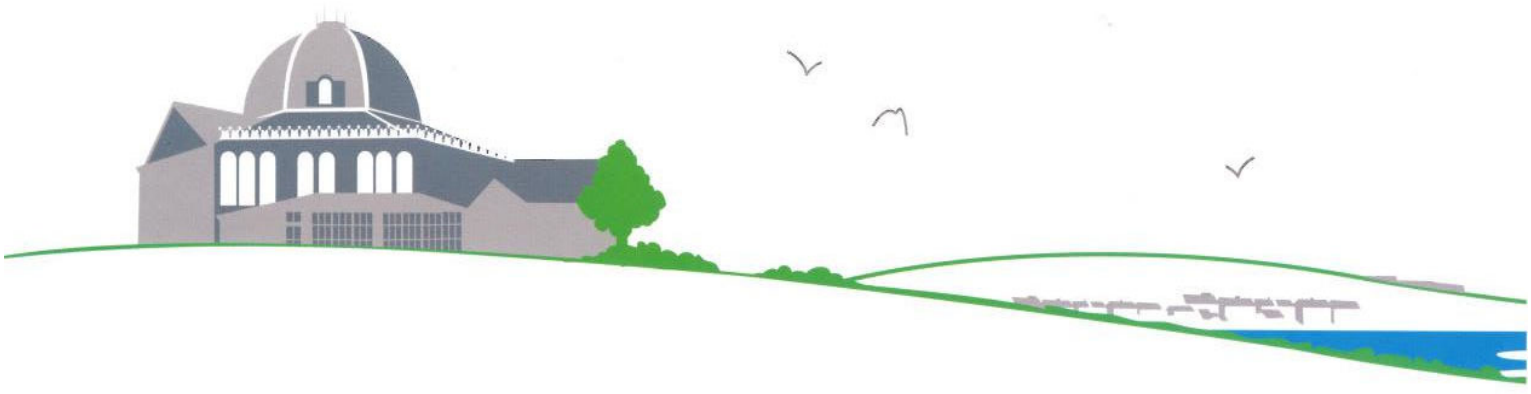
2.2.3 Ecology Report

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

JAYNIC LTD

GATEWAY 14 STOWMARKET

EURASIAN SKYLARK HABITAT MANAGEMENT PLAN



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GATEWAY 14 STOWMARKET

EURASIAN SKYLARK HABITAT MANAGEMENT PLAN

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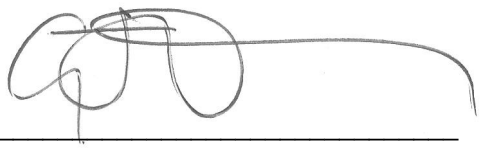
October 2021

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed: 

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1. BACKGROUND

1.1 Penny Anderson Associates Ltd (PAA) were commissioned by Jaynic Ltd to prepare a Eurasian Skylark Management Plan in relation to a planning application seeking 'hybrid' planning permission for an employment and commercial development at a site to the east of Stowmarket, Suffolk, referred to as Gateway 14. The application site extends to 67.3ha (hereafter referred to as 'the site').

1.2 Access to the application site is currently from Mill Lane, which runs east to west through the northern half of the site. The site is bound by the A14 dual carriageway to the north, agricultural fields to the east, the Ipswich to Cambridge railway line to the south and the A1120 (Gun Cotton Way) and Stowmarket to the west.

1.3 The main habitat type consists of arable fields with a large field to the south of Mill Lane, a portion of land south of Clamps Farm and east of Mill Lane. At the time of the habitat survey (PAA 2019) the crops consisted mainly of wheat and barley, with a small field of beet towards the south. Fields are bound by crop margins of varying width consisting of sections of neutral grassland, semi-improved neutral and improved grassland. Grassland, limited areas of woodland and scrub vegetation, and ruderal vegetation extend around the site.

1.4 As part of the ecological baseline assessment of the site a breeding bird survey was carried out in the spring and early summer of 2020 (PAA 2020). Several red listed Eurasian skylark (*Alauda arvensis*) territories were identified during the breeding bird survey (see Figure 1), which confirmed the presence of territories in a survey specifically targeting Eurasian skylark in 2017, when five territories were also recorded (Enims 2017) although the survey area at that time was confined to fields north of Mill Lane.

1.5 On-site mitigation at Gateway 14 for the loss of Eurasian skylark breeding territories is not possible and off-site mitigation is required. Agricultural land at Town Farm, Kelsale, near Saxmundham, Suffolk has been identified as suitable Eurasian skylark breeding habitat for enhancement in compensation for loss of suitable habitat at the Gateway 14 site. This report sets out mitigation proposals for Eurasian skylark at that location.

2. EURASIAN SKYLARK

2.1 Eurasian skylarks are ground-nesting birds preferring vegetation at a height 20-25cm and open enough to give access to the ground. To maintain their population, they need to make attempts to nest and breed two or three times between April and August. The UK population has declined (e.g. by 54% between 1970 and 2001) caused by intensification of grassland management and the switch from spring-sown wheat to winter wheat.

2.2 Crops such as winter wheat that are sown in the autumn, grow too tall and dense by June to allow for more than a single brood. If the surrounding farmland is under similar practices, Eurasian skylarks struggle to find alternative nest sites and food. The Eurasian skylark plots are undrilled patches in winter cereal fields. It has been proved that they boost nesting opportunities for Eurasian skylarks in areas of predominantly autumn-sown crops. It has been demonstrated that fields with plots have more young that are better fed, increasing their survival chances over winter and the addition of two plots per hectare in winter cereals can increase the number of Eurasian skylark chicks by 50% (RSPB 2021).

2.3 The measures to be introduced are based upon the Countryside Stewardship agri-environment Option AB4[1] and also draw upon research into breeding and feeding behaviour and their habitat requirements for successful breeding (e.g. Toepfer and Stubbe 2001; Wilson and Browne 1993) and advice provided to farmers on, for example cropping selection, sward heights, provision of plots and timing management to improve the breeding and foraging opportunities for Eurasian skylark (RSPB 2020). Research has demonstrated that the provision of field plots and strips can significantly increase breeding densities (Donald and Morris 2005; Stoate and Moorcroft 2007; Fischer *et al.* 2009). The approach has been reviewed and agreed with Sue Hooton, Principal Ecological Consultant providing specialist advice to Place Services, Essex County Council, under a service level agreement (pers comm 17/10/2021).

Photo 1 Eurasian Skylark Plot in a Field of Winter Wheat

(from: BTO Understanding Birds https://www.bto.org/understanding-birds/species-focus/skylark. Photo: Gavin Siriwardena)

[1] *https://www.gov.uk/countryside-stewardship-grants/skylark-plots-ab4*

3. THE MITIGATION AREA

3.1 On-site mitigation at Gateway 14 for the loss of Eurasian skylark breeding territories is not possible and suitable off-site mitigation is required. It is proposed that agricultural land at Town Farm, Kelsale, near Saxmundham, Suffolk (grid reference TM 39095 66530) will be specifically managed to enhance breeding habitat for Eurasian skylark as compensation for loss of suitable habitat at the Gateway 14 site. An aerial view of the mitigation area is presented as Figure 2 of this report.

3.2 The area consists of three large fields (labelled West, Central and East in Figure 2) to the south of Town Farm Lane, that together cover an area of 31.85ha. Presently, it is planted with barley. It is the same area proposed and accepted under previous planning permissions as a mitigation site for the loss of habitat at Gateway 14. A habitat survey was carried out in May 2021, habitat notes from this are provided in Appendix 1.

3.3 A breeding bird baseline survey has been carried out at Town Farm by Landmark Ecology, involving three visits in May and June 2021. No Eurasian skylarks were registered during the first of three surveys (5/5/21). On the second survey (23/5/21) three to four Eurasian skylarks were recorded singing on site, one in each of the fields, with an additional bird singing on the northern boundary of the middle field. During the third survey (12/6/21) there was a single Eurasian skylark singing over the middle field with a second foraging in the eastern field that flew off-site to the north-east carrying food. This indicates that that currently there is sufficient food and nesting opportunities to sustain Eurasian skylarks. There is a precedent for providing two plots at the mitigation site per pair at the application site and the agri-environment scheme guidance for Eurasian skylark plots is two per hectare[2].

3.4 Since there is a need to enhance the existing population at the mitigation site, the number of pairs at the mitigation site should be added to the number from the application site to calculate the total number of Eurasian skylark plots to be created at the mitigation site. Based on this formula, even taking a very conservative approach, there should be more than sufficient space within the mitigation site.

[2] *https://www.gov.uk/countryside-stewardship-grants/skylark-plots-ab4*

4. MITIGATION METHOD STATEMENT

Objective

4.1 The aim of the mitigation proposals is to provide Eurasian skylarks with suitable access to nesting habitats in winter cereal crops throughout their breeding season.

4.2 If successful there will be:

- plots providing access into the growing cereal during the spring and summer;
- Eurasian skylarks holding territory and singing over the fields of winter cereals where the plots are located and, ideally, landing in the plots themselves; and
- increased numbers of singing Eurasian skylarks across the farm.

Methods

4.3 Eurasian skylark plots are proposed for ten years at Town Farm, Kelsale, Saxmundham. In keeping with best practice guidance and through specialist consultation, plots will be created to the following specifications:

- During the autumn/winter fallow plots will be created within the winter cereal crop, i.e. following initial implementation which will happen before 1st March 2022, plots will be available from 1st January each year until the crop is harvested in August;
- There will be a minimum of two plots per ha and each plot will be at least 3 metres (m) wide and will have a minimum area of 16 square metres (e.g. 4x4m, 3x6m);
- These plots will be retained until the crop is harvested;
- In total, there will be at least ten unsown plots (five breeding territories lost – two plots/lost territory);
- A minimum 50m buffer between the Eurasian skylark plots and the edge of the field;
- Plots to be located away from tram lines, boundaries and margins as this increases nest predation), and away from potential predatory perching features, e.g. telegraph poles;
- Plots created by switching the drill off when sowing or spraying out plots before the end of December; and
- Plots to be provided in annual rotation to prevent succession and thereby maximise their importance as a foraging resource for breeding Eurasian skylarks; and
- If the owner of the land is already receiving funding for Ecological Focus Areas declared for the Basic Payment Scheme, then the Eurasian skylark plots referred to in this Agreement should be additional.

Management

- Plots can be managed with the same treatment as the remainder of the field after drilling;
- Plots do not need to be kept weed-free, but spot-treating with herbicide in April will ensure Eurasian skylarks have access to their nesting sites;
- Where there are Eurasian skylark plots in fields of crops, mechanical weeding is not recommended as it will destroy any nests present; and

- Photographs should be taken of the plots each year in mid-summer. These could be taken by the farmer or the ecological consultant and kept on file for future reference.

Location

- Plots shall be established in a position to be varied from year to year within the site depending on crop rotation.

Compliance Monitoring

- The ecological consultant will be responsible for monitoring the Eurasian skylark plots and the owner must heed to reasonable instructions of the ecologist, including providing information of the locations of Eurasian skylark plots as required and permitting reasonable access to allow monitoring;
- A monitoring plan covering the duration of the Agreement will be produced by the ecologist and agreed by the parties;
- The ecologist will be entitled to undertake annual compliance checks to provide confirmation of compliance and ensure the habitat is provided every year, as agreed;
- Monitoring will consist of a survey in years one, two, four and seven following the introduction of Eurasian skylark plots. This requires three surveys during the breeding season between April and June;
- Monitoring will look at relevant indicators of success, such as:
    - availability of Eurasian skylark plots at key times;
    - presence of Eurasian skylark and breeding activity;
    - use of created plots; and
    - overall numbers at the farm as compared to previously (baseline).
- Photographs should be taken of the plots each year in mid-summer. These could be taken by the farmer or the ecological consultant and kept on file for future reference.

Baseline Survey

4.4 A breeding bird survey and habitat assessment for fields proposed for Eurasian skylark plots has established the likely current breeding assemblage and the suitability of the farmland for the introduction of the Eurasian skylark plots. The mitigation measures proposed will provide greater opportunities for further breeding. The purpose of the longer-term monitoring is to review the effects of introducing the plots and inform any necessary further action.

5. REFERENCES

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FIGURES

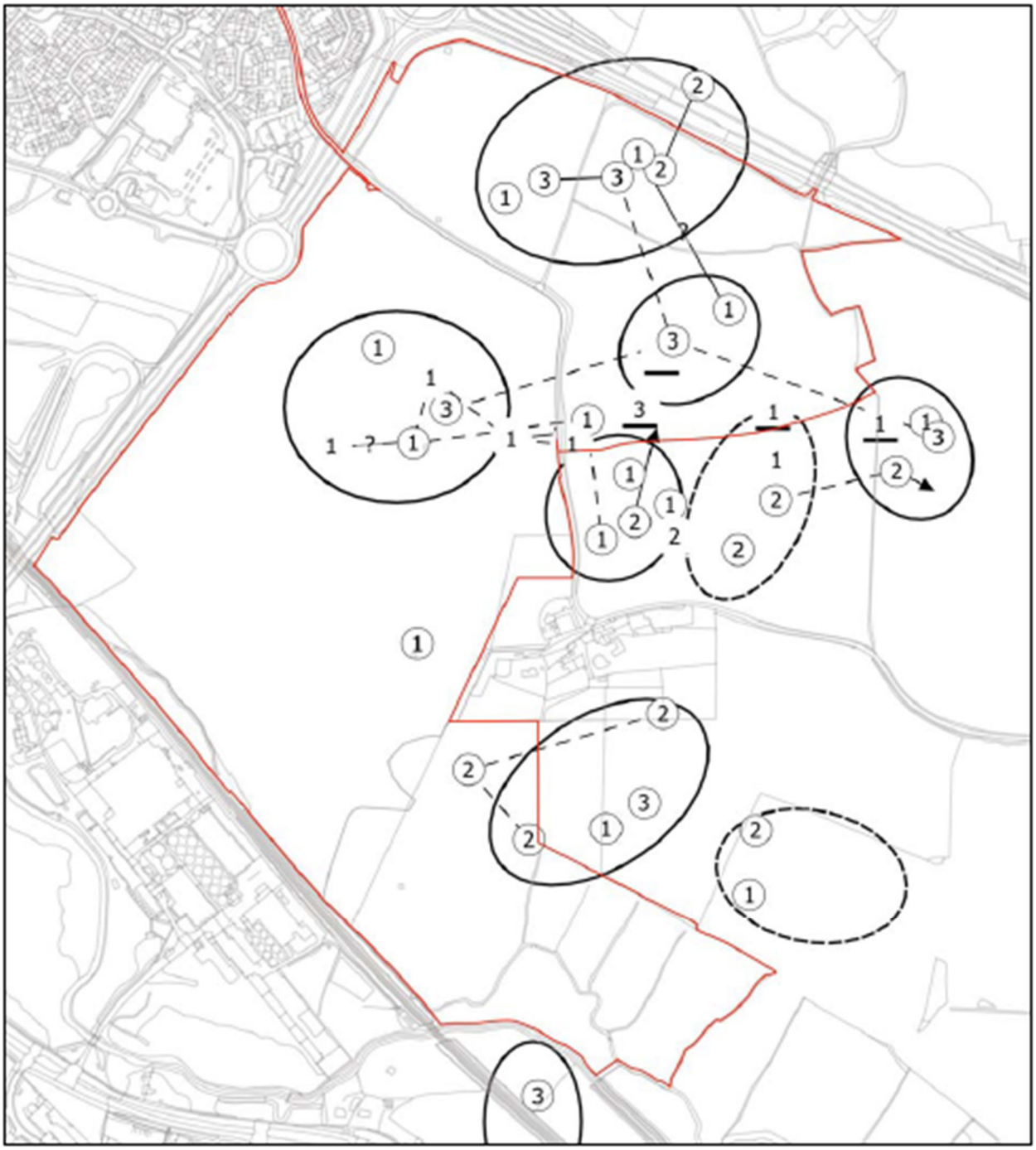


Figure 1 Map of Eurasian Skylark Registrations and Likely Territorial Groupings, Land off Mill Lane Stowmarket (PAA 2020)

Numbers indicate the visit during which a registration took place. Solid ellipses indicate registrations likely to comprise a single territory, but do not indicate the location of territory boundaries. Dashed ellipses indicate potential territories where information is insufficient to be certain. (Please note that since the bird survey the red line boundary has been changed to exclude parts of the south-west corner of the site.)

Figure 2 Land at Town Farm, Kelsale, Saxmundham

The area within the yellow line covers the area where the Eurasian skylark plots will be introduced. Presently, each are planted with barley. At this stage, the precise location for the plots has yet to be determined. During the life of the ten-year agreement, plots will be rotated.

APPENDIX 1

Habitat Notes May 2021

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

APPENDIX 1 HABITAT NOTES MAY 2021

Land at Town Farm, Kelsale, Saxmundham

Location

The site (approximately centred on OS grid reference TM 391 667) is situated between the villages of Yoxford (that lies about 1.5km to the N) and Kelsale (about 1km to the S). The A12 runs NNW-SSW just beyond its western boundary (The Red House Farm at its NW-limits); the northern boundary is bordered by a minor road (Town Farm Lane) and Town Farm itself. The site is located within a predominantly intensively cultivated, arable farmland landscape.

Habitats within Survey Area

Overview

The survey area (31.85 ha) comprises two large arable fields plus about 50% of a third arable field (the eastern-most of the three), plus hedges around most of their margins (no hedge along part of the N-edge of the central field along Town Farm Lane, W of Town Farm). The land rises gently from S to N (about 31 to 41m a.s.l). The fields are mostly bordered by species-poor to moderately species-rich hawthorn- (*Crataegus monogyna)* dominated hedgerows, with field maple (*Acer campestre*) and blackthorn (*Prunus spinosa*) being frequent component woody species. The hedges in present condition are, overall, of low to moderate quality nesting habitat for birds. There are a very few hedgerow trees (mainly ash (*Fraxinus excelsior*), field maple and pedunculate oak (*Quercus robur*)). Habitats within the survey area are summarised, below. A photograph (Figure) of each field is given in Appendix 1.1, and a map of habitats in Appendix 1.2.

Arable Fields

The three survey fields, designated West Field (Figure 1), Central Field (Figure 2) and East Field (Figure 3), were all under a tall, very dense (other than along tractor lines) barley crop at the time of survey (May-June 2021).

Hedgerows

West Field

(a) N edge – hawthorn-dominated approx. 1.8m tall x 1.5 wide, running along Town Farm Lane;

(b) W edge – a line of tall Leyland cypress (*Cupressocyparis* x *leylandii*) (with a row of lombardy-type poplars (*Poplus* sp.) behind, i.e. to W) N of The Red House Farm. To the S of the farm, the hedge is tall (4 to 8m) and variably wide (2 to 4m) but somewhat gappy and sparse; hawthorn-dominated with suckering elm (*Ulmus* sp.), and occasional small/semi-mature ash and field maples;

(c) S edge – western 20% no hedge, otherwise approx. 1.7 to 2m tall by 1.5 m wide but fairly sparse; moderately species-rich including hawthorn, blackthorn, elm, field maple and hazel (*Corylus avellana*); and

(d) E edge – shared with W margin of Central Field, mostly about 2.5m tall by 1.5m wide; hawthorn-dominated with two semi-mature oaks at its N end, five along the southern-half and singles of field maple and semi-mature ash at the S end.

Central Field

(a) N edge – hawthorn-dominated, approximately 1.8m tall x 1.5 wide. (There is no hedge along the western half of the N edge of the central field along Town Farm Lane, i.e. W of Town Farm, this comprising a grassy verge);

(b) W edge – see West Field (d), above;

(c) S edge – 2m tall x 3m wide; hawthorn-dominated, other woody species including bramble (*Rubus fruticosus*), field maple and three part-cut trimmed small pedunculate oaks (with oak, hawthorn and willow (*Salix sp.*) scrub around the margin of the pond abutting the S of the survey area by the hedge).

(d) E edge – shared with W margin of East Field, a long straight hedge, approx. 2 to 2.8m tall by 1 to 3m wide; hawthorn-dominated, other species including blackthorn and bramble.

East Field:

(a) N edge – there is no hedge along the N and E margin of Town Hall Farm farmyard. There is then a variably tall (2 to 6m) by variably broad (2 to 4m) gappy hedge around the S and E margins of the grass field (lying off site). Along Town Farm Lane the hedge is gappy and about 1.5 to 1.8m tall by 1 to 2m broad; hawthorn and blackthorn-dominated. There is a semi-mature pedunculate oak at its W end;

(b) W edge – see Central Field (d), above;

(c) S edge – approx. 2m tall by 1.5m wide; moderately species-rich, hawthorn-dominated with other woody species including blackthorn, field maple and spindle (*Euonymus europaeus*); and

(d) E edge – the N section is a variably 3 to 8m tall by 1 to 3m broad hedgerow with a sparse base, running SW to a pond surrounded by scrub with a large field maple tree; hawthorn-dominated with other woody species including blackthorn and field maple. (The survey area boundary to the SW of the pond runs through the field to a hedge section along its southern edge, see above).

Trees

In addition to a few semi-mature trees within hedgerows (addressed in 'Hedgerows', above), there is:

(1) a dying mature ash tree in the NW corner of the central field;

(2) there is a small pedunculate oak at the SE edge of the survey area within the eastern-most field; and

(3) a mature pedunculate oak towards the northern margin of the eastern-most field (E of Town Farm).

Around the pond on the eastern margin of the survey area and East Field, there is a mature field maple (as well as scrub around the pond's perimeter).

Habitats Adjacent to the Survey Area

The Red House Farm lies just beyond the NW limits of the survey area, and Town Farm towards its NE margin. A small field E of Town Farm comprised rough grassland. Otherwise, the site is surrounded arable (Town Farm Lane running along the survey sites northern margin). Most abutting arable fields were under a barley crop at time of survey. One field to the E was under oilseed rape and the one to the NE under beans/peas. There was a strip of old stubble (presumably a 'game strip') with much bare ground, bordering the W-half of the southern edge of the Central Field.

Five small ponds (surrounded by scrub/small-medium-size trees) lie just beyond the limits of the survey area:

(1) about 300m W of Town Farm, N side of the lane;

(2) on the southern margin of Central Field;

(3) NW of Town Farm by Town Farm Lane;

(4) just E of Town Farm; and

(5) at the central-eastern end of the site within East Field.

About 100m to the SE of the survey site boundary is a block of broadleaved woodland.

APPENDIX 1.1 PHOTOS OF THE SURVEY FIELDS, TOWN FARM, KELSALE

Figure 1 Looking SW across 'West Field' from its NE corner.

As the other two fields, under a dense (except along tractor lines), tall barely crop at time of survey, with margins bordered by species-poor to moderately species-rich hedgerows including a few semi-mature hedgeline trees (primarily pedunculate oaks, ash and field maple). Red House Farm (just beyond the survey site NW-limits) is visible to the W (right hand side of photo). 23/05/2021.

Figure 2 Looking S from Town Farm Lane across 'Central Field'

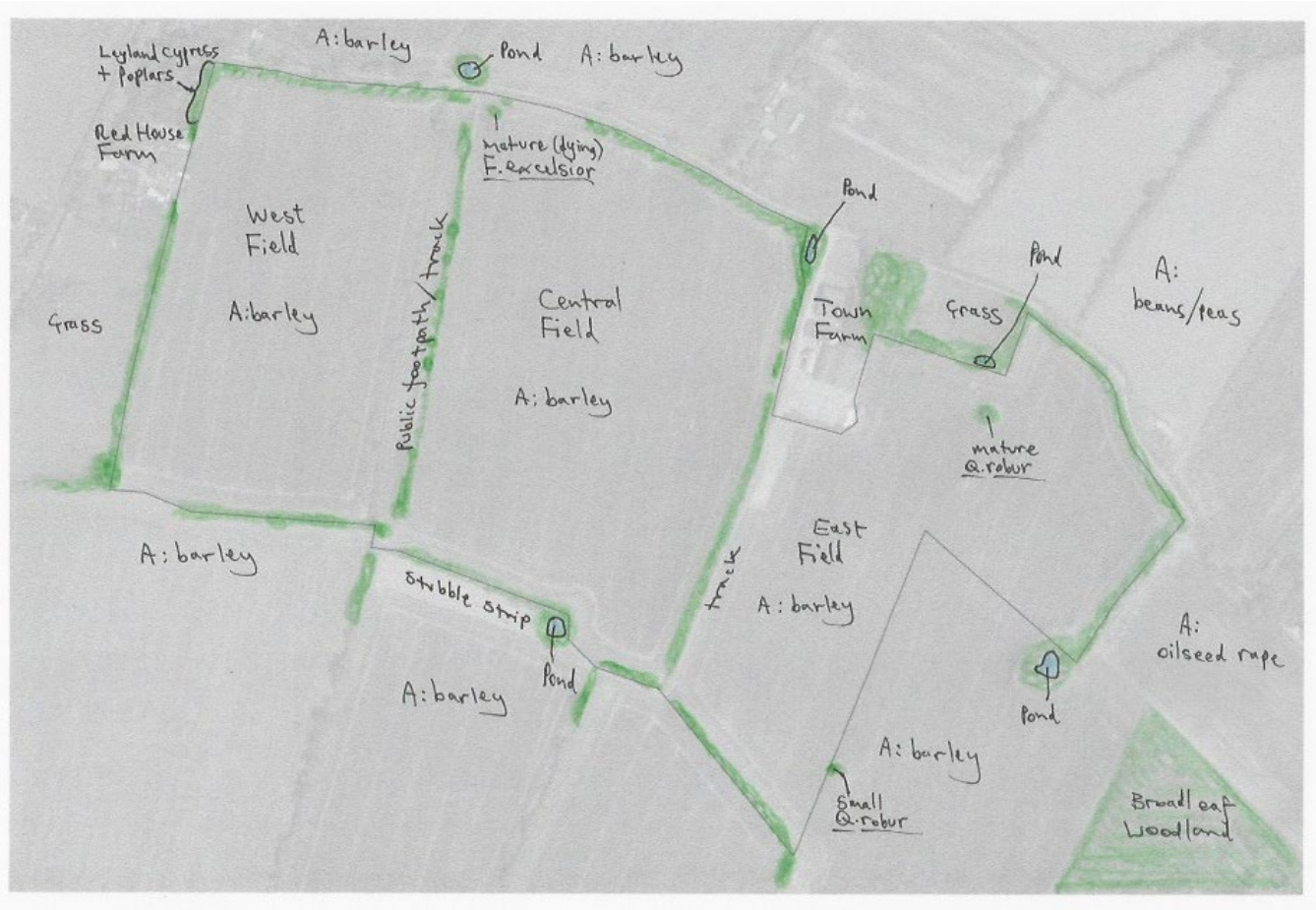
Bordered around most of its margins by species-poor to moderately species-rich hedgerows; Town Farm is visible to the E (left hand side of photo). Note the uniformly tall and very dense barley crop at time of survey (cow parsley *Anthriscus sylvestris* – white flowers – foreground along Town Farm Lane verge). 23/05/2021.

Figure 3 Looking SW from Town Farm Lane across ‘East Field’

Bordered around most of its margins (except Town Farm farmyard) by species-poor to moderately species-rich hedgerows. Town Farm is visible to the W (right hand side of the photo). Note the tall (approx. 60cm), dense (other than along tractor lines) barley crop at time of survey; the tree in the field is a pedunculate oak. 23/05/2021.

APPENDIX 1.2 HABITATS MAP SHOWING THE THREE SURVEY FIELDS, CROP TYPE (INCLUDING ADJACENT FIELDS), HEDGES, SELECTED TREES AND PONDS

KEY
A = arable



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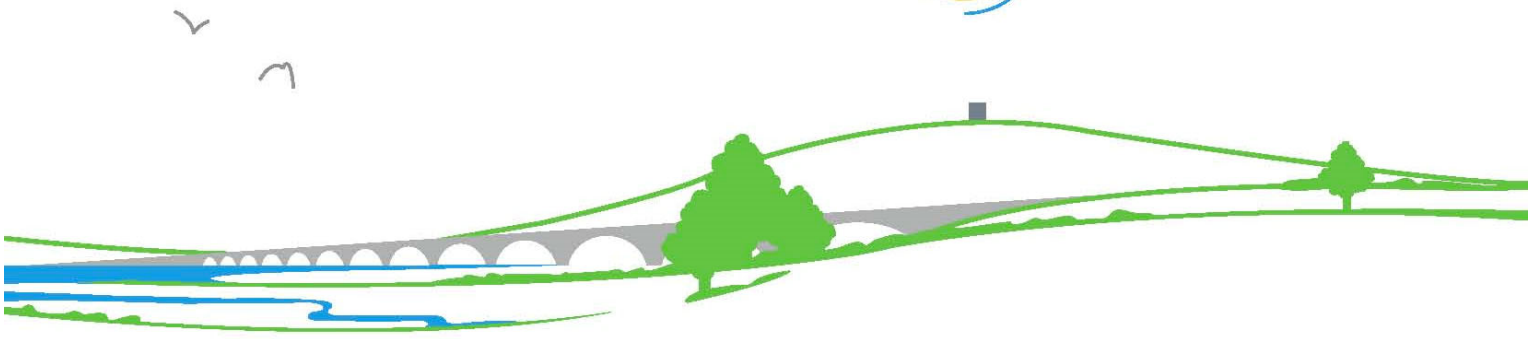

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Our Ref: JBA 20/014 ECO04 SR

1st July 2022

Jaynic Investments LLP

RE: Updated Ecological Walkover Survey of Plot 4000 – Gateway 14, Stowmarket, Suffolk

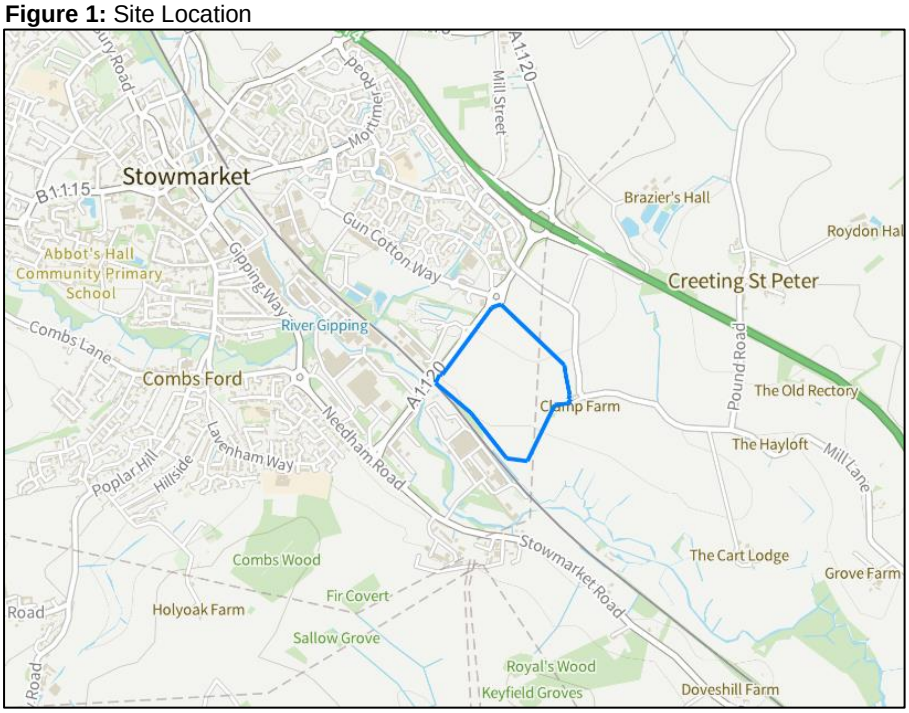
Introduction and Background

James Blake Associates Ltd. (JBA) was instructed by Jaynic Investments LLP to undertake an updated ecological walkover survey of land at Plot 4000 – Gateway 14 (G14), Stowmarket, Suffolk to assess the potential for protected species and invasive & non-native species and provide a report to summarise the findings of the walkover survey, highlighting any significant constraints for the site since the previous surveys in 2019 and 2020.

The site is approximately 30 hectares in size and is located adjacent the A1120, south of the A14 to the east of Stowmarket town, Suffolk (see Figure 1 below). The wider landscape includes the town of Stowmarket, residential and commercial buildings and arable fields. A railway line runs parallel to the southern boundary of the site.

At the time of the extended Phase 1 habitat survey (Penny Andersen Associates Limited (PAA), 2019 – revised 2020) and previous species surveys, the site was predominately arable land, with a strip of unimproved grassland at the north-western and south-eastern boundary and semi-improved grassland with a small section of broadleaved woodland and scrub at the southern boundary.

Figure 1: Site Location



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Various ecological surveys and reports have been undertaken and produced for the wider G14 boundary, which includes Plot 4000. These are detailed below;

- An extended Phase 1 habitat survey (PAA, 2019 – revised 2020)
- Badger survey (PAA, 2019 – revised 2020). This was later updated by JBA in April 2022.
- Otter and water vole survey (PAA, 2019 – revised 2020). This was later updated by JBA in May 2022.
- Reptile survey (PAA, 2019 – revised 2020).
- Breeding bird survey (PAA, 2020)
- Habitat suitability index assessment and eDNA analysis (PAA, 2020)
- Shepherd's needle Translocation and Working Method Statement (PAA, 2021)
- Eurasian Skylark Habitat Management Plan (PAA, 2021)
- Updated Shepherd's needle (*Scandix pecten-veneris*) Translocation and Working Method Statement (JBA, 2022)
- Construction and Environmental Management Plan for Biodiversity (CEMP: Biodiversity) (JBA, 2022).

The updated ecological walkover survey was undertaken on the 22nd June 2022 by Sean Minns BA (Hons). This report is intended to give an overview of the site habitat(s) and condition at the time of the survey and should be read in conjunction with the various previous surveys and reports produced by PAA and the CEMP: Biodiversity (JBA, 2022).

The survey methodology followed the standard Phase 1 methodology of Joint Nature Conservation Committee Guidelines (JNCC, 2010). An extension of this basic methodology was also undertaken to provide further details in relation to notable or protected habitats present within the survey area, or in relation to habitats present that have the potential to support notable or protected species (CIEEM, 2013).

The baseline conditions reported in this document represent those identified at the time of the survey on 22nd June 2022. Although a reasonable assessment of habitats present can be made during a single walkover survey, seasonal variations are not observed.

The relevant wildlife legislations and planning policies are listed below:

- Conservation of Habitats and Species 2019 (Amendment) (EU Exit) 2019, ('The Habitats Regulations'). The Habitats Regulations implement The Habitats Directive 1992 (92/43/EEC) into English Law. (Amended by the Conservation of Habitats and Species (Amendment) Regulations 2012 S.I. 2012/1927).
- Wildlife and Countryside Act, 1981 (as amended) (WCA). [Amended by the Countryside and Rights of Way Act (2000)].
- The Natural Environment and Rural Communities Act, 2006 (NERC).
- The Protection of Badgers Act, 1992 (The Badgers Act).
- The Wild Mammals (Protection) Act, 1996.
- The Hedgerows Regulations, 2007.
- National Planning Policy Framework, 2021 (NPPF).

Results and Evaluation

Due to archaeological works and site clearance, the site itself has seen some change since the previous extended Phase 1 survey (PAA, 2020). The most evident change recorded on site is the development of arable fields into mostly bare ground with ephemeral/ short perennial vegetation and signs of vegetation recolonisation. Large earth bunds are present on site, particularly to the south, east and north-west of the site. A site compound area is also present in the north-western corner of the site. A harrowed strip runs the length of the southern and western boundary of the site in preparation for future infrastructure works. The woodland and associated scrub is still present at the southern boundary, with majority of the semi-improved grassland present.

Majority of the site is considered unsuitable for nesting birds, reptiles and invertebrates, however the small woodland section and associated scrub and grassland to the southern boundary could be used by these species, as well as off-site habitat adjacent the north-western boundary.

Bird species observed and/or heard during the updated ecological walkover survey included; blackcap (*Sylvia atricapilla*), carrion crow (*Corvus corone*), long-tailed tit (*Aegithalos caudatus*), pied wagtail (*Motacilla alba*), swift (*Apus apus*), swallow (*Hirundo rustica*), whitethroat (*Sylvia communis*) and woodpigeon (*Coumba palumbus*). No nests were seen at the time of the survey.

Invertebrate species observed during the updated ecological walkover survey included; meadow brown (*Maniola jurtina*), large white (*Pieris brassicae*), small skipper (*Thymelicus sylvestris*), small tortoiseshell (*Aglais urticae*), azure damselfly (*Coenagrion puella*), brown hawker (*Aeshna grandis*), red-tailed bumblebee (*Bombus lapidarius*), 7-spot ladybird (*Coccinella septempuctata*) and cranefly sp. (*Nephrotoma sp*.).

The site could provide opportunities for badger sett creation, particularly in the earth bunds, however surrounding habitat is bare ground which doesn't provide any sheltering opportunities and limited foraging habitat. No badger setts or evidence was recorded during the updated walkover survey.

