CSA environmental

Land off Forest Road,
Onehouse

Ecological Impact Assessment

Prepared by
CSA Environmental

on behalf of
Harris Strategic Land

Report No: CSA/5398/03

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This report may contain sensitive ecological information. It is the responsibility of the Local Authority to determine if this should be made publicly available.

Report Reference	Date	Revision	Prepared by	Approved by	Comments
CSA/5398/03	27/08/2021	-	CH	JW	Draft for comment

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EXECUTIVE SUMMARY

Residential development of 20 dwellings is proposed at Land off Forest Road, Onehouse, for which outline planning permission is sought.

CSA Environmental was instructed by Harris Strategic Land to undertake an Ecological Impact Assessment (EcIA) of the proposed development. To inform this assessment, a desktop study followed by a suite of targeted species and habitat surveys were undertaken.

The Site is of limited ecological interest, being dominated by arable land with narrow field margins. On-site ecological interest is restricted to the boundary hedgerows/trees.

Further survey work in regards to bats has identified no roosts, and shown on-site bat activity to be dominated by common pipistrelle, with very small numbers of 'S41' priority bat species occasionally utilising the Site. A sensitive external lighting scheme is proposed in order to maintain foraging opportunities at the Site for bats. A third (final) remote monitoring survey for bats is scheduled for September 2021, the results of which will subsequently be provided in an updated EcIA report.

Great crested newt HSI and eDNA surveys were undertaken of ponds within 250m of the Site (where access was granted). The results of the eDNA survey were negative, indicating likely absence of GCN.

Ecological enhancement measures have been proposed, including the provision of integrated bird and bat boxes, and hedgehog holes. Measures have also been proposed in respect of safeguarding badgers and nesting birds.

Based on successful implementation of the proposed avoidance, mitigation and enhancement, the development is not anticipated to result in any significant residual negative effects on important ecological features.

Furthermore, it has been demonstrated that the scheme can secure a net gain in biodiversity through on-site habitat creation.

The scheme is considered to accord with all relevant nature conservation legislation, as well as with the provisions of Babergh and Mid Suffolk Local Plans.

1.0 INTRODUCTION

1.1 This report has been prepared by CSA Environmental on behalf of Harris Strategic Land. It sets out the findings of an Ecological Impact Assessment (EcIA) of proposed development at Land off Forest Road, Onehouse (hereafter 'the Site'). Residential development is proposed at the Site, for which outline planning permission is sought.

1.2 The scope of this assessment has been determined with consideration of best-practice guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the Biodiversity: Code of practice for planning and development published by the British Standards Institute (BS 42020:2013).

1.3 The Site occupies an area of c. 1.37ha and is located around central grid reference TM 0257 5944, to the south-east of Onehouse and north-west of Stowmarket, Suffolk. The site comprises part of an arable field with narrow field margins and boundary hedgerows with occasional standard trees to the north, east and west. A ditch is also located along with northern Site boundary (see Habitats Plan in Appendix A).

1.4 An initial desk study and extended Phase 1 Habitat survey were undertaken for the Site in 11 March 2021 as part of a Preliminary Ecological Appraisal, the findings of which are presented herein. In addition, the following further survey work was undertaken between May and August 2021:

- GCN (May - June 2021)
- Bat surveys (July - August 2021)

1.5 This EcIA aims to:

- Establish baseline ecological conditions at the Site.
- Determine the importance of ecological features which could be affected by the proposed scheme.
- Identify any likely significant impacts or effects of the proposed development on important ecological features, in the absence of mitigation, including cumulative impacts.
- Set out any measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
- Identify any compensation measures required to offset residual impacts.
- Set out potential ecological enhancement measures that may be secured by the proposed scheme, and quantify the overall net change in biodiversity using the Natural England Biodiversity Metric 3.0.

- Confirm how proposed mitigation, compensation and enhancement measures could be secured.
- Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be imposed by the relevant authority.

1.6 An EcIA can be used for the appraisal of projects of any scale. This is a best practice evaluation process, recommended by CIEEM (2018). It is intended that the evaluation of findings presented here-in will aid the local authority in their review of the planning application.

