

# Hopkins Ecology

**Site:** Land South of Taverham  
Road, Taverham

**Work  
Item:** Strategic Ecological  
Assessment

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## Summary

Hopkins Ecology Ltd was appointed by Bidwells on behalf of Mrs Peplow to prepare a strategic ecological assessment of Land South of Taverham Road, Taverham, with a view to identifying constraints and opportunities in the context of its promotion for residential development.

The Site is on the south-west fringe of Taverham in a valley-side location above the River Wensum. It comprises an arable field with partial boundary hedgerows, a small block of woodland, sparse scrub and tall ruderal vegetation. It is ~3.2ha in area and the main development Site is roughly rectangular with two access corridors onto Taverham Road.

The designated boundary of the River Wensum Special Area of Conservation (SAC) is ~85m south. It is thought unlikely that recreational impacts on the River Wensum SAC would result from a residential scheme, by virtue of the lack of public access to the valley bottom and bankside areas of the River Wensum SAC. Other potential pathways of relevance include general urbanising impacts, such as lighting, and surface water run-off. It is thought feasible for impacts from both these pathways to be mitigated via on-Site measures, such as scheme design and an appropriate mitigation train for surface water treatment.

The Marriott's Way County Wildlife Site (CWS) is an Euclidean distance of ~245m east. Recreational impacts are thought likely to be negligible, by virtue of the existing use of the Marriott's Way CWS for recreation and existing infrastructure to manage visitors. It is not thought that other CWSs will receive significant numbers of visitors from the Site, by virtue of distance and the lack of public access.

On-Site a block of young (post-1949) woodland and the boundary hedgerows are considered to qualify as Habitats of Principal Importance. Access is off Taverham Road, with a corridor of tall ruderal vegetation at the north-east corner of the Site and then through a garden with a residential property close to the north-west corner.

Most species of conservation concern are scoped-out from being present, but widespread declining species including Species of Principal Importance maybe present as components of larger local populations. Such species include birds such as dunnock, hedgehogs, foraging bats and widespread moths, and they would be present as components of larger local populations.

Follow-up surveys are recommended for bats and great crested newts. Three trees are rated as having low but not negligible potential suitability for roosting bats; if these are to be directly impacted or receive significant indirect impacts then appropriate surveys are recommended. The bungalow on the western access corridor has low roost potential and direct activity surveys are required. Direct surveys for great crested newts are recommended for a lagoon within a former gravel workings ~90m to the west. It is thought that the mitigation of impacts on bats and / or great crested newts are feasible, subject to protected species mitigation licensing if required.

The likely loss of semi-natural habitat will be limited, and mitigation via appropriate soft landscaping is the most appropriate. At a strategic level such landscaping would offer new habitat area potentially relevant to wider green infrastructure corridors and two local landscape-scale conservation projects: the Norwich Fringe *Wooded Ridges* and the Wensum *B-Line* for pollinating insects.

In conclusion, it is considered that mitigation for protected species (if present) is feasible and attainable, and the likely impacts on the majority of species can be mitigated via appropriate landscaping and scheme design. Such landscaping could contribute to local countryside projects and initiatives. The mitigation of impacts on the River Wensum SAC is considered to be feasible via on-Site measures, including scheme design and an appropriate surface water mitigation train.

# 1. Introduction

## BACKGROUND

- 1.1 Hopkins Ecology Ltd was appointed by Bidwells on behalf of Mrs Peplow to prepare a strategic ecological assessment of the Land South of Taverham Road, Taverham, with a view to identify constraints and opportunities in the context of its promotion for residential development.
- 1.2 Two site accesses are proposed for the site. The western access corridor comprises the vehicular access for the site, through no.55 Taverham Road. The eastern access corridor aims to provide a secondary footway/cycleway onto Taverham Road.

## SITE CONTEXT AND STATUS

- 1.3 The Site is on the south-west fringe of Taverham and comprises an arable field with partial boundary hedgerows and a small block of woodland and scrub, ~3.2ha in area. The main arable field is roughly rectangular with two access corridors proposed onto Taverham Road.
- 1.4 The Site is in a valley-side location above the River Wensum and it is within the Central North Norfolk Natural Character Area<sup>1</sup> where the landscape is typified as:

*“... ancient countryside with a long-settled agricultural character, where arable land is enclosed by winding lanes and hedgerows, interspersed with woodland and remnant heath and dissected by lush pastoral river valleys”.*

## LEGISLATION AND PLANNING POLICY

- 1.5 The following key pieces of nature conservation legislation are relevant to legally protected species (with a more detailed description in Appendix 5):
  - The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations); and
  - The Wildlife and Countryside Act, 1981 (as amended).
- 1.6 Also, the National Planning Policy Framework (DfCLG, 2012<sup>2</sup>) requires local authorities to avoid and minimise impacts on biodiversity and, where possible, to provide net gains in biodiversity when making planning decisions. A substantial number of species are of conservation concern in the UK. A small number of these species are fully protected under the legislation listed above, but others in England are recognised as Species of Principal Importance under the Natural Environment and Rural Communities Act 2006 and reinforced by the National Planning Policy Framework. For these species local planning authorities are required to promote the “*protection and recovery*” via planning and development control. Examples include the widespread reptiles, skylarks and soprano pipistrelle and, brown long-eared bats.
- 1.7 Although the NPPF has an overarching aim of minimise 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 the overall aim of minimising impacts on biodiversity.

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<sup>1</sup> Natural England (2014) *NCA Profile 84: Central North Norfolk*. Available from: <http://publications.naturalengland.org.uk/publication/6232246738485248?category=587130>

<sup>2</sup> DCLG (2010) *A National Planning Policy Framework for England*. Department for Communities and Local Government, London.

## 2. Methods

### DESK STUDY

- 2.1 At the desk study comprised a formal data search from the local records centre and review of relevant data from 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 ( <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> )	Additional information on statutory sites, habitats of principal importance and wider countryside information
Broadland DC and GNDP planning policy documents	Information regarding local planning policies, in particular any specific mention of the River Wensum in Taverham
Local Planning Applications, manual searching of the Broadland 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 of Norfolk ( <a href="http://www.historic-maps.norfolk.gov.uk/">http://www.historic-maps.norfolk.gov.uk/</a> )	Aerial photographs from 1988 and 1946 (with Google Earth for later images); OS maps from 1880s and earlier

### FIELD SURVEY

- 2.2 A Site walkover was undertaken on 15 February 2018, when habitats were described according to the methods of JNCC (2010)<sup>3</sup> and hedgerows following DEFRA (2007<sup>4</sup>), albeit with herbs and possibly some woody species probably overlooked due to the time of year; the assessment of trees against the Hedgerow Regulations was therefore not undertaken. Trees were surveyed from ground level for their potential suitability for roosting bats, looking for gaps, cracks and other potential roost features (Collins, 2016<sup>5</sup>); searches were also made for signs of badgers.
- 2.3 The suitability of any ponds would be assessed using the Habitat Suitability Index (ARG, 2010)<sup>6</sup>.

### GUIDANCE

- 2.4 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.
- 2.5 An outline Habitats Regulations Assessment screening is presented, to identify key areas of potential impacts and mitigation requirements. This follows the standard stages shown in Table 1.

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

<sup>4</sup> DEFRA (2007) *Hedgerow Survey Manual*. DEFRA, London.

<sup>5</sup> Collins, J. (2016) *Bat Surveys for Professional Ecologists*. Bat Conservation Trust, London.

<sup>6</sup> ARG (2010) *Great Crested Newt Habitat Suitability Index*. May 2010 Advice Note 5. Available from: <http://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file>

**Table 1.** The stages of a Habitat Regulations Assessment.

Task	Requirements
Evidence Gathering	Collation of documentation relating to the project Collecting information on relevant European sites, their conservation objectives and characteristics
Stage 1	The 'test of likely significant effect' Establishing whether a plan is 'likely to have a significant effect' on a European site, and therefore requiring the Appropriate Assessment
Stage 2	Assessment of whether there is an effect on site integrity This is potentially a two-stage process, with a consideration of whether there are likely to be effects, followed if necessary by a detailed consideration of site-specific factors
Stage 3	If there is an effect on site integrity then the project should be re-assessed with the inclusion of compensation and a repeat of stage 2

## **CONSTRAINTS**

- 2.6 It should be noted that whilst every effort has been made to provide a comprehensive description of the Site, the time of year limited the botanical survey with many species undoubtedly overlooked. The broad characterisation and assessment of the Site is, however, considered to be robust.



### 3. Designated Sites

#### OVERVIEW

3.1 The 2km radius around the Site covers the valley bottom area and higher terrain to the west and east of the valley (Figure 1). Sites of nature conservation value are associated with the River Wensum and its floodplain including former gravel workings, and also the higher terrain. Habitats of Principal Importance shown in the immediate vicinity of the Site on MAGIC are:

- Coastal and Floodplain Grazing Marsh along much of the valley bottom, and
- Lowland Deciduous Woodland adjacent to part of the west boundary.

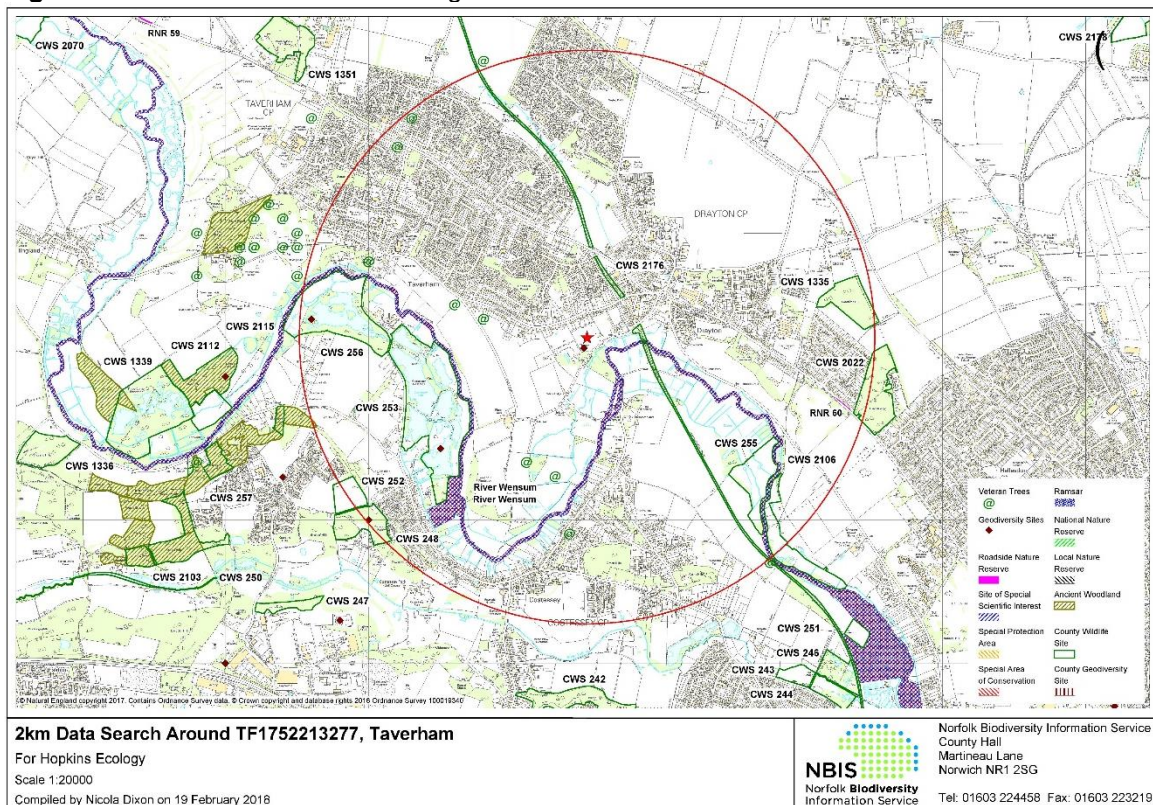
#### STATUTORY (INTERNATIONAL AND NATIONAL) SITES

3.2 The only statutory site within 2km is the River Wensum, designated at European and national levels (Table 2). The River Wensum and its features are considered again in Section 8: Impacts: International Sites.

**Table 2.** Summary of statutory sites within 2km.

Site	Designation	Location	Description
River Wensum	River Wensum Special Area of Conservation (SAC)	85m south	Chalk river and associated vegetation and invertebrates
	River Wensum Site of Special Scientific Interest (SSSI)	85m south	Chalk river and associated vegetation and invertebrates

**Figure 1.** Data search results for designated sites within a 2km radius.



### NON-STATUTORY SITES

3.3 A total of nine County Wildlife Sites (CWSs) and one Roadside Nature Reserve are within 2km (Table 3). The nearest is the Marriott's Way CWS, which is a promoted walking and cycle route offering access into the wider countryside and also into urban Norwich.

**Table 3.** CWSs within 1km.

Location	Proximity		Name (reference)	Description
	Distance and direction			
Valley bottom	245m east		Marriott's Way (2176)	A disused railway line now used by walkers, cyclists and horse-riders. The central track is generally unvegetated but the track edges and embankments are variously scrub, woodland and grassland
River Wensum floodplain, upstream	0.85km west		Costessey Pits (East) (253)	A complex mosaic of grassland and woodland centred around old gravel diggings which are now used extensively for water-skiing and angling
	0.9km west		Taverham Mill (256)	A fishing lake south of the River Wensum, surrounded by marshy and neutral grassland and a mixture of planted and semi-natural woodland
River Wensum floodplain, downstream	1.1km south east		Low Road Meadow (255)	A species-rich meadow grazed by horses and crossed by several deep, clean dykes
	1.46km south-east		Wensum Mount Farm (2106)	Low-lying river valley floodplain, wet grassland and fen, adjacent to the River Wensum
Valley sides	1.5km east		Canham's Hill (1335)	Rough unmanaged ground, a mixture of self-seeded mature woodland, some scrub and unimproved neutral grassland
	1.8km south-west		Snakes Hills (248)	Young semi-natural woodland which runs along the top and sides of a steep sandy ridge
	1.8km south-west		Brickfield Farm (252)	Neutral grassland lying on gently sloping ground
	1.9km east		Drayton Wood (2022)	Mixed, semi-natural woodland, open access, with an extensive network of informal footpaths throughout
	1.5m south-east		Roadside Nature Reserve: Drayton High Road	Designated for a legally protected fungus



## 4. Strategic Policies and Projects

### GREEN INFRASTRUCTURE

- 4.1 Green infrastructure (GI) is considered to be a key requirement for development in the Norwich fringes, with the policy requirements originating in the Joint Core Strategy<sup>7</sup>. The spatial vision for these corridors is informed by a Green Infrastructure Strategy (CBA, 2007<sup>8</sup>) and associated studies (e.g. Green Networks: Norfolk Wildlife Trust, 2007<sup>9</sup>). A schematic of local GI features of note is shown below (Figure 2): the Site itself is fairly close to the Marriott's Way, which is an important part of the green infrastructure spatial vision<sup>10</sup>, the River Wensum corridor<sup>11</sup> and also in close proximity to identified Green Infrastructure corridors (GI corridors) and the Norwich Fringe Project<sup>12</sup> for the *Wooded Ridges*, which has the ambition to:

*"... enhance the wooded ridge around the fringes of Norwich to accentuate a strong visual, historic and ecological landmark to remind the community of the significance of the ridge around Norwich, especially highlighting the north of the city and following a 10-25m contour band. Tree planting and management of existing trees, including street trees, garden trees, boundaries as well as woodland-scale, would be undertaken, following detailed plans, involving communities and engaging with the design stages of new developments would ensure that this setting for Norwich is retained as a prominent feature for future generations".*

### COUNTRYSIDE PROJECTS

- 4.2 The Site is not within the Norfolk Wildlife Trust's 'Living Landscapes' project areas but it does lie within an area identified for creating habitat for pollinating insects. This project is overseen by Buglife – The Invertebrate Conservation Trust and is termed a *B-Line* ('bee-line')<sup>13</sup>. This landscape schemes fits within the National Pollinator Strategy (DEFRA 2015<sup>14</sup>) and is described as follows:

*"The B-Lines are a series of 'insect pathways' running through our countryside and towns, along which we are restoring and creating a series of wildflower-rich habitat stepping stones. They link existing wildlife areas together, creating a network, like a railway, that will weave across the British landscape. This will provide large areas*

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<sup>7</sup> 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/>

<sup>8</sup> 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>

<sup>9</sup> Norfolk Wildlife Trust (2006) *Report of the Ecological Network Mapping Project for Norfolk*. Available from: [http://www.norfolkbiodiversity.org/pdf/news/Final\\_report\\_of\\_indicative\\_map\\_July%202006.pdf](http://www.norfolkbiodiversity.org/pdf/news/Final_report_of_indicative_map_July%202006.pdf)

<sup>10</sup> Norfolk County Council (undated) *Marriott's Way Improvement & Delivery Plan 2015—2025*. Available from: <https://www.norfolk.gov.uk/-/media/norfolk/downloads/out-and-about/norfolk-trails/marriotts-way/marriotts-way-improvement-and-delivery-plan-appendices.pdf>

<sup>11</sup> Coombes, M., Curini, A., Howard Keeble, E.A., Green, T. and Soar, P. (2007) *River Wensum Restoration Strategy. Natural England Research Reports, Number 024*. Available from: <http://publications.naturalengland.org.uk/file/59064>

<sup>12</sup> <http://www.greaternorwichgrowth.org.uk/dmsdocument/512>

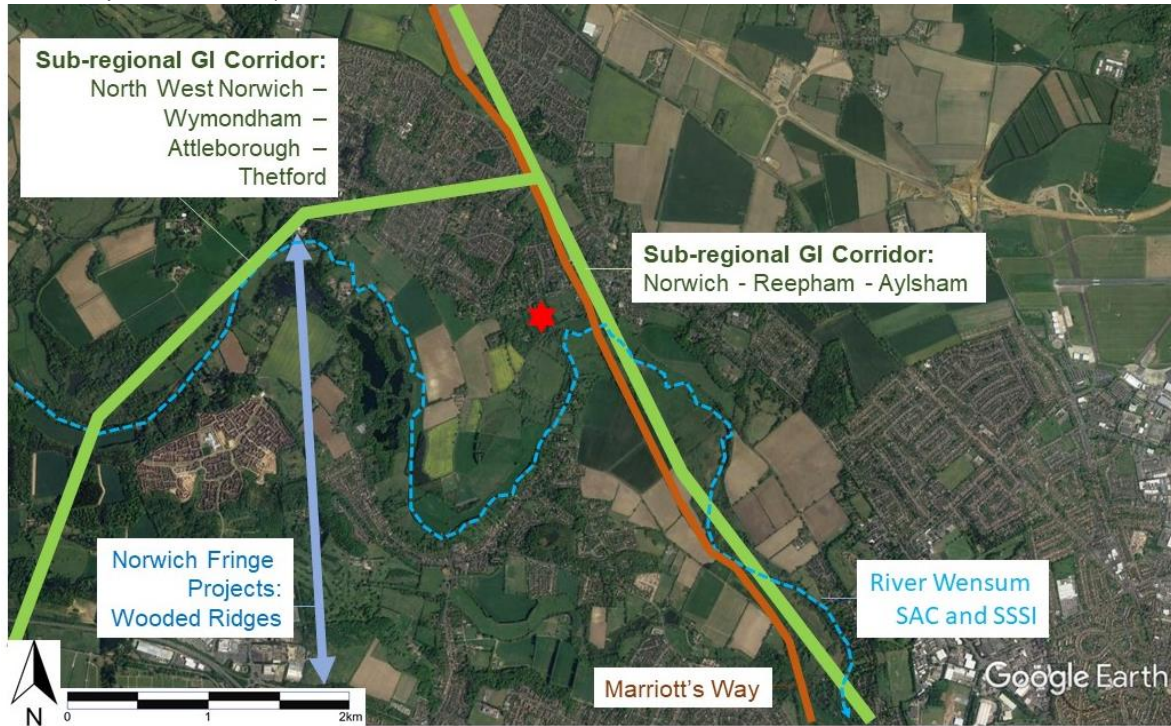
<sup>13</sup> <https://www.buglife.org.uk/b-lines-hub/east-of-england>

<sup>14</sup> DEFRA (2015) *National Pollinator Strategy: Implementation Plan*. Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/474386/nps-implementation-plan.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/474386/nps-implementation-plan.pdf)

*of brand new habitat benefiting bees and butterflies– but also a host of other wildlife”.*

4.3 The *B-Line* runs along the Wensum Valley and then westwards to link Norwich and King’s Lynn.

**Figure 2.** Green infrastructure schematic for the Site and local context (GI corridors taken from CBA loc. cit, updated 2011<sup>15</sup>).



<sup>15</sup> <http://www.greaternorwichgrowth.org.uk/dmsdocument/1590>

## 5. Habitats and Botany

### OVERVIEW

- 5.1 The Site comprises an arable field with partial boundary hedgerows and small areas of scrub and young woodland (Figure 3). As viewed on historical aerial photographs and maps, the woodland and scrub on-Site and also much of the adjacent woodland to the west has developed post-1946. Two blocks of adjacent off-Site woodland (one of which is plantation) appear to be older and developed over small gravel workings and are shown as lightly wooded in the 1880s (these blocks are adjacent to the north and south-west boundaries). The soil is classed as a 'freely draining slightly acid sandy soil'.

Figure 3. Habitat survey map.



### ARABLE FIELD AND GRASS VERGES

- 5.2 The arable fields comprise the majority of the Site. At the time of survey, the field was under cereal stubbles with sterile brome *Anisantha sterilis* as an extensive cover with occasional common weeds such as groundsel *Senecio vulgaris* and spear thistle *Cirsium vulgare*. The arable margins are narrow and weed-free and the cropped area extends to nearly the margins of permanent grass sward.
- 5.3 The grass margins alongside the boundaries are mostly similar throughout, comprising a sward of mainly false oat grass *Arrhenatherum elatius* and cock's foot *Dactylus glomerata* with patches of red fescue *Festuca rubra*, patches of sterile brome with common herbs of rough grassland: nettle *Urtica dioica*, white dead nettle *Lamium album*, cow parsley *Anthriscus sylvestris*, hedge bedstraw *Galium mollugo* and cleavers *Galium aparine*. In two locations there are a few tall ruderals not present more widely:
- South-west margin, where hemlock *Conium maculatum* is present as occasional plants; and
  - The south boundary to the curtilages of dwellings on Costessey Lane, where woody vegetation does not shade the margin and mugwort *Artemisia vulgaris*, hogweed



*Heracleum sphondylium*, broad-leaved dock *Rumex obtusifolius* and patches of the moss *Calliergonella* species are present.

## HEDGEROWS

5.4 Three hedgerows are present, all shown on the 1946 aerial photograph and 1880s maps, but with some scrub and woodland growth reducing the distinction of the south hedgerow as a distinct hedgerow:

- The east hedgerow is shown as a feature on the 1946 and 1880s plans. It is tall (>5m) and straggly without recent management, with a young oak *Quercus robur* tree at its north end. It is on a low bank. The main species is hawthorn *Crataegus monogyna* with occasional patches of blackthorn *Prunus spinosa* and other native species as occasional individuals: elder *Sambucus nigra*, oak, bramble *Rubus fruticosus* agg; ivy *Hedera helix* is present as moderate growth on occasional stems and as ground cover. Non-natives present as singleton or occasional plants are: butterfly bush *Buddleia davidii* and lilac *Syriniga* species. Woodland herbs associated with the hedgerow rather than grass verges comprise lords and ladies *Arum maculatum*, ground ivy *Glechoma hederacea* and garden daffodils *Narcissus* species.
- The west hedgerow is shown as a feature on the 1946 and 1880s plans, and the southern end has woodland to its rear (west side) that has developed since 1946. It is on a low bank. At the north end is an oak tree of large stature and a number of other oak trees of smaller stature. The remainder of the hedge is tall (>5m) and straggly. The main species is hawthorn with blackthorn, oak, elder, bramble, hazel *Corylus avellana* and ivy, with a single yew *Taxus baccata* and non-native butterfly bush. Woodlands herbs noted comprise: lords and ladies and wood sage *Teucrium scorodonia*.
- Along part of these south boundary is a short length of hedgerow, the remainder obscured by woody vegetation growth. The hedgerow appears narrow in 1946. The hedgerow is tall (>5m) and straggly, mainly hawthorn with oak, elm, blackthorn, ash *Fraxinus excelsior*, ivy and also a singleton non-native evergreen honeysuckle *Lonicera nitida*.

5.5 The north and part of the south boundaries are to garden curtilages and are marked variously by fence panels, wire fences and hedging.

- The north boundary has lengths of ornamental hedging and also native shrub species, mainly blackthorn and ivy; some lengths lack boundary features. Woodland herbs along the boundary comprise: lords and ladies and sweet violet *Viola odorata*. A wide band of grass verge (up to ~5m) lies to the south of the boundary and this includes patches of scrub: bramble, elder, dog rose *Rosa canina*, non-native cherry laurel *Prunus laurocerasus* and privet *Ligustrum* species (probably *L. japonica*).
- The south boundary along its eastern end is against garden curtilages and woody vegetation is largely absent other than some non-natives, namely snowberry *Symphoricarpos albus* and lilac.

## SCRUB

5.6 Sparse scrub is present at various points along the north, east and west boundaries. comprising various natives: blackthorn, bramble and hawthorn and, as described above, along the north boundary there is also cherry laurel and privet.

## SEMI-NATURAL BROADLEAVED WOODLAND

- 5.7 Two blocks of woodland are present, alongside the south boundary, both believed derived from post-1946 growth:
- A small block of woodland is located adjacent to the existing farm entrance onto Costessey Lane with young, narrow oaks and sycamores *Acer pseudoplatanus* with a shrub layer of elm *Ulmus minor* suckers, field maple *Acer campestre*, blackthorn and hawthorn. The ground flora is mainly ivy, with occasional clumps of false oat grass, white dead nettle, cow parsley and garden daffodils and snowdrops *Galanthus* species.
  - At the south-west corner of the Site, is a small block of woodland continuous to more extensive off-Site woodland. This is probably partly derived from a hedgerow with post-1946 woodland development. The trees are of narrow, close grown stature and comprise oak, sycamore, and small-leaved elm with a sparse ground flora of ivy and lords and ladies; the scrub layer absent. This block is shown as Lowland Woodland Habitat of Principal Importance on MAGIC.

## TALL RUDERAL

- 5.8 Along the eastern access corridor from Taverham Road (located at the north-east corner of the field) the vegetation comprises tall ruderal vegetation, mainly nettle with hogweed and broad-leaved dock also noted. There is a large mature oak at its northern and the south end has sparse hawthorn and blackthorn scrub.

## GARDEN AND BUILDING

- 5.9 The western access corridor from Taverham Road (located close to the north-west corner of the field) is through an existing garden and bungalow. The garden comprises amenity lawn, amenity shrubs and mature trees mostly of tall stature: silver birch *Betula pendula*, sycamores and beech *Fagus sylvatica* and also, adjacent to Taverham Road, a tall non-native conifer (possibly a fir *Abies* species).

## OFF-SITE

### Woodland

- 5.10 A block of woodland lies adjacent to the south-west boundary. This woodland is mostly developed post-1946 on the slopes of former aggregate workings, although a small block is shown in 1880s and then again in 1946 on the slopes of an older small pit. As viewed, this woodland is very similar to the woodland on-Site: narrow, close grown stature oaks and sycamores with a sparse ground flora of ivy and lords and ladies and with the scrub layer absent. Much of this woodland is shown as Lowland Woodland Habitat of Principal Importance on MAGIC.

### Plantation

- 5.11 Adjacent to the north boundary is a block of tall beech *Fagus sylvatica* plantation, almost certainly of post-1946 in origin. The trees have narrow, close-grown stature typical of plantation trees.

### Pond / Lagoon

- 5.12 Approximately 90m west of the Site is a lagoon. This is within an area of former aggregate workings and was not viewed directly, but from its shape on OS maps is almost certainly a tailings lagoon.

## 6. Scoping for Species of Conservation Concern

### PLANTS

- 6.1 The wider landscape is considered to have a moderate diversity of arable margin species (Walker et al. 2012<sup>16</sup>). The data search returned records for a small assemblage of plants of arable margins and disturbed ground (but with all recorded locally from a post-industrial site rather than arable): basil thyme *Clinopodium acinos*, purple milk-vetch *Astragalus danicus*, clustered clover *Trifolium glomeratum*, common cudweed *Filago vulgaris* and hound's-tongue *Cynoglossum officinale*.
- 6.2 The Site has narrow arable margins, with cropping close to the grass verges rather than having a wide boundary of sparse sward with only periodic disturbance; the woodland is young. No arable weeds or other plants of note were recorded<sup>17</sup>.

### BATS

- 6.3 Records for nine species of bat were returned by the data search: barbastelle, Daubenton's, Natterer's, Leisler's, serotine, noctule, Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle, and brown long-eared. The majority of these records were obtained during field surveys for the Norfolk Bat Survey<sup>18</sup>; a number of roosts are reported from survey work related to a development scheme in Costessey and also the 'well-known' roost in Taverham Mill (all >1.5km distant).
- 6.4 The Site itself is classed as follows:
- Foraging. Much of the Site is an open arable field with foraging habitat restricted to the boundary hedgerows, scrub and woodland. High quality foraging habitat, such as extensive wetlands, wet humus-rich soil, herb-rich grassland or extensive woodland are absent. The overall quality of the Site for foraging bats is therefore considered to be low, the numbers of bats regularly foraging are likely to be low, and the overall assemblage is likely to comprise a small number of species.
  - Trees. Three trees within the Site or on its boundaries are rated as having low but not negligible bat roost potential (see Figure 3: Habitat Plan). These are: an oak located along the eastern access corridor from Taverham Road; a fir along the western access corridor from Taverham Road; and an oak on the west boundary of the main field.
  - Buildings. The bungalow within the western access corridor probably dates from the 1960s or 70s and is in good repair and is rated as having low but negligible roost potential.
- 6.5 In summary, much of the Site is of very low suitability for foraging with the boundary hedgerows and woodland being the main potential areas of habitat likely to be used by bats, albeit by low numbers. Two trees have low but not negligible potential suitability for roosting.

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<sup>16</sup> Walker, H., Cunningham, S., Ellis, B., Neal, S. and Swan, E. (2012) *Important Arable Plant Areas in Norfolk*. Available from: [http://www.nbis.org.uk/sites/default/files/documents/Important%20Arable%20Plant%20Areas%20in%20Norfolk\\_SCREEN.pdf](http://www.nbis.org.uk/sites/default/files/documents/Important%20Arable%20Plant%20Areas%20in%20Norfolk_SCREEN.pdf)

<sup>17</sup> Common cudweed was noted at an unrelated site near Norwich in the same week as this survey, thus it would have likely been visible if present, and it is probably absent rather than overlooked.

<sup>18</sup> <http://www.batsurvey.org/>



## GREAT CRESTED NEWTS

- 6.6 The only records of great crested newts are from ~1.2km west of the Site, within gravel pits on the opposite side of the River Wensum. The only pond within 250m of the Site<sup>19</sup> is the lagoon shown within the former gravel workings, ~90m west. There are also waterbodies shown on the River Wensum floodplain, and although these cannot be scoped-out at this stage it is noted that great crested newts are not typically associated with the valley bottom of the River Wensum – or at least they are not noted as a feature in the River Wensum Restoration Strategy (Coombe et al., loc. cit.) – and waterbodies here are likely to support fish following winter river flooding and consequently be of low suitability.
- 6.7 Great crested newts cannot be discounted based solely on the absence of nearby records. However, the absence of nearby records suggests that only local population would be small. For example, if in the lagoon then a population would likely to be isolated within the pit area rather than part of a larger diffusely distributed population. The on-Site terrestrial habitat suitable for great crested newts is restricted to the boundary verges, scrub and woodland.

## BIRDS

- 6.8 The data search returned a diverse range of species records, including a number unlikely to be relevant, such as Slavonian grebe and other species with strong association with wetland areas or present only as vagrants. Included on the search are species potentially likely to overwinter on arable farmland and utilise open fields, verges, hedgerows, scrub and woodland for nesting:
- Wintering on farmland: skylarks and grey partridge.
  - Nesting in open fields: skylarks.
  - Nesting in scrub and hedgerows: turtle dove; willow warbler, dunnock, song thrush, mistle thrush, linnet, bullfinch, and reed bunting.
  - Margins: grey partridge.
- 6.9 During the Site visit no wintering birds of note were recorded. The quality of the Site for wintering small (passerine) farmland species is generally low, lacking seed-rich margins. Although the field was under winter stubbles no birds were noted feeding.
- 6.10 For nesting birds:
- The field margins are generally narrow and grassy rather than weed- and herb-rich, thus they are probably of lower value for species that nest or feed in such areas, e.g. grey partridge. The Site is near to residential properties and thus a level of cat predation is likely.
  - The hedgerows and scrub are probably not dense enough for some species such as turtle dove, but would likely to be used by widespread but declining species such as dunnock, bullfinch and others.
  - The open field habitat is suitable for skylark, but probably too small to support a territory based on average territory size in winter cereals of 4.5ha<sup>20</sup>.

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<sup>19</sup> 250m is considered an appropriate search radius given the size of the Site, following: English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

<sup>20</sup> Based on territory sizes of 4.5ha in winter cereals and 2.5ha in other arable types, taken from: Poulsen, J.G., Sotherton, N.W., & Aebischer, N.J. (1998) Comparative nesting and feeding ecology of skylarks *Alauda arvensis* on arable farmland in southern England with special reference to set-aside. *Journal of Applied Ecology*, 35(1), 131-147.

6.11 In summary, the main part of the Site is generally of lower value for wintering and nesting by many farmland birds. The hedgerows, scrub and woodland are likely to support a small assemblage of widespread, declining species.

### REPTILES

6.12 Local reptile records are restricted to slow worms from the Marriott's Way CWS, the nearest records ~450m distant, and also slow worms and grass snakes from Costessey (the opposite side of the River Wensum and >1.5km distant).

6.13 Arable landscapes typically support few if any reptiles and the verges on the Site are of very low quality, lacking cover and shelter and with sharp transition to scrub, and are small in area. Common lizards and slow worms are scoped-out and considered absent. Grass snakes range widely from their core wetland habitat, and although they cannot be scoped-out entirely at most they are likely to be present only as vagrant singletons.

### SMALL MAMMALS

6.14 Small mammals are assessed as follows:

- Badger records from within 2km are all south of the River Wensum and there is no evidence on-Site. They are considered to be absent.
- Otters and water voles are known extensively from the River Wensum and immediately adjacent areas. There is no open-water on-Site and it is separated from the valley bottom by Costessey Lane. Both species are scoped-out from further consideration.
- Hedgehogs are known widely locally. The hedgerows and woodland block offer shelter and foraging habitat and they are probably present in low numbers.
- Brown hares are known from numerous records south of the River Wensum and a singleton record to the north. The Site is probably too isolated from other larger tracts of open farmland and grassland and they are assumed to be absent.
- Harvest mice are known from a singleton record in the River Tud floodplain (>1km distant). The Site generally lacks the tall sward habitat required, and what is present is of low quality and isolated. They are assumed to be absent.

### INVERTEBRATES

6.15 Records for a small assemblage of wetland species was returned: white-clawed crayfish *Austropotamobius pallipes* and Desmoulin's whorl snail *Vertigo moulinsiana*. The on-Site habitat is wholly unsuitable for both.

6.16 The other species of conservation concern known from within 2km are two Breckland specialists that are assumed to be vagrants, and a suite of moths that all Species of Principals Importance on the basis of national declines while remaining widespread<sup>21</sup>. A number of these moths are likely to be present widely in the wider landscape, their caterpillars feeding on a range of host plants in a range of habitats.

6.17 The Site offers little specialist habitat and resources for invertebrates, largely lacking high quality features typically associated with species of conservation concern:

- The arable margins are narrow and weed-free, thus not offering seed-rich periodically disturbed conditions;

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<sup>21</sup> Butterfly Conservation (2007) *Biodiversity Action Plan – Moths*. Available from: <http://butterfly-conservation.org/files/uk-bap-species-moths-research-only.pdf>

- The woodland is young and small in area, the ground flora species-poor, and the dead wood comprises small amounts of common types, rather than rot holes, larger timbers of heartwood decay; and
- The hedgerows and scrub are small in area, lacking dead wood and without association with transition habitats such as grassland-scrub matrix or flower-rich areas.

6.18 The Site is likely to be of low value for invertebrates and at most it may support a small assemblage of generalist species, including a number of moths classed as Species of Principal Importance that have undergone national declines but remaining of widespread occurrence.

## 7. Evaluation

### HABITATS OF PRINCIPAL IMPORTANCE

- 7.1 Two on-Site habitats are considered to qualify as Habitats of Principal Importance (Maddock, 2011<sup>22</sup>):
- Hedgerows. The hedgerows qualify due to their woody composition being >80% native species. They are thought unlikely to qualify as Important Hedgerows under the Hedgerow Regulations (but subject to a full assessment).
  - Lowland Mixed Deciduous Woodland. The two small blocks of woodland qualify as a Habitat of Principal Importance, but it is also appreciated that both are relatively low quality examples, being young (post-1946) and without higher quality features such as over-mature trees or well developed ground flora.
- 7.2 The off-Site woodland to the west also qualifies as the Lowland Mixed Deciduous Woodland Habitat of Principal Importance, while recognising that it is relatively young (post-1949).

### SCOPING FOR SPECIES OF CONSERVATION CONCERN

- 7.3 The Site is a typical arable field with partial boundary hedgerows and small areas of other habitats. The assemblages of species of conservation concern are likely to be relatively species-poor and with low numbers (Table 4). Notwithstanding any legal protection to individual species, it is likely that the Site is of relatively low ecological value and with species present likely to be present in low numbers and as part(s) of larger local population(s).

**Table 4.** Summary of scoping for species of conservation concern.

Feature	Description	Assessment
Bats	Three trees with low bat roost potential A building with low roost potential Habitat for foraging limited to boundary hedgerow, scrub and woodland block	Likely of low importance for foraging. Roosts not scoped-out in three trees within the site or on the boundary, and the building within the western access corridor
Great crested newts	None to the north of the River Wensum within 2km, only singleton record south of the River Wensum	A gravel lagoon lies ~90m west. Local presence of great crested newts cannot be scoped-out
Birds	Hedgerows and verges relatively sparse and not suitable for some species Arable verge habitat of low quality, lacking weed- and herb-rich margins	Nesting likely in hedgerows and verges, scrub, woodland and also possibly open field. Assemblage likely restricted to common and also widespread, declining species. The assemblage is likely to be small and with low numbers
Reptiles	Slow worm recorded from Marriot's Way Habitat of very low quality and small in extent	Scoped-out and at most singleton transitory grass snakes may be present
Badgers	No records from within 2km north of the River Wensum and no evidence on-Site	Considered absent

<sup>22</sup> Maddock, A. (2011) *UK BAP Priority Habitat Descriptions*. Available from: [http://jncc.defra.gov.uk/PDF/UKBAP\\_PriorityHabitatDesc-Rev2010.pdf](http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2010.pdf)

Feature	Description	Assessment
Brown hare	Single record from within 2km north of the River Wensum Site is small and isolated from other areas of suitable habitat.	Considered absent
Hedgehogs	Known to be present locally and hedgerows and woodland offer shelter and foraging habitat	Potentially present
Invertebrates	Records of widespread but declining moths. Specialist microhabitats generally absent	Only generalist species likely to be present but including widespread but declining moths

## RECOMMENDATIONS FOR ADDITIONAL SURVEYS

7.4 Follow-up surveys for the purposes of the assessment of impacts and legal compliance are recommended for:

- Great crested newts in the lagoon to the west. Any population is likely to be isolated within the former gravel workings and the Site is largely not suitable as terrestrial habitat. It is very likely that impacts can be mitigated, if present.
- Bat roosts. Three trees are rated as having low roost potential, and if these are to be directly impacted or receive indirect impacts such as significant lighting then it is recommended that appropriate surveys are undertaken to determine the presence-absence of bat roosts. Likewise, the western access will require the demolition of the bungalow and as a building with low roost potential it is recommended that this is directly surveyed to determine the presence-absence of roosts. See Section 9: Mitigation for additional details of such survey requirements. It is considered that any impacts on roosts can be mitigated.

## 8. Impacts, Mitigation and Enhancements

### IMPACTS: INTERNATIONAL SITES

#### Scoping-of Sites

- 8.1 As an initial screening of European / international sites, a 10km search radius was taken around the Site and within this radius are three groups of European / international sites:
- Norfolk Valley Fens SAC, 7.9km north (the component site being Buxton Heath SSSI). This is scoped-out by virtue of distance and broad geography (being separated by the urban conurbation of Taverham and not within the same river catchment).
  - The Broads SAC, and the Broadland Special Protection Area and Ramsar site, 9.1km north-east (the component site being Crostwick Marsh SSSI). This is scoped-out by virtue of distance and broad geography (being separated by the urban conurbation of Taverham and being nearer to other villages such as Spixworth and Horsham St Faith's, and not within the same river catchment).
  - The River Wensum SAC, located 85m south. This is scoped-in for further consideration.

#### River Wensum SAC

- 8.2 The designated features of the River Wensum SAC are in-channel and wetland species found in swamp or very wet marginal vegetation (Table 5).

**Table 5.** European sites within 2km.

Site name	Designated feature of the European site
River Wensum SAC	<p>Annex I habitats:</p> <ul style="list-style-type: none"> <li>• 3260 Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</li> </ul> <p>Annex II species:</p> <ul style="list-style-type: none"> <li>• 1092 White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i></li> <li>• 1016 Desmoulin`s whorl snail <i>Vertigo moulinsiana</i></li> <li>• 1096 Brook lamprey <i>Lampetra planeri</i></li> <li>• 1163 Bullhead <i>Cottus gobio</i></li> </ul>

- 8.3 The boundary is located 85m south of the Site separated by Costessey Lane, a country lane with a moderate level of traffic. The designated boundary then lies ~40m south of this road, albeit with a channel directly connecting to the River Wensum ~15m south of the road.

#### Scoping of Potential Impacts

- 8.4 The *Habitats Regulations Assessment of Greater Norwich Local Plan Issues and Options Stage* (The Landscape Partnership, 2017<sup>23</sup>) lists potential pathways of impact and distances over which they may operate; these are screened in Table 6.

<sup>23</sup> The Landscape Partnership (2017) *Habitats Regulations Assessment of Greater Norwich Local Plan Issues and Options stage for Greater Norwich Development Partnership*. Available from: [https://gnlp.jdi-consult.net/documents/pdfs\\_14/reg.18\\_gnlp\\_interim\\_hra.pdf](https://gnlp.jdi-consult.net/documents/pdfs_14/reg.18_gnlp_interim_hra.pdf)



**Table 6.** Screening of potential impact pathways.

Pathway	Screening
Water abstraction	Not considered further here, to be considered at plan level in conjunction with a wider water-use strategy
Foul water disposal	Not considered further here, to be considered at plan level in conjunction with a wider water-use strategy
Surface water impacts (pollution and run-off)	Considered below
Recreational pressure	Considered below
General urbanising impacts	Considered below

### *Surface Water Management*

- 8.5 Surface water management is not presented in detail at this stage. However, it is understood that surface water management would follow best practice with respect to run-off rate and water quality. It is recognized that the River Wensum SAC would be defined as a receptor of high sensitivity (Ellis et al., 2012<sup>24</sup>), and as such the mitigation train will include sufficient stages and capacity (CIRIA, 2015<sup>25</sup>) to ensure that long-term and peak flows avoid impacts, being of 'high' quality and appropriate volume.

### *Recreational Pressure*

- 8.6 The River Wensum SAC and the wider valley bottom does not have public access. The nearest public footpath providing bankside access or providing access to the valley bottom habitats is >1km distant (Euclidean), leading off the A1067 Fakenham Road. The wider valley bottom area is very wet for much of the year and informal access onto this area is less likely.
- 8.7 As noted within the *Habitats Regulations Assessment of Greater Norwich Local Plan Issues and Options Stage* (The Landscape Partnership, loc. cit. pp41):

*"Aquatic interest (of the River Wensum SAC) is not affected by bankside recreation and public access to the river is in any case very limited. Boating is very limited in the SAC but encouraged downstream beyond the SAC in Norwich".*

### *General Urbanising Impacts*

- 8.8 As noted above, there is no access to the valley bottom and bankside areas of the River Wensum SAC. As such it is thought that pathways such as fly tipping and general vandalism are not relevant. More diffuse impacts such as artificial lighting can be mitigated via design considerations.

### **Test of Likely Significant Effects**

- 8.9 Three pathways of potential impacts are taken forward for consideration by the test of likely significant effects (Table 7). For recreational impacts, based on the available information impacts would appear unlikely. For the other two pathways (surface water and urbanisation) it is thought likely that design considerations located within the Site boundary will be able to mitigated impacts while recognising that these are not yet available. It is therefore thought that

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<sup>24</sup> Ellis, J. B., Revitt, D. M., & Lundy, L. (2012). An impact assessment methodology for urban surface runoff quality following best practice treatment. *Science of the Total Environment*, 416, 172-179.

<sup>25</sup> CIRIA C753 (2015) *The SuDS Manual*. Available from: [http://www.ciria.org/Resources/Free\\_publications/SuDS\\_manual\\_C753.aspx](http://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx)

impacts on site integrity are unlikely both in isolation and in-combination although this is subject to re-assessment once scheme details are available.

**Table 7.** Test of likely significant effects.

Pathways	Comment	Conclusions
Surface water impacts	Surface water management strategy to have sufficient capacity and levels of mitigation within the train	Mitigation is feasible within Site boundaries, subject to final design
Recreational impacts	No public access to the River Wensum bankside or valley bottom within vicinity of the Site Qualifying features of the River Wensum SAC of low vulnerability to recreational impacts	Impact unlikely, subject to scheme design
General urbanising impacts	Some impacts can be scoped-out by virtue of limited access to the valley bottom and River Wensum bankside, others (e.g. lighting) to be subject to mitigation via scheme design	Mitigation is feasible within Site boundaries, subject to final design

### IMPACTS: NATIONAL STATUTORY SITES

8.10 The assessment of impacts on the River Wensum SSSI is the same as that presented for the River Wensum SAC.

### IMPACTS: NON-STATUTORY COUNTY WILDLIFE SITES

8.11 The only County Wildlife Site in the vicinity of the Site (within 500m) is the Marriott's Way CWS. This is accessible from:

- Taverham Road, ~300m from the eastern access corridor.

8.12 Other CWS in the vicinity lack public access and the only one thought to be regularly used for recreation is Drayton Wood CWS, located 1.9km distant and separated by the main residential areas of Drayton.

8.13 Although the Marriott's Way CWS is likely to be used informal recreation by residents of the scheme the route itself receives significant promotion as a recreational area<sup>26 27 28</sup> and for associated health benefits<sup>29</sup>. Within the vicinity of the Site there are existing residential areas and any increase in recreation and subsequent impacts are likely to be relatively low.

8.14 It is thought that impacts on County Wildlife Site including the Marriott's Way CWS resulting from any increased recreational use will be negligible.

### MITIGATION OF CONSTRUCTION IMPACTS

8.15 Generic guidance to mitigate construction impacts at this stage are:

- General Site clearance works should avoid the nesting bird season.
- Three trees have low potential suitability for roosting bats, of which two are on the edges of the two access corridors onto Taverham Road. Based on the potential roost features being at most suitable for small numbers of bats it is appropriate to follow a precautionary approach to any tree works or if subject to significant indirect impacts. These may comprise direct inspections or activity surveys (following Collins, loc. cit., pp.48). The bungalow has low roost potential and direct activity surveys are required

<sup>26</sup> <http://www.marriotts-way.info/>

<sup>27</sup> <https://www.norfolk.gov.uk/out-and-about-in-norfolk/norfolk-trails/long-distance-trails/marriotts-way>

<sup>28</sup> <https://positivestepspt.co.uk/events/marriotts-way-trail-marathon-and-half-marathon-1>

<sup>29</sup> <https://www.walkingforhealth.org.uk/content/taverham-thorpe-marriott-way-b30>

prior to demolition. If roosts are found to be present the removal of this tree will require European Protected Species Licensing.

- Subject to the results of great crested newts surveys, there may be a requirement for mitigation under an European Protected Species Mitigation Licence. Measures would likely include exclusion fencing and removal of individuals from areas of verge and scrub subject to construction impacts.
- Site works should follow good practice with respect to avoiding water quality impacts (SEPA, 2017<sup>30</sup>).

## ENHANCEMENTS AND OPPORTUNITIES

### Strategic Context

8.16 As noted, the Site is within an area:

- Close to sub-regional green infrastructure (GI) corridors;
- Close to the Norwich Fringe *Wooded Ridges* project area; and
- Within the Wensum *B-Line* for pollinating insects.

8.17 The Site is located on a valley-side slope and is unlikely to be relevant in terms of wetland and fen habitats *per se*. It is not thought to occupy a location that is particularly significant in terms of its wider landscape role in connecting high value sites for nature conservation. As such it is thought that at a strategic level appropriate enhancement should comprise:

- Increasing the strength of woodland planting within the Site, contributing to the wider non-arable landscape and specifically wooded habitat relevant to the *Wooded Ridges*.
- Offering flower-rich habitats and vegetation, contributing to the *B-Line* aspirations of providing resources for pollinating insects.

### Generic Soft Landscaping

8.18 Soft landscaping is the most appropriate Site-wide enhancement, using appropriate native species and species of known wildlife value. Key points for many species groups is the need for insect prey, for bats and also for the chicks and fledgling birds of many species. Thus, a range of native plant types should be planted to provide a range of resources across the seasons from spring to autumn (insects and their predators), and also fruit and berry producing species in autumn and winter (birds).

8.19 For woody species appropriate for structural planting, those typical of local hedgerows (Norfolk County Council, undated<sup>31</sup>) are:

- Hawthorn, blackthorn, ash, maple, dogwood *Cornus sanguinea*, elm and hazel, with lesser amounts of crab apple *Malus sylvestris*, hornbeam and holly, and scattered examples of privet *Ligustrum vulgare*, oak, spindle *Euonymus europaeus*, wild cherry *Prunus avium* and guelder rose *Viburnum opulus*.

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<sup>30</sup> 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>

<sup>31</sup> Norfolk County Council (undated) *Planting Hedges in Norfolk – Maintaining Regional Character*. Available from: <http://www.norfolkbiodiversity.org/pdf/reportsandpublications/HedgeBookletPROOF4.pdf>

8.20 Shrubs suitable for planting within the scheme include most of the species listed for hedgerows. There is particular merit in having trees intended to develop as parkland or 'open growth form' trees, able to develop features of high value in the medium and long term (such as dead wood and cavities); oak and beech would be of very high value in such situations. Where smaller trees are required then appropriate species include silver birch, rowan *Sorbus aucuparia*, whitebeams *Sorbus* species, and fastigate forms of hornbeam.

8.21 Within areas of grassland and SUDS features a number of wildflower seed mixes are available from commercial suppliers, including wetland and pond planting (e.g. Emorsgate EM8 meadow mixture for wetlands), 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).

### **Additional Measures**

8.22 Additional measures could include:

- Bat boxes to be erected on buildings, either as integral 'bat tubes' embedded within walls or as external boxes, and also within the on-Site block of woodland. A wide range of types are suitable<sup>32</sup>.
- Bird boxes should be erected for locally relevant species, including swifts and house sparrows.
- The scheme should allow for the continued movements of hedgehogs, with garden gates raised to allow them to pass under and holes within gravel boards to allow them to pass through<sup>33</sup>.

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<sup>32</sup> <http://www.wildlifeservices.co.uk/batboxes.html>

<sup>33</sup> <https://www.jacksons-fencing.co.uk/News/outdoor-living/new-hedgehog-friendly-gravel-boards-winter-news-topical-treats-and-more-6511.aspx>

## 9. Conclusion

- 9.1 The main part of the Site is considered to be typical of an intensive arable field, with a small block of woodland, boundary scrub and lengths of hedgerow. The species of conservation concern likely or potentially present mostly comprise widespread but declining species as components of larger local populations.
- 9.2 Further surveys are recommended to establish the presence-absence of roosts within three trees with low potential suitability for bat roosts if these are directly impacted or likely to receive significant indirect impacts. Activity surveys are also recommended on the bungalow within the western access corridor. Direct surveys are recommended for great crested newts in a pond to the west. For both bats and great crested newts it is thought that the mitigation of impacts will be feasible, in conjunction with appropriate protected species mitigation licensing as required.
- 9.3 Other than for bats (if present) and great crested newts (if present) the mitigation of impacts during construction are generic, to follow good practice with respect to the timing of the nesting bird season and works near water.
- 9.4 The likely loss of habitat for any scheme will likely be low and mitigation via appropriate soft landscaping is the most appropriate. At a strategic level such landscaping would offer new habitat area potentially relevant to two local conservation projects: the Norwich Fringe *Wooded Ridges* project and the Wensum *B-Line* for pollinating insects.
- 9.5 It is thought likely that impacts on the River Wensum SAC can be mitigated via on-Site design measures integral to the scheme. These include an appropriate surface water mitigation train and other design measures, such as a lighting design to limit light spill. Recreational impacts and urbanising impacts such as vandalism are thought unlikely to impact site integrity by virtue of the lack of public access to the valley bottom and bankside areas.
- 9.6 In conclusion, it is considered likely that the impacts on the majority of species can be mitigated, and appropriate landscaping and scheme design, has the potential to deliver net ecological enhancement relevant to local green infrastructure and countryside projects.



## 10. Appendix 1: Photographs



**Figure 4.**  
View of the main part of the Site from the south.



**Figure 5.**  
The east hedgerow.



**Figure 6.**  
North boundary from the west, with the off-Site plantation woodland visible.





**Figure 7.**  
West hedgerow.



**Figure 8.**  
Verge to Costessey Lane.



**Figure 9.**  
Tree with low bat roost potential on  
north end of eastern access corridor.



**Figure 10.**  
The western access corridor.



**Figure 11.**  
View of Costessey Lane with valley  
bottom habitat beyond.



## 11. Appendix 2: Legislation

### Non-technical account of relevant legislation and policies.

Species	Legislation	Offence	Licensing
Bats: European protected species	Conservation of Habitats and Species Regulations 2017 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 2017 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.