No rare or protected plant flora was identified during the updated walkover survey. However, a strip of pyramidal orchids (*Anacamptis pyramidalis*) were present parallel to the harrowed land at the north-western boundary of the site. Invasive plant species, such as Japanese knotweed (*Fallopia japonica*), were also not identified at the site during the walkover. A full plant list is provided in Appendix A.

Recommendations

A badger check was undertaken as part of this updated walkover survey, which found no sign of badger; however, if the earth bunds are to be removed after six months of this report, then another check for badger signs should be undertaken to ensure badgers have not utilised the area in the interim.

Previous excavations on site have not been filled and therefore, 'ladders' should be provided to allow badgers and other animals to escape if they were to get stuck within the excavations. The 'ladders' can be pieces of wood which can act as a ramp.

Eurasian skylark (*Alauda arvensis*) were previously identified on site and a habitat management plan has been produced for mitigation (PAA, 2021). It was recommended that the construction zone be kept bare of vegetation to ensure nesting birds (and other animals) do not recolonise the area.

The woodland section to the south of the site is likely to require removal due to a new overhead pole which is to be installed by UK Power Network. Furthermore, as part of the planning requirements, secure palisade fencing is to be installed along the southern boundary to ensure pedestrians do not access the railway track. Therefore, works in this area will require a nesting bird check immediately prior to clearance and an Ecological Clerk of Work (ECoW) present with respect to reptiles. If birds are found to be nesting, then no works should be undertaken within ~7m (depending on species) of the nest until chicks have fledged.

Precautionary measures regarding reptiles are provided within the CEMP: Biodiversity. These are also detailed in Appendix B.

Shepard's needle (*Scandix pecten-veneris*) translocation has taken place in February 2022 to an area to the south of Plot 4000. Shepherd's needle translocation and working method statement was produced by PAA in 2021 and later updated by JBA in 2022. The receptor area should not be disturbed until the following year (2023) when annual rotavation (by power harrow or plough) is carried out in late autumn. No fertilisers or herbicides/pesticides should be applied at any time.

Lighting should be designed so as to not shine directly into any retained boundary hedgerows with respect to potential bat habitat. Information on lighting is readily available from the Bat Conservation Trust (2018) (Guidance Note 08/18), Bats and the Built Environment series.

Conclusion

An updated ecological walkover survey of Plot 4000 at G14, Stowmarket was undertaken on the 22nd June 2022 by JBA. Habitats on site have seen some change since the previous reports due to archaeological works and site preparation.

The site is considered largely unsuitable for protected and Priority species, however precautionary measures have been provided for reptiles, badgers and breeding birds. Details provided within the CEMP: Biodiversity (JBA, 2022) should be followed.

If works do not begin within 2 years of this survey, another walkover survey will be required to note any changes in the interim.

Yours sincerely,

Sam Rigg
Ecologist
James Blake Associates

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Appendix A – Plants recorded during the updated walkover survey

Bare ground	
English Name	Latin name
Bristly oxtongue	*Helminthotheca echoides*
Cleavers	*Galium aparine*
Common knotgrass	*Polygonum aviculare*
Common poppy	*Papaver rhoeas*
Common ragwort	*Jacobaea vulgaris*
Creeping thistle	*Cirsum arvense*
Dovesfoot cranesbill	*Geranium molle*
Fat hen	*Chenopodium album*
Field pansy	*Viola arvensis*
Fig-leaved goosefoot	*Chenopodium ficifolium*
Greater willowherb	*Epilobium hirsutum*
Groundsel	*Senecio vulgaris*
Hedge mustard	*Sisymbrium officinale*
Prickly sowthistle	*Sonchus asper*
Scarlet pimpernel	*Anagallis arvensis*
Scentless mayweed	*Tripleurospermum inodorum*
Smooth sowthistle	*Sonchus olearaceus*
Spear thistle	*Cirsum vulgare*
Square-stemmed willowherb	*Epilobium tetragonum*
Sun spurge	*Euphorbia helioscopia*
Wild carrot	*Daucus carota*
Mugwort	*Artemesia vulgaris*
Semi-improved neutral grassland strip (calcareous influence) on W edge)	
English Name	Latin name
Birdsfoot trefoil	Lotus corniculatus
Bulbous buttercup	Ranunculus bulbosus
Common centaury	*Centaurium erythraea*
Common knapweed	Centaurea nigra
Common vetch	Vicia sativa
Cow parsely	*Anthriscus syvestris*
Cowslip	*Primula veris*
Goatsbeard	*Tragaopon pratense*
Grass vetchling	*Lathyrus nissolia*
Greater plantain	*Plantago major*
Lesser trefoil	*Trifolium dubium*
Oxeye daisy	*Leucanthemum vulgare*
Pyramidal orchid	*Anacamptis pyrimidalis*
Red campion	*Silene dioica*
Ribwort plantain	*Plantago lanceolata*
Rough chervil	*Chaerophyllum temulentum*

Self-heal	*Prunella vulgaris*
White campion	*Silene latifolia*
Wild carrot	*Daucus carota*
Yarrow	*Achillea millefoium*
Woodland/Hedgerow edge	
English Name	Latin name
Ash	Fraxinus excelsior
Blackthorn	Prunus spinosa
Bramble	Rubus fruticosa
Common nettle	Urtica dioica
Dog rose	Rosa canina
Elder	Sambucus nigra
Field Maple	Acer campestre
Hop	Humulus lupulus
Ivy	Hedera helix
Sycamore	Acer pseudoplatanus
Travellers Joy	Clematis vitalba
White willow	Sakix alba

Appendix B – Reptile precautionary measures detailed within the CEMP: Biodiversity (JBA, 2022)

Due to a low population of reptiles at the south of the site, precautionary measures have been provided within the reptile survey report (PAA, 2020). These measures are detailed below.

A toolbox talk should be given by a qualified ecologist to inform contractors of the appropriate action to be taken in the event of slow worm and other reptile species being found.

In the event of a reptile being found, an experienced ecologist should be contacted for advice.

Potential reptile refugia (rubble, rock, woodpiles) should be checked and removed by hand by a suitably experienced ecologist. If translocation is necessary it should be to the retained buffer zone area which will need to be isolated from the development area by reptile exclusion fencing. Research has shown that adder, for example, can be site faithful and return to the area where they were originally found (Nash and Griffiths 2018). Thus, the fencing is required to prevent reptiles from returning to the development area.

The reptile exclusion fencing should be retained and checked regularly for the duration of the development and removed only once construction is complete. Checks should take place on a weekly basis by the Site Manager and on a monthly basis by an ECoW.

Particular care should be taken with tufts of vegetation and tussocky grassland where reptiles are more likely to take refuge. If necessary, vegetation within the development footprint can be strimmed to 150mm to facilitate hand searches for reptiles prior to soil stripping. This should be undertaken under the supervision of an ECoW.

Reptiles should not be moved if heavily gravid, while hibernating, in extreme weather (e.g. heat, drought, flooding) or during autumn (GOV.UK 2015);

If any habitat management is proposed within the reptile buffer strip then this should be tailored to reptile requirements. The ideal management regime would be an annual grass cut in late summer to a height of 150mm.

Penny Anderson Associates Ltd
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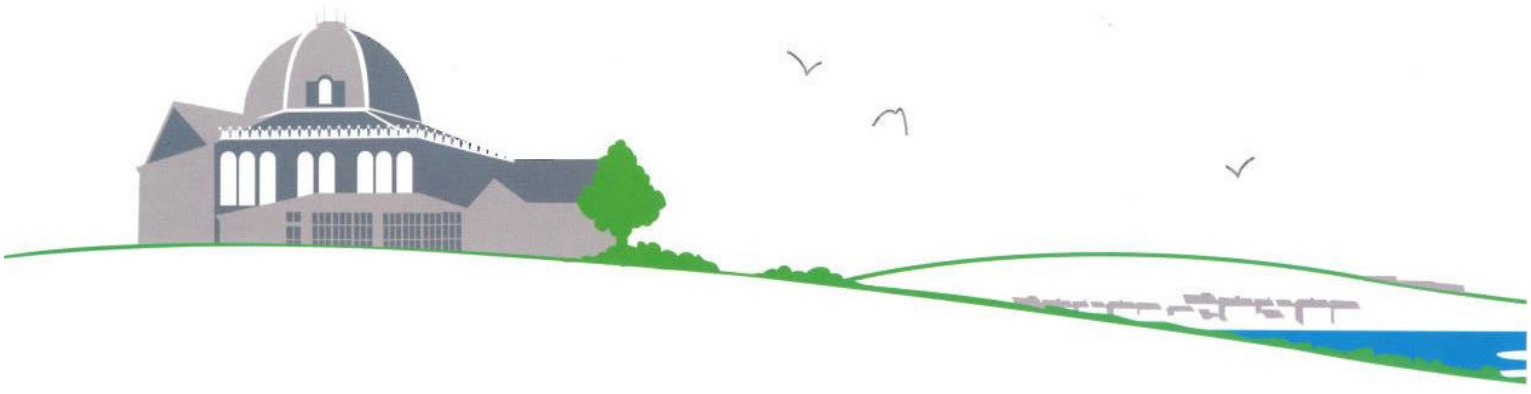
JAYNIC LTD

GATEWAY 14 STOWMARKET

SHEPHERD'S NEEDLE TRANSLOCATION AND WORKING METHOD STATEMENT



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GATEWAY 14 STOWMARKET

SHEPHERD'S NEEDLE TRANSLOCATION AND WORKING METHOD STATEMENT

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October 2021

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

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CONTENTS

PHOTOGRAPHS

FIGURE

APPENDIX

1. INTRODUCTION

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Jaynic Ltd to prepare a Shepherd's Needle Translocation and Working Method Statement document. This is required in relation to a planning application seeking 'hybrid' planning permission for an employment and commercial development at a site to the east of Stowmarket, Suffolk, referred to as Gateway 14. The site extends to 67.3ha (hereafter referred to as 'the site').

1.2 Access to the site is currently from Mill Lane (see Figure 1), which runs east to west through the northern half of the site. The site is bound by the A14 dual carriageway to the north, agricultural fields to the east, the Ipswich to Cambridge railway line to the south and the A1120 (Gun Cotton Way) and Stowmarket to the west.

1.3 The main habitat type consists of arable fields with a large field to the south of Mill Lane, a portion of land south of Clamps Farm and east of Mill Lane. At the time of the habitat survey (PAA 2019) the crops consisted mainly of wheat and barley, with a small field of beet towards the south. Fields are bound by crop margins of varying width consisting of sections of neutral grassland, semi-improved neutral and improved grassland. Grassland, limited areas of woodland and scrub vegetation and ruderal vegetation extend around the site.

1.4 During the extended Phase 1 habitat survey (PAA 2019) the presence of shepherd's needle (*Scandix pecten-veneris*) was recorded in scattered small patches in the field margins of the northern fields. The locations of plants at the time of the survey are shown on Figure 1 (at the base of hedges H1 and H2, the field margins of F1 and F3) associated with semi-improved neutral grassland.

Photo A Shepherd's needle in the crop margin at Gateway 14

1.5 Shepherd's needle is rare and a critically Endangered Species with an extreme risk of extinction (Stroh *et al*. 2014). In the absence of mitigation, the scattered plants would be lost to the proposed development.

1.6 This report aims to provide background information and an appropriate management strategy and working method statement for the translocation of shepherd's needle to a suitable site within the Gateway 14 development area.

2. SHEPHERD'S NEEDLE

2.1 Shepherd's needle is a member of the carrot family (Apiaceae) and is an annual species of arable land and waste places, typically found in the margins of fields sown with winter cereals. The plant has triangular, finely divided (pinnate) leaves, with small white flowers in umbrella clusters (umbels). It is when fruiting that it attains the characteristic needle-like fruit or seedhead that gives the plant its name.

Photo B Shepherd's needle showing flowers and seed-bearing 'needles'. Photo courtesy of G. Hagedorn.

2.2 It is an annual herb, flowering from April to July and fruiting shortly after flowering. The seed is dispersed on ripening and is catapulted up to 1m from the parent plant. Germination can occur when the seeds are shed, in autumn (October to early winter) or seeds may become dormant over winter so that they germinate in the spring. Most germination occurs in the year after seed production, and it is thought that the seed viability is short-lived (Salisbury 1961). Autumn-germinated seedlings form an overwintering rosette which flowers the following year (Plantlife 2007).

2.3 It was formerly distributed throughout England and was even regarded as a problematic agricultural weed. Records become sparser to the north and west and most records are associated with calcareous soils, particularly the boulder clay of East Anglia and the intensive cereal-growing areas of the East Anglian Plain that includes Cambridgeshire, Essex and Suffolk (Plantlife 2007). In Suffolk it has possibly developed some resistance to herbicide sprays and is now quite widespread and locally abundant on field margins so that Suffolk has a significant proportion of the British population (Sanford and Fisk 2010).

2.4 It has been in severe decline for around 60 years following changes in agricultural practices such as the increased use of herbicides and fertilisers, demise of crop rotations, improvements in seed cleaning methods, loss of field edge refuges and winter stubble. Over the last 50 years it has become extinct in Ireland and rare in northern Britain.

3. WORKING METHOD STATEMENT

Habitat Management Implications

3.1 The methods described are for the removal and translocation of the soil seedbank to a suitable and prepared area within the Gateway 14 site.

3.2 As illustrated in Figure 1, at the time of the Phase 1 habitat survey, shepherd's needle was confined and scattered along the northern field margins (referred to as the 'donor' site). The receptor site (where soil/seed material will be relocated) is on the south-east margin of the site adjacent to the Ipswich to Cambridge railway line and is also shown on Figure 1.

Photo C Receptor site (railway right of picture)

3.3 It is important that the conditions at the receptor site, e.g. aspect, slope, soil drainage, soil nutrient status and hydrology are similar to the donor site. As the receptor site is within Gateway 14 there should not be significant differences in soil type or historical management, as it is currently located in the margins of an arable field. The relatively short distance between the donor and receptor area should help in the execution of translocation.

3.4 The soils consist of lime-rich loamy and clayey soils that tend to have slightly impeded drainage that have developed over superficial deposits of glacial till (BGS Open Science 2021, Soilscapes 2021). The shallow and friable nature of the soil means translocating whole turves is problematic as the soil lacks the structural cohesion to be taken as whole turves.

3.5 An alternative, less technically demanding and more cost-effective approach is proposed. This involves the removal of soil and the seedbank beneath the plants and an area 1m surrounding the plants. The viable seedbank will be relatively shallow and be housed predominantly in the top few centimetres.

3.6 There should be an Ecological Clerk of Works (ECoW) supervising all elements of the translocation.

Donor Site

3.7 A programme of works is presented in Appendix 1.

3.8 An update survey will be required in the May immediately before translocation when flowering or later when fruiting. The survey should be completed by an ecologist to locate and accurately map the plants. The distinctive 'needles' will aid identification up until the end of August.

3.9 To prevent accidental eradication during early enabling works, all plants found during the update survey should be clearly delineated and cordoned off with suitable fencing such as hi-viz tape and marker posts and remain undisturbed.

3.10 Works should be carried out in autumn prior to that year's seed germinating and over-wintering basal leaves forming. The soil in a 1m area around the plants should be scraped up to a depth of 300mm, placed in a dumper and taken to the receptor site.

Receptor Site

3.11 The receptor site consists of a 5m x 100m strip of flat land that adjoins the boundary with the railway line in the south-west corner of the site. It is open and away from heavy shading in what is presently a semi-neutral grassland field margin. The soils consist of lime-rich loamy and clayey soils that tend to have slightly impeded drainage.

3.12 An area of 500m^2 has been identified for the receptor area. This can be extended further along the south-west boundary if 500m^2 is found to be insufficient.

3.13 Preparation of the donor site should occur in advance of the translocation and comprise stripping the vegetation and rooting zone. The soil should be removed from the receptor site.

3.14 Vehicle tracking over prepared soil on the receptor site should be avoided as this can lead to excessive compaction.

3.15 The translocation area should be ploughed and harrowed to a reasonably fine tilth and lightly rolled to form a suitable receptor surface.

3.16 The 300mm depth of soil scraped from the donor area should be spread to a depth of 150mm. This should be lightly rolled to firm the surface. If the soil is dry, it should be watered. The ECoW should advise if this is necessary.

Post-translocation Monitoring and Management

3.17 Post-translocation monitoring should be carried out by an appropriately skilled ecological consultant with knowledge of the species (hereafter referred to as the 'Ecologist'). They would work with the County Flora Recorder for Suffolk Naturalists Society[1] with a view to publication of details for the success of the translocation, in order to inform similar translocations in the future.

[1] *http://www.sns.org.uk/*

3.18 Management will be carried out by the applicant's landscape management contractor following guidance from the Ecologist.

3.19 In the first season after translocation, establishment of the plant within the receptor site should be monitored by the Ecologist, using a walkover of the receptor area every eight weeks over December to June (3 x visits) following translocation. It is most visible in mid-May to July when flowers and fruit are visible. New plants should be counted and carefully mapped and their maturity recorded (rosette; young plant; mature flowering plant; plant in seed).

3.20 The receptor area should not be disturbed until the following year when annual rotovation (by power harrow or plough) is carried out in late autumn. This replicates the soil disturbance that is known to support shepherd's needle when growing in association with cereal crops. The timing of the first disturbance will be advised by the Ecologist following the results of the monitoring.

3.21 No fertilisers or herbicides/pesticides should be applied at any time.

3.22 In the second and subsequent seasons after translocation, a single walkover by the Ecologist should be undertaken in the late summer period. Again, plants should be carefully mapped and described to record if seed is being set and the colony is persisting.

3.23 Recommendations for adjustments to the management of the area may be required, depending on the results of monitoring.

3.24 Monitoring should continue each year for a total of five years after translocation, after which the management approach in place should allow for the continuation of the plant species at this location. The results of the first five years monitoring should be submitted to the Local Planning Authority and, based on their comments, the need to continue with annual monitoring should then be reviewed and any future monitoring requirements agreed.

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FIGURE

606200 606400 606600 606800 607000 607200 607400 607600 607800 608000

258600 258400 258200 258000 257800 257600 257400 257200 257000

F1
A

F2
A

F3
A

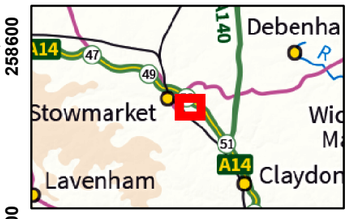
F4
A

I
A

SI
H1
H3
H2
T1
Qr
Fe
Sxci
Rf
Cxri
Sxf
Pc

Sheperd's Needle Receptor Area (100m x 5m)

Cxri	Carex riparia	greater pond sedge
Fe	Fraxinus excelsior	ash
Pc	Phragmites communis	common reed
Qr	Quercus robus	pedunculate oak
Rf	Rubus fruticosus agg.	bramble
Sxci	Salix cinerea	grey willow
Sxf	Salix euxina	crack willow



Legend

- Boundary

Habitat

- Broadleaved woodland - semi natural
- Continuous scrub
- Neutral grassland - semi improved (SI)
- Neutral grassland - semi improved and scrub (SI)
- Neutral grassland with calcareous influences - unimproved
- Improved grassland (I)
- Poor semi-improved grassland (SI)
- Tall herb and fern - ruderal
- Swamp
- Marginal vegetation
- Wet ditch
- Dry ditch
- Arable (A)
- Hardstanding
- River
- Scrub
- Scrub and trees
- Hedge
- Tree
- Scattered scrub
- Shepherd's needle
- Shepherd's needle receptor area

N

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

Metres
0 25 50 100 150 200

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Project Name: Mill Lane, Stowmarket

Discipline: Ecology

Title:

Shepherd's Needle Receptor Area

Scale: 1:6,500		Drawing No.: Figure 1	
Drawn By: CC	Originator: GJH	Date: 13/07/2021	
PAA Ref.		Revision: 1.0	

Figure 1 - Phase 1 Habitats and Shepherds Needle - BAMS01-5 CC 150621.mxd

APPENDIX

APPENDIX 1

Programme of Works

Appendix 1 Programme of Works Covering Plant Translocation, Site Management and Monitoring

Activity	Year					
	1	2	3	4	5	6
Donor site update survey and marking locations of plants	May-August					
Receptor site preparation – vegetation striping, ploughing and harrowing	June-September					
Translocation of vegetation and soil from donor areas	November-December					
Spreading of translocated soil at receptor site	November-December					
Annual rotovation of receptor site		October-December	October-December	October-December	October-December	October-December
Monitoring of receptor site		May-July	May-July	May-July	May-July	May-July and review
Targeted herbicide application at receptor site (if required)		May or October	May or October	May or October	May or October	May or October

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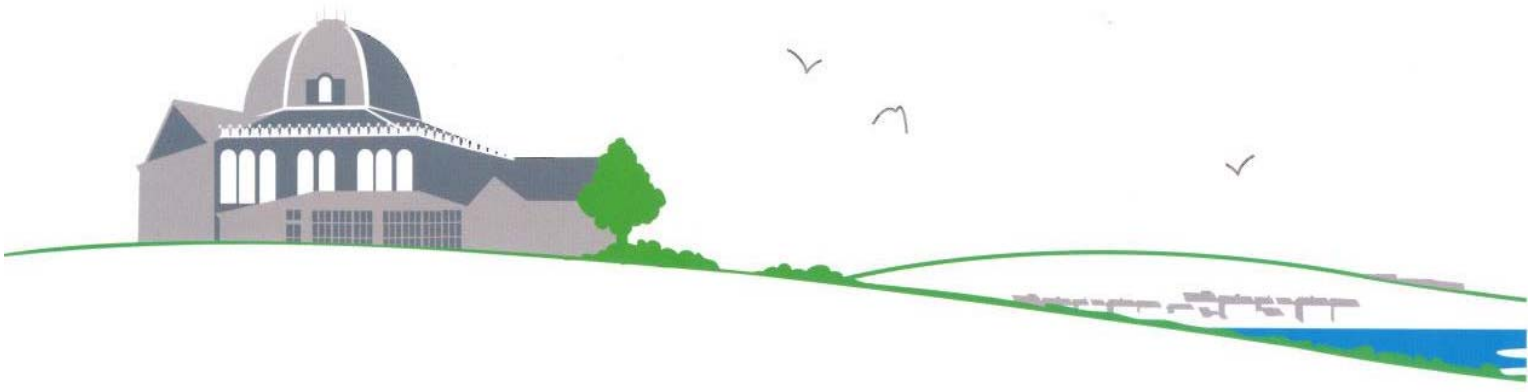
BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

CONFIDENTIAL BADGER SURVEY REPORT



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

CONFIDENTIAL BADGER SURVEY REPORT

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Author
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November 2019 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

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CONSULTANT ECOLOGISTS

CONTENTS

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Babergh and Mid Suffolk District Council to carry out a number of ecological surveys at land off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site').

1.2 This report presents the results of a badger (*Meles meles*) survey of the site with discussion of the constraints, and recommendations for any proposed development on the site.

1.3 Badgers are vulnerable to illegal persecution and it is generally accepted that it is undesirable to advertise the locations of badger setts. The contents of this report should, therefore, be treated as **strictly confidential** and should only be released to individuals and parties with a *bona-fide* interest. The legislation and best practice relating to badgers is given in Appendix 1.

1.4 The main objectives of the detailed survey was to:

- locate any badger setts on or close to the site;
- determine as far as possible the social configuration and links between any setts found;
- identify commuting routes and favoured foraging areas; and
- identify the impacts of development and provide recommendations to manage land for badgers in the future.

Badger Biology

1.5 Badgers are common and widespread in Britain. In the UK, it is estimated that there are 562,000 badgers in Britain (Matthews *et al*. 2018).

1.6 Badgers typically live in social groups. Social group size can vary considerably but typically averages five animals per group (Neal and Cheeseman 1996). Badgers live in complexes of underground tunnels and chambers called setts, which are excavated in a variety of locations including woodlands, hedge banks, drainage ditches, quarries, railway cuttings or other suitable locations with well-drained soil that is suitable for digging (Neal and Cheeseman 1996).

1.7 Badgers are nocturnal and their diet is principally composed of earthworms, which account for approximately 75% of their food intake, these being caught in pasture/short grassland or in woodland, particularly on wet nights. Badgers require a steady supply of food throughout the year, so when conditions are unsuitable for catching worms, other foods such as fruit, bulbs, cereals, root crops, insects, amphibians, rabbits and other small mammals become more important (Kruuk 1989, Neal and Cheeseman 1996).

1.8 Badger territories are centred on a main sett but there may also be several auxiliary setts within the badgers' territory which are used at different times of the year (the different types of sett are described in Section 2). Territory sizes can vary from as little as 15ha to over 300ha and are often dependent upon the availability of suitable foraging habitat and the proximity of other neighbouring badger social groups. Larger territories are found where badger groups are widely spread and this is often associated with patchily distributed or sub-optimal foraging areas. Territorial boundaries of social groups are typically marked by dung pits or latrines. These boundaries are regularly patrolled and actively defended from other trespassing badgers (Kruuk 1989).

1.9 Mating can take place at any time of year but the main peak period is during the spring. Normally only the dominant female in a social group breeds each year. Litters of two to three cubs are born in February or March, regardless of the time of mating. This is due to delayed implantation which ensures that cubs are born at the most appropriate time of year to maximise

their chances of survival. Cubs are able to forage independently after approximately 15 weeks (Kruuk 1989, Neal and Cheeseman 1996).

Legislative and Policy Context

1.10 Badger are not an endangered species but have a long history of persecution and cruelty. As such, badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended), which makes it illegal for any person to kill, injure or take a badger.

1.11 It is also an offence to destroy, damage or obstruct a badger sett, or to disturb a badger whilst it is within a sett. There are also additional offences relating to possession of, buying and selling a dead badger, or anything derived from a badger, and causing a dog to enter a sett.

1.12 The Act defines a sett as 'any structure or place which displays signs of current use by a badger'. Setts are defined by English Nature (1995) as 'usually underground tunnel systems providing shelter for badgers, but may include other structures used by badgers such as hay bales, drainage culverts, or cellars'. 'Current use' is more difficult to define but is usually interpreted by the presence/absence of badger field signs over several observations of the sett (Natural England 2006).

2. METHODS

Badger Survey

2.1 The badger survey was undertaken on 7th November 2019, by Ecologist Caroline Boffey (ACIEEM[1]), a suitably qualified ecologist who has appropriate practical experience in survey methods and the required knowledge, skills and experience set out in CIEEM competency guidelines (CIEEM 2013)..

2.2 The survey method was based on the standard approach detailed in the Mammal Society publication *Surveying Badgers* (Harris *et al*. 1991) and used during the National Badger Survey (Cresswell *et al.* 1990) and *Surveying for Badgers* (Scottish Badgers 2018). This involved searching for field signs associated with badgers, including setts, runs, foraging activity, latrines and footprints. Other signs searched for included scratching posts and hairs caught on fences.

2.3 A 'sett' is currently defined as 'any structure or place which displays signs indicating current use by a badger'. In practice this highlights the need for recent surveys as badger activity is dynamic, holes can appear overnight or currently un-used holes be brought back into use. Setts may be used at different times of the year, and the status of a sett can change.

2.4 Sett status is categorised as follows:

- **Main sett** – A sett within a badger territory that appears to be the largest (usually with at least five holes) and the most well-used, with much activity in the vicinity, is categorised as a main sett. Signs of current use can include large amounts of spoil at the entrance to the sett, often with bedding material mixed in, separate piles of bedding or guard hairs in the entrance, signs of recent digging and footprints. Main setts always have active badger runs leading away from them and are normally marked by latrines. Social groups have one main sett, which is the most important sett in the territory. It is used throughout the year and is the main breeding sett;
- **Annexe setts** – Setts are categorised as annexe setts where they are assumed to form a part of the main sett area but are unlikely to be directly linked by an underground passage to the main sett either due to a barrier (e.g. separated by a watercourse or ditch) or by distance. Annexe setts are normally linked to the main sett by a well-used path and lie within 150m of a main sett entrance;
- **Subsidiary setts** – Setts that offer an alternative large sett complex to the main sett are categorised as subsidiary setts. Often marked by latrines, subsidiary setts are normally at least 50m from the main sett and are not always obviously linked by a well-used path to the main sett (unlike annexe setts). Subsidiary setts often exhibit moderate levels of activity, are larger than outlier setts but smaller than main setts;
- **Outlier sett** – These setts often comprise just one or two holes. They are used infrequently and can be found at the boundaries of a badger social group's territory;
- **Disused and Inactive setts** - A badger sett that appears to have been abandoned by a badger social group for at least a year is described as 'disused'. Disused setts often have entrance holes that are completely blocked with vegetation or have collapsed. These differ from 'inactive' setts, which are judged to be temporarily disused, with lack of a clear

[1] *CIEEM (Chartered Institute of Ecology and Environmental Management)*

pathway nearby, absence of spoil heaps and other signs of badger activity outside, and with vegetation establishing around the entrance. Temporarily disused entrance holes are termed 'partially used'.

2.5 Where badger setts were found, the number of entrances was recorded along with activity levels and overall sett status (see Appendix 2). Individual entrance hole locations were recorded using hand-held GPS (Garmin GPSmap 60CSx) and mapped using a combination of grid references and features in the field.

Survey Limitations

2.6 Badger surveys can be undertaken at any time of the year, although the optimal time is considered to be early spring and late autumn. This survey is, therefore, within the optimal survey period for badgers.

2.7 Conditions during the day were mild and mainly dry and visibility was good. The whole of the site was accessible. The results are, therefore, considered to be robust.

3. RESULTS

Badger Survey

3.1 The site is largely given over to arable crop production, with grassy margins around the field edges with margins considerably narrower in the north of the site. There are patches of woodland or scrub and several ditches and streams across the site. A number of hedgerows bound the fields to the north. The indicative site plan shows the semi-natural grassland area to the south of the site, with the series of ditches across it, is to be retained post-development. The woodland/scrub area to the south and much of the field margins are also to be retained.

3.2 Two setts were identified in the survey. These are situated at the north-eastern end of the site, one within the triangular patch of woodland, and the other along the top of the bank next to a ditch. Both setts are considered to be outliers, one currently active and the other inactive but with signs of moderately recent use.

3.3 The setts identified on the site are described below, with the Phase 1 survey results (PAA 2019) presented in Figure 1a and the badger survey results presented in Figure 1b, showing individual entrance holes within each sett. A series of representative photographs of the setts and badger activity within the site are presented in Appendix 2.

Sett 1 – Outlier Sett

3.4 This sett, comprising three holes, is located on a slope within the north-western corner of the woodland next to the dual carriageway retaining wall and approximately 6m up the slope from the ditch. (Photo 1). The entrances face so that the tunnels travel into the woodland, away from the development site.

3.5 The entrance to hole 1, approximately 1m from the wall, appears to be the most recently-used, with bare earth at the entrance and fresh seedlings of cleavers starting to grow. There was a very faint badger footprint on the slope near the entrance. An absence of other field signs, however, such as guard hairs or pathways nearby, and the presence of leaf litter in the entrance to the hole indicate that the sett is currently not in use. It is therefore assessed as partially used (Photo 2).

3.6 Hole 2 appears currently unused, with leaf litter in the entrance, and vegetated ground with a lack of bare earth surrounding the entrance to the hole (Photo 3). It is also assessed as partially used as, although currently not in use, it could potentially be brought back into use at other times of the year.

3.7 Hole 3 has collapsed, with leaf litter blocking the entrance and is therefore assessed as disused (Photo 4).

3.8 There are no obvious pathways leading to or from the sett, further indicating that the sett is currently inactive.

3.9 Badger activity is dynamic, however, and setts can be brought back into use, or sett preference can change over time.

Sett 2 – Outlier Sett

3.10 This sett comprises a single, isolated entrance hole at the top of the ditch bank, with the direction of the sett leading towards the site (Photo 5). The hole appears to be active, with fresh spoil surrounding the entrance and a clear, bare path through the vegetation down to the water in the ditch (Photo 6).

Badger Field Signs within the Site

3.11 There is some evidence of badgers using the north-east corner of the site for commuting and foraging, with a clear pathway underneath hedgerow H3 near the setts, shown on Figures 1a and 1b (Photo 7), which could indicate a regular crossing point for badgers. A lack of clear pathways along the field margin up to the crossing, however, and other accompanying field signs such as footprints or guard hairs, mean that it is not completely clear that the path under the hedgerow is being used by badgers or another animal, such as fox (*Vulpes vulpes*).

3.12 The survey in May showed a path leading into the woodland through the ditch (Photo 8), which was potentially being used by badgers to access Sett 1 in the woodland.

3.13 There were no large latrines marking territorial boundaries within the site.

4. EVALUATION

Summary of Setts and Sett Usage

4.1 Two outlier setts were observed in the north-east corner of the site, a three-holed sett (Sett 1) at the corner of the patch of woodland next to the retaining wall of the dual carriageway, and a single-holed sett (Sett 2) along the top of the ditch. The setts are likely to belong to the same badger social group.

4.2 Sett 2 is considered to be active, evidenced by the bare earth surrounding the entrance hole and a clear pathway up the ditch bank leading to it.

4.3 Sett1 is considered to be currently inactive, although there are signs that it has had limited use relatively recently.

Suitability of Habitat

4.4 There was limited evidence of badgers using the site for foraging and commuting; this is confined to the area near to where the setts are located. A strong pathway leading underneath the hedgerow near the setts could be attributable to badger activity, and a path across the ditch, noted in the initial survey in May, also suggested a regular access point into the woodland used by badgers. A lack of other field signs, however, such as clear pathways along the field margins, indicates that activity is minimal in the surrounding areas. The application site is largely characterised by arable fields and the best foraging habitat is restricted to field margins.

5. IMPACTS OF DEVELOPMENT AND MITIGATION

Potential Impacts to Setts

5.1 When planning any development in the northern section of the site where the setts are located, the potential impact on setts and foraging habitat for badger should be considered. The current setts may potentially be at risk of disturbance from machinery during construction. Works which could cause disturbance to badgers whilst in the setts and/or interference to the setts themselves (by tunnel collapse due to ground vibration) would include:

- the use of pile driving machinery or blasting within 100m;
- the use of heavy machinery within 30m (Figure 1 shows 30m buffer zones around each sett);
- lighter machinery within 20m; and
- the use of hand tools within 10m of an active sett.

5.2 The presence of a concrete retaining wall between the ditch and edge of the woodland containing Sett 1 could provide an element of protection against disturbance from machinery during any development works.

Potential Impacts to Habitats used by Badger

5.3 Development could result in the loss of existing hedgerow and areas of grassland. This could be compensated for by providing additional created habitat across the site with extra trees planted. A landscaping design that includes wildlife corridors to allow access to other areas of the site would increase the overall area of habitat suitable for foraging badgers post-development.

Proposed Mitigation

5.4 The following measures are recommended:

- Badgers can excavate setts within a relatively short period, and re-surveying the setts prior to site works is essential to ensure that an accurate representation of the current situation is understood, and that finalised mitigation can be designed on this basis;
- A toolbox talk for contractors is also recommended prior to works, and during the construction phases the badger setts and any buffer zone would be regularly monitored by an appropriately experienced ecologist;
- No works involving the use of heavy machinery should be conducted within 30m of the setts, thereby protecting them from disturbance and potential risk of collapse. Protective fencing should be erected along the 30m buffer prior to commencement of any construction works and remain until works are completed;
- If works are required within 30m of a sett they should be carried out adhering to a method statement under supervision by an appropriately experienced ecologist;
- Planting of shrubs and fencing works required within the 30m buffer zone should be undertaken using light machinery up to 20m of the setts and hand tools up to 10m of the setts. The use of hand tools should not take place within the 10m buffer around the setts;
- Open pipes and tunnels should be covered over to prevent access by badgers and other animals overnight;

- Ramps should be placed in trenches >0.5m deep to allow exit should an animal fall in;
- Badger pathways and access routes to water sources should be kept clear where possible;
- Noisy works and machinery close to setts should be avoided, and noisy works on the site should stop at least two hours before sunset, when badgers are likely to be out on site foraging;
- Chemicals should be stored away from setts and pathways, and spills (e.g. diesel from machinery) should be promptly cleared up;
- Consideration should be given to lighting on the site and floodlighting should not be directed onto an area containing setts; and
- Compensatory habitat suitable for foraging badgers should be provided within landscaping or any proposed development.

5.5 If it is not possible to avoid significant disturbance within 30m of active badger setts, then it would be necessary to apply to Natural England for a licence to disturb.

Natural England Licence to Disturb Badgers

5.6 A Natural England licence would be required for any development work that 'disturbs badgers whilst occupying a sett' (English Nature 2002). Natural England guidance suggests 30m as a distance within which the use of heavy machinery will disturb badgers within a sett. Consequently, a licence ***should not*** be necessary if a 30m buffer is retained around all potentially impacted setts and no heavy vehicles are utilised within this zone. It **may** be possible to carry out works no closer than 20m under a strict Method Statement. However, if the situation changes a licence may be required.

5.7 A licence application to meet Natural England's requirements would require information such as:

- a copy of the detailed planning permission for the site, including any Section 106 agreements;
- information on status, location and use by badgers of any setts that will be affected;
- an appropriately scaled map of the application site, illustrating the location of setts and the proposed development; and
- a Method Statement setting out a schedule of works that takes account of the possible presence of badgers.

