are concluded to be absent based on direct surveys of the on-Site pond, previous surveys of a pond to the west of Bungay Road and lack of access to a pond 185m to the north-east.
- 7.5 Impacts on designated sites are not anticipated, by virtue of the distance to them being >1km.
- 7.6 The species of conservation concern that are scoped in are: roosting and foraging bats, nesting birds, grass snakes, hedgehogs and invertebrates including possible wetland specialists. For most of these groups the locations of greatest relevance are to the north of the stream.
- 7.7 The scheme masterplan shows development to the south of the stream only and not within the lower lying land adjacent to the stream. It is recommended that an ecological management plan is prepared to ensure the long-term value of the ecological features on the Site, in particular the semi-improved grassland. Access will require some hedgerow removal.
- 7.8 Mitigation of works should have regard for nesting birds, either through appropriate timing or the use of a watching brief. Works should also follow good practice with respect to avoiding water pollution.
- 7.9 As stated, it is recommended that an ecological management plan is prepared to ensure the long-term value of the ecological features on the Site, in particular the semi-improved grassland. This should also cover other aspects such as site landscaping, bird and bat boxes and measures to minimise light spill onto retained areas.

8. APPENDIX 1: PHOTOGRAPHS



Figure 4.
View
across the
improved
grassland
towards
the
stream
and semi-
improved
grassland.



Figure 5.
Stream
and semi-
improved
grassland.



Figure 6.
Semi-improved sward with meadow saxifrage.



Figure 7.
Trees along north boundary.

9. APPENDIX 2: ADDITIONAL INFORMATION

Habitat Suitability Index

The pond was evaluated using the Habitat Suitability Index (HSI) methodology (ARG, loc. cit.). The HSI of a pond is determined by calculating a geometric mean of 10 component factors of 'Suitability Indices' (SI) that are known to have an influence on its suitability as a breeding location for great crested newts (see Table 3), thus:

$$\bullet \text{ HSI} = (\text{SI1} \times \text{SI2} \times \text{SI3} \times \text{SI4} \times \text{SI5} \times \text{SI6} \times \text{SI7} \times \text{SI8} \times \text{SI9} \times \text{SI10})^{1/10}$$

Once calculated, the HSI score for a waterbody can be categorised as follows:

- Excellent (>0.8)
- Good (0.7 – 0.79)
- Average (0.6 – 0.69)
- Below Average (0.5 – 0.59)
- Poor (<0.5)

Table 3. Habitat Suitability Index: component factors or SIs.

Index	Name	Description
SI1	Geographic Location	Lowland England or upland England, Scotland and Wales
SI2	Pond area	To the nearest 50m ²
SI3	Permanence	Number of years pond dry out of ten
SI4	Water quality	Measured by invertebrate diversity
SI5	Shade	Percentage shading of pond edge at least 1m from shore
SI6	Fowl	Level of waterfowl use
SI7	Fish	Level of fish population
SI8	Pond count	Number of ponds within 1km ²
SI9	Terrestrial habitat	Quality of surrounding terrestrial habitat
SI10	Macrophytes	Percentage extent of macrophyte cover on pond surface

The HSI scores for pond A is shown in Table 4 and it is rated as poor. No amphibians were recorded on any of the surveys. The conditions for each are summarized in Table 5. On each visit netting, egg search and torching were the surveyed methods deployed (it was too shallow for bottle trapping), and the turbidity on each visit was rated as 2 (on a scale of 0=completely clear, 5=very turbid) and the level of cover of the water surface by detritus was 1 (where 0=no vegetation obscuring, 5=water completely obscured).

Table 4. Habitat Suitability Index assessments (as presented in the preliminary ecological appraisal).

Factor	Pond A	
	Field Score	Factor Score (SI)
Location	Optimal	1
Pond area (m ²)	25	0.05
Pond permanence	Dries annually	0.1
Water quality	Moderate	0.67
Shade %	90	0.4
Fowl	Absent	1
Fish	Absent	1
Pond density km ⁻²	3	0.9
Terrestrial habitat	Moderate	0.67
Macrophyte cover % (likely, estimated)	0	0.3
HSI score	-	0.43

Factor	Pond A	
	Field Score	Factor Score (SI)
Rating	Poor	

Table 5. Weather conditions

Date	Weather
06 May 2018	10°C, partial cloud cover (50%), light wind (Beaufort 1)
08 May 2018	11°C, partial cloud cover (60%), light wind (Beaufort 1)
09 May 2018	11°C, partial cloud cover (60%), light wind (Beaufort 1)
11 May 2018	13°C, partial cloud cover (40%), light wind(Beaufort 1)

10. APPENDIX 3: LEGISLATION SUMMARY

Non-technical account of relevant legislation and policies.

Species	Legislation	Offence	Licensing
Bats: European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately capture, injure or kill a bat; deliberate disturbance of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	A Natural England (NE) licence in respect of development is required.
Bats: National protection	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Birds	Wildlife and Countryside Act 1981 (as amended) S.1	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. kingfisher].	No licences are available to disturb any birds in regard to development.
Great crested newt: European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately capture, injure or kill a great crested newt; deliberate disturbance of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by Natural England.
Great crested newt: National protection	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb it in such a place.	A licence is required from Natural England for surveying and handling.
Adder, common lizard, grass snake slow worm	Wildlife and Countryside Act 1981 S.9(1) and S.9(5)	Intentionally kill or injure any common reptile species.	No licence is required. However, an assessment for the potential of a site to support reptiles should be undertaken.
Scientific Interest (SSSI) It is an offence	Wildlife and Countryside Act 1981 (as amended)	To carry out or permit to be carried out any potentially damaging operation. SSSIs are given protection through policies in the Local Development Plan.	Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 before undertaking operations likely to damage a SSSI. All public bodies to further the conservation and enhancement of SSSIs.

Species	Legislation	Offence	Licensing
County Wildlife Sites	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged.