Hopkins Ecology

Site:	**Land North of Tuttles Lane East, Wymondham**
Work Item:	**Strategic Ecological Assessment**
Client:	**Welbeck Strategic Land III Ltd**

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Summary

Hopkins Ecology Ltd was appointed by Bidwells on behalf of Welbeck Strategic Land III Ltd to prepare a strategic ecological assessment of the Land North of Tuttles Lane East with a view to identifying constraints and opportunities in the context of its promotion for development.

The Site is on the northern fringe of Wymondham and comprises several arable fields and associated habitats immediately north of Tuttles Lane East, and has an area of *circa* 55ha.

There are no statutory sites within 5km but there are 44 non-statutory County Wildlife Sites, although all but two are more than 1km distant and mainly associated with the River Tiffey Valley. The two nearest sites are to the north, one a wetland associated with an unnamed tributary of the River Tiffey that runs through part of the Site (with an Euclidean distance of 560m and a channel distance of ~1.47km from the Site) and the other a grassland 95m north-east. Neither has public access.

A review of local planning policies identifies the creation of green infrastructure corridors as a key policy within the Wymondham Area Action Plan (AAP). One such corridor crosses the Site and two pass along its boundaries.

The Site comprises arable fields, one of which is >35ha in area, with boundary hedgerows, two blocks of deciduous woodland, a small block of plantation woodland, some scrub and semi-improved grass wards, ditches and two ponds. All but one hedgerow qualifies as Habitat of Principal Importance and the deciduous woodland blocks qualify as Lowland Deciduous Woodland Habitat of Principal Importance.

A review of survey reports for other schemes locally shows that the two on-Site ponds were surveyed for great crested newts in 2010, along with the vast majority of the ponds within 250m and many others also. These surveys did not find any great crested newts. There is no evidence of great crested newts in the vicinity, and if there is a local population then it will almost certainly be small.

A small number of trees are considered to have low but not negligible potential suitability for roosting bats, and there are some farm buildings and a dwelling with moderate potential suitability for roosting bats. The foraging habitat is largely restricted to the hedgerows and woodland blocks, and the assemblage of bats on the Site is likely to be small and with few species.

Other species of conservation concern scoped-in as likely or possibly present are: widespread, declining birds such as skylarks and dunnock, but with a small local assemblage and probably in low numbers; brown hares, hedgehogs and widespread, declining moths. The presence of water voles and reptiles are not wholly discounted but the habitat is of low quality.

The Site is considered to be typical of an intensive arable landscape, with any species of conservation concern present in low numbers as components of larger local populations.

Habitat loss is considered to be the principal pathway of possible adverse impact, with mitigation available for most species via appropriate soft landscaping and scheme masterplanning. Although the mitigation of impacts on some species of open fields will be difficult, the overall scheme could deliver a net biodiversity gain with a net increase of non-arable habitat and creation of green infrastructure corridors.

In conclusion, it is considered likely that the impacts on the majority of species can be mitigated. Appropriate landscaping and Site design, has the potential to deliver net ecological enhancement. A key enhancement could be the delivery of green infrastructure corridors identified within the Wymondham AAP, as part of scheme design and landscaping.

1. Introduction

BACKGROUND

1.1 Hopkins Ecology Ltd was appointed by Bidwells on behalf of Welbeck Strategic Land III Ltd to prepare a strategic ecological assessment of the Land North of Tuttles Lane East with a view to identify constraints and opportunities in the context of its promotion for residential development with associated public open space, community uses, infrastructure and a primary school.

SITE CONTEXT AND STATUS

1.2 The Site is on the northern fringe of Wymondham and comprises a tract of farmland and associated habitat immediately north of Tuttles Lane East, with a total area of *circa* 55ha.

1.3 The Site is mostly farmland with some blocks of other habitat, farm buildings, a dwelling and garden centre. It is within the *South Norfolk and High Suffolk Claylands Natural Character Area*[1], which is characterised as an agricultural landscape *"incised by numerous small-scale wooded river valleys with complex slopes"*.

LEGISLATION AND PLANNING POLICY

1.4 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 2010 (the Habitats Regulations); and
- The Wildlife and Countryside Act, 1981 (as amended).

1.5 Also, the National Planning Policy Framework (DfCLG, 2012[2]) 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.

1.6 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.

[1] Natural England (2014) *NCA Profile 83: South Norfolk and High Suffolk Claylands.* Available from: http://publications.naturalengland.org.uk/publication/6106120561098752

[2] 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; 5km search radius
MAGIC (www.magic.gov.uk)	Additional information on statutory sites, habitats of principal importance and wider countryside information
Wymondham Area Action Plan and other policy documents	Information regarding local planning policies including a synthesis of related policies
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

2.2 A Site walkover was undertaken 8 and 9 February 2018, habitats described according to the methods of JNCC (2010)[3] and hedgerows following (DEFRA, 2007[4]), 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[5]; searches were also made for signs of badgers.

2.3 The suitability of ponds for great crested newts on-Site were assessed using the Habitat Suitability Index (ARG, 2010)[6].

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.

CONSTRAINTS

2.5 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 robust.

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

[4] DEFRA (2007) *Hedgerow Survey Manual.* DEFRA, London.

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

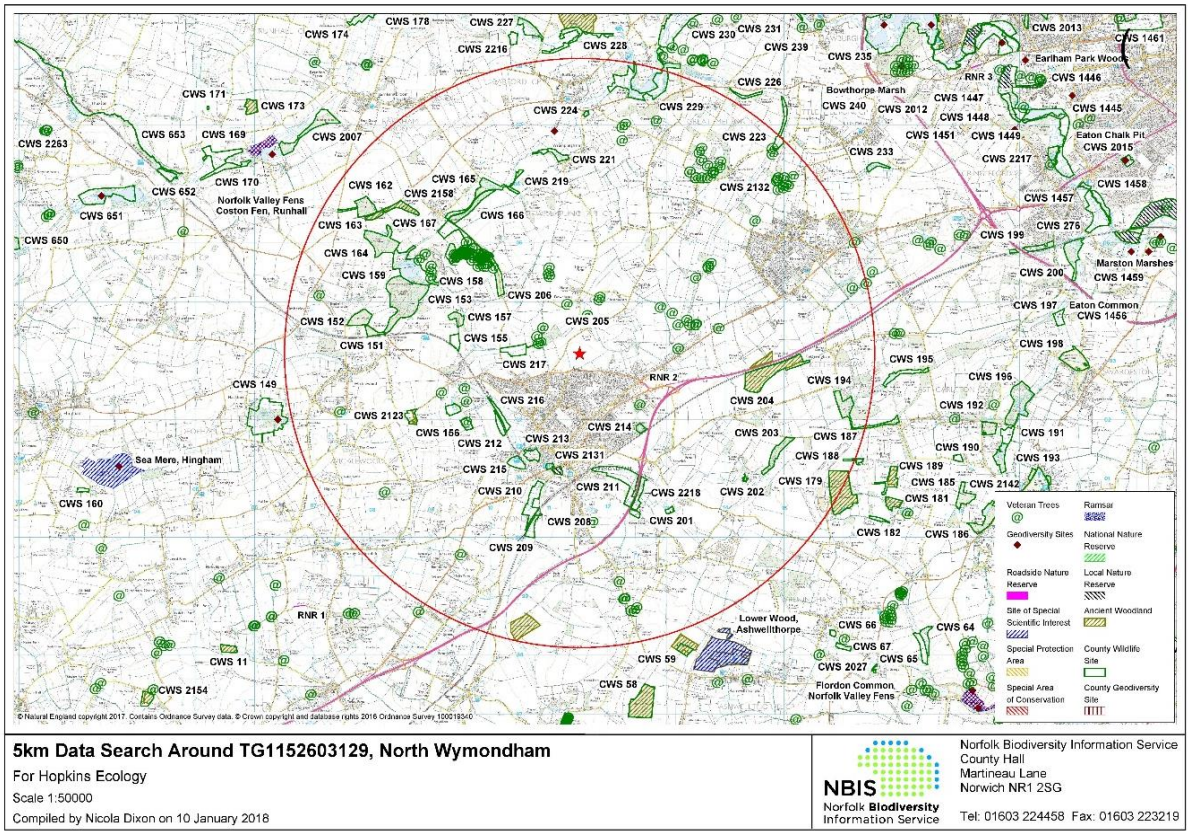
[6] ARG (2010) *Great Crested Newt Habitat Suitability Index. May 2010 Advice Note 5.* Available from: http://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file

3. Designated Sites

OVERVIEW

3.1 An overview of the Site in relation to nearby designated sites is shown in Figure 1, showing a concentration of sites along the River Tiffey Valley to the west (>500m distant) and as an 'arc' running along the western fringe of Wymondham. As reviewed under 'Section 4: Green Infrastructure Policies' these sites and the wider River Tiffey Valley are seen as important in terms of the Kett's Country landscape and local green infrastructure strategies.

Figure 1. Data search results for designated sites within a 5km radius.



STATUTORY (INTERNATIONAL AND NATIONAL) SITES

3.2 There are no statutory sites within 5km.

3.3 The nearest international site is located ~5.8km to the north-east (Euclidean), designated as the Norfolk Valley Fens Special Area of Conservation and the component site being Coston Fen, Runhall Site of Special Scientific Interest. This is designated for wetland and fenland species and vegetation, and is located on the River Yare upstream of the confluence to the River Tiffey.

NON-STATUTORY SITES

3.4 Within a 5km radius there is a high number of non-statutory County Wildlife Sites (CWSs), with 44 in total (see Figure 1 and Appendix 2). Two are located close to the site (within 1km) (Table 2), of which Deep Road Meadow CWS straddles the unnamed tributary of the River Tiffey[7] that runs along and through the eastern part of the Site and is ~1.43km downstream

[7] http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3553

(by channel length; 560m by Euclidean distance). The other is Melton Road Meadow CWS, 95m north. Neither of these CWSs has public access.

Table 2. CWSs within 1km.

CWS reference | name	Location	Description
217 | Deep Road Meadow	560m north-west	Tall fen vegetation with associated dykes and a species-poor dry grassland. The unnamed tributary of the River Tiffey that exists the site flows through this CWS, with a channel distance of ~1.43km from the Site boundary
205 | Melton Road Meadow	95m north-east	A grassland site with invading scrub

3.5 The remaining CWS are summarised in Table 3, broadly divided into 'zones' for brevity: those associated with the River Tiffey and River Yare Valleys, and those of open countryside. The River Tiffey Valley and its high density of CWSs is of particular significance in that it is specifically named within local planning policies (see Section 4: Green Infrastructure Policies). At the closest point the River Tiffey and its associated CWSs are ~1.3km west of the Site (separated by urban areas or 1.47km across arable fields). A full listing of the CWSs is given in Appendix 2: Table 9.

Table 3. Other CWSs within 5km, according to broad location and habitat association.

Zone	Number of CWSs	Summary
River Tiffey valley, downstream of confluence	10	Associated with the River Tiffey including sections of the channel. Extending roughly north-eastwards from the confluence with the unnamed tributary to the confluence of the Rivers Tiffey and Yare ~4.9km north (Euclidean)
River Tiffey Valley, upstream of confluence	10	Associated with the River Tiffey including sections of the channel. Extending roughly south-eastwards around the edge of Wymondham and then eastwards under the A11 into open farmland
River Yare valley	1	A single CWS 5.2km north-east associated with the River Yare below its confluence with the River Tiffey
Wider countryside north or west of Wymondham	12	Located as parcels within open farmland north and north-west of Wymondham, and without close association with the River Tiffey or comprising wetland or fen habitat likely to be of functional association with the River Tiffey. Mainly woodland and parkland habitat with some grasslands
Wider countryside south or east of Wymondham	9	Located mainly within open farmland along the western and southern edges of Wymondham and also extending east of the A11 into open countryside. Mainly woodland habitats but also ponds and lakes

4. Green Infrastructure Policies

OVERVIEW

4.1 Green infrastructure is considered to be a key requirement for development in the Wymondham area, with the policy requirements originating in the Joint Core Strategy[8]. Wymondham is considered a priority area for green infrastructure with two converging corridors: the *'Wymondham to Norwich'* corridor and the *'Five Rivers'* corridor along the River Tiffey Valley (along the wester fringe of Wymondham) and into open countryside both upstream and downstream. The spatial vision for these corridors is informed by a Green Infrastructure Strategy (CBA, 2007[9]) and associated studies (e.g. Green Networks, Norfolk Wildlife Trust, 2007[10]). Such policies are broadly in-line with other countryside restoration schemes, such as the Norfolk Wildlife Trust's *'Claylands Living Landscape'* project[11] within the South Norfolk area:

> *"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."*

4.2 The green infrastructure policies relevant to the Site and north Wymondham area are synthesised within the Wymondham Area Action Plan[12] (AAP), referring to the local countryside as a "Kett's Country". The broad environmental objective is described as:

> The *"Kett's Country pastoral landscape of grassland, woodland, farmland, hedgerow and wetland habitats will be protected and enhanced with the aim of strengthening the role of the Tiffey valley, maintaining the open land between Wymondham and Hethersett, conserving the historic landscape setting of the town and abbey and creating connections between green infrastructure".*

POLICIES

4.3 The individual documents and policies of relevance are summarised in Table 4, with the identified routes of green infrastructure corridors shown in Figure 2. The green infrastructure corridors proposed within the AAP and relevant to the site are:

- A local neighbourhood green infrastructure corridor running along Melton Road, north-eastwards from Wymondham. This is currently field boundaries largely without woody vegetation and open and featureless in character.

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[8] 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/

[9] 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

[10] 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

[11] https://www.norfolkwildlifetrust.org.uk/a-living-landscape/claylands

[12] South Norfolk DC (2015) *South Norfolk Local Plan. Wymondham Area Action Plan Adopted Version 2015.* Available from: https://www.south-norfolk.gov.uk/sites/default/files/Wymondham_Area_Action_Plan_1.pdf

- A local neighbourhood green infrastructure corridor running perpendicular to Tuttles Lane East following the route of a footpath across the open arable field on the south-western part of the Site.
- A neighbourhood green infrastructure corridor running along Tuttles Lane East. Substantial lengths of this route lack woody vegetation with only occasional clumps of low scrub as well as a short length of trimmed hedgerow. There is a small block of woodland at its eastern limit.

4.4 Additional points of note within the Wymondham AAP policies is the aspiration to achieve net biodiversity gain from development.

Figure 2. Plan of the local green infrastructure proposals (from AAP) with local areas of semi-natural habitats (from MAGIC).

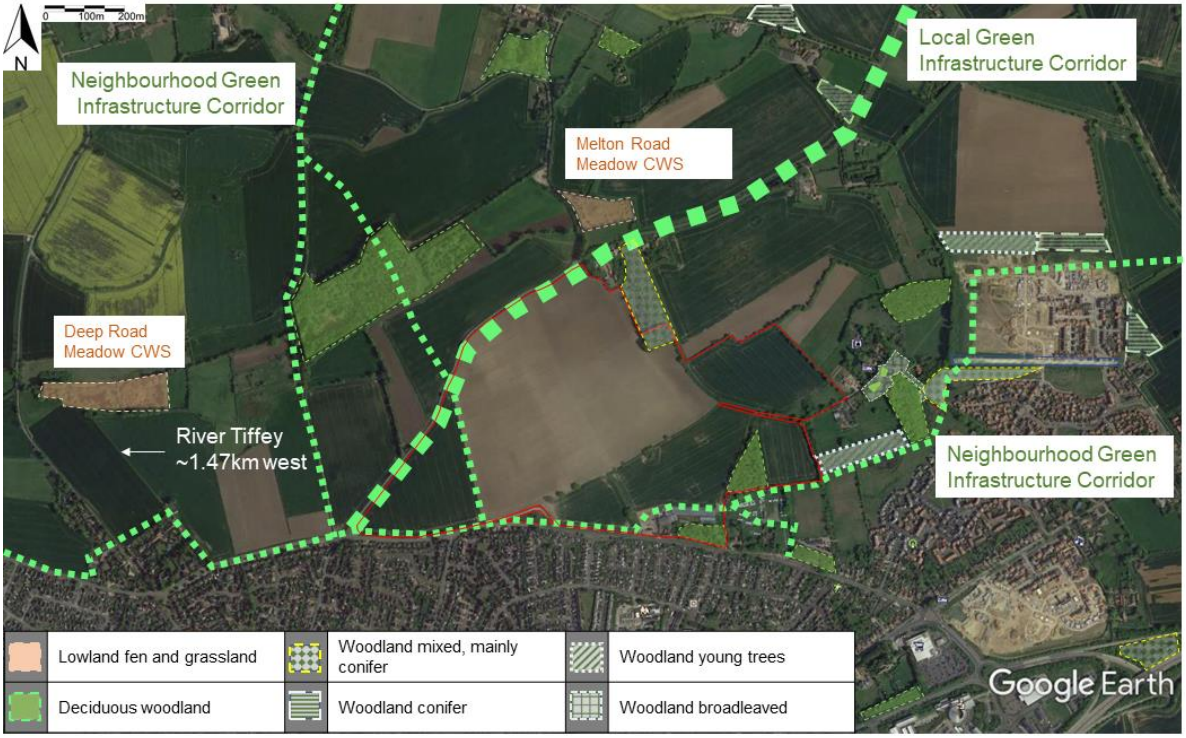


Table 4. Summary of polices and background documents relevant to green infrastructure and ecology.

Source	Text
Joint Core Strategy	
Area-wide policies addressing climate change and protecting environmental assets and Policy 10: Locations for major new or expanded communities in the Norwich Policy Area, with associated requirements and policies	Provision of extensive levels of green infrastructure around Wymondham to create a Kett's Country pastoral landscape
GNDP (2007) Green infrastructure strategy	
Overview of potential green infrastructure requirements within the greater Norwich area	Wymondham as a point where two strategic and one local infrastructure corridors meet
Wymondham AAP	
POLICY WYM 8 General green infrastructure requirements for New Developments within Wymondham AP area	New development in Wymondham will be required to maintain, protect and enhance green infrastructure, and developers will be expected to contribute towards green

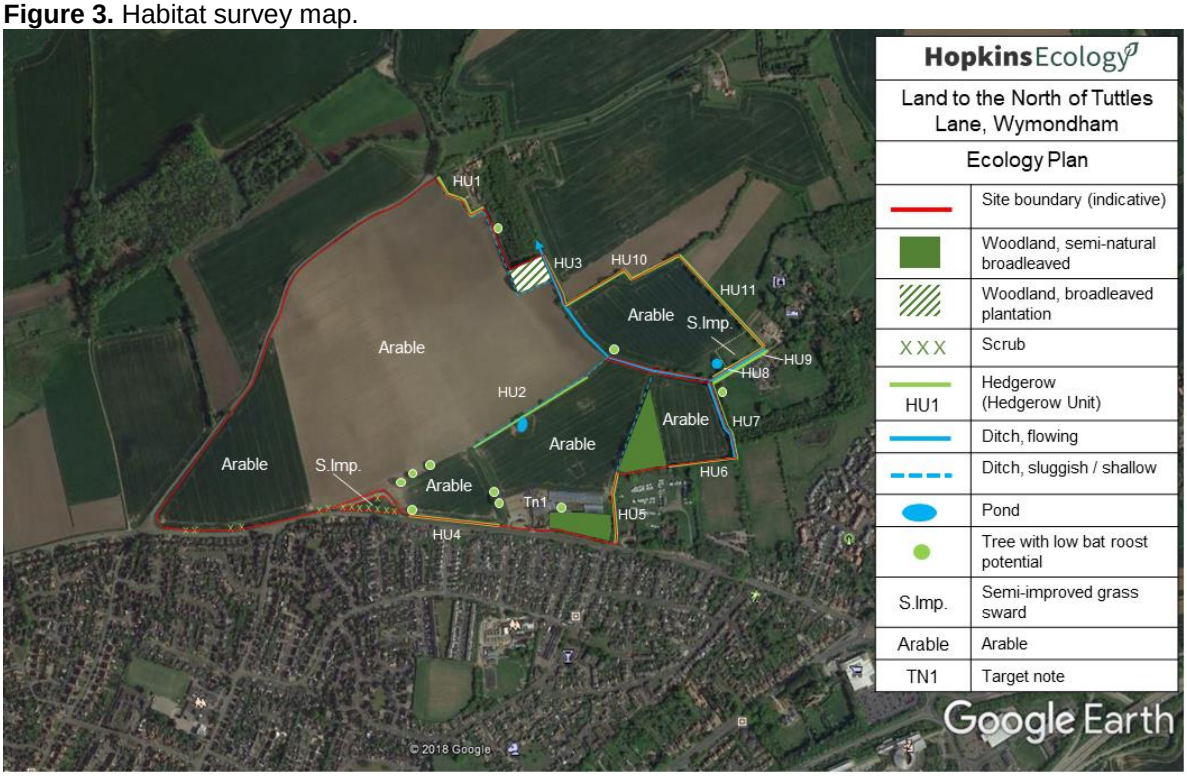
Source	Text
	infrastructure requirements through s106 contributions and/or CIL as appropriate Where appropriate new developments will be required to provide ecological links to the nearest green infrastructure and provide effective ecological buffers, the design of which to be negotiated with South Norfolk Council and other relevant bodies to ensure adequate protection of important ecological sites and maintenance of habitat connectivity. In particular it will be important for new development to consider the following (where relevant): 1) Improved habitat connectivity 2) Improved public access to the countryside 3) Improved recreational provision to alleviate visitor pressure on sensitive areas 4) Improve the quality of local County Wildlife Sites All new developments should aspire to net biodiversity gain and planning proposals should be accompanied by detailed ecological assessment where appropriate. The cumulative impact of developments on biodiversity assets should be considered.
POLICY WYM 9 General green infrastructure requirements for new developments in the north of Wymondham	In particular, where relevant, new development must consider the following: 1) Improved public access to the countryside 2) Improved recreational provision And where appropriate and/or through community projects: 3) Creation of footpaths and cycleways between Health Walk 5 and the west to Kimberley park [N1] the north of Wymondham and to the east to the site allocations, rugby club and Kett's Oak 4) Enhancement of the setting of Kett's Oak 5) Planting of hedgerow/parkland trees along Tuttles Lane East, from east to west creating an ecological corridor

5. Habitats and Botany

OVERVIEW

5.1 The Site is largely arable cropland, with a single field extending to over 35ha in area and a total area of circa 55ha. At the time of survey, the arable fields were not under a crop, presumably in anticipation of spring ploughing. As well as arable fields there are lengths of hedgerow, some grass swards, woodland, ditches and two ponds (Figure 3). The soil is classed as a 'lightly acid loamy and clayey soil with impeded drainage'.

Figure 3. Habitat survey map.



ARABLE FIELDS

5.2 The arable fields comprise the majority of the Site. At the time of survey the fields were not under a crop, presumably in anticipation of spring ploughing. Most of the large, central field appeared to have been recently cleared of sugar beet and the other fields supported a sparse sward of sterile brome *Anisantha sterilis* with common weeds such as groundsel *Senecio vulgaris* and adventitious brassica, probably oil seed rape.

GRASS SWARDS

5.3 The grass swards are all considered to be semi-improved, with three areas:

- A block of grass sward near the east boundary (~0.3ha) appears to be unmanaged other than perhaps occasional cutting, and comprises a rank sward of false oat grass *Arrhenatherum elatius* with cock's foot *Dactylus glomerata* with occasional tall herbs such as creeping thistle *Cirsium arvense*, nettle *Urtica dioica* and shorter herbs such as creeping buttercup *Ranunculus repens*.
- A small patch (~0.2ha) is located alongside Tuttles Lane East, cut off from the adjacent field by a secondary farm road. The sward is short with some evidence of rabbit grazing and mainly a meadow grass *Poa* species sward with rye grass *Lolium* species and

Yorkshire fog *Holcus lanatus*, with occasional plants of nettle, creeping buttercup, dove's foot cranesbill *Geranium molle*, ground ivy G*lechoma hederacea* and ragwort *Jacobaea vulgaris*. This is the proposed route of a green infrastructure corridor.

- Alongside Melton Road is a long stretch of verge (~0.9km in length) on a low bank and with only a few patches of woody vegetation but with the vast majority of the length without woody vegetation. This is the proposed route of a green infrastructure corridor. The sward appears to be mainly false oat grass with rye grass, couch, red fescue *Festuca rubra*, and cock's foot as occasional components. An occasional straggly stem of bramble *Rubus fruticosus* agg and ivy *Hedera helix* are also present as prostrate cover. The herb component comprises widespread grassland and tall ruderal species, those noted being: white dead nettle *Lamium album*, spear thistle *Cirisum arvense*, yarrow *Achillea millefolium*, hogweed *Heracleum sphondylium*, dandelion *Taraxacum officinale*, broad-leaved dock *Rumex obtusifolius*, ground ivy, cow parsley *Anthriscus sylvestris*, lanceolate plantain *Plantago lanceolata*, creeping buttercup, mugwort *Artemisia vulgaris*, dove's foot cranesbill, hedge bedstraw *Galium mollugo* and cleavers *Galium aparine.*
- The grass verge running alongside Tuttles Lane East is generally narrow (~1.5m) with sections lacking associated woody vegetation (western end) and also sections with associated linear scrub and hedgerow. The sward is similar to that along Melton Road, with Alexanders *Smyrnium olusatrum* as an additional species.

HEDGEROWS

5.4 The hedgerows on the Site comprise lengths running for parts or entire lengths of various field boundaries, albeit with extensive lengths of hedgerow missing from existing fields. Pre-1980s hedgerow removal created larger fields.

5.5 Typically, the hedgerows are tall and leggy with hawthorn *Crataegus monogyna* and oak *Quercus robur* as the most frequent species but with additionally other widespread species occurring in many lengths: sycamore *Acer pseudoplatanus*, ivy, dog rose *Rosa canina*, field rose *Rosa arvensis*, hazel *Corylus avellana*, ash *Fraxinus excelsior*, blackthorn *Prunus spinosa*, elder *Sambucus nigra*, elm *Ulmus* species and field maple *Acer campestre*; hornbeam *Carpinus betulus* is also present as occasional specimens.

5.6 The verges are narrow and grassy swards, with only lords and ladies *Arum maculatum*, herb Robert *Geranium robertianum* and dog's mercury *Mercurialis perennis* as woodland species (as defined by Schedule 2 of the Hedgerow Regulations), along with more widespread herbs: buttercup, nettle, ground ivy, red dead nettle *Lamium purpureum*, white dead nettle, common sowthistle *Sonchus oleraceus*, lanceolate plantain, ground ivy, cow parsley, hedge bedstraw, celandine *Ranunculus ficaria* and cow parsley. Table 5 summarises each length.

Table 5. Hedgerow descriptions (reference numbers cross-reference to Figure 2).

Reference	Description	Woody species	Woodland herbs (from Schedule 2 of Hedgerow Regulations)
HU1	Tall (>5m), defunct hedgerow to garden curtilage	Hawthorn, oak, ash, bramble, elm also ornamentals (juniper *Juniperus* species, privet *Ligustrum japonica* and others)	-
HU2	Trimmed to ~1.5m, associated with a ditch	Hawthorn, bramble, ivy, hazel, and field maple	-

Reference	Description	Woody species	Woodland herbs (from Schedule 2 of Hedgerow Regulations)
HU3	Hedgerow on opposite side of ditch on low bank, tall (>5m) and straggly	Hawthorn, oak, hazel, field maple, ivy and bramble	-
HU4	Trimmed to ~1.5m, leggy and on a low bank	Hawthorn with bramble and ivy	Lords and ladies
HU5	Tall (>5m) alongside garden curtilage	Hawthorn, sycamore, hazel, elm, ivy, bramble, dog rose and blackthorn	-
HU6	A wire fence with hedgerow on opposite side on low bank. Leggy and tall (>5m)	Hawthorn, field maple, elder, bramble, hazel and sycamore	Dog's mercury and lords and ladies
HU7	Hedgerow op opposite side of a ditch. Tall (>5m)	Hawthorn, ivy, ash, sycamore, oak, hazel, bramble and an ornamental cherry *Prunus* species	-
HU8	Mostly trimmed to ~1.5m but with young oak and sycamore standards. Part of a double hedgerow alongside a track	Oak, sycamore, hawthorn, bramble, field rose and ivy	-
HU9	Located on the opposite side of a ditch, part of the double hedgerow alongside a track	Oak, sycamore, hawthorn, bramble, field rose and ivy	-
HU10	Tall (>5m), leggy on a low half-bank. Some former coppice stool specimens of oak and sycamore	Oak, sycamore, field rose, hawthorn, ivy, elder, ash and bramble	Dog's mercury and lords and ladies
HU11	Tall (>5m), leggy on a low bank. Some former coppice stool specimens of oak and sycamore	Oak, sycamore, field rose, hawthorn, ivy, elder, ash and bramble; a single horse chestnut *Aesculus hippocastanum* of low stature	Dog's mercury and lords and ladies

SCRUB

5.7 The central section of the boundary to Tuttles Lane East lacks a hedgerow but has developed a sparse scrub vegetation, mainly bramble with some hawthorn and an occasional butterfly bush *Buddleja davidii*. Growing through are occasional tall ruderals: nettle, mugwort *Artemisia vulgaris*, and creeping thistle.

SEMI-NATURAL BROADLEAVED WOODLAND

5.8 There are two blocks of semi-natural broadleaved woodland, both of which are shown on the OS map of the 1880s:

- A block located close to the south-east boundary (~0.7ha) appears to be former coppice, now with a high canopy and sparse shrub layer and ground flora. The most frequent canopy species is oak with ash, but hornbeam also present as coppice stools; sycamore also forms a canopy component but without apparent coppiced specimens. The shrub layer comprises occasional bushes of elder, hawthorn, bramble and hazel. The ground flora was sparse at the time of survey but plants noted included extensive patches of dog's mercury with lords and ladies, ground ivy, celanide, nettle, ivy and wood rush *Luzula* species.

- Alongside Tuttles Lane East is a block of mature woodland, albeit without overmature or veteran trees and without evidence of former coppicing (~0.5ha). The main canopy species is oak, with sycamore and a small number of Scot's pines *Pinus sylvatica*. The shrub layer is moderately dense with holly *Ilex aquifolium*, brambles, elm suckers and hawthorn. The ground flora was sparse at the time of surveys with nettle, lords and ladies and prostrate ivy evident.

DECIDUOUS PLANTATION WOODLAND

5.9 Towards the north boundary, continuous with a block of young broadleaved plantation woodland located off-Site is a small (~0.3ha) block of poplar plantation, probably hybrid Canadian poplar *Populus x canadensis*. The shrub layer is sparse with occasional brambles and elder.

DITCHES

5.10 The field survey was undertaken in late winter, with moderate amounts of rain in the preceding weeks. Two types of ditches are described:

- Flowing ditches, possibly with open water all year but nevertheless shallow and with a gravel substrate in places. These are managed with steep sides and lack aquatic flora.
- Wet ditches with at most sluggish flow, and likely to be dry for much of the year. Again, managed with steep sides, lacking aquatic or wetland flora and with silty substrates.

PONDS

5.11 There are two ponds on-Site:

- A hedgerow pond is located roughly centrally, with a diameter of ~5m. It is heavily shaded by surrounding scrub of hawthorn and oak, lacking aquatic flora and likely to have open water in most summers.
- A field pond is located towards the eastern boundary, with a diameter of ~5m. It is heavily shaded by surrounding scrub of willow *Salix* species, hawthorn and oak, lacking aquatic flora and likely to have open water in most summers.

BUILDINGS (TN1)

5.12 Alongside Tuttles Lane East are a series of buildings including a traditional cottage with modern extension, a converted barn used as a garden centre and modern farm buildings with pre-fabricated structure.

6. Scoping for Species of Conservation Concern

PLANTS

6.1 The data search returned records for few plants of conservation concern, the only non-wetland species is small flowered catchfly *Silene gallica*, an arable margin species. The broader landscape has a moderate diversity of arable margin species (Walker et al. 2012[13]).

6.2 The extent and quality of habitat for arable species on the Site is, however, likely to be very low, with cropping close to the grassy field margins and only limited areas of 'field corners' with a reduced intensity of cultivation. The assemblage of arable flora is likely to be small.

BATS

6.3 Records for eight species of bat were returned by the data search: barbastelle, serotine, Natterer's, 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[14]; the only roost records are for two separate brown long-eared roosts, both >1.5km distant.

- Foraging. Much of the Site is open arable farmland with very little foraging habitat for bats and without the linear features (i.e. hedgerows) that many bats need for commuting or foraging along. The patches of grassland are low in quality and extent, and while the woodlands offer habitat of moderate suitability for several species they are small in area. 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 low but with higher value towards the eastern side. The numbers of bats regularly foraging are likely to be low and the overall assemblage comprising a small number of species.

- Trees. Eight trees within the Site or on its boundaries are rated as having low but not negligible bat roost potential, with at least two other trees off-Site but very close to the boundary likewise having low bat roost potential (see Figure 3: Habitat Plan). The two blocks of woodland are likewise of low potential suitability. The trees are mostly living trees with minor dead limbs and moderate ivy cover, although one towards the eastern boundary is a tall 'snag' (a dead, standing tree). Many of the trees are isolated within open fields without nearby cover or associated linear features, such that the likelihood of bats using them is reduced.

- Buildings TN1. The cottage and converted barns adjacent to Tuttles Lane East have at least moderate potential suitability for roosting bats, with traditional pantile roofs, presumably lined, and associated features of potential value such as flashing and fascias. The modern farm buildings appear to lack potential roost features and have negligible potential suitability.

6.4 In summary, extensive tracts of the Site are of very low suitability for foraging with the hedgerows and woodland blocks being the main potential areas of habitat likely to be used by bats, albeit by low numbers. A number of trees have low but not negligible potential suitability

[13] 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

[14] http://www.batsurvey.org/

for roosting, but with the likelihood of roosts being present reduced by the isolation of these trees. The buildings along Tuttles Lane East have moderate potential suitability for roosting.

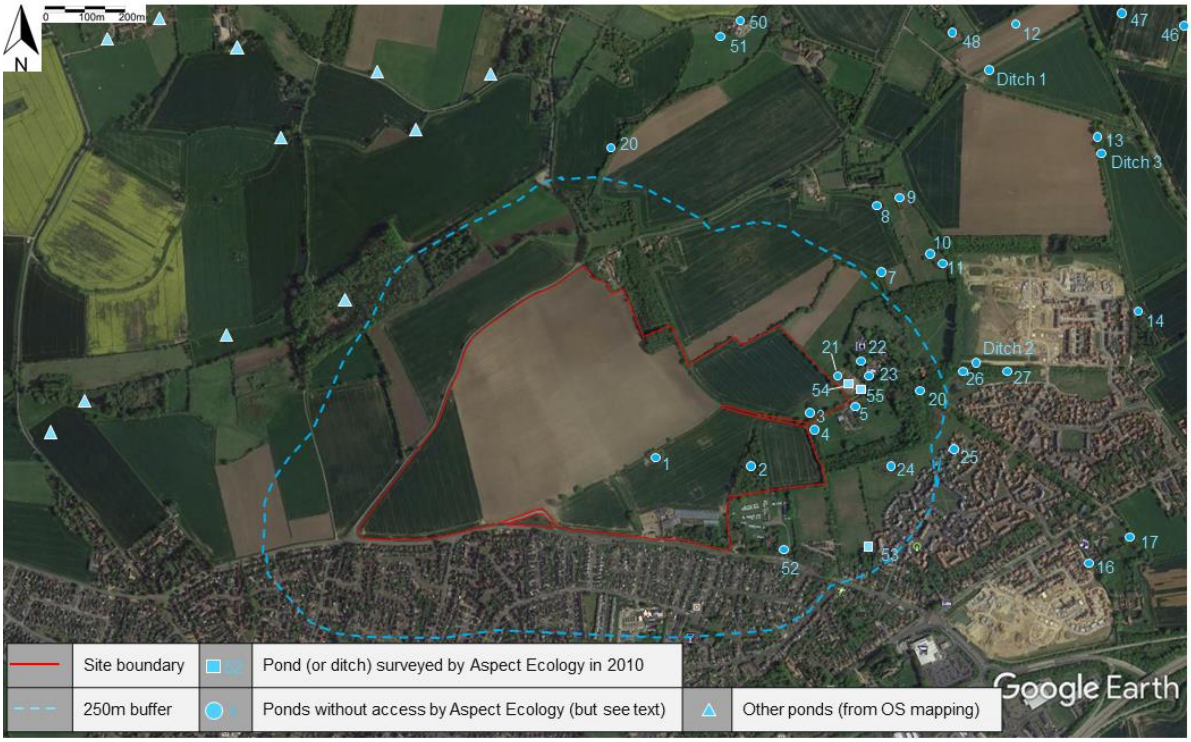
GREAT CRESTED NEWTS

6.5 The South Norfolk Claylands area is considered to be a 'stronghold' for the great crested newt[15]. The data search returned numerous records from the south of Wymondham, such as from The Lizard CWS and other sites near to Siflield Road. From the northern part of the search radius, more relevant to the Site, the only records are from the north-east near to Hethersett and further afield (at least 2.4km distant).

6.6 In terms of assessing the potential for great crested newts to be present, consideration is typically given to on-Site ponds and nearby ponds, with a 250m radius considered appropriate given the open character of surrounding habitat (following English Nature, 2001[16]).

6.7 Within the Site boundary there are two ponds and others nearby. From previous surveys for nearby schemes all of the on-Site ponds and the vast majority of those within 250m and nearby were surveyed in 2010, with some surveys in 2008 and earlier (see Figure 4 and Table 6). No great crested newts were recorded by any of these surveys.

Figure 4. Ponds within the Site and nearby with 250m buffer shown.



6.8 The on-Site ponds supporting water in 2018 were numbers 1 and 3 (in Figure 4), with both being relatively isolated and rated as being of 'poor' suitability for great crested newts, with heavy shading, low water quality and without aquatic flora. Pond 2 was not present.

6.9 Negative survey data for great crested are typically recognised as valid for 5-years, but nevertheless the 2010 survey results are probably sufficient to strongly suggest that great crested newts are almost certainly absent from the Site and nearby countryside to the north-east. At most, any population currently present in this area would almost certainly be small.

[15] Natural England (2007) loc. cit.

[16] English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

Table 6. Summary of previous survey work locally (cross-referencing to Figure 4).

Pond reference (as shown on Figure 4)	Source	Survey result for great crested newts
All numbered ponds	Aspect Ecology (2014)[17]	Negative
52, 53,2,4, 3, 29, 30, and 31	PAA (2008)[18]	Negative
27 and 14	Surveyed by Bioscan in 2004 and 2008	Negative
"27 ponds in the wider north Wymondham area)" believed to have been surveyed in 2008	Unpublished data cited by PAA (loc. cit.)	Negative
Not shown (now filled-in), within garden centre curtilage	Norfolk Wildlife Services (2007)[19]	Negative

BIRDS

6.10 The data search returned a diverse range of species records, including a number unlikely to be relevant, such as great white egret and species with strong association with wetland areas. Included on the search are species potentially likely to overwinter on arable farmland and utilise open fields and hedgerows / verges for nesting:

- Overwintering species: lapwing, golden plover, herring gull, lesser black-backed gull and passerines, namely skylark, and yellowhammer;
- Nesting in open fields: skylarks; and
- Nesting in hedgerows and field margins: grey partridge, turtle dove, willow warbler, dunnock, mistle thrush, song thrush, bullfinch, yellowhammer and reed bunting.

6.11 During the Site visits 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 or cereal stubbles. For species of open fields such as lapwing the Site is probably of greater potential value, although none were noted; such species may be sensitive to disturbance from the footpath and the two roads than run to the south and north-east but nevertheless extensive tracts are likely to be free of disturbance.

6.12 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 and yellowhammer.
- The hedgerows are relatively narrow and 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 of potential value to skylark, offering open habitat with limited disturbance. Based on a Site area of *circa* 55ha and typical upper and lower densities for skylarks in arable[20] the numbers of skylark pairs could be in the range of 13 to 24 pairs, although it would be exceptional for the Site to be at capacity.

[17] South Norfolk DC planning reference 2015|1482.

[18] South Norfolk DC planning reference 2008|2092.

[19] South Norfolk DC planning reference 2007|2476.

[20] Based on territory sizes of 4.5ha in winter cereals and 2.5ha in other arable types, 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.

6.13 In summary, for most typical farmland species the Site is probably of lower value based on the lower quality of wintering habitat and the general absence of weed- and herb-rich field margins. The hedgerows are likely to support a small assemblage of widespread, declining species. The open field habitat is likely to support skylarks, a widespread but declining species.

REPTILES

6.14 The data search returned records for slow worm, grass snake and common lizard, all from the south edge fringe of Wymondham (>1.4km distant).

6.15 Arable landscapes typically support few if any reptiles and much of the Site is rated as being of negligible suitable and lacking reptiles, with only narrow grass verges and little other shelter or cover. Elsewhere, there some areas of grassland in association with scrub and hedgerows, but the overall extent is small and it is of lower quality. At most, reptiles would be expected to be present in low numbers.

SMALL MAMMALS

6.16 Small mammals are assessed as follows:

- Badgers, numerous records from countryside to the north but none within 1km. Considered to be absent.
- Harvest mice are known from ~1km west in vegetation associated with the unnamed tributary of the River Tiffey. Tall grassland habitat is very scarce on the Site and of low quality, thus harvest mice are considered absent.
- Otters and water voles are known from numerous records along the River Tiffey, from south of Wymondham and then downstream (northwards) for much of its length. None are within ~1.3km of the Site. The on-Site ditches are all shallow, possibly dry in periods without rainfall, and lacking aquatic vegetation. It is very unlikely that water voles are present.
- Brown hares are reported widely from open countryside within the 5km data search radius, both to the south and north of Wymondham. The large arable fields offer suitable habitat although none were seen, and it is possible that low numbers of hares are present.
- Hedgehogs are known widely locally, including nearby residential areas. The hedgerows and woodland blocks offer shelter and foraging habitat and they are probably present in low numbers.

INVERTEBRATES

6.17 Records for 76 species of invertebrate of conservation concern were returned from within 5km, comprising records of species collected from incidental recording and also regular moth trapping stations in domestic gardens in Wymondham and Hethersett.

6.18 These data are analysed using Natural England's *Invertebrate Species-habitat Information System*[21] (ISIS) that classifies such inventory data into standardised habitat assemblages (Table 7). A small number of species are associated with wetland habitats and microhabitat (Broad and Specific Assemblage Types), but the majority are generalists of grassy and

[21] Drake C.M., Lott, D.A., Alexander, K.N.A. & Webb, J. (2007) Surveying *Terrestrial and Freshwater Invertebrates for Conservation Evaluation.* Natural England, Sheffield.

woodland vegetation with the only potentially relevant specialist species being those found in 'open short sward' grassland and 'bark and sapwood decay'.

Table 7. Habitat (assemblage type) associations of the invertebrates from the data search.

Assemblage code	Assemblage name	Number of species
Broad Assemblage Type		
A1	Arboreal canopy	14
F2	Grassland & scrub matrix	11
W3	Permanent wet mire	5
F1	Unshaded early successional mosaic	4
A2	Wood decay	3
Specific Assemblage Type		
W313	Moss and tussock fen	2
F112	Open short sward	2
W314	Reedfen and pools	1
A212	Bark & sapwood decay	3

6.19 The extent of habitat for noteworthy invertebrates on the Site is low, restricted to hedgerows, woodland and grass verges. The field boundary habitats are typically narrow and isolated from habitats that would enhance their value, such as areas with an abundance of blossom. The woodland blocks are also small and isolated, and lack specialist microhabitats such as dead wood (other than narrow fallen timbers, and without more high value dead wood such as heart rot). Specifically, the Site lacks 'open short sward' grassland associated with some of the specialist species known locally and the 'bark and sapwood decay' resource is low in quality without associated flower-rich foraging habitat.

6.20 The Site is likely to be of low value for invertebrates, and at most it may support a small assemblage of generalist moths that include a number of Species of Principal Importance that have undergone national declines but remain widespread (Butterfly Conservation, 2007[22]).

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

7. Evaluation

STRATEGIC GREEN INFRASTRUCTURE

7.1 A key policy requirement locally is the provision of green infrastructure to maintain and enhance habitat connectivity across the landscape. The Site is relevant to three green infrastructure corridors:

- A local neighbourhood green infrastructure corridor running along Melton Road, north-eastwards from Wymondham;
- A local neighbourhood green infrastructure corridor running northwards, perpendicular to Tuttles Lane East; and
- A neighbourhood green infrastructure corridor running along Tuttles Lane East.

7.2 At present all three corridors are of low quality and are likely to have limited value as green infrastructure in ecological terms, lacking structural features likely to offer shelter, habitat and a structural feature across the landscape. As discussed below ('Mitigation'), the scheme could offer soft landscaping to create green infrastructure and significantly enhance the ecological value of these corridor.

7.3 There are footpaths away from the Site onto open countryside at the western end, but the two nearby CWSs are without public access.

HABITATS OF PRINCIPAL IMPORTANCE

7.4 In general, the Site is typical of lowland farmland, with large fields of arable cropland with partial boundary hedgerows and smaller patches of other habitats. Two habitats that are considered to qualify as Habitats of Principal Importance (Maddock, 2011[23]):

- Hedgerows, the majority of which qualify (other than HU14 against the garden curtilage in the north). These hedgerows meet the criterion of >80% native woody species.
- Lowland mixed deciduous woodland. The two blocks of woodland to the south-east satisfy the criteria for this habitat type, both being shown on OS maps from the 1880s and with native tree cover, some layering of vegetation and woodland ground flora.

7.5 Further assessment would be required to determine the status of:

- Ponds. To qualify they should be of high ecological quality, most likely achieved here by supporting great crested newts. Surveys in 2010 were negative, but if re-surveys did locate any then these ponds would qualify as Habitat of Principal Importance.

SCOPING FOR SPECIES OF CONSERVATION CONCERN

7.6 The Site appears to be 'typical' of farmland habitat, with some extensive tracts of open arable fields and limited lengths of boundary hedgerows and other habitats. The assemblages of species of conservation concern are likely to be relatively species-poor and with low numbers. 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). The protected species scoping is summarised below (Table 8).

[23] Maddock, A. (2011) *UK BAP Priority Habitat Descriptions*. Available from: http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2010.pdf

Table 8. Summary of ecology assessment.

Feature	Description	Assessment
Bats	Foraging habitat largely restricted to hedgerows but extensive tracts of very low quality arable habitat Small number of trees with low roost potential Buildings with moderate roost potential	Likely to support foraging bats in low numbers and with a small assemblage Roosting cannot be discounted but at most only a few roosts likely
Great crested newts	None reported by surveys in 2010, although two ponds within 250m not surveyed On-Site habitat largely restricted to hedgerows and verges	Any local population – if present – likely to be small. The risk of great crested newts being present is low but cannot be wholly discounted
Birds	Hedgerows and verges relatively sparse and not suitable for some species Arable verge habitat of low quality, lacking weed- and herb-rich margins Open fields suitable for skylarks	Nesting likely in hedgerows and also open fields by common and also widespread, declining species. The assemblage is likely to be small and with low densities
Reptiles	No local records from the north fringe of Wymondham. Habitat restricted to verges, but low in extent and quality	Potentially present
Badgers	No records from within 1km and no evidence on-Site	Considered absent
Harvest mice	Known from ~1km west, but very little tall herb vegetation and the habitat present disturbed and isolated	Considered absent
Otters and water voles	Know from the River Tiffey~1.3km distant. On-Site ditches of very low quality, lacking vegetation and possibly dry in summer	Low risk of being present but cannot be wholly discounted
Brown hare	Hares reported from within 2km but none noted during surveys. On-Site habitat suitable within open fields	Potentially present
Hedgehogs	Known to be present locally and hedgerows and woodland offer shelter and foraging habitat	Potentially present
Invertebrates	Specialist microhabitats generally absent, although the trees support dead wood that may be relevant to dead wood species but a rich dead wood fauna is not known locally	Most likely only widespread species present

RECOMMENDATIONS FOR ADDITIONAL SURVEYS

7.7 The work reported here provides a strategic overview of the Site and the main ecological features. For a full baseline assessment, it is recommended that surveys are undertaken for: bats (roosting and foraging), great crested newts, breeding and wintering birds, reptiles and water voles.

8. Impacts, Mitigation and Enhancements

IMPACTS

8.1 Adverse impacts from the development of the Site are likely to be driven by habitat loss, with the significance of this dependant on the extent and location of development while also noting the likely value of the ecological features and species as being relatively low, as widespread species that are component(s) of larger local populations(s). Mitigation of impacts will be achievable in most instances. Site landscaping, provision of open green space and also the creation of the green infrastructure corridors will provide the potential for net biodiversity gain.

8.2 Other potential pathways of impacts include:

- Surface water management, with the River Tiffey Valley and the Deep Road Meadow CWS connected via the unnamed tributary of the River Tiffey. Mitigation of flows and water quality will require an appropriate surface water management mitigation train, and is likely to be achievable.
- Recreational impacts on the two CWSs are of low likelihood given that neither has public access. In terms of broader recreational impacts in the vicinity of Wymondham, the Site has public footpaths leading from the Site to nearby open countryside and the creation of the green infrastructure corridors with on-Site greenspace will further mitigate recreational impacts.

8.3 It is not expected that there will be impacts on statutory sites, by virtue of distance and location. In particular the nearest component site of the Norfolk Valley Fens SAC is associated with the River Yare upstream of the confluence with the River Tiffey, at an Euclidean distance of 5.8km; impacts on its integrity are very unlikely.

MITIGATION OF CONSTRUCTION IMPACTS

8.4 Direct measures to avoid impacts during construction may depend on the results of follow-up surveys, e.g. for reptiles. Generic guidance at this stage includes:

- General site clearance works should avoid the nesting bird season; and
- Measures to prevent soil and other run-off into the ditch network should be avoided, by following appropriate guidance[24].

ENHANCEMENTS

Green Infrastructure Corridors

8.5 As described, three green infrastructure corridors are identified as being relevant to the scheme, based on the Wymondham AAP. These are required to enhance connectivity across the landscape by offering movement corridors for species and also habitat in their own right. Figure 5 shows these corridors within the masterplan strategy. Key principles for such corridors are:

- As far as possible, the corridors should offer near-continuous belts of structural planting along which species that tend not to stray from cover will fly along. This includes many bats and also birds.

[24] *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

- Conversely, structural planting should not form overly dense belts of trees through which many species will struggle to fly. The options are to create paths through the planting, akin to double hedgerows or by spacing trees such that gaps will be retained between individual tree canopies. Planting should also aim to provide a diversity of local conditions, from open grassland to longer grassland forming a matrix with scrub, ultimately grading into denser scrub and tree cover.
- The corridors should be as dark as possible, through a combination of reduced lighting and also structural planting to screen from light spill (Gunnell and Grant, 2012[25]).
- The corridors should offer resources for a range of species, increasing the value of the corridors as stepping stones across the landscape. Examples include the provision of blossom over an extended period, required by many pollinating insects, and fruit and berries in autumn for many birds, and insect food plants.

Figure 5. Scheme masterplan strategy.

Generic Soft Landscaping

8.6 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, 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).

[25] Gunnell, K. and Grant, G. (2012) *Landscape and Urban Design for Biodiversity and Bats*. Bat Conservation Trust, London.

8.7 For woody species appropriate for structural planting, those typical of local hedgerows (Norfolk County Council, undated[26]) 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*.

8.8 Shrubs suitable for planting within the scheme include most of the species listed for hedgerows, other than blackthorn and hawthorn (due to spines) and those with requirements for large distances to the nearest buildings (mainly ash and oak). Small trees with smaller minimum distances to buildings include silver birch *Betula pendula*, rowan *Sorbus aucuparia*, whitebeams *Sorbus* species, and fastigiate forms of hornbeam. Within open green space trees allowed to develop open growth forms typical of parkland trees would be of particular value in the medium- and long-term, with oak and beech *Fagus sylvatica* of very high value in such contexts.

8.9 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 on heavy soils (e.g. EM4 meadow mixture for clay soils and EM10 tussock mixture) and flowering lawns for areas with more intensive use and management (e.g. EL1 flowering lawn mixture).

8.10 Along the ditch-side areas soft landscaping would serve to substantially enhance the value of these areas for wildlife, as areas of habitat and also as corridors across the landscape.

8.11 Additional measures could include:

- Bat boxes to be erected on buildings, either as integral 'bat tubes' embedded within walls or as external boxes. A wide range of types are suitable[27].
- 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[28].

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

[27] http://www.wildlifeservices.co.uk/batboxes.html

[28] 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 Site is considered to be typical of an intensive arable landscape, dominated by relatively large fields with partial hedgerows and small areas of other habitats. A number of species of conservation concern are likely or potentially present, many of which will be widespread but declining species, and present as components of larger local populations. Further surveys are recommended to provide a robust baseline for the Site, but it is thought likely that any such species found will be in low numbers and the overall assemblages of species will be small.

9.2 Habitat loss is considered to be the principal pathway of adverse impact, with mitigation available for most species via appropriate soft landscaping and scheme masterplanning. Although mitigation of impacts on some species associated with open fields will be difficult, the overall scheme could deliver a net biodiversity gain with a net increase of non-arable habitat and creation of green infrastructure corridors.

9.3 In conclusion, it is considered likely that the impacts on the majority of species can be mitigated. Appropriate landscaping and scheme design has the potential to deliver net ecological enhancement. A key enhancement could be the delivery of the green infrastructure corridors identified within the Wymondham AAP, as part of scheme design and landscaping.

10. Appendix 1: Photographs

Figure 6.
Arable field, with adventitious weeds and brassica seedlings.

Figure 7.
Semi-improved grass sward adjacent to Tuttles Lane East.

Figure 8.
Semi-improved grass sward adjacent to east boundary.

Figure 9.
Melton Road boundary, looking north-east. Grass sward along route of former hedgerow but now lacking woody vegetation.

Figure 10.
Hedgerow (HU2)

Figure 11.
Hedgerow (HU12)

Figure 12.
Semi-natural broadleaved woodland, near east boundary.

Figure 13.
Semi-natural broadleaved woodland, adjacent to Tuttles Lane East.

Figure 14.
Flowing ditch.

11. Appendix 2: Additional Data

Table 9. Details of County Wildlife Sites within 5km.

Zone	Location	CWS Reference	Name	Description
River Tiffey valley, downstream of confluence	1.4km west	156	Big Wood Meadow	Three distinct fields of undulating marshy grassland of moderate species diversity with species rich ditches
	1.44km north-west	153	Falstoff's Wood	A large wet woodland criss-crossed by drains and a stream
	1.44km west	155	Little Profit	An area of moderately species-rich marshy grassland
	1.55north-west	157	Crownthorpe Carr	Semi-natural woodland to the west of the River Tiffey
	2.8km north-west	159	Kimberley Lake	A large lake with small inlets and islands which is surrounded by a diversity of habitats
	2.8km north-west	166	Carlton Plantation	A thin strip of wet woodland adjacent to the River Tiffey
	2.8km north-west	165	Tiffey River Corridor	An area of woodland situated adjacent to the River Tiffey
	3.1km north-west	164	Reed Meadow	A large and varied site with woodland to the west but fen and grassland towards the east
	3.5km north	219	Spring Plantation	An L-shaped area of old plantation on sloping land alongside the River Tiffey.
	3.6km north	221	Tiffey Woods	An area of woodland lies either side of the River Tiffey
River Yare valley	5.2km north-east	229	Yare Valley (Marlingford Hall)	Woodland, marshy grassland and fen either side of the River Yare
River Tiffey Valley, upstream of confluence	2.3km south-east	2218	Silfield Newt Reserve	Five connected fields with ponds, grassland, scattered scrub and hedges
	2.6km south	201	Breakers Yard Meadow	A largely of improved grassland with small pockets of semi-improved, wet grassland
	1.16km west	216	Tiffey Meadow North	Remnant of marshy grassland situated adjacent to a disused railway
	1.18km west	212	Tiffey Meadow South	Marshy grassland situated adjacent to a disused railway line
	1.44km west	215	Wymondham Marshes	Marshy grassland crossed by dykes which support a pure swamp vegetation
	1.7km south	211	The Lizard	A mixed grassland site with species-rich acidic grassland to the south and less rich, largely improved grassland to the north
	1.8km west	2131	Toll's Meadow & Friarscroft	Toll's Meadow, a designated Local Nature Reserve (LNR), is situated on both sides of the River Tiffey, which bisects the site from east to west

Zone	Location	CWS Reference	Name	Description
	2.0km south-west	210	Bays River Meadow North	A narrow, river valley wetland mosaic
	2.6km south-west	209	Bays River Meadows South	A mosaic of wet basic and neutral grasslands and swamp
	3.9km north	224	Turnpike Farm Pond	A sizeable fenced-off pond surrounded by species-poor grassland
Unnamed tributary of the River Tiffey	560m north-west	217	Deep Road Meadow	Tall fen vegetation with associated dykes and a species-poor dry grassland
Wider countryside north or north-west of Wymondham	1.17km south-west	213	Wymondham Abbey Meadows	Dry neutral grassland around the remains of Wymondham Abbey
	1.3km north	206	Wymondham Plantations	A belt of mature plantation with a semi-natural character
	95m north-east	205	Melton Road Meadow	A grassland site with invading scrub
	2.2km north-west	158	Wymondham Plantation	Planted woodland and parkland either side of the driveway to Kimberley House
	2.4km north-west	151	Alma Plantation	An area of neglected coppice woodland with standards
	2.4km west	2123	Groundsel Wood	A small block of ancient woodland, consisting of coppice with standards
	2.7km north-west	167	Kimberley Park	Parkland site consisting of oak Quercus robur over a species-poor improved grassland
	3.1km north-west	152	New Wood	An area of broad-leaved woodland over an acid soil
	3.1km north-west	163	Forehoe Wood	An ancient woodland site that is now a broad-leaved plantation
	3.1km north-west	2158	Farthingale Wood	A boomerang-shaped semi natural ancient woodland
	3.2km north-west	162	Forehoe Big Wood & Bullsmoor Strips	A large block of plantation woodland and an additional narrow strip, both of considerable age
	5.1km north-east	2132	Beckhithe Meadow	A small meadow sloping down to the west
	5.2km north-east	223	Low Common	A mosaic of grassland, fen and woodland around a stream
Wider countryside south or east of Wymondham	1.04km south	214	Moot Hill	Semi-natural woodland surrounded by a moat
	2.4km east	204	Smeeth Wood	A mixed plantation wood on what is a site of ancient woodland
	2.6km south-west	208	Railway Pond	A moderate sized mesotrophic pond with a varied aquatic and marginal vegetation
	2.8km south-east	202	Stanfield Hall Moat	A mesotrophic water surrounding Stanfield Hall
	3.3km south-east	203	North Drive	Semi-natural woodland

Zone	Location	CWS		Description
		Reference	Name	
	3.6km east	194	Bean & Outer Park Woods	Mixed plantation which is surrounded by a dense high hedge and crossed by several rides
	3.9km south-east	179	Hethel Wood	semi-natural woodland
	4.1km east	187	St. Thomas' Belt	Broad-leaved plantation crossed by several dykes and containing local marshy areas
	4.1km south-east	188	Hethel Hall Moat	A small, shaded and partially dry U-shaped moat surrounded by grassland and woodland

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.

Species	Legislation	Offence	Licensing
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.
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.