5.8 It should also be noted that Natural England will not normally issue licences between November and July (inclusive) because of the possible presence of a pregnant or nursing sow with cubs and a reluctance of badgers to emerge during long winter periods.

5.9 Further information on the licensing process can be obtained from the website: www.gov.uk.

Summary Statement

5.10 There are currently two outlier badger setts located at the north-eastern corner of the site. One single-holed sett on the bank top next to the ditch appears currently active. The other sett, in the woodland near the dual carriageway, appears currently unused, but has signs of use in the recent past.

5.11 These setts should be protected from disturbance during works. This may be by incorporation of a 30m wide buffer from any proposed construction and landscaping works.

5.12 Works should only take place within the 30m buffer zone but no closer than 20m under a strict Method Statement to avoid significant disturbance to active setts.

5.13 Hand tools can be used up 10m from any active sett but not within 10m of the sett.

5.14 It is recommended that the 30m buffer zone is marked out with fencing around each sett prior to development works taking place, to ensure the disturbance levels are kept to a minimum during the construction phase.

5.15 If, for any reason, significant disturbance to active setts cannot be avoided, a Natural England licence to disturb badgers and interfere with their setts (through potential tunnel collapse) is likely to be required.

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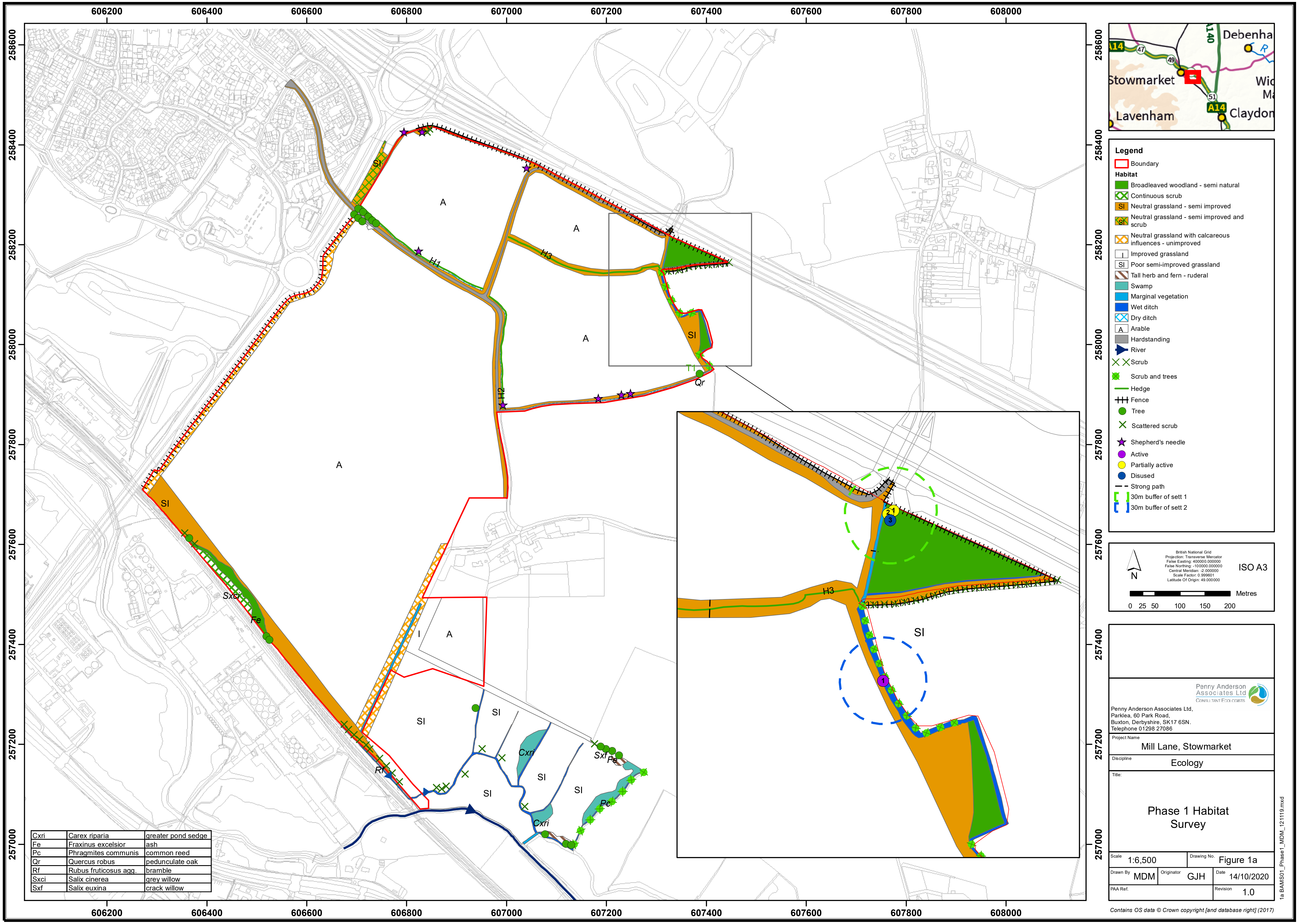
FIGURES


Legend
Boundary
Habitat
Broadleaved woodland - semi natural
Continuous scrub
Neutral grassland - semi improved
Neutral grassland - semi improved and scrub
Neutral grassland with calcareous influences - unimproved
Improved grassland
Poor semi-improved grassland
Tall herb and fern - ruderal
Swamp
Marginal vegetation
Wet ditch
Dry ditch
Arable
Hardstanding
River
Scrub
Scrub and trees
Hedge
Fence
Tree
Scattered scrub
Shepherd's needle
Active
Partially active
Disused
Strong path
30m buffer of sett 1
30m buffer of sett 2
Cxri Carex riparia greater pond sedge
Fe Fraxinus excelsior ash
Pc Phragmites communis common reed
Qr Quercus robus pedunculate oak
Rf Rubus fruticosus agg. bramble
Sxci Salix cinerea grey willow
Sxf Salix euxina crack willow
Stowmarket
Debenham
Lavenham
Claydon
British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000
ISO A3
Metres
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Penny Anderson Associates Ltd
Consultant Ecologists
Penny Anderson Associates Ltd,
Parklea, 60 Park Road,
Buxton, Derbyshire, SK17 6SN.
Telephone 01298 27086
Project Name
Mill Lane, Stowmarket
Discipline
Ecology
Title:
Phase 1 Habitat Survey
Scale 1:6,500
Drawing No. Figure 1a
Drawn By MDM
Originator GJH
Date 14/10/2020
PAA Ref.
Revision 1.0
1a BAMS01_Phase1_MDM_121119.mxd
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258200 258100

H3

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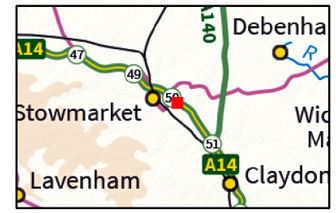
1



Legend

Boundary

Habitat

- Broadleaved woodland - semi
- Neutral grassland - semi
- Marginal vegetation
- Wet ditch
- Arable
- Hardstanding
- Scrub
- Scrub and trees
- Hedge
- Fence
- Active
- Partially active
- Disused
- Sett 1 - 30m buffer
- Sett 2 -30m buffer
- Strong path

NB: Number inside circle is hole number

N

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

0 4 8 16 24 32 Metres

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Project Name: Mill Lane, Stowmarket

Discipline: Ecology

Title:

Badger Survey Results

Scale	Drawing No.
1:850	Figure 1b

Drawn By	Originator	Date
MDM	CBo	19/11/2019

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Revision 1.0

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APPENDICES

APPENDIX 1

Summary Legislation Relating to Badgers and their Setts

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

SUMMARY OF THE LEGISLATION RELATING TO BADGERS AND THEIR SETTS

Badgers (*Meles meles*) are not an endangered species but have a long history of persecution and cruelty. As such, badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended), which makes it illegal for any person to kill, injure or take a badger. It is also an offence to destroy, damage or obstruct a badger sett, or to disturb a badger whilst it is within a sett. There are also additional offences relating to possession of, buying and selling a dead badger, or anything derived from a badger, and causing a dog to enter a sett.

The Act defines a sett as 'any structure or place which displays signs of current use by a badger'. Setts are defined by English Nature (1995) as 'usually underground tunnel systems providing shelter for badgers, but may include other structures used by badgers such as hay bales, drainage culverts, or cellars'. 'Current use' is more difficult to define but is usually interpreted by the presence/absence of badger field signs over several observations of the sett (Natural England 2006).

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Local authorities in England are required to consider the likelihood of any proposed development adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations. The planning guidance for Wales, Technical Advice Note (Wales) 5, identifies the need to comply with the Protection of Badgers Act 1992.

English Nature, 1995. *Species Conservation Handbook*. English Nature, Peterborough.

Natural England, 2006. *Guidance on 'Current Use' in the definition of a badger sett*. Natural England, Peterborough.

Please note: the above text provides a brief summary of the legislation in relation to badgers for England and Wales and the original Act and amendments should be referred to for the precise wording.

APPENDIX 2

Photographs

Photo 1

Sett 1, on slope of earth bank near to the wall

Photo 2

Hole 1, of Sett 1 , with bare earth at entrance – partially active

Photo 3

Hole 2, of Sett 1 – partially active

Photo 4

Hole 3, of Sett 1 – disused

Photo 5

Sett 2 – active

Photo 6

Sett 2, with pathway from entrance hole down to the ditch

Photo 7

Pathway underneath hedgerow H3

Photo 8

Pathway across ditch next to woodland containing Sett1, noted in earlier survey in May

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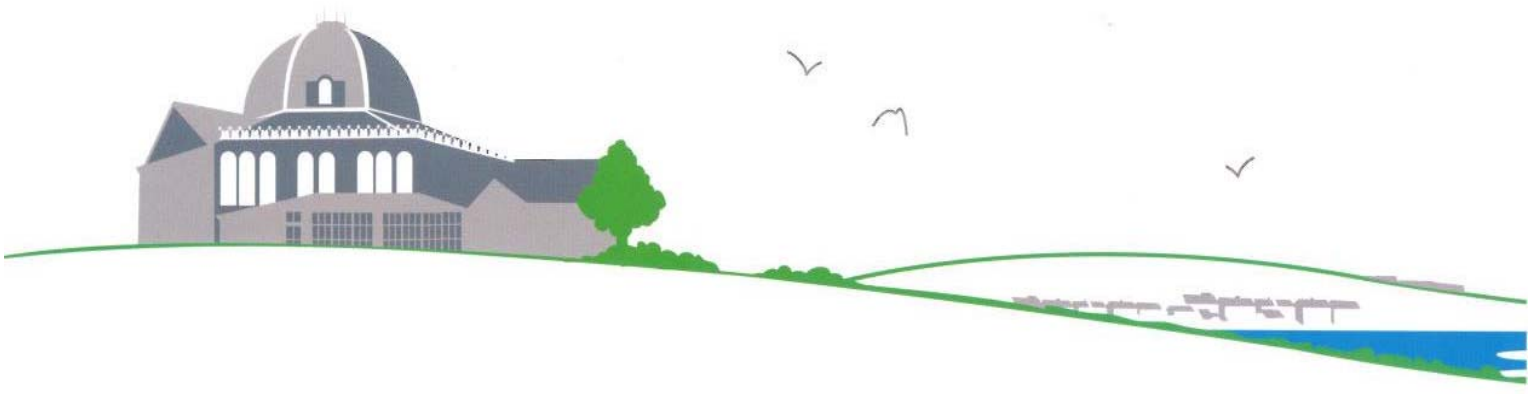
BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

BREEDING BIRD SURVEY REPORT



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

BREEDING BIRD SURVEY REPORT

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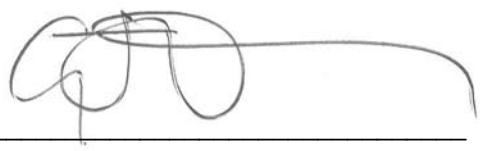
July 2020 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed: 

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CONTENTS

1. INTRODUCTION

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Babergh and Mid Suffolk District Council to carry out a number of ecological surveys at a site off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site'), where there is a proposal for development.

1.2 Following the preliminary Phase 1 habitat survey (PAA 2019), a recommendation was made to complete a breeding bird survey, given that the habitat was suitable and the desk study request for biological records returned records for many birds.

1.3 This report is one of a number of reports that examines the baseline conditions and evaluates the ecological resources that would be impacted by the development. More specifically, this report presents the findings of a breeding bird survey, and assesses the potential impact of the proposal on these protected species.

1.4 At the time of the surveys the application area included an area of semi-natural grassland with a series of wet ditches in the south-east. This area has been subsequently removed from the application and only a narrow section of the site now borders the River Gipping. However, the field, ditches and river lie in close proximity to the site and for completeness the breeding bird results have been reported for this area.

Site Description

1.5 The site is situated on the south-eastern fringe of the town of Stowmarket, Suffolk. The A14 dual carriageway runs along the north-eastern boundary of the site with arable farmland beyond. The north-western boundary is formed by the A1120, beyond which lies residential and industrial development. The south-western boundary of the site lies beside the Ipswich-Stowmarket rail line and close to the River Gipping. A malt factory and farmland lie beyond the rail line. To the east the site is largely bordered by arable farmland on higher ground and grasslands in lower lying areas beside the River Gipping.

1.6 Lying between 22m and 45m above sea level, the 78.5ha site rises in height gently from south to north. The majority of the site comprises arable farmland which was planted with sugar beet in Spring 2020 and a small area of cereals. Field sizes are generally large with small hedgerows present along some of the boundaries. A small woodland of largely single-aged trees lies in the north-eastern corner of the site.

Aims

1.7 This report documents the methods and findings of the ornithological field surveys and desk study carried out in order to establish the existing ornithological interest within the site.

1.8 The breeding bird survey was undertaken in order to describe and evaluate the site's breeding bird assemblage.

Legislative, Policy and Conservation Context

Legislation

1.9 There are several different acts of legislation and regulations which refer to the protection of wildlife. Legislation with particular relevance to birds is outlined below[1].

1.10 This is a brief summary of the legislation and is not to be regarded as a definitive legal opinion. When dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

1.11 Key legislation for birds in the UK includes:

- Council Directive 79/409/EEC on the conservation of wild birds (the EC Birds Directive); and,
- Wildlife and Countryside Act 1981 (as amended).

1.12 Annex 1 of the EU Birds Directive lists rare and vulnerable species of regularly occurring or migratory wild birds that are subject to special conservation measures. The Directive also provides for the designation of SPAs for the protection of these species, which form part of the Natura 2000 network of sites protected by European wildlife legislation.

1.13 Part 1 of the Wildlife and Countryside Act sets out how the provisions of the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention'), the EU Birds Directive and the EC Habitats Directive are implemented in Great Britain.

1.14 Under Part 1, Section 1 of the Wildlife and Countryside Act it is an offence to:

- 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; and,
- Take or destroy the egg(s) of any wild bird.

1.15 Schedule 1 of the Wildlife and Countryside Act lists a number of species which, in addition to the provisions listed above, are protected by special penalties from disturbance at or near the nest, while the nest is being built, while the nest contains eggs to young and while they have dependant young.

1.16 The Wildlife and Countryside Act requires the prosecuting authority to prove that an offence was intentional, however the Countryside and Rights of Way (CRoW) Act 2000 strengthens the provisions of the Wildlife and Countryside Act by introducing an additional offence of 'reckless' disturbance for species listed on Schedule 1 of the Wildlife and Countryside Act, which means that ignorance of the presence of a protected species cannot be used as a reliable defence should a breach of the Wildlife and Countryside Act be committed.

1.17 Schedule 1 includes birds such as barn owl[2] (*Tyto alba*), black redstart (*Phoenicurus ochruros*), woodlark (*Lullula arborea*) and Cetti's warbler (*Cettia cetti*). Please refer to the Wildlife and Countryside Act 1981 (as amended) for a complete list of Schedule 1 species.

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[1] *Also, see appendix 1 for summary legislation*

[2] *Names of bird species follow British Ornithologists' Union 2017.*

Policy

1.18 Local, regional and national biodiversity targets identify habitats and species, including birds, of conservation concern for which Action Plans have been devised to help safeguard the most threatened species. Of particular relevance to this survey are species listed as priorities for conservation in accordance with Section 41 of the NERC Act 2006 and on the Suffolk Priority Species list.

Conservation Status

1.19 The Royal Society for the Protection of Birds (Eaton *et al.* 2015) has published lists of Birds of Conservation Concern. These lists, which are updated every few years, indicate the species which are of highest conservation concern. Red List species are those whose breeding population or range is rapidly declining (50% or more in the last 25 years), recently or historically, and those of global conservation concern. Amber List species are those whose breeding population is in moderate decline (25 – 49% in the last 25 years), rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

1.20 These lists confer no legal status; however, they are useful when assessing the significance of predicted impacts and determining the level of mitigation that may be required when birds are affected by development or any other activity.

2. METHODS

Desk Study

2.1 Suffolk Biodiversity Information Service, which is the local environmental record centre for the county of Suffolk, provided bird records for the site and a 2km radius. These records are used to identify species likely to be using the site and inform survey priorities and methods for surveying the site.

Field Survey

2.2 The surveys were based on the British Trust for Ornithology's Common Birds Census (Marchant 1983, as described in Gilbert *et al.* 1998). Surveys are undertaken during the breeding season between April and June with multiple visits timed to ensure that early and later breeding species are encountered.

2.3 Surveys are conducted during the early morning, avoiding rainy, windy or foggy conditions which can reduce visual and aural detectability of birds as well as suppressing activity levels.

2.4 During each survey, an experienced ornithologist walks slowly along a pre-determined route around the site covering all areas of suitable habitat and recording the species, number, age, sex, location and breeding behaviour of each bird.

Determination of Breeding Status

2.5 The breeding status of each species can be classified into four categories: confirmed breeder, probable breeder, possible breeder and unlikely breeder. The behaviour, sex, age and location of individual birds allow conclusions to be drawn about breeding status, based on categories devised for breeding bird atlases. The types of behavioural evidence used in this report is set out in Appendix 2.

Visit Details

2.6 The surveys were carried out by David Hodkinson MBioSci ACIEEM, a professional ornithological surveyor skilled in using both sight and sound to detect birds. David has over 15 years' experience as a surveyor and bird ringer in Europe, North America and Central Asia, supporting projects in the scientific, charitable, commercial and government sectors. He is also an instructor for the British Trust for Ornithology's training courses and an Associate Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

2.7 Three survey visits were conducted. Details are set out in Table 1.

Table 1 Visit Conditions

Visit No.	Date	Temperature (°C)	Wind Speed	Cloud Cover (Okta)
1	23 April 2020	6→15	1→2	0/8
2	15 May 2020	2→10	1	0/8
3	12 June 2020	13→15	3	8/8

Limitations

2.8 The survey visits took place under optimal weather conditions. However, during the second and third survey road noise from increased traffic levels on the A14 reduced detectability of birds by

sound in habitats immediately adjacent. There is potential for some birds to be missed or to go unnoticed due to the nature of breeding bird surveys and possibility of birds not vocalising and/or being present in dense vegetation. While it is possible that fewer birds were recorded in the affected areas, it is considered that overall, the current breeding bird survey provides an accurate assessment of the ornithological value of the site to breeding birds.

2.9 The detectability of breeding behaviours indicative of probable or confirmed breeding varies by species and the abundance of the species. It is, therefore, likely that some species that breed in the site may not have been observed during the survey visits exhibiting behaviours indicative of their actual breeding status. As such, the breeding status of all species should be considered a minimum estimate.

3. RESULTS

Desk Study

3.1 A total of 761 bird records of 89 species were returned by Suffolk Biodiversity Information Service as part of the desk study (see Appendix 3 for details). The records covered the period 1999 – 2018 with the majority of the records occurring between 2007 and 2016.

3.2 This included 63 species included on the red list, amber list, Section 41/Suffolk Priority Species list and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Just over half of these species are wintering species, passage migrants or lack suitable breeding habitat within or adjacent to the site. Of the remaining 31 species, 18 are on the red list, 9 on the amber list, 12 listed as Section 4/Suffolk Priority Species and 7 species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

3.3 Among the Schedule 1 species barn owl, hobby (*Falco Subbuteo*) and kingfisher (A*lcedo atthis*) were the most frequently reported, while the majority of records of red listed species comprised house sparrow (*Passer domesticus*), starling (*Sturnus vulgaris*), turtle dove (*Streptopelia turtur*), song thrush (*Turdus philomelos*), Eurasian skylark (*Alauda arvensis*), grey partridge (*Perdix perdix*), common linnet (*Linaria cannabina*) and yellowhammer (*Emberiza citrinella*). Among the amber listed species, the most commonly reported were dunnock (*Prunella modularis*), Eurasian bullfinch (*Pyrrhula pyrrhula*), reed bunting (*Emberiza schoeniclus*), kingfisher and common house martin (*Delichon urbicum*) and of the Section 41/Suffolk Priority Species house sparrow, turtle dove, Eurasian skylark, reed bunting and yellowhammer were the most reported. All these species have potential to use the site or adjacent habitats during the breeding season.

3.4 It should be noted that the number of species recorded does not necessarily indicate the population size. Less common species may be recorded more frequently because of their rarity and more common species may be recorded less often.

Field Survey

Breeding Bird Assemblage

3.5 During the field surveys, a total of 50 bird species were recorded within the site and its immediate vicinity across the three visits (see Table 1). This included six species for which suitable breeding habitat within the site was lacking and were only observed flying over site (black-headed gull (*Chroicocephalus ridibundus*), herring gull (*Larus argentatus*), lesser black-backed gull (*Larus fuscus*), Canada goose (*Branta canadensis*) and grey heron (*Ardea cinerea*)).

3.6 Among the species recorded, 44 species are considered to be 'Confirmed', 'Probable' or 'Possible' breeding species associated with the habitats within or immediately adjacent to the site.

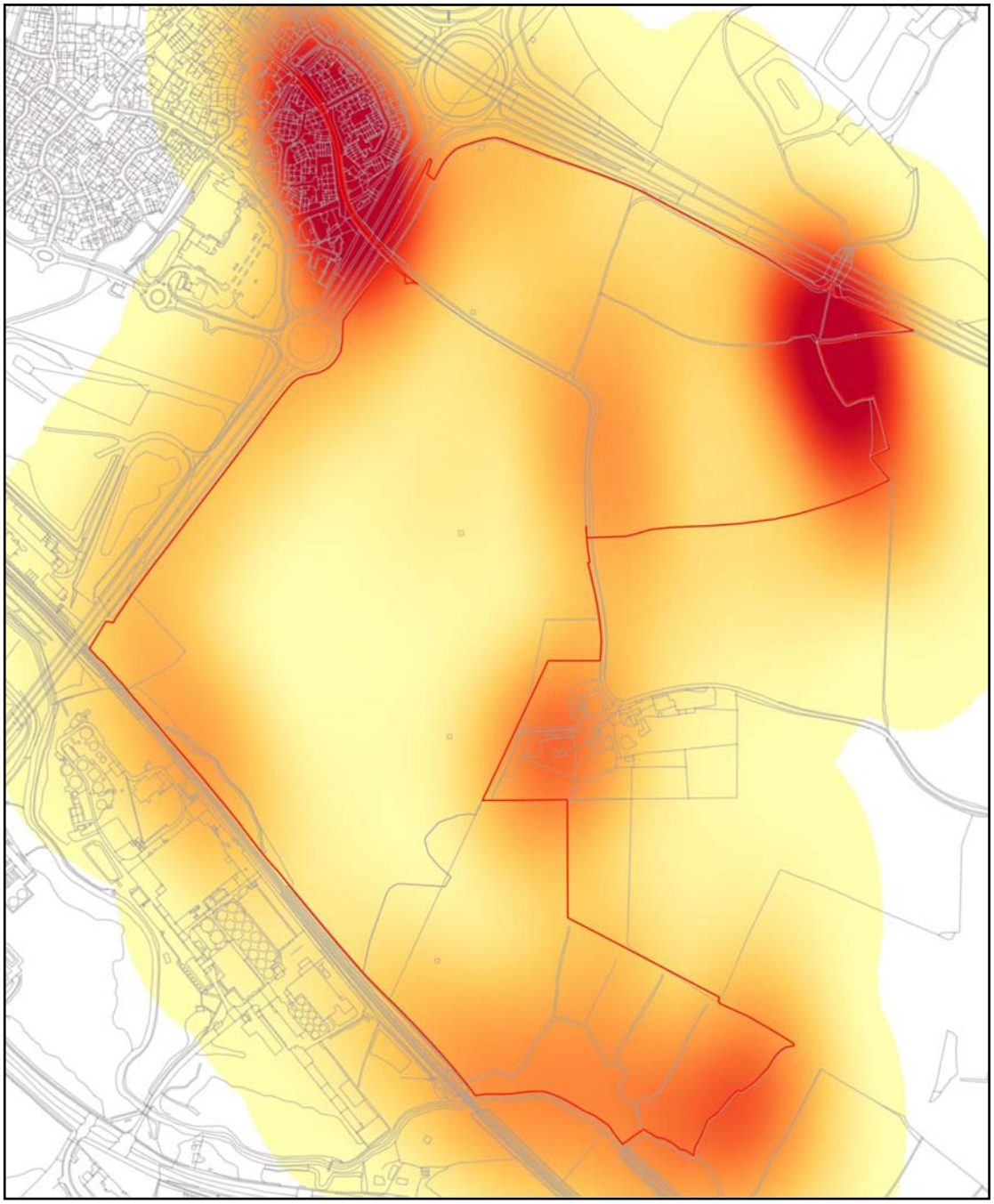
3.7 The breeding assemblage within the site primarily comprised a range of common and widespread species but also a substantial number of species listed on Schedule 1, Section 41/Suffolk Priority Species and Birds of Conservation Concern.

3.8 Observations of birds were not evenly distributed across the site. The majority of records came from field boundaries, patches of woodland, scrub and uncultivated land. Particularly high densities of birds were recorded along Creeting Road East to the west of the A1120 where a large hedgerow provides habitat adjacent to urban gardens and buildings. A hotspot was also detected in the north-eastern corner of the site around the small woodland with a large hedgerow and ditch radiating to the south. A broad but significant concentration of bird activity was also identified in the south-eastern corner of the site where damp grasslands neighbour the

River Gipping (See Figure 1). These concentrations of birds indicate area of greatest value to birds.

Figure 1 Map of Bird Activity Levels Across Bird Species

Birds were encountered at greater numbers where colours are a deeper shade of red. Heatmap is based upon kernel density estimates from encounters of all species across all visits. Flyovers are excluded.

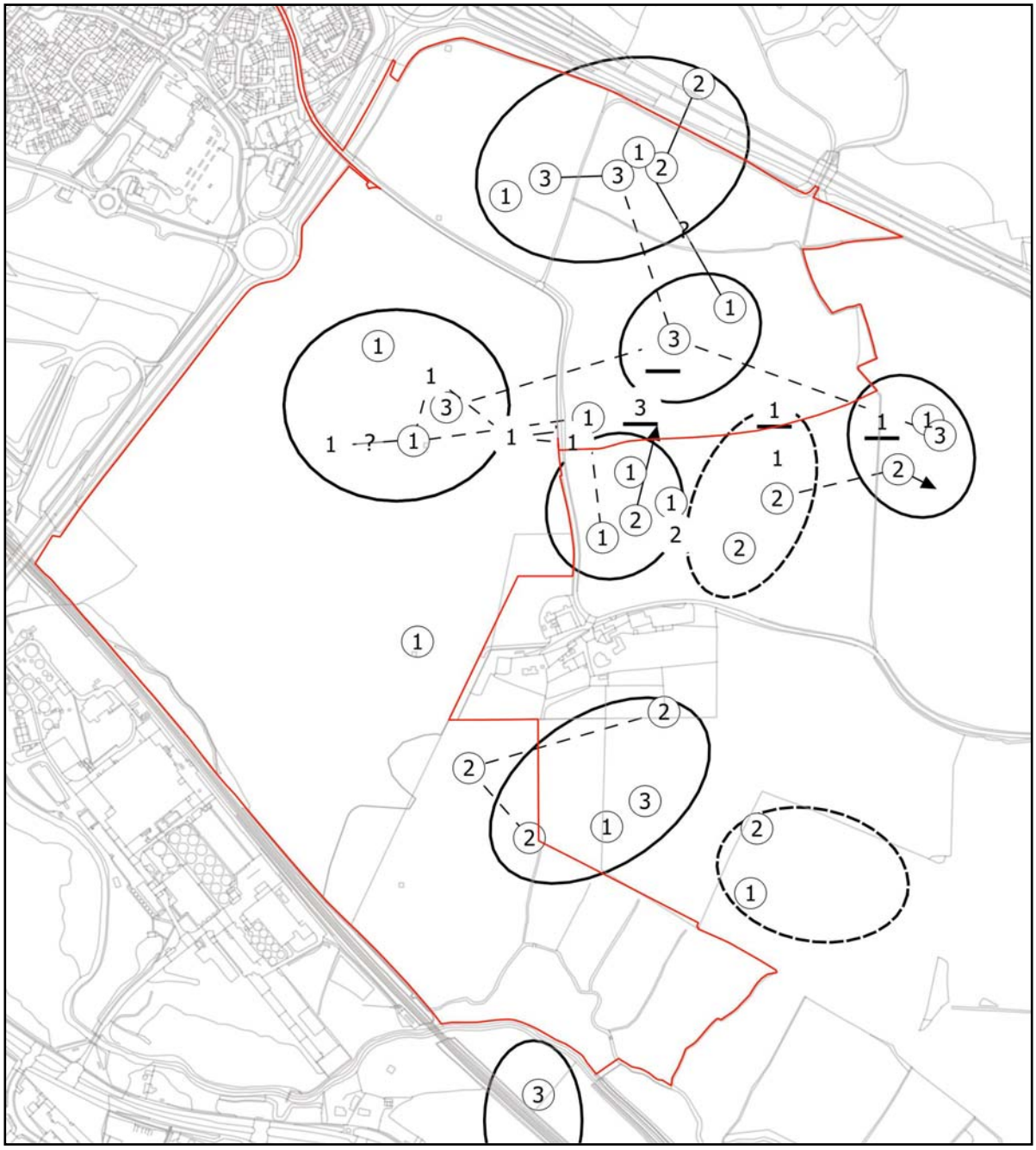


3.9 While the majority of bird activity was focused along the field boundaries, a few species were found exclusively within the field interiors, most notably Eurasian skylark. At least three

Eurasian skylark territories were located entirely within the site with another two territories overlapping and at least two others making some use of the site. See Figure 2 for details of registrations and potential territories.

Figure 2 Map of Eurasian Skylark Registrations and Likely Territorial Groupings

Numbers indicate the visit during which a registration took place. Solid ellipses indicate registrations likely to comprise a single territory, but do not indicate the location of territory boundaries. Dashed ellipses indicate potential territories where information is insufficient to be certain.



Breeding Status

3.10 Five species exhibited behaviour that confirmed breeding within the site and its immediate vicinity. Amongst these were the red listed species house sparrow and starling.

3.11 Behaviour indicative of probable breeding was displayed by 14 species, including the red listed Eurasian skylark and yellowhammer and amber listed dunnock, mallard (*Anas platyrhynchos*), reed bunting and stock dove (*Columba oenas*). These species were observed in typical breeding habitat and whilst behaviour that confirmed breeding was not recorded, it is extremely likely that all these species were breeding within or adjacent to the site.

3.12 A further 25 species were recorded as possible breeders within the site and its immediate vicinity, including the red listed common linnet and song thrush and amber listed kestrel (*Falco tinnunculus*), kingfisher, dunnock, Eurasian bullfinch and common house martin. Since the surveys only represent a brief snapshot into the species and behaviours of birds within the site it is likely that many of the species in this category actually breed within the site, but did not exhibit behaviours indicative as such at the time of the survey visits.

Designated Species and Birds of Conservation Concern

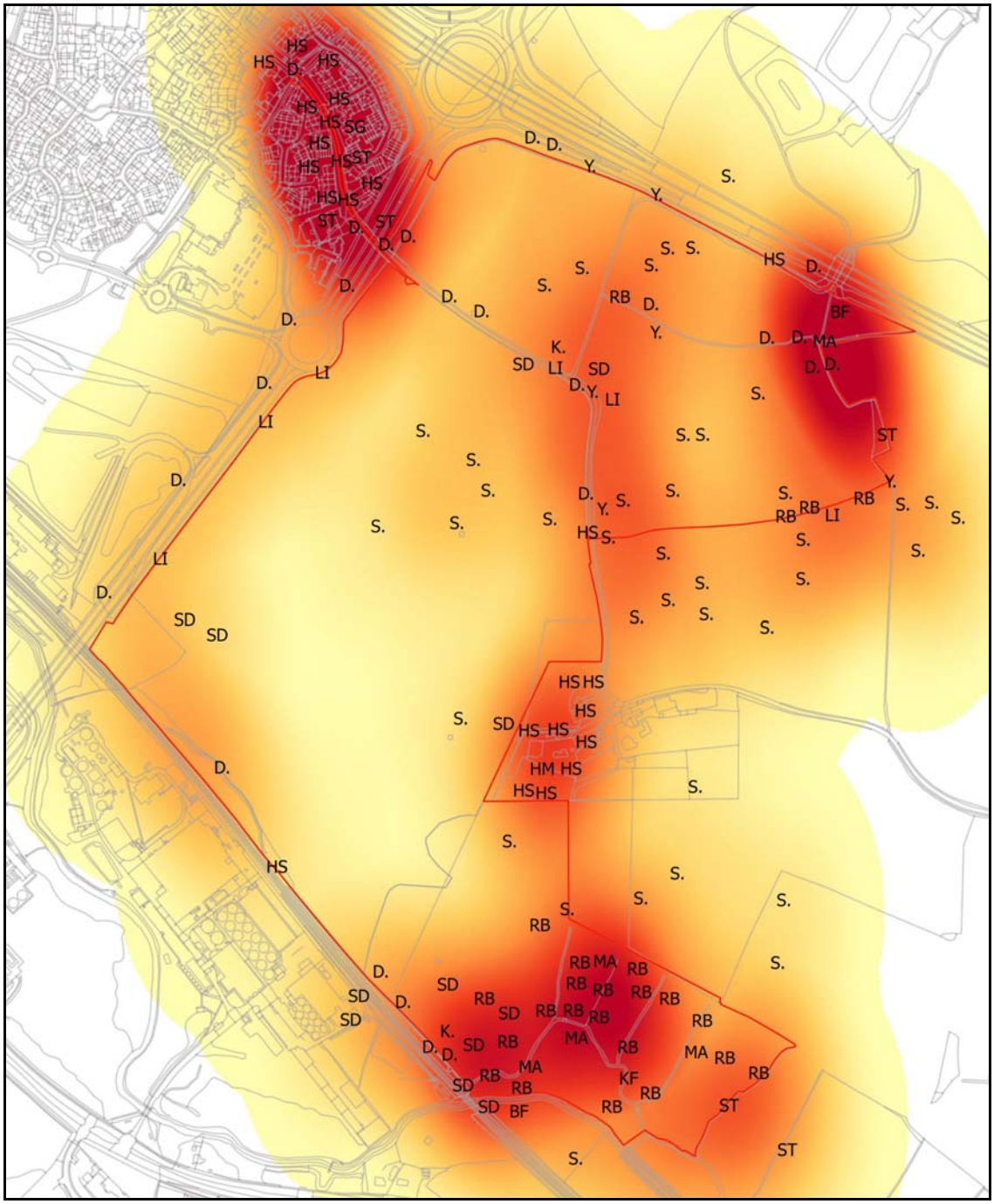
3.13 14 species are categorised as Birds of Conservation Concern (Eaton *et al.* 2015); six are red listed species: house sparrow; starling; common linnet; Eurasian skylark; song thrush; and yellowhammer, and eight amber listed species: common house martin, Eurasian bullfinch, dunnock, kestrel; kingfisher; mallard; reed bunting; and stock dove.

3.14 Ten species are also Section 41/Suffolk Priority Species: Eurasian bullfinch; dunnock; kingfisher; starling; house sparrow; song thrush; common linnet; Eurasian skylark; yellowhammer; and reed bunting.

3.15 Usage of the site by red and amber list species was primarily focused in four areas: along Creating Road East in the north-west of the site; in the woodland and thick hedgerow habitats located in the north-eastern corner of the site; across the damp meadows in the south-east of the site; and to a lesser extent towards the centre of the site along the hedgerows of Mill Lane (See Figure 3).

Figure 3 Density of Designated Species Across the Site

Designated species were encountered at greater density where colours are a deeper shade of red. BTO species codes indicate individual registrations of each species. Heatmap is based upon kernel density estimates of all designated species across all visits.



Birds Afforded Additional Protection - Schedule 1 of the WCA (1981)

3.16 One species, kingfisher is listed on Schedule 1 of the Wildlife and Countryside Act 1981.

3.17 A summary of species, conservation status and protection with indicative breeding status is presented in Table 2 below. Maps showing registrations of all species are presented in Appendix 4.

Table 2 Full List of Species Recorded with Conservation and Legal Status

Common Name	Scientific Name	Breeding Status	Amber	Red	S41/Suffolk Priority	Schedule 1
Barn swallow	*Hirundo rustica*	Possible				
Black-headed gull	*Chroicocephalus ridibundus*		Y			
Blue tit	*Cyanistes caeruleus*	Confirmed				
Canada goose	*Branta canadensis*					
Carrion crow	*Corvus corone*	Possible				
Collared dove	*Streptopelia decaocta*	Probable				
Common blackbird	*Turdus merula*	Probable				
Common buzzard	*Buteo buteo*	Possible				
Common chaffinch	*Fringilla coelebs*	Possible				
Common chiffchaff	*Phylloscopus collybita*	Probable				
Common house martin	*Delichon urbicum*	Possible	Y			
Common linnet	*Linaria cannabina*	Possible		Y	Y	
Common reed bunting	*Emberiza schoeniclus*	Probable	Y		Y	
Dunnock	*Prunella modularis*	Probable	Y		Y	
Eurasian blackcap	*Sylvia atricapilla*	Probable				
Eurasian bullfinch	*Pyrrhula pyrrhula*	Possible	Y		Y	
Eurasian magpie	*Pica pica*	Possible				
Eurasian skylark	*Alauda arvensis*	Probable		Y	Y	
Eurasian wren	*Troglodytes trogoldytes*	Probable				
European green woodpecker	*Picus viridis*	Possible				
European herring gull	*Larus argentatus*			Y		
Feral pigeon	*Columba livia*					
Garden warbler	*Sylvia borin*	Possible				
Goldfinch	*Carduelis carduelis*	Possible				
Great tit	*Parus major*	Possible				

Common Name	Scientific Name	Breeding Status	Amber	Red	S41/Suffolk Priority	Schedule 1
Greenfinch	*Chloris chloris*	Possible				
Grey heron	*Ardea cinerea*					
House sparrow	*Passer domesticus*	Confirmed		Y	Y	
Jay	*Garrulus glandarius*	Possible				
Kestrel	*Falco tinnunculus*	Possible	Y			
Kingfisher	*Alcedo atthis*	Possible	Y		Y	Y
Lesser black-backed gull	*Larus fuscus*		Y			
Lesser whitethroat	*Sylvia curruca*	Possible				
Long-tailed tit	*Aegithalos caudatus*	Possible				
Mallard	*Anas platyrhynchos*	Probable	Y			
Moorhen	*Gallinula chloropus*	Possible				
Pheasant	*Phasianus colchicus*	Possible				
Pied wagtail	*Motacilla alba*	Possible				
Red-legged partridge	*Alectoris rufa*	Confirmed				
Reed warbler	*Acrocephalus scirpaceus*	Possible				
Robin	*Erithacus rubecula*	Probable				
Rook	*Corvus frugilegus*	Confirmed				
Sedge warbler	*Acrocephalus schoenobaenus*	Possible				
Song thrush	*Turdus philomelos*	Possible		Y	Y	
Starling	*Sturnus vulgaris*	Confirmed		Y	Y	
Stock dove	*Columba oenas*	Probable	Y			
Western jackdaw	*Corvus monedula*	Possible				
Whitethroat	*Sylvia communis*	Probable				
Woodpigeon	*Columba palumbus*	Probable				
Yellowhammer	*Emberiza citronella*	Probable		Y	Y	

4. EVALUATION AND RECOMMENDATIONS

4.1 The abundance and number of bird species present was commensurate with the size and diversity of habitats present within the site and its surrounds. The site holds substantial numbers of designated species with 30% of all birds encountered during the surveys being of designated species.

4.2 Birds were present across almost the entire site, but usage was uneven. Several areas with higher levels of bird activity were identified, indicating the habitats which are of greatest value to all bird populations. Usage was highest along the field and site boundaries, which is to be expected as there are few species which are specialists of infield habitats. However, several Eurasian skylark territories were identified, indicating that these habitats are also of conservation value.

4.3 Among designated species usage of the site was broadly similar, although a number of differences identified habitats of elevated importance for species of conservation concern.

4.4 Kingfisher, a Schedule 1 species, was recorded in the south-east of the site and has potential to nest in the steep banks of the deep drainage ditches in this part of the site as well as in the banks of the River Gipping where it borders the southern boundary of the site. Any works close to these habitat features have the potential to disturb this species and risk a breach of the Wildlife and Countryside Act 1981 (as amended).

4.5 The desk study identified 31 species on either the red, amber, Section 41 or Schedule 1 lists that had potential to be present within the site. The majority of these species were encountered within the site and those that were not typically have habitat requirements that were not present within the site. Two Schedule 1 species (barn owl and hobby) were not recorded during the field survey; however, the site contains a number of large trees that would make suitable nest sites for these species.

4.6 The majority of designated species recorded during the survey are species typical of open country with scattered woody vegetation such as hedgerows and scrub which tend to avoid urban and suburban development. Species in this group found during the surveys include kestrel, common linnet, Eurasian skylark, reed bunting, stock dove and yellowhammer. These species would require mitigation to avoid negative impacts on the local population.

4.7 There were also a number of designated species recorded during the survey that are able to adapt well to, or be tolerant of, urban and suburban development. Species such as house sparrow, starling, dunnock and common house martin would require lower levels of mitigation in order to maintain or enhance local breeding populations.

Recommendations

4.8 All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). It is, therefore, recommended that for potential breeding bird habitats within the site, vegetation is removed outside the breeding season, which runs from March to September (inclusive).

4.9 If this is not possible then a suitably experienced ecologist must check the vegetation no more than 48 hours prior to site clearance to ensure no active nests are present. If clearance is delayed for more than 48 hours after a check then a further check is required. If nesting birds are confirmed to be present then works within the wider vicinity of the nest would need to be postponed and the area cordoned off until young have fledged and/or nesting has been completed. A further check would then be necessary to ensure that no further nests are present before vegetation clearance could continue. This approach is recommended to minimise the risk of destroying active nests and, therefore, any infringement of legislation.

4.10 Should any works need to take place during the breeding season near the River Gipping or the drainage ditches in the south-eastern section of the site, a kingfisher nesting survey should be completed by a licensed ornithologist or ensure that no kingfishers are nesting in the area.

4.11 Similarly, prior to the felling of any large trees during the breeding season, the trees should be inspected by a licensed ornithologist to ensure that the trees are not in use for nesting by barn owl or hobby. This will likely require the assistance of a tree climber.

4.12 The landscaping design should give consideration to breeding birds and include species that provide feeding opportunities for birds, directly as seeds and indirectly by supporting insects.

4.13 Landscape planting will take a while to develop and mature; in the interim period proposals should seek to provide enhanced functionality in support of the breeding bird assemblage present. It is recommended that a suite of species-specific nest boxes, based upon survey results and desk study data, are located in suitable locations, with input from an ecologist to provide nesting opportunities for birds known to be and likely to be present in the post-development habitats present.

5. REFERENCES

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APPENDICES

APPENDIX 1

Summary of the Legislation Relating to Breeding Birds

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

SUMMARY OF THE LEGISLATION RELATING TO BREEDING BIRDS

All wild species of breeding birds and their nests are protected under Part 1 of the Wildlife and Countryside Act (WCA) 1981, as amended by later legislation including the Countryside and Rights of Way (CRoW) Act 2000. This legislation applies in England and Wales.

Part 1 (Section 1:1) of the WCA states that:

> 'If any person intentionally,
>
> (a) kills, injures or takes any wild bird;
>
> (b) takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
>
> (c) takes or destroys an egg of any wild bird,
>
> he shall be guilty of an offence.'

Part 1 (Section 1:5) of the WCA (amended by the CRoW Act 2000) refers to specific birds listed on Schedule 1 of the WCA, and states that:

> 'If any person intentionally or recklessly,
>
> (a) disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
>
> (b) disturbs dependent young of such a bird,
>
> he shall be guilty of an offence and liable to a special penalty.'

Schedule 1 includes birds such as Western barn owl (*Tyto alba*), black redstart (*Phoenicurus ochruros*), woodlark (*Lullula arborea*) and Cetti's warbler (*Cettia cetti*). Please refer to the WCA for a complete list of Schedule 1 species.

Some provisions are made to allow the killing and taking of certain species under certain circumstances, as follows:

- Birds listed on Schedule 2 (Part 1) of the Act may be taken or killed outside of the 'close season' for each individual species (the 'close season' is defined by the Act). This includes various wild duck and geese species.
- Birds listed on Schedule 2 (Part 2) of the Act may be killed or taken by authorised persons at all times. This includes species such as carrion crow (*Corvus corone*), Eurasian magpie (*Pica pica*), feral pigeon[1] (*Columba livia*) and greater Canada goose (*Branta canadensis*). An 'authorised person' is defined as a person who has written authorisation to undertake the act from the relevant statutory authority. The written authority is in the form of a licence, either a general licence which covers a number of the more typical 'pest' species, or an individual licence for other individual species. In England these licences are issued by Natural England and in Wales by the Welsh Assembly Government.

Please note: the above text provides a brief summary of the legislation in relation to breeding birds in England and Wales and the original Act and any amendments should be referred to for the precise wording.

[1] *Also known as rock dove*

APPENDIX 2

Categories of Breeding Bird Evidence

Appendix 2 Categories of Breeding Bird Evidence

Class	Category of Evidence
Non-breeding	Flying over
	Species observed but suspected to be still on migration
	Species observed but suspected to be summering non-breeder
Possible Breeding	Species observed in breeding season in possible nesting habitat
	Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat
Probable Breeding	Pairs observed in suitable nesting habitat in breeding season
	Permanent territory presumed through registration of territorial behaviour (song etc) on at least two different days, a week apart, at the same place, or many individuals on one day.
	Display and courtship (judged to be near potential breeding habitat).
	Visiting probable nest site
	Agitated behaviour or anxiety calls from adults, suggesting probably presence of nest or young nearby
	Brood patch on adult examined in the hand, suggesting incubation
	Building nest or excavating nest-hole
Confirmed Breeding	Distraction display or injury feigning
	Used nest or egg shells found (occupied or laid within the survey period)
	Recently fledged young (nidicolous species) or downy young (nififugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful.
	Adults entering or leaving nest site in circumstances indicating occupied nest or adult sitting on nest
	Adults carrying food for young or faecal sacs
	Nests containing eggs
	Nest with young seen or heard

EOAC and BTO Guidelines (combined)

APPENDIX 3

Desk Study Returns within 2km

Appendix 3 Desk Study Returns within 2km

Common Name	Scientific Name	Number of Records	Amber	Red	S41	Schedule 1
Barn Owl	*Tyto alba*	12				**Y**
Bewick's Swan	*Cygnus columbianus*	2	**Y**		**Y**	**Y**
Black Kite	*Milvus migrans*	1				
Black Redstart	*Phoenicurus ochruros*	3		**Y**		**Y**
Black-headed Gull	*Chroicocephalus ridibundus*	11	**Y**			
Bohemian Waxwing	*Bombycilla garrulus*	8				
Brambling	*Fringilla montifringilla*	2				**Y**
Coal Tit	*Periparus ater*	11				
Common Bullfinch	*Pyrrhula pyrrhula*	15	**Y**		**Y**	
Common Buzzard	*Buteo buteo*	9				
Common Coot	*Fulica atra*	1				
Common Crossbill	*Loxia curvirostra*	2				
Common Cuckoo	*Cuculus canorus*	4				
Common Grasshopper Warbler	*Locustella naevia*	1		**Y**	**Y**	
Common Gull	*Larus canus*	6	**Y**			
Common Kingfisher	*Alcedo atthis*	11	**Y**			**Y**
Common Linnet	*Linaria cannabina*	13		**Y**	**Y**	
Common Moorhen	*Gallinula chloropus*	12				
Common Nightingale	*Luscinia megarhynchos*	5		**Y**		
Common Redpoll	*Acanthis flammea*	2	**Y**			
Common Redshank	*Tringa totanus*	1	**Y**			
Common Snipe	*Gallinago gallinago*	2	**Y**			
Common Starling	*Sturnus vulgaris*	51		**Y**	**Y**	
Common Swift	*Apus apus*	53	**Y**			
Common Tern	*Sterna hirundo*	2	**Y**			
Dunnock	*Prunella modularis*	40	**Y**		**Y**	
Eurasian Hobby	*Falco subbuteo*	6				**Y**
Eurasian Oystercatcher	*Haematopus ostralegus*	2	**Y**			
Eurasian Siskin	*Spinus spinus*	6				
Eurasian Skylark	*Alauda arvensis*	14		**Y**	**Y**	
Eurasian Treecreeper	*Certhia familiaris*	11				
Eurasian Wigeon	*Anas penelope*	1	**Y**			
Eurasian Woodcock	*Scolopax rusticola*	10		**Y**		
European Golden Plover	*Pluvialis apricaria*	5				
European Goldfinch	*Carduelis carduelis*	27				
European Greenfinch	*Chloris chloris*	20				
European Honey-	*Pernis apivorus*	1	**Y**			**Y**

Common Name	Scientific Name	Number of Records	Amber	Red	S41	Schedule 1
Buzzard						
European Nuthatch	*Sita europaea*	1				
Fieldfare	*Turdus pilaris*	10		**Y**		**Y**
Goldcrest	*Regulus regulus*	13				
Great black-backed Gull	*Larus marinus*	3	**Y**			
Great Cormorant	*Phalacrocorax carbo*	2				
Great Spotted Woodpecker	*Dendrocopos major*	15				
Green Sandpiper	*Tringa ochropus*	3	**Y**			**Y**
Green Woodpecker	*Picus viridus*	14				
Grey Heron	*Ardea cinerea*	3				
Grey Partridge	*Perdix perdix*	2		**Y**	**Y**	
Grey Wagtail	*Motacilla cinerea*	14				
Greylag Goose	*Anser anser*	2	**Y**			
Hawfinch	*Coccothraustes coccothraustes*	1		**Y**	**Y**	
Herring Gull	*Larus argentatus*	6		**Y**	**Y**	
House Martin	*Delichon urbicum*	11	**Y**			
House Sparrow	*Passer domesticus*	66		**Y**	**Y**	
Lesser Black-backed Gull	*Larus fuscus*	10	**Y**			
Lesser Redpoll	*Acanthis cabaret*	3		**Y**	**Y**	
Little Egret	*Egretta garzetta*	10				
Little Owl	*Athene noctua*	10				
Marsh Tit	*Poecile palustris*	7		**Y**	**Y**	
Meadow Pipit	*Anthus pratensis*	7	**Y**			
Mistle Thrush	*Turdus viscivorus*	8		**Y**	**Y**	
Northern Lapwing	*Vanellus vanellus*	4		**Y**	**Y**	
Northern Pintail	*Anas acuta*	1	**Y**			
Osprey	*Pandion haliaetus*	2	**Y**			**Y**
Peregrine Falcon	*Falco peregrinus*	1				**Y**
Pied Avocet	*Recurvirostra avosetta*	1	**Y**			**Y**
Pied Wagtail	*Motacilla alba*	24				
Red Kite	*Milvus milvus*	4				**Y**
Redwing	*Turdus iliacus*	11		**Y**		**Y**
Reed Bunting	*Emberiza schoeniclus*	12	**Y**		**Y**	
Ring Ouzel	*Turdus torquarus*	2		**Y**	**Y**	
Ringed Plover	*Charadrius hiaticula*	1		**Y**		
Rock Pipit	*Anthus petrosus*	1				
Sand Martin	*Riparia riparia*	2				
Short-eared Owl	*Asio flammeus*	2	**Y**			
Song Thrush	*Turdus philomelos*	20		**Y**	**Y**	
Spotted Flycatcher	*Musciapa striata*	4		**Y**	**Y**	

Common Name	Scientific Name	Number of Records	Amber	Red	S41	Schedule 1
Stonechat	*Saxicola rubicola*	2				
Stone-curlew	*Burhinus oedicnemus*	1	**Y**		**Y**	**Y**
Tawny Owl	*Strix aluco*	8	**Y**			
Tufted Duck	*Aythya fuligula*	4				
Turtle Dove	*Streptopelia turtur*	14		**Y**	**Y**	
Water Rail	*Rallus aquaticus*	2				
Whimbrel	*Numenius phaeopus*	1				
Willow Warbler	*Phylloscopus trochilus*	13	**Y**			
Wood Lark	*Lullula arborea*	1		**Y**		**Y**
Yellow Wagtail	*Motacilla flava*	3		**Y**	**Y**	
Yellowhammer	*Emberiza citrinella*	9		**Y**	**Y**	

APPENDIX 4

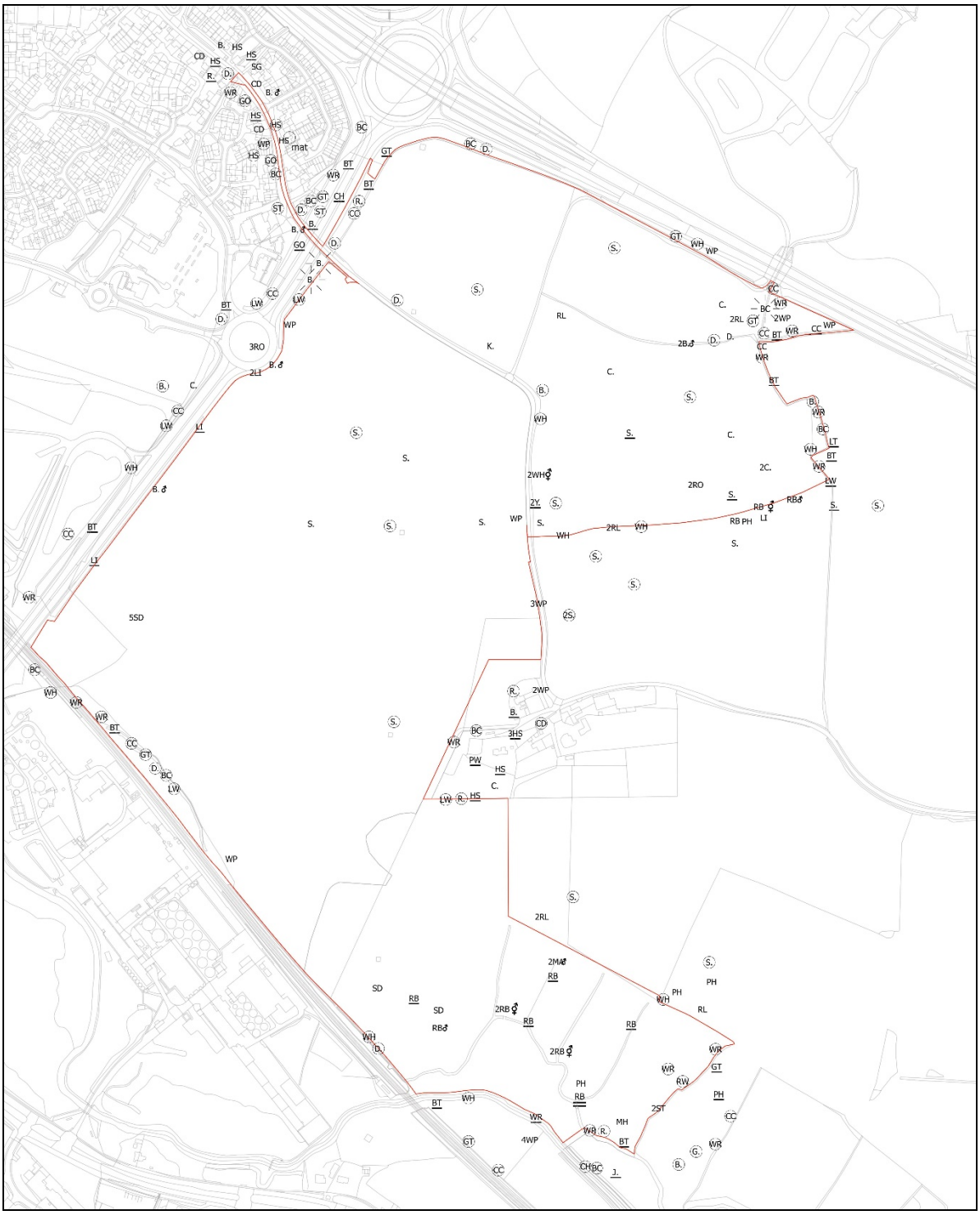
Breeding Bird Survey Results

Appendix 4 Breeding Bird Survey Results

For clarity details of flyovers, movements and simultaneous observations have been omitted from the following maps.

Symbols and codes follow methods from the BTO Common Bird Census (Marchant 1983).

Visit 1



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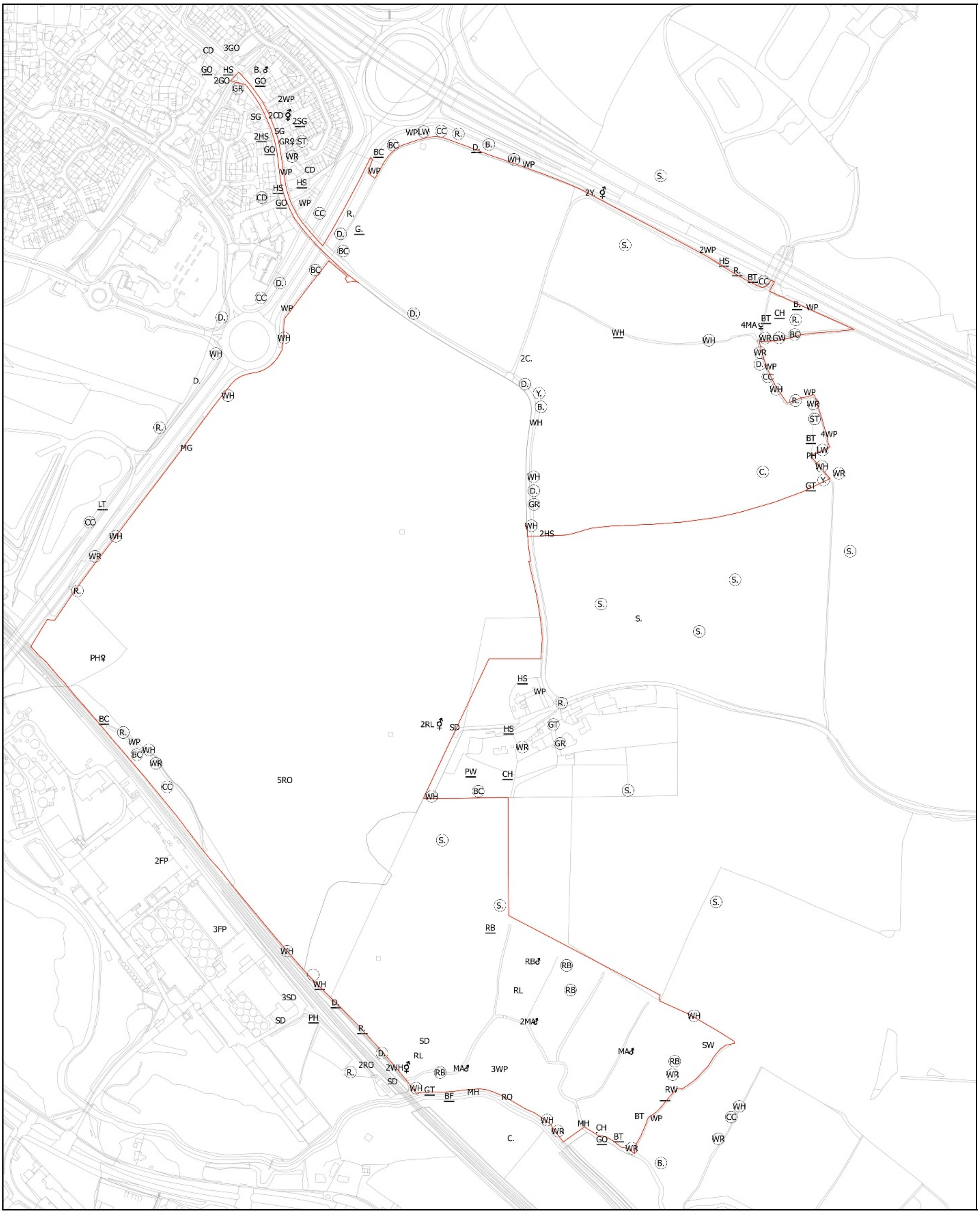
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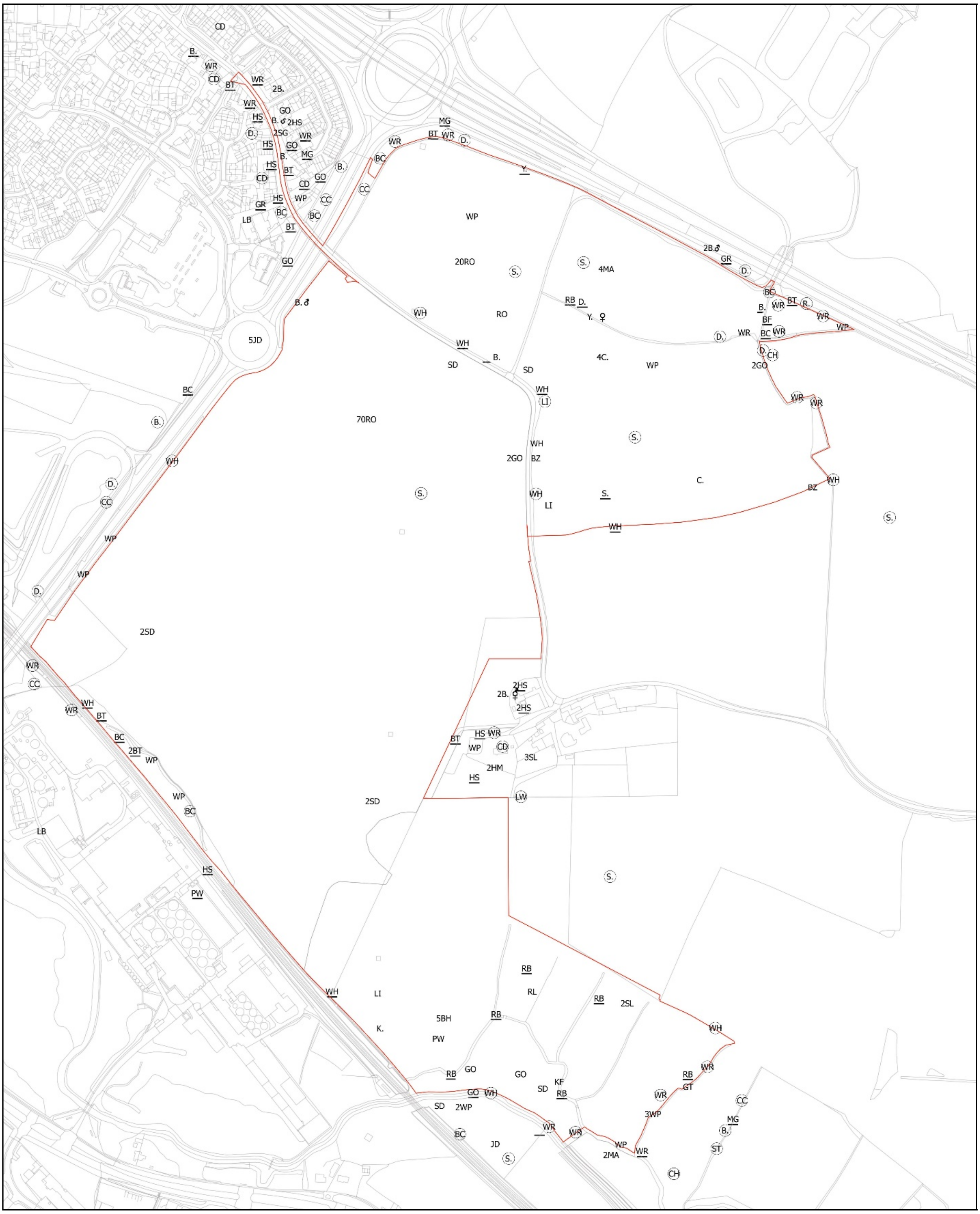

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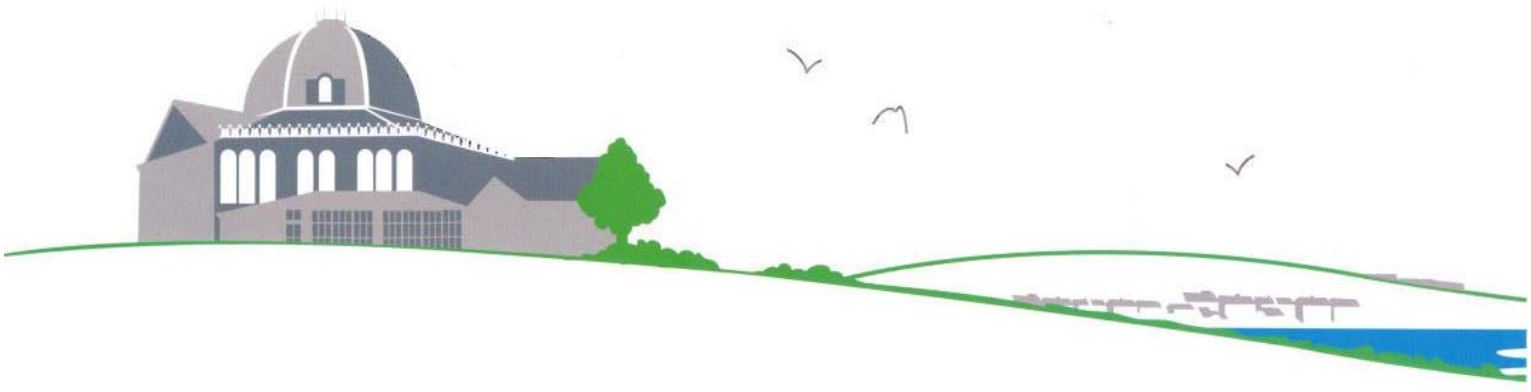
BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

EXTENDED PHASE 1 HABITAT SURVEY



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

EXTENDED PHASE 1 HABITAT SURVEY

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July 2019 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

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TABLES

FIGURES

APPENDICES

1. INTRODUCTION

Background

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Barbergh and Mid Suffolk District Council to carry out an extended Phase 1 habitat survey of a site off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site'). The site is proposed for re-development.

1.2 The ecological assessment included a desk study for the site and the area within 2km of its centre. The desk study examined all data records for protected sites, habitats and species held by the Suffolk Biodiversity Information Service (SBIS), the county biological records centre, as well as other data repositories, in order to ecologically characterise and contextualise the site within the surrounding area.

1.3 This report details the results of a desk study and site surveys and evaluates the results in the context of the proposed development of the site, making recommendations for any further survey work as required.

Site Description

1.4 The site covers an area of 67.132ha and is bounded to the north by the A41 dual carriageway and to the west by the A1120. A railway line forms the boundary to the south-west and farmland lies to the east. There are no built structures and the majority of the site is given to arable production with large fields divided by fencing and hedgerows with field margins

Legislative Context

1.5 The text below provides a brief summary of the legislation in relation to the species or species group in England and Wales. The original Acts, Regulations and any amendments should be referred to for the precise wording.

1.6 A range of international and national legislation has been established in the UK to protect important nature conservation sites and priority species. At the international level, European Union (EU) Directives require individual member states to implement their conservation provisions nationally for the benefit of Europe as a whole. These Directives have been transposed into UK law by the Conservation of Habitats and Species Regulations 2017; further details can be obtained from the Joint Nature Conservation Committee (JNCC) web site at www.jncc.defra.gov.uk.

1.7 Other international conventions include: the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979), which requires the maintenance of populations of wild flora and fauna, giving particular protection to endangered and vulnerable species; and the Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979), which requires the protection of migratory species throughout their entire range. The above conventions are implemented in England and Wales via the Wildlife and Countryside Act (WCA) (1981) (as amended) and Countryside and Rights of Way (CRoW) Act 2000. This legislation also protects important habitats and sites such as Sites of Special Scientific Interest (SSSI).

1.8 At the national level, the UK Post-2010 Biodiversity Framework published in 2012 is the Government's response to the Convention on Biological Diversity (2010). It describes the UK's biological resources, commits a detailed plan for the protection of these resources within the UK's devolved framework across England, Wales, Scotland and Northern Ireland. The document identifies future priorities for nature conservation and adopts a more strategic approach, including ecosystem services and sustainability alongside biodiversity. Despite administrative changes following devolution, there is still an underlying objective of protecting

and enhancing a range of priority species and habitats, often still based on the objectives and classifications of the original UK Biodiversity Action Plan (BAP). Biodiversity 2020 is England's national biodiversity strategy. Building on the Natural Environment White Paper published in 2011, this provides a means of delivering the international and EU commitments to biodiversity. Under Biodiversity 2020, Priority Species and Habitats referred to are those of 'Principal Importance' for the conservation of biodiversity in England listed on Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006.

1.9 Finally, the National Planning Policy Framework (NPPF), updated 2019, provides guidance for local authorities on the content of the Local Plans and is a material consideration in determining planning applications. Briefly, with an overall focus on sustainable development, the NPPF states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. The NPPF states that the planning system should contribute to and enhance the natural environment through a range of actions, including:

- protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils;
- recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services; and
- minimising impacts on biodiversity and providing net gains for biodiversity including establishing coherent ecological networks that are more resilient to current and future pressures.

1.10 To protect and enhance biodiversity and geodiversity, plans should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Invasive Species

1.11 Certain non-native species that have been introduced into the UK are regarded as being a threat to native biodiversity. Legislative measures have, therefore, been put in place to prevent the spread of these invasive species in the wild.

1.12 Under section 14 of the WCA 1981 (as amended), it is illegal to introduce plants listed under Part II of Schedule 9 of the WCA into the wild or sell these species. Offences include causing the spread of viable plant material or neglecting to contain or appropriately manage non-native species.

1.13 Commonly introduced Schedule 9 species include non-native cotoneaster species, specifically, small-leaved cotoneaster (*Cotoneaster microphylla*) and wall cotoneaster (*C. horizontalis*), Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Reynoutria japonica*).

Protected Species

1.14 Details of the protected species legislation relevant to this report can be found in Appendix 1.

2. METHODS

Desk Study

2.1 The desk study consisted of a consultation exercise to gather local and site-specific ecological information, the data from which, along with survey results, was used to assess the value of habitats and protected species at the site.

2.2 A request for records of protected and notable species and wildlife sites within 2km of the centre of the site was made to SBIS in April 2019.

Phase 1 Habitat Survey

2.3 Daytime site surveys were carried out by Ecologist Caroline Boffey on 29th and 30th May 2019. Caroline has appropriate practical experience in survey methods and the required knowledge, skills and experience set out in Chartered Institute of Ecology and Environmental Management (CIEEM) competency guidelines (CIEEM 2013).

2.4 The Phase 1 Habitat Survey methodology was based on guidance set out in the *Handbook for Phase 1 Habitat Survey* (JNCC 2010). Habitats were assessed based on the plant species present, with the results reported and presented on an annotated Phase 1 habitat survey map (see Figure 1). This habitat map details the location and extent of all habitat types recorded within the site boundaries. Habitat types were recorded, along with an indication of the relative abundance of each plant species using the 'DAFOR' scale (where D = dominant; A = abundant; F = frequent; O = occasional; R = rare; L = Locally). Common names for species are given in the text and a full list with common and scientific names after Stace (2019) is presented in Appendix 2.

Protected Species Assessment

2.5 The habitat survey was 'extended' (Institute of Environmental Assessment 1995, CIEEM 2017) to include a general assessment of the suitability of the site for supporting any protected or notable species. Features with suitability for any individual species were noted, together with any incidental field signs found such as footprints, feeding remains or sightings of animals themselves.

2.6 A number of trees were assessed for their bat roost potential. The assessment of suitability was based on the broad criteria outlined in the table below (after Collins 2016), combined with the professional judgement and experience of the surveyor in recognising suitable habitat features and field signs of bats

Table 1 Bat Roost Assessment Criteria

Suitability	Description of Roosting Habitats
Negligible	No features on site likely to be used by roosting bats.
Low	A tree of sufficient size to contain potential roost features but none seen from the ground or only those with very limited suitability. (i.e. suitable for occasional day roosting but unsuitable for maternity or hibernation roost.)
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost type of high conservation significance (i.e. suitable for day roosting but unsuitable for maternity or hibernation roost.)
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. (i.e. suitable for maternity and/or hibernation roost.)
Confirmed Roost	A tree with evidence of bat presence, i.e. droppings, feeding remains, audible bat calls heard during daytime survey or sightings of the animals themselves, existing (reliable) record of bats roosting at the location.

Limitations

2.7 It is important to note that the desk study results provide an indication of the species present in and around the site, but do not confirm current presence or absence of any particular species. Protected species are often under-recorded in county wildlife databases.

2.8 The weather conditions during the surveys were suitable being sunny and dry. Access was available to the whole of the site and the findings of the survey are considered to be robust.

3. RESULTS

Desk Study

Statutory Protected Sites

Special Area of Conservation

3.1 Special Areas of Conservation (SAC) are protected sites with strict conservation protection, designated under Article 3 of the European Commission Habitats Directive.

3.2 There are no SAC within the 2km search area

Sites of Special Scientific Interest

3.3 SSSI are statutory sites designated to support species of plants and animals that find it more difficult to survive in the wider environment. They represent a selection of this country's best wildlife and geological sites, and cover approximately 7% of the terrestrial area of the country (with over 4,000 separate sites in England).

3.4 There is a SSSI to the south-west of the site: Combs Wood.

3.5 Combs Wood is an ancient woodland owned and managed by the Suffolk Trust for Nature Conservation. It is notified for well developed coppice of hornbeam (*Carpinus betulus*) and a variety of woodland types that include pedunculate oak-hornbeam with ash and field maple and scattered stands of pedunculate oak. A more detailed description is given in Appendix 3.

Non-Statutory Protected Sites

Regionally Important Geological and Geomorphological Sites

3.6 Regionally Important Geological and Geomorphological Sites (RIGS) are locally designated sites of local, regional and national importance for geodiversity and protect important Earth Science and landscape features. They are conserved and protected from development as a material consideration through the planning system.

3.7 There are no RIGS within the search zone for the site.

County Wildlife Sites

3.8 The County Wildlife Sites (CWS) designation is in recognition of a site's high value for wildlife with many sites of county, regional and national importance. They may support characteristic or threatened species and habitats that are local and national priorities for conservation. Listed below and briefly described are the CWS within the search area. More detailed citation descriptions are presented in Appendix 4 and locations in Figure 2.

- River Gipping (12.62ha) – Supports diverse emerging fringe vegetation e.g. common reed (*Phragmites australis*), pond sedge (*Carex* riparia), bur-reed (*Sparganium erectum*), arrowhead (*Sagittaria sagittifolia*) and spiked water-milfoil (*Myriophyllum spicatum*). Valuable mixed coarse fishery (Class A).
- Stowland/Creeting St Peter (3.59ha) – Roadside nature reserve with sulphur clover (*Trifolium ochroleucon*) and pyramidal orchids (*Anacamptis pyramidalis*).
- Cedars Park Grasslands (3.1ha) – Large area of unimproved and semi-improved calcareous grassland. Species include: pyramidal orchid, hoary ragwort, wild parsnip, wild basil (*Clinopodium vulgare*) and grey sedge (*Carex divulsa*).

- Roadside Nature Reserve RNR 200 (0.05ha) – Chalk flora.
- Church Meadow (3.87ha) – Unimproved grassland including neutral grassland and wet grassland of high conservation value. Sulphur clover and early marsh-orchid (*Dactylorhiza incarnata*).
- Stowmarket Business Park Meadow (0.41ha) – Unimproved species-rich grassland and high density of flowering plants, some increasingly rare in Suffolk e.g. strawberry clover (*Trifolium fragiferum*), stone parsley (*Sison amomum*), purging-flax (*Linum catharticum*) and spiny restharrow (*Ononis spinosa*).
- Keyfield Groves (2.87ha) – Ancient woodland. Hazel and hornbeam coppice and ash stools indicating wood's antiquity. Southern area consists of field maple, elder, rose (*Rosa* sp.), elm and hazel. Large ash standards dominate the canopy.

Protected and Notable Species

Bats

3.9 Table 2 shows the number of each species of bat recorded in the search zone.

Table 2 Bat Records Provided by SBIS

Common Name	Scientific Name	No. of Records
Serotine bat	*Eptesicus serotinus*	1
Unidentified bat species	N/A	1
Daubenton's bat	*Myotis daubentonii*	1
Natterer's bat	*Myotis nattereri*	1
Pipistrelle species	*Pipistrellus spp.*	6
Nathusius's pipistrelle	*Pipistrellus nathusii*	1
Soprano pipistrelle	*Pipistrellus pygmaeus*	3
Brown long-eared bat	*Plecotus auritus*	1
Noctule bat	*Nyctalus noctula*	1
Lesser noctule	*Nyctalus leisleri*	1

3.10 The majority of the records returned are for pipistrelle species (*Pipistrellus* sp.). There are two native species - common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus)*. The common pipistrelle is one of the UK's most common bat species, found in a wide range of habitats including suburban and urban habitats. Soprano pipistrelle is also widely distributed across the UK. There are single records for other species.

3.11 Myotis species recorded include the Daubenton's bat (*Myotis daubentonii)*, which characteristically fly and forage over water sometimes taking prey directly from the water surface. The Natterer's (*Myotis nattereri)* bat is widespread, but scarce in the UK. The brown long-eared bat (*Plecotus auritus*) is found throughout the UK and is widespread in the rest of Europe. The noctule (*Nyctalus noctula)* bat is a tree dweller and roosts in rot holes and woodpecker holes. It is one of the largest British species and is usually the first to appear in the evening, sometimes before sunset. The serotine (*Eptesicus serotinus*) bat is also a relatively large bat, similar in size to the noctule. Their distribution is restricted to southern Britain. The

lesser noctule or Leisler's bat (*Nyctalus leisleri)* is found throughout Britain (Bat Conservation Trust 2019).

Section 41 Species

3.12 Some of the rarest and most threatened species are listed under Section 41 (S41) of the 2006 NERC Act as Species of Principal Importance. The Government's Biodiversity 2020 strategy has an ambition to ensure that by 2020 there will be an overall improvement in the status of wildlife and no further extinctions of known threatened species. To achieve this, a range of actions have been identified to help in the recovery of S41 species.

Birds

3.13 The majority of S41 species returned are for birds. These are listed in Appendix 5, along with their conservation status.

3.14 Please note that the number of records does not necessarily indicate the population size. Rarer species tend to attract the attention of recorders and some of the more common species may not be included in counts.

3.15 The Red and Amber conservation status assessment (Eaton *et al*. 2015) is based on a number of criteria: historical decline, trends in population and range, rarity, localised distribution and international importance. Nevertheless, some species remain relatively common, such as the common starling[1], dunnock *(Prunella modularis)* and house sparrow. Species are Red listed because of a 50% decline in their population and Amber listed species have suffered a 25% decline.

3.16 Schedule 1 species are protected under the WCA 1981 as amended by the Environmental Protection Act 1990. It is an offence to intentionally disturb any of these species during the breeding season without a valid licence. The Schedule 1 species recorded include a number of birds of prey including osprey, peregrine, red kite, Eurasian hobby and European honey-buzzard. Other species that are associated with the habitats at the site include barn owl, common kingfisher, redwing and fieldfare.

Mammals

European Badger

3.17 Badger (*Meles meles*) and their setts are protected under the Protection of Badgers Act 1992 in England and Wales. It is an offence to kill or injure a badger, or to damage, destroy or interfere with its sett or to allow a dog to enter a sett.

3.18 There are six records of unspecified badger signs within the 2km search area. Please note that information relating to badgers and their setts is confidential.

West European Hedgehog

3.19 Hedgehog (*Erinaceus europaeus*) is protected in the UK under the WCA 1981 and is classed as a Species of Principal Importance under Section 41 of the NERC Act 2006. Surveys in urban and rural areas indicate falling numbers of hedgehog.

3.20 There are 258 records of hedgehog in the search area.

[1] *Please see Appendix 5 Desk Study Bird Records for scientific names of species – common names are used in the text*

Brown Hare

3.21 Brown hare (*Lepus europaeus*) has little legal protection, as they are game animals managed by farmers and landowners.

3.22 There are records for three in the search area.

European Otter

3.23 The otter (*Lutra lutra*) is protected in the UK under the WCA 1981. Priority Species under the UK Post-2010 Biodiversity Framework. European Protected Species (EPS) under Annex IV of the European Habitats Directive.

3.24 By the 1970s otter numbers were in rapid decline thought to be caused by organo-chlorine pesticides. Since these were withdrawn from use, otters have been spreading back into many areas, especially in northern and western England.

3.25 There are nine records for otter, five of which are on the River Gipping.

European Water Vole

3.26 Water vole (*Arvicola amphibious*) are protected under the WCA 1981 and are Priority Species under the UK Post-2010 Biodiversity Framework. It is estimated that 90% of sites once occupied by water voles have been lost because of a combination of pollution, habitat loss and fragmentation and predation by American mink (*Neovison vison*) over recent years.

3.27 There are five records for water vole largely along the River Gipping.

Harvest Mouse

3.28 The harvest mouse (*Micromys minutus*) is protected under the WCA 1981 and a Priority Species under the UK Post-2010 Biodiversity Framework. They have become much scarcer in recent years thought to be related to changes in habitat management and agricultural methods.

3.29 There are ten records for harvest mouse, all reported from near to the village of Creeting St Peter.

Amphibians

Great Crested Newt

3.30 Great crested newts (*Triturus cristatus,* GCN) are protected under the Conservation of Habitats and Species Regulations 2017, WCA 1981 (as amended) and are an EPS. Protection is afforded to their eggs, breeding sites and terrestrial resting places.

3.31 There are three records for GCN, two from Combs Wood and one simply listed as being from a 'pond'.

Smooth Newt

3.32 The smooth newt (*Lissotriton vulgaris*) is protected under Schedule 5 of the WCA 1981 and it is illegal to sell individuals. It is the most common of the native newts.

3.33 There are two records for smooth newt.

Common Toad

3.34 The common toad (*Bufo bufo*) is protected in the UK under the WCA 1981. Priority Species under the UK Post-2010 Biodiversity Framework.

3.35 There are three records of common toad in the search area.

Common Frog

3.36 The common frog (*Rana temporaria*) is protected in the UK under the WCA 1981.

3.37 There are three records for common frog

Reptiles

3.38 All reptiles are protected under the WCA 1981 (as amended), making it illegal to intentionally kill or injure a common reptile. Rare reptiles (smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*)) also receive legal protection under the Conservation of Habitats and Species Regulations 2010.

3.39 Two records were returned for common lizard (*Zootoca vivipar*), 11 for slow-worm (*Anguis fragilis*) mainly in Badley Wood and nine for grass snake (*Natrix natrix*), the majority recorded in Combs Wood.

Invasive Species

3.40 Under section 14 of the WCA 1981 (as amended), it is illegal to introduce plants listed under Part II of Schedule 9 of the WCA into the wild or sell these species.

3.41 There are records for Himalayan balsam and Japanese knotweed. American mink have also been recorded, which is of concern given the records for the native water vole in the search area. American mink are an active predator, feeding on ground-nesting birds and water voles.

Phase 1 Habitat Survey

Overview of Site

3.42 The main habitats on the site are shown on the extended Phase 1 habitat map 2019 (Figure 1), with botanical species lists for each habitat presented in Appendix 2. Target notes on Figure 1 denote species of interest where they were observed during the survey and also identify areas which have the same habitat classification but different characteristics. A selection of illustrative photographs of the site is presented in Appendix 6.

3.43 The site comprises predominantly arable fields, mainly wheat and barley at the time of the survey, with a small part-field of beet towards the south. A tarmac road with grassy verges, Mill Lane, cuts through the site, separating the three crop fields to the north and the much larger crop field to the south. The site extends in a narrow strip along Mill Lane, partway into the housing area to the north-west. A tarmac/concrete track runs perpendicular to Mill Lane, through the arable fields to the north then alongside the grassy/scrubby bank of the main A14 road, where it exits the site through a tunnel under the road.

3.44 A narrow, improved grassland track borders the poor semi-improved grassland fields and extends in a strip along the edge of the beet crop.

3.45 Two sections of managed hedgerow border the road verges north of Mill Lane with adjacent roadside ditches. A third section of hedgerow separates the crop fields in the north-east of the site.

3.46 There are several small areas of semi-natural broadleaved woodland at the edges of the site and a patch of willow carr near to the railway line. A cluster of mature/semi-mature trees are present along Mill Lane near to the road bridge at the north-west and scattered trees in the semi-natural area to the south of the site. Otherwise, trees are generally scarce within the main part of the site. Bramble has established along the boundary next to the railway track in the south.

3.47 The site is set within a wider arable landscape, with crop fields to the north, east and further away to the south. Boundary hedgerows and lines of trees create linear corridors for wildlife and there are occasional patches of woodland/scrub, including Combs Wood SSSI, which lies within 2km to the south-west of the site.

3.48 The town of Stowmarket is to the west of the site, with a large supermarket and Cedars Park Grassland CWS with unimproved/semi-improved calcareous grassland nearby to the south west. Busy roads fringe the site to the north and west, with embankments of neutral grassland/scrub adjacent and within the site boundary. A notable area of grassland is RNR 169 CWS roadside nature reserve at the large roundabout to the north of the site.

3.49 A railway line borders the south-west boundary of the site, with a factory on the opposite side of the line.

Main Habitat Types Present

3.50 The site chiefly comprises the following habitats, as shown on Figure 1:

Arable Fields

3.51 Arable cereal cropping is the predominant land use on the site. There is a large field to the south-west of the site (Photo 1) and three fields to the north-east of the site (Photo 2). A narrow strip of cultivated bare soil, up to 1m wide, is present along the edges of the crop; this has been sprayed with herbicide on the field to the south-west where it is devoid of arable plant species in the margins. Within the crop margins around the fields north of the road, however, are eight isolated small populations of the rare arable plant, shepherd's needle (Photo 3). Shepherd's needle is classed as a Red Data List Critically Endangered species in Great Britain and Endangered in England. The exact locations of the populations were marked with GPS and are shown as a purple star on Figure 1.

3.52 There is a small area of beet crop towards the south of the site where the site boundary cuts partially through the field (Photo 4).

3.53 Grassland margins, of various widths, surround the arable fields; these are described more fully in the following paragraphs.

Neutral Grassland with Calcareous Influences – Unimproved

3.54 Along the western edge of the southern cereal crop field is a species-rich margin, between 6-10m wide, of unimproved neutral grassland with calcareous influences, which forms a border to the site (Photo 5 and 6). Smooth meadow-grass and red fescue are abundant with frequent cock's-foot and crested dog's-tail grasses. Forbs are abundant, with bristly oxtongue and wild carrot, both species which favour calcareous soils, occurring frequently to abundantly throughout the sward. Other prominent species include lesser trefoil, hoary ragwort, common vetch and ribwort plantain. Oxeye daisy is occasional and wild parsnip patchy. Cowslip and the uncommon species grass vetchling (Photo 7) occur rarely. Perennial rye-grass, a species of improved grassland, is present only at low frequency in the sward. The grassland is flattened in part, having been driven along.

3.55 There are also two strips of species-rich unimproved neutral grassland either side of the ditch on the south-east side of the crop field (Photo 8).

Neutral Grassland – Semi-improved

3.56 The wider grassland margin (TN2) along the south-western edge of the site, adjacent to the railway line, is grassier and less forb-rich. Taller grasses of cock's-foot and false oat-grass are abundant, with other shorter grassy areas of locally abundant soft brome and perennial rye-

grass (Photo 9 and 10). Lesser trefoil is constant and abundant in the sward with frequent cut-leaved crane's-bill and smooth tare.

3.57 The grassy verges alongside Mill Lane and the margins around the edges of the fields to the north of the road are semi-improved neutral grassland, with false-oat grass, cow parsley, hogweed and perennial rye-grass prominent in the sward (TN3) (Photo 11 and 12).

Improved Grassland

3.58 The narrow vegetated track approximately 2m wide along the edge of the meadow fields is perennial rye-grass-dominated improved grassland with locally abundant rough meadow-grass. The improved grassland strip continues at the end of the beet crop, where the grass is taller (Photo 4).

Tall Ruderal Vegetation

3.59 There are two small patches of common nettle-dominated tall ruderal vegetation at the edges of the poor semi-improved field in the south-east corner of the site.

Scrub

3.60 There is a small area of grey willow-dominated wet woodland scrub with common nettle-dominated ground flora next to the railway line. Wet woodland is classified as a Section 41 Habitat of Principal Importance and BAP Priority Habitat. The willow carr extends from an area of hawthorn scrub.

3.61 Other areas of scrub on the site are bramble along the field edge next to the poor semi-improved grassland meadows and occasional bramble and blackthorn next to the ditches.

3.62 There is scattered scrub over semi-improved neutral grassland on the embankment next to the main road A1120.

Broadleaved Woodland – Semi-natural

3.63 A patch of semi-natural broadleaved woodland (TN4) is present near the railway (Photo 9), adjacent to the willow carr. Ash is the dominant tree, with occasional white and grey willow and locally abundant suckering English elm, other woody species are rare. There are signs of ash dieback on the ash saplings. Common nettle and cleavers dominate the ground flora, with an associated wide range of species including arable weed species and garden escapees. There were no bird nests or Potential Roost Features (PRF) seen in the trees at the time of the survey.

3.64 There are two small semi-natural broadleaved woodlands in the north-east of the site: the smaller woodland (TN7) (Photo 13 and 14) has a range of native species with blackthorn, grey willow and English elm frequent and a carpet of dog's mercury in the ground vegetation. There are three mature pedunculate oaks within the woodland, none of which were seen to have PRF or bird nests. The slightly larger woodland (TN8) was dominated by ash with frequent blackthorn and a range of other tree species. Cleavers and false oat-grass are prominent in the ground vegetation.

Scattered Trees

3.65 There is a small cluster of trees alongside Mill Lane at the north-western edge: three semi-mature/mature Norway maples along the southern verge and four mature field maples, one immature ash tree and a semi-mature wild cherry along the northern verge. None of the trees contained PRF.

3.66 There is a mature pedunculate oak, T1 (Photo 15), with a young English elm growing beneath it, present within the margin of the crop field in the north of the site. This was assessed against

the criteria outlined in Table 1 for bat roost potential and found to have moderate roost potential.

Hedgerows

3.67 The three sections of hedgerow on the site are intact, managed, 1-2m high and contain a number of woody species, in varying proportions. None of the hedgerows, however, meet the criteria to classify as Important Hedgerows under the Hedgerow Regulations, 1997.

3.68 Hedgerow H1 is predominantly field maple with frequent hawthorn and occasional dogwood and dog rose. Other species of wild cherry, ash, blackthorn and elder occur rarely (Photo 11 and 12).

3.69 Field maple is also the dominant species in Hedgerow H2, with occasional blackthorn, dogwood and dog rose. English elm and hawthorn are locally frequent and the other woody species of hazel, grey willow and ash occur rarely. The ground flora underneath the hedgerow is species-poor.

3.70 English elm, field maple and blackthorn are the most frequently-occurring woody species in hedgerow H3, with occasional dogwood and dog rose. Other species of holly, hawthorn and elder occur rarely. Cleavers is dominant in the ground flora.

Lines of Trees/Scrub

3.71 There are two short sections of tree lines along the south-west field edge next to the railway track, with Norway maple the most frequently occurring tree. These lines widen out into the area of semi-natural broadleaved woodland and patch of willow carr.

3.72 At the north-east edge of the site there is a line of scrub and trees next to the ditch along the edge of the site, with abundant blackthorn, frequent hazel and several other species at lower frequency.

Ditches/Marginal Vegetation

3.73 There are several ditches across the site with different characters and vegetation assemblages.

3.74 North of Mill Lane, the ditch along the north-eastern edge of the site is deep, with shallow water at the time of the survey, but lacking in vegetation. The wet ditch to the west of the triangle of woodland (TN8) is well vegetated with abundant fool's watercress and occasional water-cress. An animal track crosses the bank of the ditch into the woodland. There are narrow, vegetated roadside ditches next to the hedges H1 and H2 and a dry ditch along the edge of the crop field to the east of Mill Lane.

Hardstanding

3.75 The tarmac road of Mill Lane cuts north-east to south west, from the built-up residential area through the site. A narrower tarmac track leads off Mill Lane, becoming concrete where it turns the right hand bend and then runs parallel to the main A14 road. The tarmac and concrete hardstanding is devoid of plant species other than on the concrete pavements on the road bridge section over the A1120 road, where there are occasional ruderal species as found elsewhere on the site.

Protected Species Assessment

3.76 The potential of habitats on site to support protected or notable species are set out below.

Birds

3.77 Skylark were heard in two of the cereal crop fields within the site and a crop field adjacent to the site (Target Note 1). Skylark nest on the ground and favour habitats where the vegetation is not too dense or tall and where they can access a seed resource from the plants surrounding the crop.

3.78 A buzzard (*Buteo buteo*) was also heard on the site (Target Note 6), a kestrel (*Falco tinnunculus*) was seen hovering over the meadows at the south of the site (Photo 24) and a flock of crows (*Corvus* sp.) was present in the beet field.

3.79 The varied habitats on site of ditches, swamp, hedgerows, woodland, scrub, grassland and arable margins in and close to the site provide a range of habitats for a variety of bird species.

Bats

3.80 One mature oak tree T1 was assessed as having PRF and moderate potential.

Other Protected Species

GCN

3.81 GCN have been recorded within the search area and there is a population at Church Meadow CWS, approximately 2km from the site.

3.82 The ditches to the south-east and within 250m of the site boundary contain water and could potentially support breeding populations of GCN.

Brown Hare

3.83 A brown hare was seen running out of the long grass in the meadow at the south of the site (Target Note 5).

4. EVALUATION

Habitats and Botanical Interest

4.1 The site contains a number of habitats and botanical species of interest:

4.2 The species-rich grassland margins, particularly the two unimproved neutral/calcareous grassland margins of the largest crop field, contain a wide variety of species including wild parsnip, cowslip and grass vetchling.

4.3 There are three CWS in close proximity to the site. In addition to RNR 169 there are Cedars Park Grassland and Suffolk Business Park Meadow, which have species-rich calcareous/neutral grassland and a number of notable plants such as sulphur clover, pyramidal orchids, ploughman's-spikenard (*Inula conyzae*) and bee orchids (*Ophrys apifera*). The species-rich grassland margins of the site add to this local repository of species-rich habitat.

4.4 A species of considerable importance is the rare annual Shepherd's needle found in sections of crop margins around the fields to the north of Mill Lane.

4.5 The small areas of semi-natural broadleaved woodland, scrub, trees and hedgerows also provide habitat for birds, bats and other animals.

4.6 Section 41 Habitats of Principal Importance present include grey willow wet woodland and hedgerows.

Protected Species

4.7 In the course of the field survey a number of protected and notable species were recorded.

4.8 Birds included Red listed skylark were heard in three of the cereal crop fields within and adjacent to the site (Target Note 1). A buzzard was heard in the crop field to the north (Target Note 6) and the Amber listed kestrel was seen hovering over the poor semi-improved meadows to the south of the site.

4.9 As noted earlier a single mature (T1) was assessed as having bat roost potential. The invertebrates associated with the river corridor, ditches, grasslands, scrub and wooded habitat are likely to be an important food source for bats.

4.10 Several of the habitats on site are suitable for reptiles and the desk study identified records of common lizard, slow-worm and grass snake. Common lizards are associated with a wide range of habitats, some found within the site: woodlands and hedgerows.

4.11 The flower-rich margins provide nectar sources for invertebrates and during the survey a red-tailed bumblebee (*Bombus lapidarius*) and common blue butterfly (*Polyommatus icarus*) were seen.

5. RECOMMENDATIONS

Bats

5.1 The mature oak (T1) with moderate bat roost potential should be surveyed if it is to be impacted by the proposed development, in keeping with good practice guidelines (Collins 2016). This would involve two dusk and/or dawn surveys or a combination. This will be reviewed once the final Masterplan for the site has been determined.

Birds

5.2 The site and the extent of the proposed development are large and habitat changes that would affect bird's breeding and foraging habitat are likely. It is recommended that a breeding bird survey is carried out informed by best practice guidelines. The survey methodology would be based on the breeding bird survey methodology devised jointly by the British Trust for Ornithology (BTO), the Royal Society for the Protection of Birds (RSPB) and the JNCC (Gilbert *et al.* 1998). This methodology requires three visits to be made between late March and early July, with each visit being approximately four weeks apart.

5.3 As part of the survey it would be important to determine how the site is being utilised by skylark, to locate nesting sites and map their territories. Two skylarks were heard in the cereal crop fields and another outside the site in an adjacent field during the Phase 1 survey (Target Note 1). The foraging habitat for skylark will be reduced as a consequence of the development and suitable alternative areas would need to be found. The poor semi-improved meadows to the south of the site were considered for potential as skylark habitat post-development. However, the grass at present is too long and dense to be favourable nesting habitat and the fields were damp in parts, particularly further towards the east, which would discourage nesting skylark.

Badger

5.4 There are records for badger within the desk study search area. Badgers are common and widespread in Britain. In the UK, it is estimated that there are 288,000 badgers, 190,000 of which are in England (Battersby 2005). It is recommended that a detailed badger survey is carried out with the objective of: locating any badger setts on or close to the site and identify the impacts of development and provide necessary recommendations to minimise any potential impacts to badgers.

5.5 The survey method would be based on the standard approach detailed in the Mammal Society publication *Surveying Badgers* (Harris *et al*. 1991) and used during the National Badger Survey (Cresswell *et al.* 1990) and *Surveying for Badgers* (Scottish Badgers 2018). This involves searching for field signs associated with badgers, including setts, runs, foraging activity, latrines and footprints.

Reptiles

5.6 There is suitable reptile habitat on site and it is recommended a reptile survey is carried out. The purpose of the surveys would be to ascertain if reptiles are present on or immediately adjacent to the site and provide recommendations for appropriate mitigation where necessary. The survey would be informed by a number of established protocols using a combination of direct observation and artificial refuge surveys, in line with current best practise guidelines in the *Reptile Mitigation Guidelines* (e.g. Natural England 2011; Draper 2015; Gent and Gibson (2003). Peak months for reptiles are April and May and later in the year between late August and late September.

Amphibians

5.7 There are a number of wet ditches and suitable terrestrial habitat to support amphibians to the south-east and within 250m of the site boundary. The desk study returned records for common toad, common frog, smooth newt and GCN. The latter is an EPS. It is recommended that the ditches are initially assessed for their potential to support GCN using the Habitat Suitability Index (HSI) (Oldham *et al.* 2000; ARG, 2010). The HSI score is calculated by allocating scores to a range of factors that reflect the potential suitability of a waterbody to support GCN. These include the geographical location of the waterbody, the number of waterbodies within 1km, surface area and permanence, biological water quality, shading, presence of fish and birds, coverage of macrophytes and the suitability of surrounding terrestrial habitat.

5.8 Depending on the results of the HSI assessment further surveys may be seen as necessary. This could be by using eDNA analysis of water samples, which can be used to determine if GCN are present or absent. If GCN are detected then further surveys are required following 'traditional' methods of bottle trapping, netting torching and egg searching to estimate the population class. It is possible that works within 250m of a waterbody with GCN would require a Natural England mitigation license.

Retention of Priority Habitats and Notable Species

Hedgerows

5.9 There are a number of hedgerows present that would benefit from management and additional planting. Hedgerows are a Priority Habitat providing visual screening, function as field boundaries and are a key element of the cultural landscape.

5.10 Hedgerows are important ecological assets and green infrastructure and provide habitat for invertebrates and food sources for bats and birds, as well as roosting and nesting opportunities. Many bat species are reluctant to cross open ground and linear features, such as hedgerows and tree lines provide flight paths between roosts and foraging sites. They are important ecological corridors, promoting genetic exchange and colonisation that link greenspaces. For these reasons, the loss of hedgerows should be avoided.

5.11 Native trees and shrubs can be selected to create any new hedges and fill gaps in existing hedgelines, especially those that provide flowers and berries for insects and birds. Hawthorn, blackthorn and hazel are excellent species for hedge creation and field maple, holly, wild privet (*Ligustrum vulgare*), dog rose and buckthorn (*Rhamnus cathartica*) can be included to add variety and diversity.

Woodland

5.12 Patches of woodland and mature standard trees should be retained wherever possible. Woodland management should aim to create a mixed age structure, with thinning and coppicing carried out to allow some light to reach the ground to benefit the understory and herbaceous ground-flora species. Thinning and woody material would be bailed and retained *in situ* to form brash bundles and log piles to support invertebrates and provide refugia for reptiles and amphibians.

Shepherd's Needle

5.13 If the crop fields north of Mill Lane are to be affected by development, then seed from the rare shepherd's needle plants in the crop margins should be collected post-flowering, or the seedbank surrounding the individual plants collected. This seed/seedbank should be translocated to an alternative suitable receptor area of cultivated margin of similar pH and

nutrient status and free from competing weed species of cleavers, grasses, docks and thistles (Plantlife 2019).

Grassland Margins

5.14 As species-rich grassland is a greatly reduced habitat in the UK, it is recommended that the unimproved neutral grassland margins are retained on site post-development if possible. The grassland should be maintained by mowing post-flowering with removal of the arisings to maintain low soil fertility and prevent competing species getting established and reducing species diversity. If the habitat is not possible to be retained it is recommended to be translocated to a suitable alternative receptor site of soil of similar pH and low soil fertility.

Additional Habitat Enhancement Opportunities

5.15 National Planning Policy requires that opportunities for ecological enhancement are sought within all development proposals, moving towards the aim of 'biodiversity net gain'. To achieve this, projects must be considered on an individual basis to ensure that new features, planting and management regimes are suitable for the conditions on site and thus likely to be successful in the longer term. Below are a number of general considerations for enhancement measures.

Native Species

5.16 Planting schemes used in urban environments often include non-native species. These may be selected for their aesthetic appeal, pollution tolerance, evergreen foliage and low maintenance, and many nectar-bearing exotic species do support insects and provide foraging and nesting opportunities for birds. However, native species, preferably of local provenance, tend to support greater biodiversity as they have adapted to the local conditions. Wherever practical, native trees and shrubs should be selected in the landscape design.

Artificial Refugia

Bird Boxes

5.17 Where practical, bird boxes can be installed, targeted towards species currently known to utilise the site and its surrounds, to potentially accommodate a range of small birds. Traditional nest boxes can be attached in locations around the site on the south-west or south-eastern side of buildings, or nesting cavities of appropriate dimensions for a range of bird species can be incorporated in the façade of new buildings. Advice on suitable target species, nest internal dimensions and entrance sizes can be provided by a suitably qualified ecologist.

Bat Boxes

5.18 Building standards that demand greater insulation tend to remove features that traditionally have been used by bats and birds. Loss of natural roosts has increased the importance of man-made structures for bats and artificial roosts are becoming essential for the survival of many bat species. Bat boxes installed facing south-west, south-east and north would provide additional roosting opportunities for commuting and feeding bats in various weather conditions.

Bat Bricks

5.19 Bat roosting sites, often referred to as 'bat bricks' can be incorporated within the structure of new buildings, e.g. in place of the usual building bricks. A range of designs and materials are available including traditional brick shapes (e.g. Bioquip www.bioquip.net/acatalog/boxes_for_building.html) as well as concrete and 'woodcrete' models. These would be best placed on the south-west or south-east side of buildings.

Lighting Design

5.20 Artificial lighting can be disturbing to wildlife, particularly species such as bats that are nocturnal and adapted to forage in low-light conditions. Even if no roost is present on site, it would be good practice to adopt a sensitive lighting scheme to maximise biodiversity value post-development, with consideration given to the following points:

- Directing lamps where they are needed to avoid unnecessary light spillage;
- Use of narrow spectrum light sources with low ultra-violet, blue or white wavelength component to minimise insect attraction at lamps;
- Avoiding illumination of features and habitats that are likely to have the greatest value to bats, such as tree canopies and ponds; and
- Use of timers and/or motion sensors to limit periods of illumination to essential times only.

5.21 Further guidance on lighting specifications is provided in publications available from the Bat Conservation Trust website (www.bats.org.uk). This includes the impacts of different types of lighting (RCEP 2009), effects of artificial lighting on bat behaviour (Stone 2013) and guidelines for mitigation (Bat Conservation Trust 2014).

Green Roofs

5.22 Green roofs (living roofs) are intrinsically of greater benefit to biodiversity than more traditional roofing methods. Green roofs can vary in their appearance and character. They can be designed to support low-growing mosses and sedums, wildflowers and grasses.

Mitigation during Construction

5.23 Appropriate general mitigation measures to avoid adverse effects during the construction phase of the development will comprise:

- Ensuring that work compounds and access tracks etc. are not located in, or adjacent to, areas that maintain habitat value e.g. hedgerows and trees;
- Establishing protection zones around the retained trees and waterbodies, which are clearly marked out to be visible to site operatives both on foot, in vehicles and when using machinery;
- Install temporary site fencing to prevent access to areas outside working areas, particularly in areas adjacent to features of ecological interest/value;
- Implementing procedures to cover site safety issues, including storage of potentially dangerous materials and have at hand spill kits for any potentially contaminating operations such as refuelling of vehicles and machinery;
- Providing briefings and instruction to contractors regarding the biodiversity issues present on the site;
- Establish protocols and contingency plans for dealing with incidents, should they arise such as spillages; and
- Trenches and excavations should be covered at night to avoid mammals such as badger and hedgehog becoming trapped.

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7. ABBREVIATIONS

BAP	Biodiversity Action Plan
BTO	British Trust for Ornithology
CIEEM	Chartered Institute of Ecology and Environmental Management
CRoW	Countryside and Rights of Way
CWS	County Wildlife Site
EPS	European Protected Species
EU	European Union
GCN	Great Crested Newt(s)
HSI	Habitat Suitability Index
JNCC	Joint Nature Conservation Committee
NERC	Natural Environment and Rural Communities
NPPF	National Planning Policy Framework
PAA	Penny Anderson Associates Ltd
PRF	Potential Roost Feature(s)
RIGS	Regionally Important Geological and Geographical Sites
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBIS	Suffolk Biodiversity Information Service
SSSI	Site of Special Scientific Interest
WCA	Wildlife and Countryside Act

FIGURES

606200 606400 606600 606800 607000 607200 607400 607600 607800 608000

258600 258400 258200 258000 257800 257600 257400 257200 257000

A14 47 49 51 A14 A140 Debenham Stowmarket Lavenham Claydon

SI H1 H2 H3 Qr Rf Sxci Fe Sxf Pc Cxri

A I

Cxri	Carex riparia	greater pond sedge
Fe	Fraxinus excelsior	ash
Pc	Phragmites communis	common reed
Qr	Quercus robus	pedunculate oak
Rf	Rubus fruticosus agg.	bramble
Sxci	Salix cinerea	grey willow
Sxf	Salix euxina	crack willow

Legend

- Boundary

Habitat

- Broadleaved woodland - semi natural
- Continuous scrub
- Neutral grassland - semi improved
- Neutral grassland - semi improved and scrub
- Neutral grassland with calcareous influences - unimproved
- Improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Swamp
- Marginal vegetation
- Wet ditch
- Dry ditch
- Arable
- Hardstanding
- River
- Scrub
- Scrub and trees
- Hedge
- Fence
- Tree
- Scattered scrub
- Shepherd's needle
- 250m buffer of ditch D8

N

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

Metres
0 25 50 100 150 200

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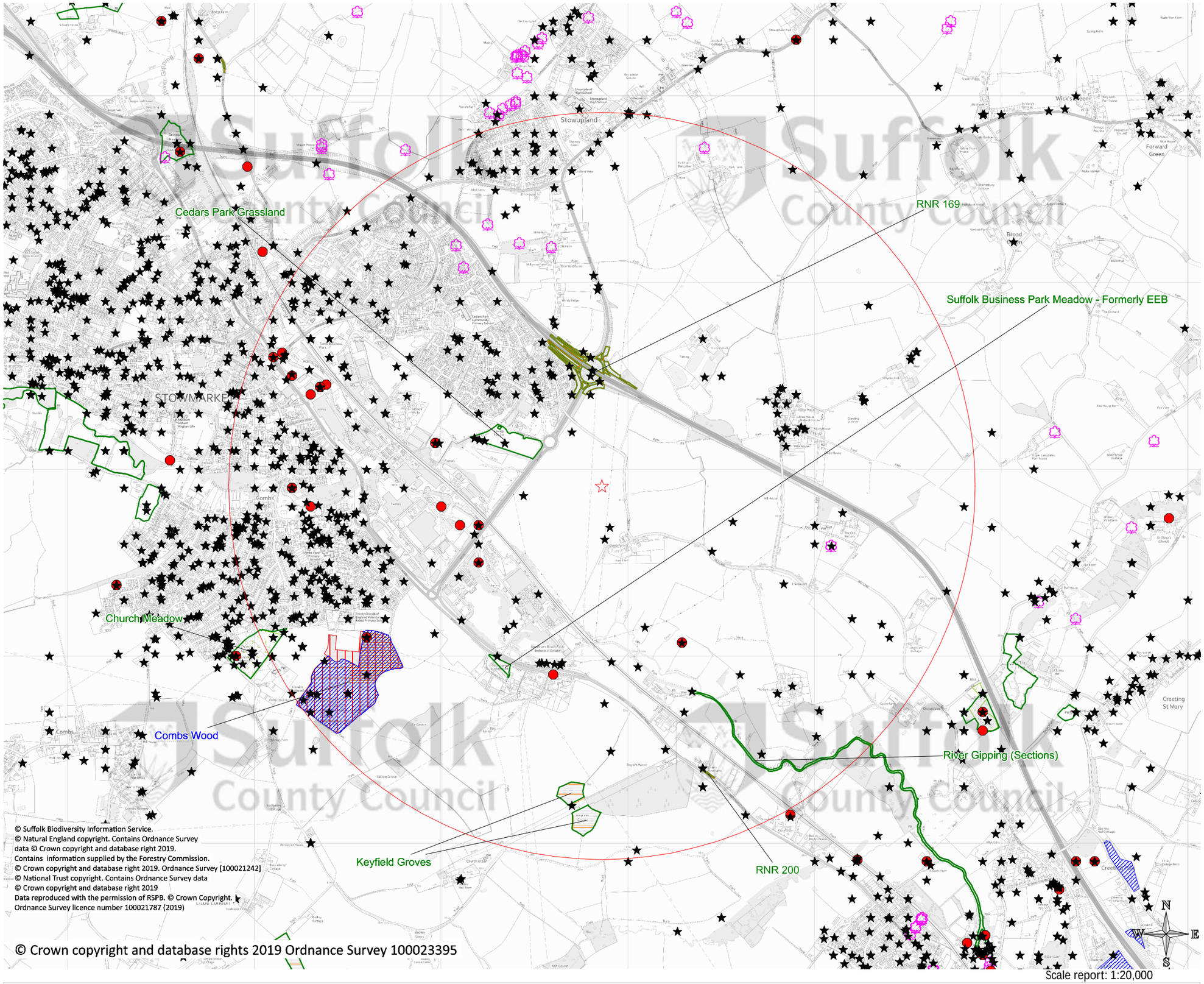
Project Name: Mill Lane, Stowmarket

Discipline: Ecology

Title: Phase 1 Habitat Survey

Scale 1:6,500		Drawing No. Figure 1	
Drawn By MDM	Originator GJH	Date 16/10/2020	
PAA Ref.		Revision 1.0	

Figure 1 BAMS01_Phase1_MDM_151020.mxd



Scale report: 1:20,000

Data Enquiry
- Search Point
- Search Area

Protected, Locally Scarce and Rare Species
- Record Locations (for grids of 6 fig. or greater)

Schedule 9 Species
- Record Locations (for grids of 6 fig. or greater)

Ancient/Veteran/Notable Trees

Roadside Nature Reserve

County Wildlife Sites

County GeoSites

SSSI

LNR

SPA

SAC

RAMSAR

NNR

SWT Reserve

Ancient Woodland Inventory

AONB
- Suffolk Coast and Heaths or Dedham Vale

National Park
- The Broads

Other Public or Conservation Ownership/Management
- Forestry Commission, National Trust (public access), RSPB (public access)

Figure 2. Wildlife Sites

Penny Anderson (Stowmarket TM0686057910) 2km Data Enquiry

SBIS
Suffolk Biodiversity Information Service

Date: 29/04/2019 | Drawn by: Andy Mercer

APPENDICES

APPENDIX 1

Summary Protected Species Legislation

Penny Anderson Associates Ltd
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SUMMARY OF THE LEGISLATION RELATING TO BADGERS AND THEIR SETTS

Badgers (*Meles meles*) are not an endangered species but have a long history of persecution and cruelty. As such, badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended), which makes it illegal for any person to kill, injure or take a badger. It is also an offence to destroy, damage or obstruct a badger sett, or to disturb a badger whilst it is within a sett. There are also additional offences relating to possession of, buying and selling a dead badger, or anything derived from a badger, and causing a dog to enter a sett.

The Act defines a sett as 'any structure or place which displays signs of current use by a badger'. Setts are defined by English Nature (1995) as 'usually underground tunnel systems providing shelter for badgers, but may include other structures used by badgers such as hay bales, drainage culverts, or cellars'. 'Current use' is more difficult to define but is usually interpreted by the presence/absence of badger field signs over several observations of the sett (Natural England 2006).

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Local authorities in England are required to consider the likelihood of any proposed development adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations. The planning guidance for Wales, Technical Advice Note (Wales) 5, identifies the need to comply with the Protection of Badgers Act 1992.

English Nature, 1995. *Species Conservation Handbook*. English Nature, Peterborough.

Natural England, 2006. *Guidance on 'Current Use' in the definition of a badger sett*. Natural England, Peterborough.

Please note: the above text provides a brief summary of the legislation in relation to badgers for England and Wales and the original Act and amendments should be referred to for the precise wording.

SUMMARY OF THE LEGISLATION RELATING TO BATS

All wild species of bat are protected under the Wildlife and Countryside Act (WCA) 1981, which has also been amended by later legislation, including the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2017 (amended), and this legislation is applicable to England and Wales. Bats are listed on Schedule 5 of the WCA and are therefore subject to some the provisions of Section 9 which, with the amendments, make it an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a bat (S9:4c).

There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

Bat species are also listed under Annexes IIa and IVa of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

(a) deliberately capture, injure or kill any wild animal of a European protected species,

(b) deliberately disturb wild animals of any such species, in such a way as –

  (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

  (iii) to affect significantly the local distribution or abundance of the species to which they belong;

(c) deliberately take or destroy the eggs of such an animal, or

(d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead bat or part of such an animal.

In addition, seven native British bat species, including the soprano pipistrelle (*Pipistrellus pygmaeus*) and the brown long-eared bat (*Plecotus auritus*), that are frequently found in buildings, are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to bats in England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

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SUMMARY OF THE LEGISLATION RELATING TO BREEDING BIRDS

All wild species of breeding birds and their nests are protected under Part 1 of the Wildlife and Countryside Act (WCA) 1981, as amended by later legislation including the Countryside and Rights of Way (CRoW) Act 2000. This legislation applies in England and Wales.

Part 1 (Section 1:1) of the WCA states that:

> 'If any person intentionally,
>
> (a) kills, injures or takes any wild bird;
>
> (b) takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
>
> (c) takes or destroys an egg of any wild bird,
>
> he shall be guilty of an offence.'

Part 1 (Section 1:5) of the WCA (amended by the CRoW Act 2000) refers to specific birds listed on Schedule 1 of the WCA, and states that:

> 'If any person intentionally or recklessly,
>
> (a) disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
>
> (b) disturbs dependent young of such a bird,
>
> he shall be guilty of an offence and liable to a special penalty.'

Schedule 1 includes birds such as Western barn owl (*Tyto alba*), black redstart (*Phoenicurus ochruros*), woodlark (*Lullula arborea*) and Cetti's warbler (*Cettia cetti*). Please refer to the WCA for a complete list of Schedule 1 species.

Some provisions are made to allow the killing and taking of certain species under certain circumstances, as follows:

- Birds listed on Schedule 2 (Part 1) of the Act may be taken or killed outside of the 'close season' for each individual species (the 'close season' is defined by the Act). This includes various wild duck and geese species.
- Birds listed on Schedule 2 (Part 2) of the Act may be killed or taken by authorised persons at all times. This includes species such as carrion crow (*Corvus corone*), Eurasian magpie (*Pica pica*), feral pigeon[1] (*Columba livia*) and greater Canada goose (*Branta canadensis*). An 'authorised person' is defined as a person who has written authorisation to undertake the act from the relevant statutory authority. The written authority is in the form of a licence, either a general licence which covers a number of the more typical 'pest' species, or an individual licence for other individual species. In England these licences are issued by Natural England and in Wales by the Welsh Assembly Government.

Please note: the above text provides a brief summary of the legislation in relation to breeding birds in England and Wales and the original Act and any amendments should be referred to for the precise wording.

[1] *Also known as rock dove*

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SUMMARY OF THE LEGISLATION RELATING TO GREAT CRESTED NEWTS (GCN)

Great crested (or warty) newts (*Triturus cristatus*) (GCN) are protected under the Wildlife and Countryside Act (WCA) 1981 (amended), which has been also amended by various legislation including the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2017 (amended), and this legislation is applicable to England and Wales. Great crested newts are listed on Schedule 5 of the WCA and are therefore subject to some the provisions of Section 9 which, with the amendments, make it an offence to:

- Intentionally or recklessly disturb a GCN while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a GCN (S9:4c).

There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

Great crested newts are also listed under Annexes IIa and IVa of EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

(a) deliberately capture, injure or kill any wild animal of a European protected species,

(b) deliberately disturb wild animals of any such species, in such a way as –

  (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

  (iii) to affect significantly the local distribution or abundance of the species to which they belong;

(c) deliberately take or destroy the eggs of such an animal, or

(d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place, whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead GCN or part of such an animal.

In addition, GCN are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to GCN for England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

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SUMMARY OF THE LEGISLATION RELATING TO REPTILES

All six of the native British reptile species are afforded varying degrees of protection under the Wildlife and Countryside Act (WCA) 1981, as amended by various later legislation, and this legislation is applicable to England and Wales. All six species are listed on Schedule 5 of the WCA.

The four widespread species, common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), grass snake (*Natrix helvetica*) and adder (*Vipera berus*) are afforded part protection under Section 9(1), making it an offence to intentionally kill or injure any of these species of reptile. The two rarer species, sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*), are subject to a greater degree of protection under Section 9(4) which, with the amendments, make it (in brief) an offence to:

- Intentionally or recklessly disturb a sand lizard or smooth snake while it is occupying a structure or place used for shelter or protection (S9:4b); or
- Intentionally or recklessly obstruct access to any structure or place a sand lizard or smooth snake uses for shelter or protection (S9:4c).

All six species are afforded protection from buying, selling or exchange under Section 9(5) of the WCA.

Sand lizard and smooth snake are also listed under Annexes IIa and IVa of EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

(a) deliberately capture, injure or kill any wild animal of a European protected species,

(b) deliberately disturb wild animals of any such species, in such a way as –

  (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

  (iii) to affect significantly the local distribution or abundance of the species to which they belong;

(c) deliberately take or destroy the eggs of such an animal, or

(d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead sand lizard or smooth snake or part of such an animal.

In addition, all six reptile species are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to reptiles for England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

APPENDIX 2

Botanical Species List

Appendix 2 Botanical Species List

Common Name	Scientific Name	Neutral Grassland with Calcareous Influences - Unimproved	Neutral Grassland - Semi-improved (TN2)	Neutral Grassland - Semi-improved (TN3)	Poor Semi-Improved Grassland	Improved Grassland	Tall Ruderal	Scrub - Willow Carr	Semi-Improved Neutral Grassland and Scrub	Broadleaved Woodland - Semi-natural (TN4)	Broadleaved Woodland - Semi-natural (TN7)	Broadleaved Woodland - Semi-natural (TN8)	Lines of Scrub/Trees and Scrub	Swamp - Reedbed	Ditches - Marginal Vegetation	Hedge H1	Hedge H2	Hedge H3	Crop Fields
Woody Species																			
Alder	*Alnus glutinosa*				R														
Alder (sapling)	*Alnus glutinosa* (sapling)				LO														
Ash	*Fraxinus excelsior*		R		R				F	D		F-LA	LO			R	R		
Ash (seedling)	*Fraxinus excelsior* (seedling)	R							R	R									
Aspen	*Populus tremulous*							F											
Blackthorn	*Prunus spinosa*				R-O			LO	O		F	F	A-LO			R	O	F	
Blackthorn (suckers)	*Prunus spinosa* (suckers)	R		R					R		F	O							
Bramble	*Rubus fruticosus agg.*	R	R	R-O	R			O	O	O	R	O	F-LA		LO	A	F		
Cherry species	*Prunus sp.*								R										
Crack willow	*Salix euxina*				LO								LF						
Dog rose	*Rosa canina*	R	R					R	O-F	R		O				O	O	O	
Dogwood	*Cornus sanguinea*			R-LA				R	O			R	O			O	O	O	
Dogwood (seedling)	*Cornus sanguinea* (seedling)	R																	
Elder	*Sambucus nigra*		R-LO							R	R	R				R		R	
Elder (sapling)	*Sambucus nigra* (sapling)									R									
Elm species	*Ulmus sp.*											O							
English elm	*Ulmus procera*		R-LO							LA	F		R-O				R-LF	F-LA	
English elm (suckers)	*Ulmus procera* (suckers)	R								LA									
Field maple	*Acer campestre*	R			R				F		O	O	R-O			A-LD	A-D	F	
Field maple (seedling)	*Acer campestre* (seedling)								R										
Goat willow	*Salix caprea*										R	O	LO						
Grey willow/sallow	*Salix cinerea*				R			D		O	F	R	O				R		
Hawthorn	*Crataegus monogyna*		R-LF		R			LA	F	R	O	R	R-LF			F	R-LF	R	
Hawthorn (seedling)	*Crataegus monogyna* (seedling)	R	R																
Hazel	*Corylus avellana*											R	F				R		
Holly	*Ilex aquifolium*																	R	
Honeysuckle	*Lonicera periclymenum*																R		
Hybrid black-poplar	*Populus x canadensis*				R														
Norway maple	*Acer platanoides*		R-LD							R									
Norway maple (seedling)	*Acer platanoides* (seedling)	R																	
Pedunculate oak	*Quercus robur*				R						O	R							
Pedunculate oak (sapling)	*Quercus robur* (sapling)									R									
Pedunculate oak (seedling)	*Quercus robur* (seedling)	R		R															
Sycamore	*Acer pseudoplatanus*								R			O							
White Willow	*Salix alba*				R					O		O							
Wild cherry (sapling)	*Prunus avium* (sapling)								R										
Herbs, Grasses and Ferns																			
Agrimony	*Agrimonia eupatoria*			R															
Autumn hawkbit	*Scorzoneroides autumnalis*	R																	
Barley crop	*Hordeum sp.*	R		R		LO				R									LD
Barren brome	*Anisantha sterilis*	R-LA	R	R-LA		O-LA			LA										
Beet species	*Beta sp.*																		LD
Bird's-foot trefoil	*Lotus corniculatus*	R																	
Black bryony	*Tamus communis*			R												R	R	R	
Black-grass	*Alopecurus myosuroides*			R-LA						R									
Branched bur-reed	*Sparganium erectum*														LD				
Bread wheat	*Triticum aestivum*	R																	
Bristly oxtongue	*Helminthotheca echioides*	A	O-F	R-O		O				R									
Broad-leaved dock	*Rumex obtusifolius*		R	O															
Bulbous buttercup	*Ranunculus bulbosus*			R															
Bulrush	*Typha latifolia*														LA				
Bush vetch	*Vicia sepium*	O																	
Butterbur	*Petasites hybridus*				R										R-LF				
Caper spurge	*Euphorbia lathyris*									R									
Cleavers	*Galium aparine*	R	R	LA			A		LA	A		A		F	R			D	
Cock's-foot	*Dactylis glomerata*	F-LA	A	O	O-LA	F			O						LF-LA				
Comfrey species	*Symphytum sp.*									R									
Common chickweed	*Stellaria media*	R																	
Common couch	*Elytrigia repens*	R							LA										
Common field-speedwell	*Veronica persica*	R																	
Common fleabane	*Pulicaria dysenterica*					R													
Common hemp-nettle	*Galeopsis tetrahit*													O					
Common knapweed	*Centaurea nigra*	R		R-LF					R										
Common mallow	*Malva sylvestris*					R													
Common mouse-ear	*Cerastium fontanum*		R		R														
Common nettle	*Urtica dioica*		R	O			D	D		A	LF			F-A	LO-LA				
Common poppy	*Papaver rhoeas*	R		R															
Common ragwort	*Jacobaea vulgaris*	R	R	LF		R													
Common reed	*Phragmites australis*													A-D					
Common vetch	*Vicia sativa*	F-LA	R	R-LA	R				O										
Cotton thistle	*Onopordum acanthium*									R									
Cow parsley	*Anthriscus sylvestris*	R	R	F-A	O-LA	R								R	LA				
Cowslip	*Primula veris*	R-LF																	
Creeping buttercup	*Ranunculus repens*		R	R	A														
Creeping cinquefoil	*Potentilla reptans*	R		R-LA					LF										
Creeping thistle	*Cirsium arvense*	R	O	R-LF	LF	O-LF				LA									
Crested dog's-tail	*Cynosurus cristatus*	F																	
Curled dock	*Rumex crispus*			R		R													
Cut-leaved crane's-bill	*Geranium dissectum*	O	F	O	R	O													
Daisy	*Bellis perennis*					R													
Dandelion	*Taraxacum officinale agg.*	R	R	R															
Dock species	*Rumex sp.*			R											R				
Dog's mercury	*Mercurialis perennis*		R								A-LD								
Dove's-foot crane's-bill	*Geranium molle*	R																	
False oat-grass	*Arrhenatherum elatius*	O-LA	A	F-LA	A-D		A		F-LA			F		LA	LA				
Fat-hen	*Chenopodium album*					R				R									
Feverfew	*Tanacetum parthenium*									R									

Common Name	Scientific Name	Neutral Grassland with Calcareous Influences - Unimproved	Neutral Grassland - Semi-improved (TN2)	Neutral Grassland - Semi-improved (TN3)	Poor Semi-Improved Grassland	Improved Grassland	Tall Ruderal	Scrub - Willow Carr	Semi-Improved Neutral Grassland and Scrub	Broadleaved Woodland - Semi-natural (TN4)	Broadleaved Woodland - Semi-natural (TN7)	Broadleaved Woodland - Semi-natural (TN8)	Lines of Scrub/Trees and Scrub	Swamp - Reedbed	Ditches - Marginal Vegetation	Hedge H1	Hedge H2	Hedge H3	Crop Fields
Field bindweed	*Convolvulus arvensis*		R	R															
Field horsetail	*Equisetum arvense*		R	R	R				R										
Fig-leaved goosefoot	*Chenopodium ficifolium*	R																	
Fool's water-cress	*Helosciadium nodiflorum*	R													LA				
Garlic mustard	*Alliaria petiolata*	R								O	LF								
Germander speedwell	*Veronica chamaedrys*		R	R	R														
Goat's-beard	*Tragopogon pratense*	R	R																
Grass vetchling	*Lathyrus nissolia*	R																	
Great willowherb	*Epilobium hirsutum*														O-LA				
Greater plantain	*Plantago major*	R	R			R-LF													
Greater pond-sedge	*Carex riparia*				LD										A-LD				
Ground-ivy	*Glechoma hederacea*	R	R	LO	LO										R				
Groundsel	*Senecio vulgaris*	R								R									
Hairy sedge	*Carex hirta*				LF														
Hard rush	*Juncus inflexus*				LA														
Hawk's-beard sp.	*Crepis sp.*		R																
Hawkweed sp.	*Hieracium sp.*	O-LF	R																
Hedge bedstraw	*Galium album*			R															
Hedge bindweed	*Calystegia sepium*													O	R				
Hedge mustard	*Sisymbrium officinale*	R		R															
Hedge woundwort	*Stachys sylvatica*			R															
Hedgerow crane's-bill	*Geranium pyrenaicum*	R		R															
Hemlock	*Conium maculatum*									R-O									
Hoary ragwort	*Jacobaea erucifolia*	F	R	LF					R										
Hogweed	*Heracleum sphondylium*	O	O	F	O				O						LO				
Hop	*Humulus lupulus*																	R-LA	
Ivy	*Hedera helix*			R-LO					O		O						R		
Ivy-leaved speedwell	*Veronica hederifolia*	R																	
Knotgrass	*Polygonum aviculare*					R													
Lady's bedstraw	*Galium verum*														LA				
Lesser trefoil	*Trifolium dubium*	A	A	R	R	O													
Mallow species	*Malva sp.*	R																	
Meadow fescue	*Schedonorus pratensis*	R-LA		R															
Meadow foxtail	*Alopecurus pratensis*			R	O-LA														
Mugwort	*Artemisia vulgaris*	R		R															
Oxeye daisy	*Leucanthemum vulgare*	O-LF	R	R					O										
Perennial rye-grass	*Lolium perenne*	R-O	LA	LA	LA	A													
Perforate St. John's-wort	*Hypericum perforatum*			R															
Phacelia	*Phacelia tanacetifolia*									R									
Prickly sow-thistle	*Sonchus asper*		R																
Red campion	*Silene dioica*	R									O	O							
Red dead-nettle	*Lamium purpureum*	R																	
Red fescue	*Festuca rubra*	A	O	O-LA	F-LA	LA			F-LA										
Reed canary-grass	*Phalaris arundinacea*			LA	R-LD										LA				
Ribwort plantain	*Plantago lanceolata*	F-LA	R	LA	R-LO	O													
Rough chervil	*Chaerophyllum temulentum*	R	R-LF	R					O	O	LA	O							
Rough meadow-grass	*Poa trivialis*	R		R	A	LA				LA				O					
Russian comfrey	*Symphytum x uplandicum*			R															
Scentless mayweed	*Tripleurospermum inodorum*			R						R									
Sedge species	*Carex sp.*							LF						LO					
Shepherd's needle	*Scandix pectin-veneris*																		R
Shepherd's-purse	*Capsella bursa-pastoris*	R				R													
Slender false-brome	*Brachypodium sylvaticum*	R	O-LF						R	LA									
Small-flowered crane's-bill	*Geranium pusillum*			R															
Smooth meadow-grass	*Poa pratensis*	A	F	LF					F-LA										
Smooth sow-thistle	*Sonchus oleraceus*	R	R	R		R													
Smooth tare	*Ervum tetraspermum*	R	F	LA		R													
Soft brome	*Bromus hordeaceus*	O	O-LA	O-LA	R-LA	O													
Solanum dulcamara	*Solanum dulcamara*											R							
Spear thistle	*Cirsium vulgare*	R	R																
Tall fescue	*Schedonorus arundinacea*	R																	
Teasel	*Dipsacus fullonum*		R	R		R				R									
Traveller's joy	*Clematis vitalba*																O	R	
Wall speedwell	*Veronica arvensis*	R																	
Water mint	*Mentha aquatica*								R										
Water-cress	*Nasturtium officinale*														LO				
Wheat	*Triticum sp.*																		LD
White campion	*Silene latifolia*			R															
White clover	*Trifolium repens*		R	R															
Wild carrot	*Daucus carota*	F	R-O	R															
Wild parsnip	*Pastinaca sativa sylvestris*	R-LA	R																
Yarrow	*Achillea millefolium*		R	R															
Yorkshire fog	*Holcus lanatus*		R		O-F	O													

KEY
D - Dominant, A - Abundant, F - Frequent, O - Occasional, R - Rare, L - Locally

APPENDIX 3

Combs Wood SSSI Citation

COUNTY: SUFFOLK SITE NAME: COMBS WOOD

DISTRICT: MID SUFFOLK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: Mid Suffolk District Council

National Grid Reference: TM 055568 Area: 14.33 (ha.) 35.41 (ac.)

Ordnance Survey Sheet 1:50,000: 155 1:10,000: TM 05

Date Notified (Under 1949 Act): 1954 Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1982 Date of Last Revision: 1987

Other Information:
This site is owned and managed by the Suffolk Trust for Nature Conservation.

Description and Reasons for Notification:
Situated just to the south of Stowmarket, Combs Wood is an ancient woodland with a well developed coppice with standards structure, on boulder clay overlain with variable amounts of sand and loess. The consequent range of soil types has led to the development of a variety of woodland types. Pedunculate oak-hornbeam woodland is predominant, with areas of typical ash-maple woodland, this grading into the heavy soil form of pedunculate oak-hazel-ash woodland where the soils are more acid.

The pedunculate oak-hornbeam woodland consists mainly of tall coppice of hornbeam *Carpinus betulus*, with some ash *Fraxinus excelsior* and field maple *Acer campestre* and scattered standards of pedunculate oak *Quercus robur*. The shrub layer is poorly developed, with occasional hazel *Corylus avellana*, midland hawthorn *Crataegus oxycanthoides* and elder *Sambucus nigra*. The ground flora is sparse, and consists mainly of dog's mercury *Mercurialis perennis* and bramble *Rubus sp.*, with early dog violet *Viola reichenbachiana*. The ash-maple woodland is dominated by coppice of ash, with frequent hazel and occasional field maple. There are occasional standards of pedunculate oak. The shrub layer is well developed, and includes hawthorn *Crataegus monogyna*, midland hawthorn, spindle *Euonymus europaeus*, dogwood *Cornus sanguinea* and guelder rose *Viburnum opulus*. The ground flora beneath this woodland type is rich and varied, and has shown a good response to the recent reintroduction of a coppice rotation over the wood. Dog's mercury and tufted hair-grass *Deschampsia cespitosa* are locally abundant, with frequent wood anemone *Anemone nemorosa*, wood sedge *Carex sylvatica* and remote sedge *Carex remota*. Other species of interest include woodruff *Asperula odorata*, greater butterfly orchid *Platanthera chlorantha*, pale sedge *Carex pallescens*, grey sedge *C. divulsa* and oxlip *Primula elatior* which is at the northern limit of its range here.

There are a number of rides within the woodland which are wet in places, and support a flora including creeping bent *Agrostis stolonifera*, soft rush *Juncus effusus*, water mint *Mentha aquatica*, greater bird's-foot trefoil *Lotus uliginosus*, bugle *Ajuga reptans* and nettle-leaved bellflower *Campanula trachelium*. The unimproved grassland of these rides and a small pond provide valuable additional habitat for invertebrates.

APPENDIX 4

County Wildlife Site Citations

County Wildlife Site Citations

CWS Number	Mid Suffolk 10
Site Name	RIVER GIPPING (Sections)
Parish	Various
District	Mid Suffolk
NGR	TM073568 - TM124471
Description	Many stretches of the River Gipping as it flows between Stowmarket and Ipswich are of considerable conservation value. Some sections support a diverse emergent fringe consisting of reed, pond sedge and bur-reed. This provides suitable habitat for breeding water birds, for example moorhen and coot. Channel vegetation is dominated by yellow water-lily but also contains some uncommon plants, for example arrowhead and spiked water-milfoil. A river corridor survey carried out in 1990 showed that kingfisher, reed bunting, reed and sedge warblers and tufted duck breed on the River Gipping. In addition grey wagtails are known to breed in old river structures, mainly locks, including Baylham Mill Lock and Sharmford Lock amongst many others. Furthermore the River Gipping supports a valuable mixed coarse fishery (Class A). Good populations of roach, dace, eel, tench, perch and pike occur in the river. In addition to its wildlife value the River Gipping is important as a leisure facility. A towpath which runs the length of the valley from Stowmarket to Ipswich is well-used by local people.
RNR Number	0
Area	12.62

County Wildlife Site Citations

CWS Number	Mid Suffolk 180
Site Name	RNR 169
Parish	Stowupland/Creetings St Peter
District	Mid Suffolk
NGR	TM 06815853
Description	Sulphur Clover & Pyramidal Orchids. This site is also a Roadside Nature Reserve.
RNR Number	169
Area	3.59

County Wildlife Site Citations

CWS Number	Mid Suffolk 190
Site Name	CEDARS PARK GRASSLAND
Parish	Stowmarket
District	Mid Suffolk
NGR	TM06345814
Description	Cedars Park consists of a large area of unimproved/semi-improved calcareous grassland on the outskirts of Stowmarket. It has links to other semi-natural habitats such as the wet grassland to the west. There is a typical assemblage of plants associated with boulder clay such as Pyramidal Orchid, Hoary Ragwort, Wild Parsnip, Wild Basil, Burnet Saxifrage and Grey Sedge. There are also uncommon species like Common Gromwell, Ploughman's Spikenard and Grass Vetchling. The site includes wet areas where drainage is impeded and some scrub; these features add to the diversity of habitats and provide important shelter and food resources for fauna such as Lizards and Slow Worms as well as a good range of invertebrates.
RNR Number	0
Area	3.1

County Wildlife Site Citations

CWS Number	Mid Suffolk 194
Site Name	RNR 200
Parish	Badley
District	Mid Suffolk
NGR	TM074563
Description	Chalk Flora. This is also a Roadside Nature Reserve.
RNR Number	200
Area	0.05

County Wildlife Site Citations

CWS Number	Mid Suffolk 46
Site Name	CHURCH MEADOW
Parish	COMBS
District	Mid Suffolk
NGR	TM050570
Description	Church Meadow is an example of unimproved grassland (biodiversity priority habitat) and has good connectivity with other nearby valuable semi-natural habitat such as Combs churchyard, Combs Wood (Ancient Woodland SSSI) and surrounding hedgerows. The site belongs to Mid Suffolk District Council and is also an LNR. Church Meadow supports two main grassland communities. The north and east of the site are neutral grassland, whilst the remainder of the site is wet grassland of high conservation value. Of particular note is the occurrence of sulphur clover in the higher drier grassland and a population of Early marsh-orchid in the wet area. The meadow ponds and watercourses support a good marginal and aquatic plant community and the ponds have a population of great created newt (protected species).
RNR Number	0
Area	3.87

County Wildlife Site Citations

CWS Number	Mid Suffolk 8
Site Name	Suffolk Business Park Meadow - Formerly EEB
Parish	STOWMARKET
District	Mid Suffolk
NGR	TM063569
Description	This site is a gently sloping area of unimproved species rich grassland (Priority habitat) adjacent to Suffolk Business Park, off the B1113 Needham to Stowmarket road. Despite its small size, the grassland community contains a high diversity of flowering plants. In addition to many fairly common meadow species such as common knapweed, selfheal, bird's-foot trefoil and wild carrot, the site also supports a number of species which are becoming increasingly scarce in Suffolk. These include strawberry clover, stone parsley, purging-flax and spiny restharrow. Pyramidal orchids and varying numbers of bee orchids are also present. One plant of greater burnet-saxifrage has also been found previously on this site.
RNR Number	0
Area	0.41

County Wildlife Site Citations

CWS Number	Mid Suffolk 9
Site Name	KEYFIELD GROVES
Parish	BADLEY
District	Mid Suffolk
NGR	TM067562
Description	Keyfield Groves is listed in English Nature's Ancient Woodland Inventory. This small woodland is divided into two sections by a wide, shrubby track, known as the Badley Walk. This footpath is well-used by local people from Stowmarket and Needham Market. The northern woodland is composed of hazel and hornbeam coppice. Some old coppiced ash stools which are also present are evidence of the wood's antiquity. Midland hawthorn, a species strongly associated with medieval woodlands, and elder are abundant in the understorey. On the woodland floor, bramble and dog's mercury form a dense layer. The southern woodland consists of field maple, elder, rose, elm and hazel. Large ash standards dominate the tree canopy. The impenetrable shrub layer provides valuable habitat for breeding birds. A significant feature of Keyfield Groves is the abundance of dead and dying wood. This provides a source of food for invertebrates, fungi and birds.
RNR Number	0
Area	2.87

APPENDIX 5

Desk Study Bird Records

Appendix 5 Desk Study Bird Records

Common Name	Scientific Name	No. of Records	Amber	Red	UK BAP	Schedule 1
Barn owl	*Tyto alba*	12				Y
Black Kite	*Milvus migrans*	1				
Black redstart	*Phoenicurus ochruros*	3		Y		Y
Black-headed gull	*Chroicocephalus ridibundus*	11	Y			
Bohemian waxwing	*Bombycilla garrulus*	8				
Brambling	*Fringilla montifringilla*	2				Y
Coal tit	*Periparus ater*	11				
Common bullfinch	*Pyrrhula pyrrhula*	15	Y		Y	
Common buzzard	*Buteo buteo*	9				
Common coot	*Fulica atra*	1				
Common crossbill	*Loxia curvirostra*	2				
Common cuckoo	*Cuculus canorus*	4				
Common grasshopper warbler	*Locustella naevia*	1		Y	Y	
Common kingfisher	*Alcedo atthis*	11	Y			Y
Common linnet	*Linaria cannabina*	13		Y	Y	
Common moorhen	*Gallinula chloropus*	12				
Common nightingale	*Luscinia megarhynchos*	5		Y		
Common redpoll	*Acanthis flammea*	2	Y			
Common redshank	*Tringa totanus*	1	Y			
Common snipe	*Gallinago gallinago*	2	Y			
Common starling	*Sturnus vulgaris*	51		Y	Y	
Common swift	*Apus apus*	53	Y			
Common tern	*Sterna hirundo*	2	Y			
Eurasian hobby	*Falco subbuteo*	6				Y
Eurasian oystercatcher	*Haematopus ostralegus*	2	Y			
Eurasian siskin	*Spinus spinus*	6				
Eurasian treecreeper	*Certhia familiaris*	11				
Eurasian wigeon	*Anas penelope*	1	Y			
Eurasian woodcock	*Scolopax rusticola*	10		Y		
European golden Plover	*Pluvialis apricaria*	5				
European goldfinch	*Carduelis carduelis*	27				
European greenfinch	*Chloris chloris*	20				
European honey-buzzard	*Pernis apivorus*	1	Y			Y
European turtle dove	*Streptopelia turtur*	14		Y	Y	
Fieldfare	*Turdus pilaris*	10		Y		Y
Goldcrest	*Regulus regulus*	13				
Great black-backed Gull	*Larus marinus*	3	Y			
Great cormorant	*Phalacrocorax carbo*	2				
Great spotted woodpecker	*Dendrocopos major*	15				
Green sandpiper	*Tringa ochropus*	3	Y			Y
Green woodpecker	*Picus viridus*	14				
Grey Heron	*Ardea cinerea*	3				
Grey Partridge	*Perdix perdix*	2		Y	Y	
Grey wagtail	*Motacilla cinerea*	14				
Greylag Goose	*Anser anser*	2	Y			
Hawfinch	*Coccothraustes coccothraustes*	1		Y	Y	
Hedge accentor	*Prunella modularis*	40	Y		Y	
Herring Gull	*Larus argentatus*	6		Y	Y	
House martin	*Delichon urbicum*	11	Y			
House sparrow	*Passer domesticus*	66		Y	Y	
Lesser black-backed	*Larus fuscus*	10	Y			

Common Name	Scientific Name	No. of Records	Amber	Red	UK BAP	Schedule 1
Gull						
Lesser redpoll	*Acanthis cabaret*	3		Y	Y	
Little Egret	*Egretta garzetta*	10				
Little owl	*Athene noctua*	10				
Marsh tit	*Poecile palustris*	7		Y	Y	
Meadow pipit	*Anthus pratensis*	7	Y			
Mew gull	*Larus canus*	6	Y			
Mistle thrush	*Turdus viscivorus*	8		Y	Y	
Northern Lapwing	*Vanellus vanellus*	4		Y	Y	
Northern pintail	*Anas acuta*	1	Y			
Osprey	*Pandion haliaetus*	2	Y			Y
Peregrine Falcon	*Falco peregrinus*	1				Y
Pied avocet	*Recurvirostra avosetta*	1	Y			Y
Red Kite	*Milvus milvus*	4				Y
Redwing	*Turdus iliacus*	11		Y		Y
Reed bunting	*Emberiza schoeniclus*	12	Y		Y	
Ring ouzel	*Turdus torquarus*	2		Y	Y	
Ringed Plover	*Charadrius hiaticula*	1		Y		
Rock pipit	*Anthus petrosus*	1				
Sand martin	*Riparia riparia*	2				
Short-eared owl	*Asio flammeus*	2	Y			
Sky lark	*Alauda arvensis*	14		Y	Y	
Song thrush	*Turdus philomelos*	20		Y	Y	
Spotted flycatcher	*Musciapa striata*	4		Y	Y	
Stonechat	*Saxicola rubicola*	2				
Stone-curlew	*Burhinus oedicnemus*	1	Y		Y	Y
Tawny owl	*Strix aluco*	8	Y			
Tufted Duck	*Aythya fuligula*	4				
Tundra Swan	*Cygnus columbianus*	2	Y		Y	Y
Water Rail	*Rallus aquaticus*	2				
Whimbrel	*Numenius phaeopus*	1				
White wagtail	*Motacilla alba*	24				
Willow warbler	*Phylloscopus trochilus*	13	Y			
Wood lark	*Lullula arborea*	1		Y		Y
Wood nuthatch	*Sita europaea*	1				
Yellow wagtail	*Motacilla flava*	3		Y	Y	
Yellowhammer	*Emberiza citrinella*	9		Y	Y	

APPENDIX 6

Site Photographs

Photo 1 Crop field to the south-west of the site, looking south towards the factory in distance

Photo 2 Crop fields to the north-east of Mill Lane

Photo 3 Shepherd's needle plant in the crop margin

Photo 4 **Wide improved grassland margin at end of beet field at the south of the site**

Photo 5 **Unimproved neutral grassland margin with calcareous influences at edge of crop field**

Photo 6 **Far end of unimproved neutral grassland margin, near railway track**

Photo 7 Grass vetchling in the unimproved neutral grassland margin

Photo 8 Wet ditch in the centre of unimproved neutral grassland margins

Photo 9 Wide semi-improved neutral grassland margin (TN2) along edge of field with area of woodland, looking south-east

Photo 10 **Wide semi-improved neutral grassland margin (TN2) along edge of field, looking north-west, with bramble scrub at edge**

Photo 11 **Semi-improved neutral grassland verges (TN3) and hedgerow H1 alongside Mill Lane, looking south-east**

Photo 12 **Semi-improved neutral grassland verges (TN3) and hedgerow H1 alongside Mill Lane, looking north-west**

Photo 13 Semi-natural broadleaved woodland (TN7)

Photo 14 Semi-natural broadleaved woodland (TN7) with pedunculate oak T1 in distance

Photo 15
T1 - mature pedunculate oak with PRF

Penny Anderson Associates Ltd

CONSULTANT ECOLOGISTS

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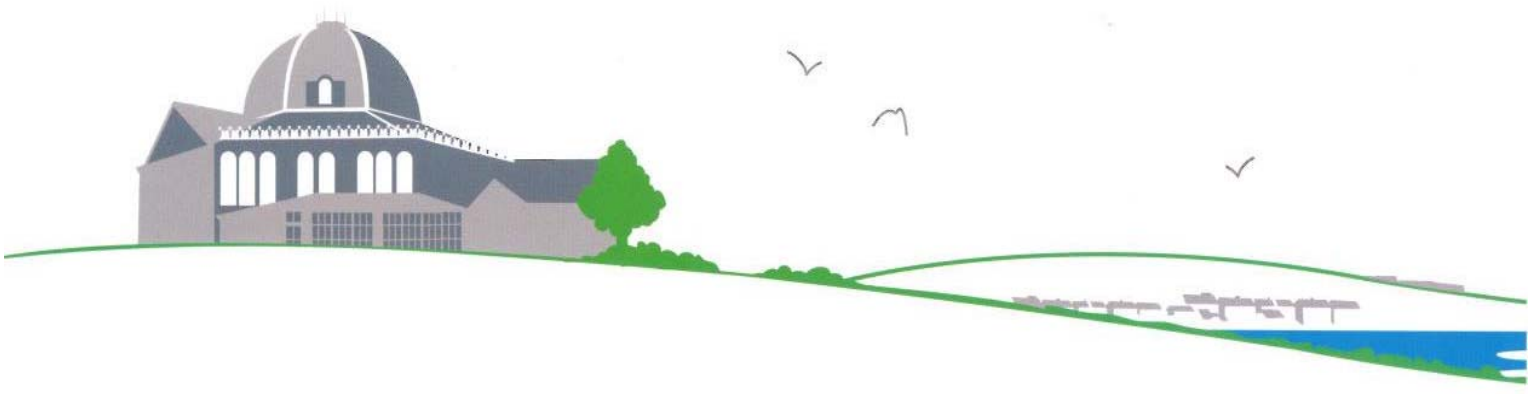
BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

HABITAT SUITABILITY INDEX ASSESSMENT AND EDNA ANALYSIS REPORT



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

HABITAT SUITABILITY INDEX ASSESSMENT AND EDNA ANALYSIS REPORT

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June 2020 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

CONTENTS

TABLES

FIGURE

APPENDICES

1. INTRODUCTION

Background

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Babergh and Mid Suffolk District Council to carry out a number of ecological surveys at a site off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site').

1.2 A survey of the waterbodies within 250m of the site boundary was recommended for great crested newt (GCN, *Triturus cristatus*) following the initial extended Phase 1 habitat survey in May 2019 (PAA 2019) in which the field survey assessed that some of the waterbodies were suitable for GCN breeding and the surrounding terrestrial habitat was also suitable.

1.3 The recommendation was for a Habitat Suitability Index (HSI) assessment. Those waterbodies with a score of 0.4 or above (scores range from 0 (completely unsuitable) to 1 (highly suitable)) should be sampled for the presence of GCN Environmental DNA (eDNA). This method establishes whether GCN are present or absent. This report presents the results of both the HSI assessment and water sampling for GCN eDNA.

1.4 GCN are widely distributed throughout lowland Great Britain although absent in Ireland. In the last century GCN numbers have declined across Europe, although the population in the UK has survived comparatively better. The decline is related to a number of factors: habitat fragmentation, agricultural intensification, pond loss and habitat deterioration. It is a strictly protected species under British law and it is an offence to: kill, injure, capture or disturb them; damage or destroy their habitat; and to possess, sell or trade. This law refers to all GCN life stages, including eggs (Amphibian and Reptile Conservation 2020).

Great Crested Newt Biology

1.5 GCN are a protected species and a material consideration in the planning process. Developments and building works have the potential to harm GCN, e.g. through the loss and fragmentation of habitat, loss of waterbodies used for breeding, pollution, increasing shade and siltation of waterbodies.

1.6 As with all British amphibians, GCN require waterbodies for breeding and spend the rest of the year in terrestrial habitat. Newts begin migrating to waterbodies early in the year, with the majority reaching ponds by mid-March. GCN are ectotherms, relying on external heat to maintain their body temperature, and movement usually takes place when the air temperature is above 5°C and there are wet conditions.

1.7 Eggs are laid normally from mid-March to mid-May on the leaves of submerged plants, and the larvae hatch about three weeks later. Adult newts generally leave the breeding pond from late May onwards while the larvae, once metamorphosed to a land-adapted juvenile, emerge later in the year. Immature newts remain largely terrestrial between two and four years. Adults and immature newts spend the winter in places that afford protection from the cold and flooding, e.g. underground amongst tree roots and above ground using suitable refuges such as dead wood and rubble piles, hibernating from October to February (English Nature 2001).

1.8 Numbers of GCN are declining in the UK despite full domestic-level protection (Langton *et al.* 2001; Wilkinson *et al.* 2011). The status of any GCN population present should be established to enable an assessment of the potential impact of the development on GCN habitat and to inform appropriate mitigation to maintain the favourable status for the species (English Nature 2001).

Aims

1.9 The purpose of the HSI and eDNA assessment is to:

- Evaluate the suitability of waterbodies within the site for supporting GCN and suitability for breeding within the site and within a 250m area around the site boundary; and
- To determine which of the waterbodies should be tested for GCN presence/absence using eDNA.

Legislative and Policy Context

1.10 GCN are protected under various legislation including the Conservation of Habitats and Species Regulations 2017 (amended), the Countryside and Rights of Way (CRoW) Act 2000 and Wildlife and Countryside Act (WCA) 1981 (as amended). Protection is afforded to their eggs, breeding sites and terrestrial resting places.

1.11 A summary of the legislation and planning policy guidance as it relates to GCN is provided in Appendix 1.

2. HSI ASSESSMENT

2.1 A request was made to the Suffolk Biodiversity Information Service (SBIS) in April 2019 for records of protected and notable species and wildlife sites within 2km of the centre of the site. This included GCN.

Field Survey

2.2 A daytime survey of the waterbodies was led by Ecologist Caroline Boffey (ACIEEM)[1] on 7th November 2019. Caroline has appropriate practical experience in the survey methodology and the required knowledge, skills and experience set out in Chartered Institute of Ecology and Environmental Management (CIEEM) competency guidelines (CIEEM 2013).

Habitat Suitability Index

2.3 Waterbodies were assessed for their potential to support GCN using the GCN HSI scoring system (Oldham et al. 2000; ARG, 2010).

2.4 The HSI score is calculated by allocating scores to a range of factors that reflect the potential suitability of a waterbody to support GCN. These include the geographical location, the number of waterbodies within 1km, surface area and permanence, biological water quality, shading, presence of fish and birds, coverage of macrophytes and the suitability of surrounding terrestrial habitat.

2.5 Oldham *et al*. (2000) has related the HSI to the probability that a particular waterbody will support GCN, and Brady (2006) expressed qualitatively the suitability of different categories of HSI scores (Table 1).

Table 1 GCN Habitat Suitability Index Categories and Likelihood of GCN Presence (after Oldham *et al.* 2000 and Brady 2006)

HSI Scores		% of Waterbodies Found to Support GCN
<0.5	= poor	3
0.5 – 0.59	= below average	20
0.6 – 0.69	= average	55
0.7 – 0.79	= good	79
> 0.8	= excellent	93

Pond Descriptions

2.6 Figure 1 shows waterbody locations. From aerial photographs and mapping it was seen that there were 11 waterbodies, largely drainage ditches. Each was visited and assessed. However, on inspection it was found that four had flowing water, which would make them wholly unsuitable for GCN breeding.

2.7 Those waterbodies with standing water were P1, D3, D4, D5, D6, D7 and D11 (see Figure 1).

[1] *Associate Member of the Chartered Institute of Ecology and Environmental Managers*

Table 2 Summary Description of Waterbodies

Pond Number	Description
P1	A small seasonal pond in a narrow corridor of coppiced wet woodland.
D3	Dredged trapezoidal drainage ditch with unvegetated sides at the time of survey. Minimal flow.
D4	Dredged trapezoidal drainage ditch with unvegetated sides at the time of survey. Field drains visible in bank sides.
D5	Recently dredged trapezoidal channel in cross-section.
D6	Being dredged at the time of survey.
D7	Partially dredged ditch that extends from a *Phragmites*-dominated reedbed.
D11	Ditch at the edge of woodland with leaf litter on channel bed.

Results

Desk Study

2.8 There are three records for GCN, all within Combs Wood, an ancient woodland owned and managed by the Suffolk Trust for Nature Conservation, at a distance greater than 1km from the perimeter of the site.

2.9 A study of granted European Protected Species (EPS) applications using the on-line resource Multi-Agency Geographic Information for the Countryside website (*www.magic.gov.uk*, MAGIC) showed the closest application to be at a distance of 6.8km from the site and this was for a GCN licence in 2010 allowing destruction of a resting place.

Habitat Suitability Index

2.10 The HSI scores and associated suitability to support GCN are presented in Table 3. Detailed descriptions and photos of each of the waterbodies surveyed are provided in Appendix 2.

Table 3 Habitat Suitability Index Scores

Waterbody Number	Index Score	Suitability for Supporting Breeding GCN
P1	0.43	Poor
D3	0.67	Average
D4	0.63	Average
D5	0.67	Average
D6	0.59	Below Average
D7	0.66	Average
D11	0.4	Poor

Limitations

2.11 The assessment was carried out in November. This is an appropriate time of the year to carry out dredging operations as GCN adults generally leave the pond between late May and July to

occupy terrestrial habitat. This movement occurs gradually, with most newts having left by August. A proportion may stay on until October (Langton *et al.* 2001).

2.12 Dredging removes aquatic vegetation, emergent and submerged plants that are used by GCN for egg-laying. The degree of macrophyte cover is one of the ten criteria that are factored into the HSI assessment and this was made difficult because the vegetation had been removed from ditches.

2.13 However, there was good access to the majority of the waterbodies and the weather on the day of the assessment was suitable with good visibility. The results of the survey are considered to be robust and a faithful reflection of the site conditions.

Recommendations

2.14 In general, ponds with high HSI scores are more likely to support GCN than those with low scores. However, the system is not sufficiently precise to conclude that any particular pond with a high score will support newts or that any pond with a low score will not. Nevertheless, the score, ranging from 0 (completely unsuitable) to 1 (highly suitable) represents a useful tool when considering the potential of a site to support GCN, and if there is a need for further more detailed investigations (ARG 2010).

2.15 Dredging operations and bank clearance is followed by plant re-colonisation and the return of aquatic plants and the surrounding terrestrial habitat does provide refugia and foraging opportunities for amphibians. Refugia include tree root systems and stumps, underground crevices and rubble piles. The HSI results cannot be used to discount GCN presence and consequently it was recommended that eDNA analysis of the waterbodies should be carried out for presence/absence.

3. ENVIRONMENTAL DNA

Background

3.1 The use of eDNA is a fairly recent technique developed for detecting the presence or absence of GCN. Sources of eDNA include GCN mucous, shed skin and faeces in the waterbody. It has a number of potential advantages over traditional detection methods that require at least four surveys deploying bottle traps, egg searching, torching and netting.

3.2 GCN are a relatively cryptic species and traditional techniques may not always be effective in detecting presence or establishing absence. Recent research has shown that DNA can be detected in water samples at very low concentrations using Quantitative Polymerase Chain Reaction (qPCR) methods (Biggs *et al.* 2014).

Methods

3.3 Water samples were collected by Katrina Wells (GradCIEEM) of Adonis Ecology on 28th April 2020.

3.4 The survey method followed technical advice and field protocols for staff collecting water samples (Biggs *et al.* 2014, Natural Resources Wales 2016). Sampling kits were obtained from United Kingdom Accreditation Service (UKAS) accredited SureScreen Scientifics laboratory, stored at room temperature and analysed within four days of delivery.

eDNA Field Sampling Protocol

3.5 The field kits include sampling tubes with preservative, sterile gloves, sampling ladle, transfer pipette and self-supporting bag (Whirl-Pak bag). Care was taken during the sampling to ensure there was no cross-contamination of water from one pond to another. In order to prevent disturbance of the pond sediment, surveyors did not enter the water. The sampling protocol followed the steps outlined below:

- 20 samples were taken from each pond and pond cluster, taking sub-samples at evenly-spaced intervals, targeting areas where there was vegetation that may be used for egg-laying and, where possible, more open water where newts might display;
- the water column was mixed gently and samples taken close to the bottom of the pond;
- 20 samples of 30ml of pond water were taken from around the ponds using the ladle and emptied into the Whirl-Pak bag, which was shaken for ten seconds to mix any DNA across the whole sample;
- wearing sterile gloves to avoid contamination, the transfer pipette was used to take about 15ml of water from the Whirl-Pak bag and transferred to a sterile tube containing 35ml of ethanol to preserve the eDNA sample;
- closing the cap, the tube was shaken for ten seconds to mix the sample and the preservative;
- the procedure was repeated for the six conical tubes in the kit; and
- samples were refrigerated overnight and dispatched by courier to the laboratory the following day.

Limitations

3.6 The eDNA sampling took place within the optimum period, which is mid-April to the end of June. There was good access available to the ponds, sampling protocols were strictly followed and the results of the surveys are considered to be valid.

Results

3.7 At the time of sampling P1 was found to be dry.

3.8 The laboratory analysis report is presented in Appendix 3 and a summary presented in Table 4 below.

Table 4 eDNA Analysis Results

Waterbody	Sample Integrity Check (SIC)	Degradation Check (DC)	Inhibition Check (IC)	Result
D3	Pass	Pass	Pass	Negative
D4	Pass	Pass	Pass	Negative
D5	Pass	Pass	Pass	Negative
D6	Pass	Pass	Pass	Negative
D7	Pass	Pass	Pass	Negative
D11	Pass	Pass	Pass	Negative

3.9 The Sample Integrity Check refers to the quality of packaging and suitability of the sample. The Degradation Check examines the sample to see if there has been degradation of the sample kit, and the Inhibition Check verifies the quality of the result. In all cases the sample was found to be acceptable.

3.10 Provided the water samples are taken correctly to avoid cross-contamination, eDNA analysis is extremely accurate. The negative result indicates that eDNA was not detected or was below the detection threshold and, therefore, there is no evidence of GCN presence.

Recommendations

3.11 No further GCN surveys are considered necessary.

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5. ABBREVIATIONS

CIEEM	Chartered Institute of Ecology and Environmental Management.
CRoW	Countryside Rights of Way
eDNA	Environmental DNA
EPS	European Protected Species
GCN	Great Crested Newt
HSI	Habitat Suitability Index
MAGIC	Multi-Agency Geographic Information for the Countryside
qPCR	Quantitative Polymerase Chain Reaction
UKAS	United Kingdom Accreditation Service
WCA	Wildlife and Countryside Act

FIGURE

606200 606400 606600 606800 607000 607200 607400 607600 607800 608000

258600 258400 258200 258000 257800 257600 257400 257200 257000

A14 A14 A14 47 49 51 A14 Debenham Stowmarket Lavenham Claydon

Legend

- Boundary

Habitat

- Broadleaved woodland - semi natural
- Continuous scrub
- Neutral grassland - semi improved
- Neutral grassland - semi improved and scrub
- Neutral grassland with calcareous influences - unimproved
- Improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Swamp
- Marginal vegetation
- Wet ditch
- Dry ditch
- Arable
- Hardstanding
- River
- Scrub
- Scrub and trees
- Hedge
- Fence
- Tree
- Scattered scrub
- Shepherd's needle
- 250m buffer of ditch D8

Cxri	Carex riparia	greater pond sedge
Fe	Fraxinus excelsior	ash
Pc	Phragmites communis	common reed
Qr	Quercus robus	pedunculate oak
Rf	Rubus fruticosus agg.	bramble
Sxci	Salix cinerea	grey willow
Sxf	Salix euxina	crack willow

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

N

ISO A3

0 25 50 100 150 200 Metres

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Telephone 01298 27086

Project Name: Mill Lane, Stowmarket

Discipline: Ecology

Title: Waterbodies Sampled for eDNA

Scale: 1:6,500		Drawing No.: Figure 1	
Drawn By: MDM	Originator: GJH	Date: 16/10/2020	
PAA Ref.		Revision: 1.0	

Figure 1 BAMS01_Phase1_MDM_151020.mxd

APPENDICES

APPENDIX 1

Summary of the Legislation relating to Great Crested Newts

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

SUMMARY OF THE LEGISLATION RELATING TO GREAT CRESTED NEWTS (GCN)

Great crested (or warty) newts (*Triturus cristatus*) (GCN) are protected under the Wildlife and Countryside Act (WCA) 1981 (amended), which has been also amended by various legislation including the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2017 (amended), and this legislation is applicable to England and Wales. Great crested newts are listed on Schedule 5 of the WCA and are therefore subject to some the provisions of Section 9 which, with the amendments, make it an offence to:

- Intentionally or recklessly disturb a GCN while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a GCN (S9:4c).

There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

Great crested newts are also listed under Annexes IIa and IVa of EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

(a) deliberately capture, injure or kill any wild animal of a European protected species,

(b) deliberately disturb wild animals of any such species, in such a way as –

  (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

  (iii) to affect significantly the local distribution or abundance of the species to which they belong;

(c) deliberately take or destroy the eggs of such an animal, or

(d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place, whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead GCN or part of such an animal.

In addition, GCN are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to GCN for England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

APPENDIX 2

Habitat Suitability Index Records 2019

Habitat Suitability Index (H S I) for GCN surveys.	Date: 7/11/19	Surveyor(s):
Site Name: Land off Mill Lane, Stowmarket	Job No. BAMS01	CBo
Pond name/number: D6	Single or part of cluster: Single	
Distance to nearest pond: 50m	Number of ponds in cluster:	

H S I ASSESSMENT:

Parameters:	Descr.	Field meas:	HSI Score
SI-1 Geographic location	Geographical area A, B or C	A	1
SI-2 Pond area	m^2	275	0.55
SI-3 Pond permanence	Drought years per decade	Annually	0.1
SI-4 Water quality	Invert assemblage, amphibs or fish presence	Poor	0.33
SI-5 Pond shading	% of perimeter affected to 1m out	0-60%	1
SI-6 Nos. Wildfowl	No. per pond (inc species)	Absent	1
SI-7 Fish occurrence	P / A + Possible impacts	Absent	1
SI-8 Pond density	No. ponds within 1km	11	1
SI-9 Newt-friendly habitat	Terrestrial habitat quality to 1km (Field and desk based - use OS map)	Good	1
SI-10 Macrophyte content	% plants reaching water surface	0%	0.3

Drawing/Photo

HSI range 0.0 (unsuitable habitat) - 1.0 (optimum habitat)

Pond HSI	0.59
Pond suitability	Below Average

APPENDIX 3

eDNA Technical Report

SureScreen Scientifics

Folio No: E7125
Report No: 1
Purchase Order: 99
Client: PENNY ANDERSON ASSOCIATES
Contact: Gerard Hawley

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 01/05/2020
Date Reported: 12/05/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1498	D6, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0
1499	D7, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0
1501	D5, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0
1502	D11, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0
1503	D3, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0
1504	D4, Mill Lane Stowmarket		Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Sarah Evans

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result

should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

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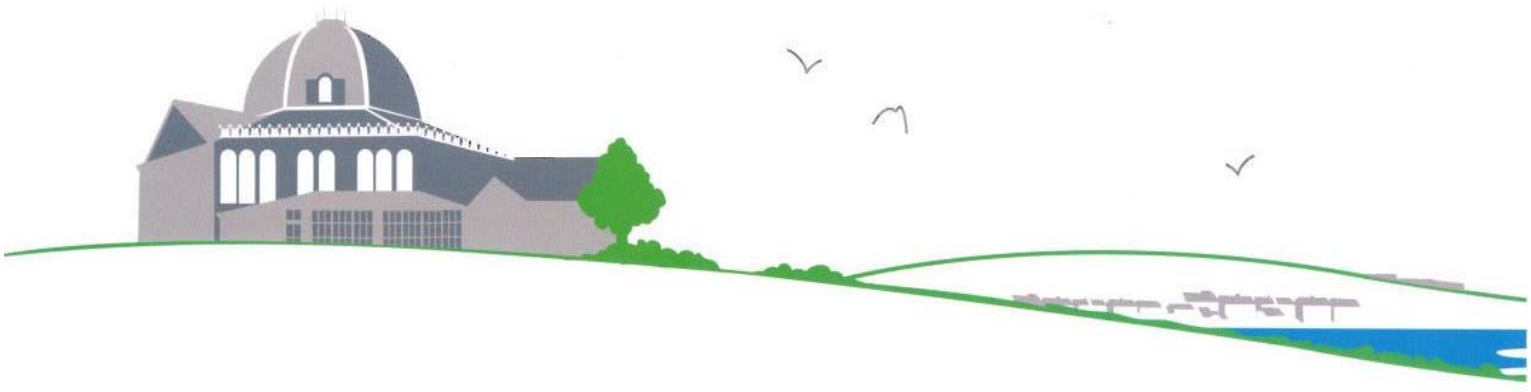
BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

OTTER AND WATER VOLE SURVEY REPORT



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

OTTER AND WATER VOLE SURVEY REPORT

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Author
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December 2019 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

CONTENTS

FIGURE

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1. INTRODUCTION

Background

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Babergh and Mid Suffolk District Council to carry out a number of ecological surveys at a site off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site').

1.2 A survey for water voles (*Arvicola amphibius*) and otters (*Lutra lutra*) was recommended, following the initial extended Phase 1 habitat survey of the site in May 2019 (PAA 2019), in which the field survey assessed the site and adjacent river as containing suitable water vole and otter habitat and the desk study request for biological records returned records for these species within the 2km search area surrounding the site.

1.3 This report presents the results of the water vole and otter survey completed for the site in November 2019. At the time of the survey the application area included an area of semi-natural grassland with a series wet ditches in the south-east. This area has been subsequently removed from the application and only a narrow section of the site now borders the River Gipping. However, the field, ditches and river lie in close proximity to the site and for completeness they are described and the survey findings reported.

Legislative and Policy Context

1.4 Both otter and water vole are protected in England and Wales under the Wildlife and Countryside Act (WCA) 1981, as amended, and are listed on Schedule 5 of the Act. In addition, otter are listed as a European Protected Species (EPS) under the Conservation of Habitats and Species Regulations 2017. Both species are a material consideration in a planning application.

1.5 The legislation and best practice relating to water vole and otter is given in Appendix 1.

Site Description

1.6 The site covers an area of approximately 78.5ha and is bounded to the north by the A14 dual carriageway and to the west by the A1120. A railway line forms the boundary to the south-west and farmland lies to the east. The River Gipping flows close to the southern boundary of the site.

1.7 There are no built structures (although there are power pylons) and the majority of the site is given over to arable production with field margins. There are lengths of hedgerow to the north of the site alongside the road verge to Mill Lane (H1 and H2), and separating two of the arable fields (H3).

1.8 In the north-east of the site there are three sections of ditch; one of the ditches flows along the site boundary, the other two ditches are at the edge of the triangular patch of woodland.

Aims

1.9 The main objectives of the detailed survey were to:

- identify any field evidence indicating that water voles and/or otters are using the site, or waterbodies adjacent to the site; and
- identify the potential of the habitats on and adjacent to the site to support water voles and/or otters.

2. METHODS

Desk Study

2.1 A data request was made to Suffolk Biodiversity Information Service (SBIS), the county biological records centre, in April 2019 for all data records held for protected sites, habitats and species within a 2km search area around the site.

2.2 This desk study examined the records supplied for water voles and otters.

Field Survey

2.3 The field survey was carried out by Ecologist Caroline Boffey (ACIEEM)[1] on 7th November 2019. Caroline has appropriate practical experience in survey methods and the required knowledge, skills and experience set out in the Chartered Institute of Ecology and Environmental Management (CIEEM) competency guidelines (CIEEM 2013).

Water Vole

2.4 Water voles are one of Britain's most rapidly declining mammals (Dean *et al* 2016), estimated to have disappeared from over 90% of the sites that were once occupied. The loss is thought to be due to a combination of habitat loss and fragmentation, pollution and predation by American mink (*Neovison vison*) over recent years.

2.5 Where potential for water vole was identified within the site or in adjacent habitats, a presence/absence survey was undertaken, based on the standard approach given in the *Water Vole Conservation Handbook* (Strachan *et al.* 2011), with modifications made to suit the particular situation and habitat conditions. Water vole signs were searched for, including latrines, burrows, nests of reeds and sedges, feeding stations of chewed vegetation, pathways, footprints and 'lawns' around burrow entrances. Any sightings and sounds of water voles entering the water were recorded.

2.6 In addition to the above, a number of features of the habitat were noted to assess suitability for water vole including width, depth and speed of watercourse, bank profile, substrate, amount of shade and vegetation cover, and the dominant plant species present. Any evidence of other riparian mammals, such as American mink or brown rat (*Rattus norvegicus*) was also recorded, as this can help to inform the assessment of the suitability of the habitat for water vole.

Otter

2.7 The otter population underwent a widespread decline during the 20th Century, thought to be related to the introduction of pesticides in the mid-1950s (e.g. Chanin and Jefferies 1978; Strachan and Jefferies 1996). A survey of England between 2009 and 2010 indicated an increase in signs of otter and continued expansion across English river systems (Crawford 2011). Recovery is thought to be related to a ban on pesticides, legal protection since 1978 and natural expansion from the remnant populations.

2.8 There is currently no specific published methodology for undertaking otter surveys although a range of publications relating to otter ecology and conservation do exist (e.g. Environment

[1] *Associate Member of the Chartered Institute of Ecology and Environmental Management (CIEEM)*

Agency 1999; Highways Agency 2001; Chanin 2003) along with generic survey approaches (https://www.gov.uk/guidance/otters-protection-surveys-and-licences).

2.9 Signs indicative of the presence of otters were searched for in habitats within or adjacent to the site which were identified as suitable. Otters are carnivorous, their diet largely consisting of fish and amphibians, and so watercourses with a good supply of fish are favoured habitats for foraging. Otters also favour watercourses with good bank side vegetation for protective cover when used as a migration route. Otters run along the banks to commute and young otters disperse to their own territories after being raised; all watercourses should, therefore, be considered as potential habitat corridors (Design Manual for Roads and Bridges 1999). Otters are solitary, elusive animals and cubs are generally born in suitable sites away from the main river. Habitats other than watercourses can also provide places for shelter and food, including marshy areas with good vegetation cover, reedbeds and woodland, although generally near (<50m) to water.

2.10 Field signs looked for during the survey included otter spraint (faeces - particularly at signing locations such as the foot of bridges), footprints, runs in the bankside vegetation, sign heaps (piles of earth or sand scraped together by an otter), underground dens ('holts') used for shelter or breeding, above ground 'couches' used for resting, and feeding remains e.g. fish carcasses.

Limitations

2.11 The weather was mild, with good visibility. There was initial light rain early on in the survey, however this soon dried up. Meteorological data for Stowmarket showed there were at least three dry days preceding the survey, allowing field signs to build up.

2.12 The optimal period for water vole survey is during the breeding season, from April to October; the survey is, therefore, just outside the optimal period. Water voles do not hibernate over the winter but spend less time out of their burrows, so giving fewer opportunities to establish their presence at this time of the year.

2.13 Otter surveys can be undertaken at any time of the year.

2.14 Access to the whole of the site was available. A public footpath (Gipping Valley River Path) next to the River Gipping and extending beyond the site boundary in either direction allowed access for close examination of the bank adjacent to the site and easy viewing of the opposite bank, to conduct a search for evidence of holts, spraints, footprints, feeding remains and other signs. It is considered that access to the river was sufficient to determine presence/absence.

2.15 The ditch in the north of the site along the boundary had restricted visibility of the banks in places, due to the scrub and trees growing over it. The surveyor found a vantage point to view all sections of bank, where possible.

2.16 The series of ditches across the grassland at the south of the site were being dredged during the visit, with the majority of them now having smoothed bare earth channels, devoid of vegetation. This is highly likely to have removed any field signs which may have been present and also limited the current suitability of the ditches as habitat for otters and water voles.

3. RESULTS

Desk Study

3.1 The SBIS data request returned a number of records of water voles and otters within the 2km search area around the site. The majority of the records were associated with the River Gipping, with a few of them in close proximity to the site. The raw data is presented in Appendix 2 and discussed in more detail below.

3.2 There are nine records for otter from 2000-2016 returned by the desk study, of which over half of the records are from the River Gipping. The nearest two records to the site, along the river, are approximately 120m from the south-west corner of the site. This location, however, is on the opposite side of the railway line which provides a potential barrier, and additionally there are no watercourses within that section of the site; the habitat immediately surrounding the river itself would provide much more suitable habitat for otters. There is another record for otter along the River Gipping at approximately 260m from the south-east boundary of the site within the ditches and grassland habitat.

3.3 There are five records for water vole, largely along the River Gipping. The closest record, from 2015, is within the site boundary, associated with the grassland/ditch area at the south-east of the site, and recorded that water voles were often seen when walking in Gipping Valley.

Field Survey

3.4 Suitable habitat within and immediately adjacent to the site boundary, identified from the initial Phase 1 survey, was surveyed for water vole and otter, to establish presence or to indicate their likely absence. Habitat considered suitable was:

- the series of ditches within the poor semi-improved grassland at the south of the site (D2-D7), and patches of sedges, rushes and reedbed habitat within the grassland;
- the section of the River Gipping along the site boundary and the ditch (D1) immediately adjacent to the site;
- the ditch within the field margin at the south (D8), between the arable field and grassland; and
- the ditches at the north-east of the site, along the site boundary (D9) and at the edge of the woodland (D10 and D11).

3.5 Figure 1 identifies the features surveyed, which are described in the text below. A number of descriptive photographs of the site are presented in Appendix 3.

Ditch 1

3.6 D1 is a short stretch of ditch just outside the site boundary with shallow, flowing water in the narrow channel and steep-sided banks. It is currently unshaded due to recent cutting of adjacent vegetation, but dense bramble scrub at other times of the year would have provided some shaded cover for the ditch. The ditch had very recently been dredged leaving smooth, un-vegetated bare earth sides to the channel, leaving a lack of protective cover for water voles or otters (Photo 1).

3.7 No field signs of otters or water voles were seen.

Ditch 2

3.8 Ditch D2 is a continuation of D1 as the channel enters the site. There is a sluggish flow of water in the channel as the ditch flows through the grassy fields, leading into ditch D7. Again, the ditch has been dredged, resulting in the moderately steep-sided banks being completely bare earth and an absence of marginal vegetation in the channel (Photo 2).

3.9 No field signs of otters or water voles were seen. There were, however, several footprints of brown rat on the banks (Photo 3) and roe deer (*Capreolus capreolus*) slots along the edge of the ditch. Brown rats are generally nocturnal and so are less reliant on bank vegetation cover for protection against predators.

Ditches D3 to D6

3.10 This is a series of four similar ditches across the poor semi-improved grassland, all connecting perpendicular with ditch D2. The banks are moderately steep and the water in the narrow ditches is shallow and more or less non-flowing, except where drains from the field flow into ditches D3 and D4, creating minimal water flow towards ditch D2 at the time of survey (Photos 4, 5 and 6). Ditches D3, D4 and D5 had all been dredged, leaving bare earth banks and a lack of vegetation in the channels, which had previously contained abundant aquatic vegetation, particularly greater pond-sedge (*Carex riparia*), earlier in the year. Ditch D6, also previously filled with sedge, was being dredged at the time of the visit (Photo 7). Patches of sedge, which could potentially be suitable as sites for otters to rest, had extended onto the field from the ditches D5 and D6 earlier in the season, however, these patches were currently not present due to the dredging operations.

3.11 No field signs of otters or water voles were seen in any of the ditches. There was one set of brown rat footprints on ditch D3 and roe deer footprints along the edges of D4 and D5. There were no signs of otter or water vole in the area of reedbed at the edge of the site or in the patches of rushes within the fields.

Ditch D7

3.12 Ditch D7, along the site boundary, becomes water-filled as it emerges from the area of reedbed at the edge of the site and runs along the site boundary, ending at the footbridge just before the river. The ditch had been approximately 50% dredged, leaving bare earth banks and a lack of vegetation in parts, otherwise there was moderately good cover of emergent vegetation in the channel. The dredging operations are likely to have created disturbance along the channel, however. The area of reedbed next to the ditch had not been affected by the dredging. The banks are moderately steep-sided on the site side and generally shallower on the opposite side of the channel and were partially shaded by trees, particularly on the opposite bank (Photo 8).

3.13 There were no signs of otters or water voles in the ditch or adjacent wetland area of vegetation.

River

3.14 The River Gipping flows along the outside of the southern boundary to the site and has a footpath along the edge of the moderately steep-sided riverbank on the site side. There is some shading cast on the banks and channel by scattered trees and scrub, particularly on the southern bank and the river channel contains occasional aquatic vegetation, such as water-starwort (*Callitriche* sp.), common duckweed (*Lemna minor*) and bulrush (*Typha latifolia*). The ditches D1 to D7 are nearby, with ditch D7 ending just before reaching the river. The river banks are suitable for water vole burrows and otter holts, and the bank vegetation is dominated by common nettle (*Urtica dioica*) and cleavers (*Galium aparine*), providing potential cover for water voles and otters (Photo 9 and 10).

3.15 Although the river is considered to provide good potential habitat for both otters and water voles, there were no signs evident during the survey of either species along the river banks within the stretch of river adjacent to the site.

Ditch D8

3.16 Ditch D8 is a very narrow, steep-walled channel within the wide grassy field margin. It contains flowing water and had been dredged at the southern end for approximately 90m, leaving smooth bare earth sides in this section (Photo 11).The banks along the ditch had been mown and the lush marginal vegetation present earlier in the year was now gone (Photo 12). The soft substrate and steep sides of the banks provides opportunity for water vole burrows, along with the grassy vegetation providing potential cover and foraging/nesting material. The narrow channel with limited water and foraging potential, and lack of connection to suitable resting/breeding habitat further into the site, makes it unlikely to support otters.

3.17 No field signs of otter or water vole were seen in the ditch or along the margins.

Ditch D9

3.18 Ditch D9, underneath scrub and trees at the eastern site boundary, is narrow, with moderately fast flowing water at time of survey and containing a lack of aquatic vegetation within the channel. The soft substrate of the ditch banks and steeper-sides in places offers suitable opportunities for water voles to burrow, however, the banks are shaded by a line of trees and scrub, and the bramble-dominated (*Rubus fruticosus*) ground vegetation results in much bare ground being present, thereby offering less cover against predators and fewer feeding opportunities along the banks for water voles. (Photo 13). The ditch was considered to have minimal suitability for otters due to its size, reduced habitat quality and cover against predators, and lack of foraging potential. The ditch is also isolated from the locations of otter records returned by the desk study.

3.19 No field signs of otters or water vole were seen during the survey.

Ditch 10

3.20 This narrow ditch at the edge of the woodland contains very little water, sporadically distributed along its length. It is surrounded by woodland which has shaded the ground, greatly reducing the vegetation cover present and limiting the protection against predators (Photo 14). The ditch is considered unlikely to support water voles or otters.

3.21 No field signs of otters or water vole were seen during the survey.

Ditch 11

3.22 Ditch D11 flows along the outside of the triangular patch of woodland. During this survey there was moderate water flow in the ditch, however, earlier in the season the water level in the ditch was considerably lower and the ditch contained abundant marginal vegetation such as fool's watercress (*Helosciadium nodiflorum*). The ditch is narrow, approximately 0.5-1m wide. The steep-sided, vegetated bank next to the field margin has a soft substrate with much of the bank above the water level, offering suitable habitat for water voles to burrow into, and potential foraging and nesting material. The banks are partially shaded by the woodland on the eastern side (Photo 15). The seasonal water levels and lack of foraging opportunities limits the suitability for otters, along with the isolation from locations of otter records seen from the desk study.

3.23 No field signs of otters or water vole were seen during the survey.

Other Species

3.24 Brown rat footprints and deer slots were seen at a number of locations along the banks of the dredged ditches at the south of the site. There was anecdotal evidence of barn owl (*Tyto alba*) seen foraging over the grassland fields at the south and nesting in nearby woodland to the south-east of the site boundary. There were sightings during the visit of roe deer in the field at the north-east of the site, and another small group in the species-poor semi-improved grassland at the south.

4. DISCUSSION AND RECOMMENDATIONS

Evaluation

4.1 There are no current signs of use by either water voles or otters of any of the waterbodies within or adjacent to the site, suitable terrestrial habitat on the site, or the section of River Gipping and the ditches adjacent to the site.

Water Voles

4.2 Habitats considered to have potential suitability for water voles, however, are:

- all ditches, except D10;
- suitable wetland habitat surrounding the ditches to the south-east of the site; and
- the river corridor adjacent to the site.

4.3 The dredging of the ditches at the south of the site would have significantly limited their current suitability for water voles, with the removal of vegetation along the banksides and within the channel resulting in an absence of cover against predators and a lack of foraging and breeding habitat for water voles. The dredging is also highly likely to have removed any field signs which may have been present, making it currently unclear whether water voles have recently been using the ditches.

4.4 The dredged ditches, however, are considered to have suitable potential to support water voles when the habitat is re-established, and the results from the desk study showing a record from this area in 2015 also supports the likelihood of water voles using the ditches within this part of the site.

4.5 The surrounding terrestrial habitat of damper grassland with patches of reedbed, rushes and sedges around the ditches at the south-east of the site also provides suitable water vole breeding sites.

4.6 The ditch, D8, within the field margin at the south of the site was assessed as suitable habitat for supporting water voles.

4.7 The River Gipping corridor adjacent to the site was assessed as providing suitable potential habitat for water voles and the majority of water vole records from the desk study were from the river, however, evidence for their presence was not found during the survey.

4.8 Two of the three ditches in the north of the site (D9 and D11) were assessed as having suitability for water voles, however, there are no previous records for water voles for a considerable distance around these ditches, and no evidence for their presence was found during the survey.

Otters

4.9 The section of River Gipping, adjacent to the site, is assessed as potentially the most suitable watercourse for otters in the locality due to the habitat quality and foraging opportunities present. The assessment is reinforced by existing records for otters at several locations along the river within the desk study search zone, and otters being known to have large home ranges and so potentially commuting along the river corridor.

4.10 The wetlands of reed, rushes and sedges associated with the ditches at the south-east of the site is also considered potentially suitable for otter resting sites and should be protected, with free access to the habitat from the river.

4.11 The narrower ditches within the south-east of the site were considered to have minimal suitability for otters due to the limited foraging opportunities present, although there may be some potential as a commuting corridor to access other sites in the wider area. The dredging of the ditches, however, would have significantly limited their current suitability, with the removal of vegetation along the banksides and within the channel resulting in an absence of cover against predators.

4.12 The ditch, D8 was assessed as unlikely to support otters, and the ditches in the north of the site were assessed as minimal suitability for otters due to a combination of factors; narrow channel size and low water depth, generally poor quality of bank vegetation cover, lack of foraging opportunities in the ditches and isolation from existing known population records.

Recommendations

Further Surveys

4.13 Guidelines for water vole surveys recommend at least two site visits, separated by a minimum of two months and undertaken sufficiently far apart to take into account habitat variations over the season; one survey in the first part of the season (generally mid April to the end of June) and the other in the second half (generally July to the end of September) (Dean *et al* 2016). There is not considered to be a requirement for a further otter baseline survey.

4.14 It is, therefore, recommended that one further survey for water voles is undertaken, with the optimum time for the survey being during the spring due to:

- The water levels are likely to have lowered in the ditches, revealing more soft substrate on the margins for footprints to be apparent;
- The vegetation in the dredged ditches at the south of the site having had opportunity to grow back and provide cover against predators, so increasing their suitability as habitat; and
- The vegetation being less likely to be overgrown this early in the season and potentially masking field signs.

4.15 It is also recommended to undertake an update assessment for signs of use by both water vole and otter, immediately prior to construction commencing, to ensure up-to-date information is available to inform the construction period.

Site Recommendations

4.16 It is recommended that development plans for the site ideally retain the existing watercourses and wetland habitats identified as being suitable habitat for water voles and otters, along with the maintenance of suitable buffer zones along the river corridor, marshy habitat and connecting habitat for both the construction and operation phases of the proposed development.

4.17 Impacts of the proposed development and options required to avoid and/or minimise the potential effects on water voles and otters should be considered at the detailed design phase, with measures developed by a suitably qualified and experienced ecologist.

4.18 A Construction Environment Management Plan (CEMP) should be produced, detailing the working practices during construction, to avoid damaging retained watercourses and wetland areas.

4.19 Opportunities for habitat enhancement on the site for water voles and otters should be sought, for example by creating new areas of suitable habitat and managing retained and new habitat appropriately. The attenuation pond may present such an opportunity. Again, advice should be

sought from a suitably experienced and qualified ecologist at the detailed design stage and management integrated into any Landscape and Ecology Management Plan (LEMP).

Licensing Considerations

4.20 Mitigation measures for the site need to be assessed in relation to the proposed development. This may require a licence from Natural England for activities potentially affecting water voles and otters, and can include limitations to the time of year that activities can be undertaken and consideration to impacts on other protected species potentially affected.

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6. ABBREVIATIONS

CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
EPS	European Protected Species
LEMP	Landscape and Ecology Management Plan
PAA	Penny Anderson Associates Ltd
SBIS	Suffolk Biodiversity Information Service
WCA	Wildlife and Countryside Act

FIGURE

606200 606400 606600 606800 607000 607200 607400 607600 607800 608000

258600 258400 258200 258000 257800 257600 257400 257200 257000

A14 47 49 51 A14 A140 Debenham Stowmarket Lavenham Claydon

SI H1 H2 H3 Qr Rf Sxci Fe Sxf Pc Cxri

A I

Cxri	Carex riparia	greater pond sedge
Fe	Fraxinus excelsior	ash
Pc	Phragmites communis	common reed
Qr	Quercus robus	pedunculate oak
Rf	Rubus fruticosus agg.	bramble
Sxci	Salix cinerea	grey willow
Sxf	Salix euxina	crack willow

Legend

- Boundary

Habitat

- Broadleaved woodland - semi natural
- Continuous scrub
- Neutral grassland - semi improved
- Neutral grassland - semi improved and scrub
- Neutral grassland with calcareous influences - unimproved
- Improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Swamp
- Marginal vegetation
- Wet ditch
- Dry ditch
- Arable
- Hardstanding
- River
- Scrub
- Scrub and trees
- Hedge
- Fence
- Tree
- Scattered scrub
- Shepherd's needle
- 250m buffer of ditch D8

N

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

Metres
0 25 50 100 150 200

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Project Name: Mill Lane, Stowmarket

Discipline: Ecology

Title: Phase 1 Habitat Survey

Scale 1:6,500		Drawing No. Figure 1	
Drawn By MDM	Originator GJH	Date 16/10/2020	
PAA Ref.		Revision 1.0	

Figure 1 BAMS01_Phase1_MDM_151020.mxd

APPENDICES

APPENDIX 1

Protected Species Legislation

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

SUMMARY OF THE LEGISLATION RELATING TO OTTERS

Otters (*Lutra lutra*), also known as European otters, are protected under the Wildlife and Countryside Act (WCA) 1981 (amended), which has also been amended by various later legislation including the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2017 (amended), and this legislation is applicable to England and Wales. Otters are listed on Schedule 5 of the WCA and are, therefore, subject to some the provisions of Section 9 which, with the amendments, make it an offence to:

- Intentionally or recklessly disturb an otter while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by an otter (S9:4c).

There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

Otters are also listed under Annexes IIa and IVa of EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

(a) deliberately capture, injure or kill any wild animal of a European protected species,

(b) deliberately disturb wild animals of any such species, in such a way as –

  (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or

  (iii) to affect significantly the local distribution or abundance of the species to which they belong;

(c) deliberately take or destroy the eggs of such an animal, or

(d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place, whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead otter or part of such an animal.

In addition, otters are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to otters for England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

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SUMMARY OF LEGISLATION RELATING TO WATER VOLES

Water voles (*Arvicola amphibius*) are protected under the Wildlife and Countryside Act 1981, as amended, and this legislation is applicable to England and Wales. Water voles are listed on Schedule 5 of the Act and are, therefore, subject to some the provisions of Section 9 which, with the amendments, make it (in brief) an offence to:

- Intentionally kill, injure or take a water vole (S9:1);
- Intentionally or recklessly damage or destroy or a structure or place used for shelter or protection by a water vole (S9:4a);
- Intentionally or recklessly disturb a water vole while it is occupying such a place (S9:4b); or
- Intentionally or recklessly obstruct access to any structure or place a water vole uses for shelter or protection (S9:4c).

There are additional offences in relation to possessing, controlling (S9:2), and buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

In addition, water voles are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services,* under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to water voles for England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

APPENDIX 2

Desk Study Data

Common_Name	Latin_Name	Location	Site_detail	Grid_Ref	Longitude	Latitude	Year	Obs_Comment	Taxon_Group	Designation	Abundance	ID
European Otter	Lutra lutra	Stowmarket	River Gipping under Navigation Approach road bridge, Stowmarket	TM0516258617	1.001658506	52.18716844	2016	spraint				
European Otter	Lutra lutra	Creeting St Peter	Badley Mill Farm	TM0734356813	1.032417029	52.17015501	2009					
European Otter	Lutra lutra	Combs	R. Rat - Comb	TM0534157808	1.003783578	52.17983774	2009					
European Otter	Lutra lutra	Stowmarket	ICI works/PPG	TM0568858026	1.008984233	52.18166592	2009					
European Otter	Lutra lutra	Badley	Gipping	TM073567	1.031720075	52.16915655	2008					
European Otter	Lutra lutra	Stowmarket	Gipping	TM051579	1.000319042	52.18075347	2008					
European Otter	Lutra lutra	Stowmarket	Gipping	TM062576	1.016203988	52.17764973	2008					
European Otter	Lutra lutra	Combs	Combs	TM052578	1.001719218	52.17981837	2001					
European Otter	Lutra lutra	Stowmarket	Gipping, PPG Paint works, Stowmarket	TM062577	1.016264781	52.17854763	2000					
European Water Vole	Arvicola amphibius	Creeting St Peter	river Gipping flood meadows creeting St. Peter	TM0709057154	1.028930596	52.17331181	2015	see them often when walking in Gipping valley				
European Water Vole	Arvicola amphibius	Stowmarket	Creeting Road, Stowmarket	TM066585	1.022594515	52.18558115	2010	one adult seen				
European Water Vole	Arvicola amphibius	Stowmarket	River Gipping Stowmarket	TM0529358533	1.003521405	52.18636545	2007	signs				
European Water Vole	Arvicola amphibius	Stowmarket	PPG Paintworks, Stowmarket	TM062577	1.016264781	52.17854763	2000					
European Water Vole	Arvicola amphibius	Stowmarket	Pikes Meadow, Stowmarket	TM051579	1.000319042	52.18075347	2000					

APPENDIX 3

Photographs

Photo 1

Ditch D1 along the south-east boundary of the site

Photo 2

Ditch D2 in the grassland at the south-east of the site, recently dredged

Photo 3

Footprints of brown rat on the recently dredged bank of Ditch D2

Photo 4

Ditch D3 in the grassland at the south-east of site, recently dredged

Photo 5

Ditch D4 in the grassland at the south-east of site, recently dredged

Photo 6

Ditch D5 in the grassland at the south-east of site, recently dredged

Photo 7

Ditch D6 in the grassland at the south-east of site, currently being dredged

Photo 8

Ditch D7 along the south-east boundary of the site, partially dredged

Photo 9

River Gipping, looking west, showing nettle-dominated bank next to the site

Photo 10

River Gipping further south, looking upstream, showing scattered scrub/trees along banks

Photo 11

Ditch D8 along the field margin at the south of the site, partially dredged

Photo 12

Mown banks of Ditch D8

Photo 13

Ditch D9 along the north-eastern boundary of the site

Photo 14

Ditch D10 along the edge of the woodland, at the north-east of the site

Photo 15

Ditch D11 on the edge of the woodland at the north-east of the site

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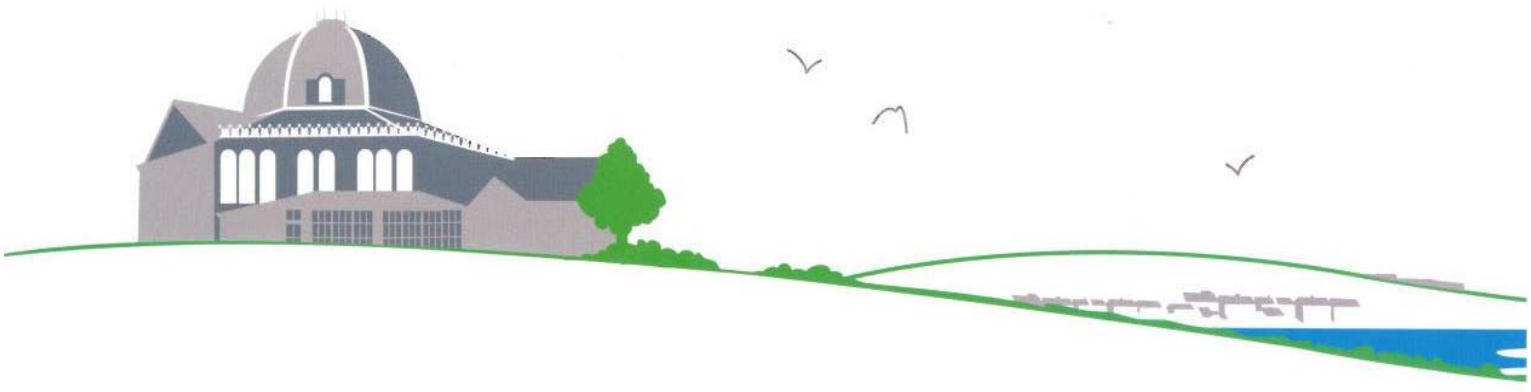
LAND OFF MILL LANE, STOWMARKET

REPTILE SURVEY REPORT



BABERGH AND MID SUFFOLK DISTRICT COUNCIL

LAND OFF MILL LANE, STOWMARKET

REPTILE SURVEY REPORT

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Project Manager and Author
Gerard Hawley BA (Hons), MSc, DipPSE (Dist), MCIEEM

November 2019 – Revised October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed:_____

Penny Anderson Associates Ltd
CONSULTANT ECOLOGISTS

CONTENTS

1. INTRODUCTION

Background

1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Barbergh and Mid Suffolk District Council to carry out a number of ecological surveys at a site off Mill Lane, Stowmarket, Suffolk (hereafter referred to as the 'site').

1.2 Following the preliminary Phase 1 habitat survey (PAA 2019), a recommendation was made to complete a reptile survey given that the habitat was suitable and the desk study request for biological records returned records for reptiles.

1.3 In England and Wales there are six native species of reptile. Snakes include the adder (*Vipera berus*), grass snake (*Natrix natrix*) and smooth snake (*Coronella austriaca*) the latter being very rare in the UK. Lizards include the common or viviparous lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*) and sand lizard (*Lacerta agilis*). The sand lizard is a rare European Protected Species (EPS). The common lizard is the UK's most common and widespread reptile found across a range of habitats.

1.4 Reptiles are most widely found on large areas of habitat such as heathland, moorland, rough grassland and sand dunes, but they are often present locally in a range of other land covers. Vegetation structure is important and good reptile habitat has a mixture of vegetation heights.

1.5 In the event of a significant reptile population being found it is important to devise suitable mitigation action. This could be in the form of displacing reptiles from sensitive areas, translocation to a receptor site, or use of temporary fencing to prevent reptiles moving into areas where there are potentially damaging activities (GOV.UK 2015, Draper 2015).

1.6 This report details the results of a reptile survey carried out in September and November 2019 and evaluates the results in the context of the proposed development of the site.

Site Description

1.7 The site covers an area of approximately 78.5ha and is bounded to the north by the A41 dual carriageway and to the west by the A1120. A railway line forms the boundary to the south-west and farmland lies to the east. There are no built structures (although there are power pylons) and the majority of the site is given over to arable production with large fields divided by fencing and hedgerows with field margins.

Aims

1.8 The purpose of the survey was to:

- Ascertain if reptiles were present on or immediately adjacent to the site; and
- Provide recommendations for appropriate mitigation where necessary.

Legislative and Policy Context

1.9 All native reptiles receive some legal protection in Great Britain making it illegal to intentionally kill or injure a common reptile. Smooth snake and sand lizard also receive legal protection under the Conservation of Habitats and Species Regulations 2017.

1.10 All reptile species are species of principle importance under the Natural Environment Rural Communities (NERC) Act 2006, and they are a material consideration in the planning process such that local authorities have a legal duty to take their conservation into account. It is illegal to intentionally kill, injure, capture or disturb a reptile, or to damage or obstruct any place used for shelter or protection.

2. METHODS

Desk Study

2.1 The desk study was undertaken in April 2019 and examined all data records for protected sites, habitats and species held by the Suffolk Biodiversity Information Service (SBIS), the county biological records centre. This included reptiles.

Field Survey

2.2 The reptile survey was informed by a number of established protocols (Froglife 1999; Gent and Gibson 2003; English Nature 2004). A combination of direct observation and artificial refuge survey were used, in line with current best practise guidelines in the *Reptile Mitigation Guidelines* (Natural England 2011).

2.3 Reptiles are often found under or on top of objects resting on the ground. These refuges can act as a place to shelter from predation and disturbance, and as an aid to absorbing heat. Certain materials trap heat and provide an opportunity for animals to warm up without exposing themselves to increased levels of danger. Artificial refuges attract reptiles and are a useful aid to surveys if correctly located.

2.4 The initial visit was used to assess habitat and determine the best sites for locating artificial refugia (roofing felt mats 100cm x 50cm) in locations considered most likely to support reptiles. The majority of the site consists of farmland under arable production and these areas were not selected for artificial refugia. The most suitable habitat was assessed as being along field margins in areas that would be close to the proposed development. The areas selected were the wide field margins to the east of the site and in the southern area next to the railway line (railways are recognised as important for reptiles and conduits for colonisation). The northern boundary margin is very narrow and adjacent to the busy main road and consequently less suitable. The reptile mats were laid out at approximately 10m intervals concentrating on micro-habitats most suited to reptiles, such as hollows and ditch banks, in particular south-facing sunny spots.

2.5 A total of 150 refuges were laid out meeting the minimum guideline density of ten in suitable habitat recommended in the guidelines provided by Froglife (1999). The protocols note that not all the site may be suitable for reptiles. Refugia should be left *in situ* for a number of days before seven further check visits, either in the morning or late afternoon at times when reptiles are more evident

2.6 The mats were placed on 2nd September 2019 (the locations are illustrated in Figure 1 and each mat was numbered). They were left to 'bed down' in the vegetation until the first survey on 10th September. Surveys then involved checking for reptiles on and under these refuges.

2.7 The surveys were not confined to checking mats alone but also inspecting any feature that might be used for basking, such as exposed rocks and stone walls. Surveyors walked slowly, treading softly, scanning the area a few metres in front aware that shadows can alarm basking reptiles.

2.8 The mats were checked by lifting one edge to near vertical to check for reptile presence. This is best done when the weather conditions are sufficient to make the surface warm to the touch.

2.9 Reptiles are generally active from March to October, but the most productive months for surveying tend to be April, May and September. It is recommended that the best times to look for reptiles are during morning hours between 8.30am to 11.00am and 4.00pm to 6.30pm in the afternoon, with peak air temperature between 9 to 20°C. Bright sunshine is favourable on cooler

days and hazy or intermittent sunshine is favourable when warmer (Froglife 1999; Draper 2015).

Visit Details

2.10 The seven survey visits were conducted by the ecology consultancy Adonis Ecology by experienced ecologists on the dates indicated in Table 1. All methods, equipment and assessment criteria were consistent with current good practice guidelines for survey and the surveyors were competent for their assigned tasks based on the CIEEM competency framework (CIEEM 2013).

2.11 Wind was estimated using the Beaufort Wind Force Scale, ranging from 0 calm to 5 moderate breeze. Cloud cover was estimated as percentage cover, where 0% is a completely clear sky and 100% when completely overcast.

Table 1 Visit Dates and Conditions

Visit	Date	Time	Temp (°C)	Wind	Cloud (%)	Surveyor Remarks
1	10/09/2019	08:00–11:00	13.5	0	90	Ground moist
2	12/09/2019	09:00– 12:00	16 - 19	3	30	Dry and warm
3	14/09/2019	16:00– 20:45	10 - 13	1	15	Dry and sunny
4	16/09/2019	08:00–11:15	9.5 – 14.5	0	100	No rain but recent drizzle
5	18/09/2019	08:00– 10:15	12.5 - 14	1	0	Dry and sunny
6	23/09/2019	16:00– 20:30	11 – 13.5	2	20	Dry and sunny
7	02/10/2019	09:00– 12:00	15 – 12.5	3	5 - 60	Sunny start but increasing cloud

Survey Limitations

2.12 The timing and the weather conditions were suitable on each of the survey visits.

3. RESULTS

Desk Study

3.1 Two records were returned for common lizard, 11 for slow-worm at Badley and nine for grass snake with the majority recorded in Combs Wood. Badley is approximately 1.1km to the south of the site with the railway line intervening and Combs Wood is approximately 1km to the south-west separated from the site by a major road and railway. In both cases ecological connectivity with the site is poor.

Field Surveys

3.2 The results of the reptile survey are illustrated on Figure 1 with illustrative photos in Appendix 1.

3.3 A single slow worm was recorded on the first of the survey visits on 10th September 2019 under mat 131. A slow worm was also recorded beneath mat 97 on two occasions on 16th and 18th September 2019. No other reptiles were recorded.

Other Species

3.4 Incidental sightings were made of field vole (*Microtus agrestis*) and common shrew (*Sorex araneus*), mostly towards the north end of the site and a brown hare (*Lepus europaeus*) was seen in the centre of the field near the pylon during the first visit.

4. DISCUSSION AND RECOMMENDATIONS

4.1 The slow worm is widespread throughout the British Isles although absent from Ireland and most common in the south-west of England and Wales.

4.2 The survey results would indicate that there is a relatively small slow worm population present. However, it should be remembered that reptiles are cryptic, fast moving animals that can be difficult to record. The habitats are suitable, providing cover from predation, hibernation refugia and foraging opportunities, e.g. invertebrates, spiders, earthworms and snails.

4.3 Although other reptiles were not recorded, this does not prove absence, and the habitats are ostensibly suitable for grass snake and common lizard with records within the 2km desk study search area.

Recommendations

4.4 In the first instance it is recommended that the habitat where slow worms were recorded, i.e. along the south-eastern field margin, is retained within a suitable undeveloped buffer zone. Such a buffer zone should be demarcated with heras fencing (or similar) and temporary reptile exclusion fencing erected to prevent slow worms and other reptiles from moving into the adjacent development footprint.

4.5 In addition, the following precautionary measures are recommended within the development footprint prior to and during site clearance:

- A toolbox talk should be given by a qualified ecologist to inform contractors of the appropriate action to be taken in the event of slow worm and other reptile species being found;
- In the event of a reptile being found, an Ecological Clerk of Works and experienced ecologist should be contacted for advice;
- Potential reptile refugia (rubble, rock, woodpiles) should be checked and removed by hand by a suitably experienced ecologist. If translocation is necessary it should be to the retained buffer zone area which will need to be isolated from the development area by reptile exclusion fencing. Research has shown that adder, for example, can be site-faithful and return to the area where they were originally found (Nash and Griffiths 2018). Thus the fencing is required to prevent reptiles from returning to the development area;
- Particular care should be taken with tufts of vegetation and tussocky grassland where reptiles are more likely to take refuge. If necessary, vegetation within the development footprint can be strimmed to 150mm to facilitate hand searches for reptiles prior to soil stripping;
- Reptiles should not be moved if heavily gravid, while hibernating, in extreme weather (e.g. heat, drought, flooding) or during autumn (GOV.UK 2015);
- The reptile exclusion fencing should be retained and checked regularly for the duration of the development and removed only once construction is complete; and
- If any habitat management is proposed within the reptile buffer strip then this should be tailored to reptile requirements. The ideal management regime would be an annual grass cut in late summer to a height of 150mm.

5. REFERENCES

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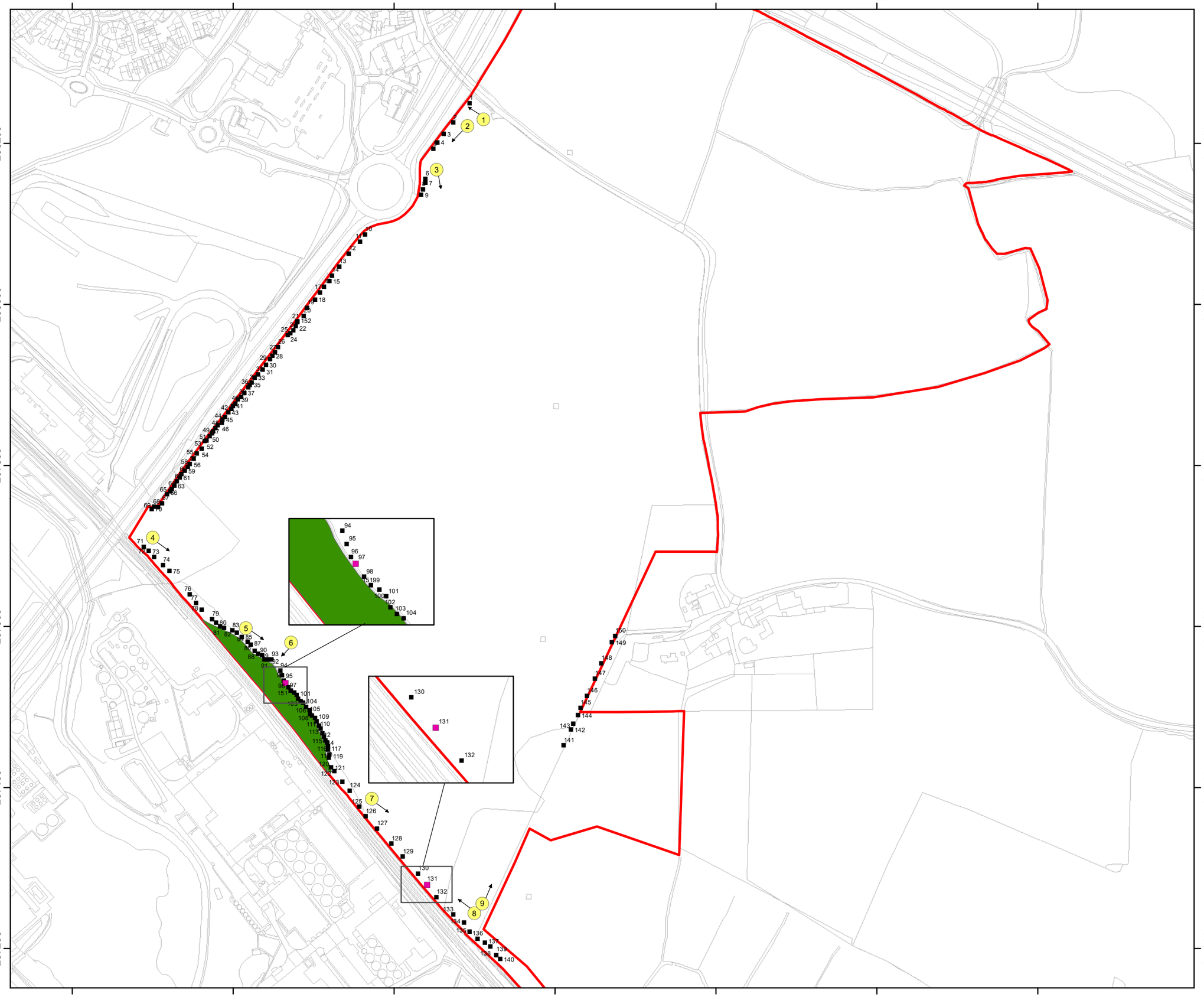
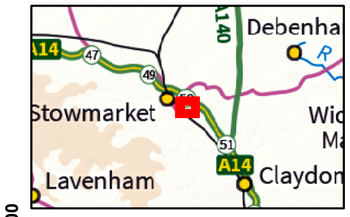
FIGURE

606200 606400 606600 606800 607000 607200 607400

258200 258000 257800 257600 257400 257200





Legend

- Boundary
- Reptile survey mats
- Slow worm recorded
- Woodland
- Photo location - arrow indicating direction pointing (see Appendix 1)

N

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: -100000.000000
Central Meridian: -2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

Metres

0 22.5 45 90 135 180

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Discipline: Ecology

Title:

Location of Reptile Survey Mats and Results

Scale	1:4,500	Drawing No.	Figure 1
Drawn By	MDM	Originator GJH	Date 13/10/2020
PAA Ref.			Revision 1.0

BAMS01_ReptileMats_MDM_061119.mxd

APPENDIX 1

Photographs

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

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Ecology

Summary Baseline Information and Key Issues

Baseline surveys of the study area have been undertaken in accordance with best practice. A Phase 1 habitat survey was completed in May 2019. This incorporated a desk study to identify protected and notable species and the location of statutory and non-statutory wildlife sites within a 2km radius of the centre of the site. Records were returned for a range of species including seven species of bat, 88 bird species that included amber and red listed and nine Schedule 1 species, records for badger (Meles meles), great crested newt (Triturus cristatus, GCN), reptiles (common lizard (Zootoca vivipara), slow-worm (Anguis fragilis) and grass snake (Natrix helvetica)), otter (Lutra lutra) and water vole (Arvicola amphibius).

Combs Wood Site of Special Scientific Interest (SSSI) is located approximately 1km to the south-west of the site boundary. It is an ancient woodland notified for well developed coppice of hornbeam (Carpinus betulus) and a variety of woodland types that include pedunculate oak (Quercus robur)-hornbeam with ash (Fraxinus excelsior) and field maple (Acer campestre) and scattered stands of pedunculate oak. There are seven County Wildlife Sites (CWS) present within the search area, three of which are close to the site. RHR 169 (Roadside Nature Reserve). located at the ring road at the northern corner of the site is noted for sulphur clover (Trifolium ochroleucum) and pyramidal orchids (Anacamptis pyramidalis); Cedars Park Grassland, immediately to the east of the site, consists of unimproved and semi-improved calcareous grassland and approximately 700m to the south is Suffolk Business Park Meadow, which is unimproved species-rich grassland.

Arable cereal cropping is the predominant land use. Mill Lane cuts through the site, separating the three crop fields to the north and a much larger crop field to the south of Mill Lane. The arable fields and poor semi-improved grassland have limited botanical interest and are of low ecological value. However, other habitats within the site are of greater botanical interest. This comprises species-rich grassland margins, particularly two unimproved neutral/calcareous grassland at the margins of the largest crop field that contain a wide variety of species including wild parsnip (Pastinaca sativa sylvestris), cowslip (Primula veris) and grass vetchling (Lathyrus nissolia). A species of considerable importance, critically endangered facing an extremely high risk of extinction in the UK is the rare annual shepherd's needle (Scandix pectin-veneris) found in sections of crop margins around the fields to the north of Mill Lane. Based on the findings of the Phase 1 habitat survey, a number of recommendations for species-specific surveys were made comprising: badger, GCN, reptiles, riparian mammals (otter and water vole) and breeding birds and detailed surveys were completed during 2019 and 2020.

There is an active outlier badger sett in the north-west corner of the site. Immediately to the south-east of the application area there is an uncut semi-improved grassland field with a number of wet drainage ditches that are within 250m of the site boundary. Water samples were taken from the ditch network for GCN DNA analysis and no presence was detected. The reptile survey recorded slow-worm on three occasions on field margins in the south-west where there are no proposals for development. A small area of the application site falls close to the River Gipping. No field signs suggesting use of the site by

water vole or otter were found. A mature oak tree that will be retained on the north-west boundary was assessed as having moderate bat roost potential. The large, open arable fields do not presently provide good foraging habitat for bats. The field margins with trees and shrubs represent better foraging opportunities and act as commuting corridors. The breeding bird survey recorded a total of 50 species within the site and its vicinity of which 44 species were considered to be either of 'Confirmed', 'Probable' and 'Possible' breeding species. Five were confirmed as breeding. The majority of records were associated with field boundaries, patches of woodland, scrub and uncultivated land.

Likely Significant Environmental Effects to be Addressed in the ES

The likely significant environmental effects on the identified important ecological features to be considered within the Environmental Statement (ES) are as follows:

- *Potential for indirect effects on adjacent CWS;*
- *The loss of valued habitat and plant species;*
- *Reduction in foraging and breeding opportunities for animal species;*
- *Displacement and risk of injury/killing/disturbance of nesting birds;*
- *Reduction in ecological connectivity with the loss of field margins and linear features;*
- *The threat of pollution to habitat condition and animal species e.g. chemical, fuel spillages; and*
- *Disturbance of protected species, including bats and nesting birds, from artificial light spill during works and the completed operational site.*

Summary Assessment Methodology

The proposed assessment methodology will follow current best practice for the assessment of effects on ecology set out in the Guidelines for Ecological Impact Assessment in the UK and Ireland from the Chartered Institute of Ecology and Environmental Management (CIEEM)[1].

The ES would describe the key habitats and species present on the site, or within the immediate vicinity, and assess the value of these ecological receptors. An assessment of the scale, magnitude and

[1] *CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Chartered Institute of Ecology and Environmental Management, Winchester.*

significance of any potential impacts associated with the proposed development would be considered, and the need for any mitigation and/or compensation measures identified.

The ES chapter would provide details of any compensation/mitigation measures and identify the residual impacts on each ecological receptor following compensation/mitigation measures. Mitigation measures would take account of relevant legislation and Local Plan policies.

The assessment will consider the effects of the Project on ecology during the construction, operation and decommissioning phases of the Project and the results will be presented in the ES.

The assessment will be informed by a suite of legislation and policy, which is summarised below. No licences or permits will be required in relation to ecology to allow for the construction, operation and maintenance of the Project.

The following legislative framework will inform the assessment of effects on ecology:

- *Conservation of Habitats & Species Regulations 2017[2] (the 'Habitat Regulations');*
- *Wildlife and Countryside Act 1981 (as amended)(WCA)[3]; and*
- *The Natural Environment and Rural Communities (NERC) Act, 2006[4].*

The Habitat Regulations 2017 replaced The Conservation (Natural Habitats, etc.) Regulations 1994 (as amended)[5], and transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive')[6,] and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive')[7] into UK law.

Regulation 41 of the Habitat Regulations 2017 makes it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2 (European protected species of animals), or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4 (European protected species of plant). Development that would contravene the protection afforded to European protected species requires a derogation (in the form of a licence) from the provisions of the Habitats Directive.

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[2] *The Conservation of Habitats and Species Regulations 2017 (accessed via www.legislation.gov.uk).*

[3] *Wildlife and Countryside Act 1981 (as amended) (accessed via www.legislation.gov.uk).*

[4] *Natural Environment and Rural Communities Act 2006 (accessed via www.legislation.gov.uk).*

[5] *The Conservation (Natural Habitats, &c.) Regulations 1994 (Statutory Instrument 1994 No. 2716)*

[6] *EC Council Directive 92/43/EEC (1992) The Conservation of Natural Habitats and of Wild Fauna and Flora. Official Journal L206, 22/07/1992 0007-0050. The European Commission Official Journal.*

[7] *Council Directive 79/409/EEC of 2 April 1979 on the Conservation of Wild Birds Official Journal* ***L103****, 25/04/1979 0001-0018.*

The WCA 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in England. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention')[8] is translated into UK law.

The NERC Act 2006 states that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. Biodiversity Action Plans (BAP) provide a framework for prioritising conservation actions for biodiversity.

Section 41 of the NERC Act 2006 requires the Secretary of State to publish a list of species of flora and fauna and habitats considered to be of principal importance for the purpose of conserving biodiversity. The list, a result of the most comprehensive analysis ever undertaken in the UK, currently contains 1,149 species, including for example, hedgehog (Erinaceus europaeus) and 65 habitats that were listed as priorities for conservation action under the now defunct UK BAP (UK BAP)[9].

As a response to the Convention on Biological Diversity (CBD) Strategic Plan for Biodiversity 2011-2020 and European Union Biodiversity Strategy (EUBS) the UK BAP was devolved and succeeded by the UK Post-2010 Biodiversity Framework (and Biodiversity 2020 strategy in England)[10]. This list (now referred to as the list of Species and Habitats of Principal Importance in England) will be used to guide decision-makers such as public bodies, including local and regional authorities in implementing their duty under Section 41 of the NERC Act 2006 'to have regard' to the conservation of biodiversity in England, when carrying out their normal functions'.

The National Planning Policy Framework (NPPF) 2018[11] sets out the Government's planning policies for England, including how plans and decisions are expected to apply a presumption in favour of sustainable development. Chapter 15 of the NPPF focuses on conservation and enhancement of the natural environment. The NPPF acknowledges the importance of protecting and improving green corridors and ecological connectivity, providing strategic green infrastructure gains, factoring in overall enhancement of natural capital.

Abbreviations

BAP *Biodiversity Action Plan*

CBD *Convention on Biological Diversity*

CIEEM *Chartered Institute of Ecology and Environmental Management*

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[8] *Council of Europe (1979) The Conservation of European Wildlife and Natural Habitats (the 'Bern Convention').*

[9] *JNCC The UK Biodiversity Action Plan: 1992-2012 (accessed via www.jncc.defra.gov.uk/ukbap).*

[10] *JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012 (accessed via www.jncc.defra.gov.uk).*

[11] *Ministry of Housing Communities and Local Government (2018) National Planning Policy Framework (accessed via www.gov.uk/government/publications).*

CWS *County Wildlife Site*

ES *Environmental Statement*

EUBS *EU Biodiversity Strategy*

NERC *Natural Environment and Rural Communities*

NPPF *National Planning Policy Framework*

SSSI *Site(s) of Special Scientific Interest*

WCA *Wildlife and Countryside Act*