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

2.1 Legislation relating to wildlife and biodiversity of particular relevance to this EcIA includes:

- The Conservation of Habitats and Species Regulations 2017 (as amended)
- The Wildlife and Countryside Act 1981 (as amended)
- The Natural Environment and Rural Communities (NERC) Act 2006
- The Protection of Badgers Act 1992

2.2 This above legislation has been addressed, as appropriate, in the production of this report. Further information on the above legislation is provided in Appendix B.

National Planning Policy

2.3 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the government planning policies for England and how they should be applied. Chapter 15: Conserving and Enhancing the Natural Environment, is of particular relevance to this report as it relates to ecology and biodiversity. Further details are provided in Appendix B.

2.4 Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). The Natural Environment PPG addresses biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services. Further guidance in respect of statutory obligations for biodiversity conservation within the planning system is provided by Government Circular 06/2005.

Local Planning Policy

2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Table 1 of Appendix B. These policies have been addressed, as appropriate, in the production of this report.

Standing Advice

2.6 Natural England Standing Advice regarding protected species aims to support local authorities and forms a material consideration in determining applications in the same way as any individual response received from Natural England following consultation. Standing advice has therefore been given due consideration, alongside other detailed

guidance documents, in the scoping of ecological surveys and production of this report.

3.0 METHODS

Desk Study

3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in March 2021 to identify the following ecological features (based on the Site's likely 'zone of influence' in respect of such features):

- Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites within 10km of the Site (including possible/proposed sites)
- Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) within 3km of the Site
- Other relevant data e.g. Ancient Woodland Inventory within 1km of the Site

3.2 Suffolk Biological Records Centre (SBIS) was contacted for details of any non-statutory nature conservation designations and records of protected/notable habitats and species. This information was requested for an area encompassing the Site and adjacent land within c. 2km of its central grid reference. This search area was selected to include the likely zone of influence of effects upon non-statutory designations and protected or notable habitats and species.

3.3 Further online resources were reviewed for information which may aid the identification of important ecological features. The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land. Interactive online mapping provided by the charity 'Buglife' was used to determine whether the Site falls within an Important Invertebrate Area.

3.4 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*; using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography.

3.5 Where possible under the terms of the data provider, relevant desk study data are presented in Appendix C.

Field Surveys

Extended Phase 1 Habitat Survey

3.6 An extended Phase 1 Habitat survey was carried out in fine and dry weather conditions on 11 March 2021 by Carly Howes ACIEEM and Matt Dale, encompassing the Site and immediately adjacent habitats that could be viewed.

3.7 Phase 1 Habitat survey is a method of classification and mapping wildlife habitats in Great Britain. It was originally intended to provide "*…relatively rapidly, a record of the semi-natural vegetation and wildlife habitat over large areas of countryside.*" The Phase 1 Habitat Survey method has been widely 'extended' beyond its original purpose to allow the capture of information at an intermediate level between Phase 1 and Phase 2 Habitat surveys. Here, the standard survey method has been 'extended' in this report to include the following:

- More detailed floral species lists for each identified habitat
- Descriptions of habitat structure, the evidence of management and a broad assessment of habitat condition
- Mapping of additional habitat types (e.g. hardstanding)
- Identification of Habitats of Principal Importance in respect of Section 41 (S41) of the NERC Act 2006
- Identification of Habitats Directive Annex I habitat types
- Evidence of, or potential for, European Protected Species (EPS) (including bats, great crested newt, dormouse and otter)
- Evidence of, or potential for, other protected species (including birds, reptiles, water vole, badger and certain invertebrates)
- Evidence of, or potential for, other notable species (including S41 Species of Principal Importance as well as notable, rare, protected or controlled plants and invertebrates)

3.8 Results of the extended Phase 1 Habitat survey are presented on the Habitats Plan in Appendix A. Appendix D provides a list of floral species recorded in each habitat.

Further Survey Work

3.9 The following detailed field survey work was carried out between May and August 2021, with full methods and results provided in the relevant Appendices:

- Bat Activity Surveys (Appendix G)
- Great Crested Newt Habitat Suitability Index (Appendix H)
- Great Crested Newt eDNA survey (Appendix H)

Limitations

3.10 There were no specific limitations to the desktop study. The botanical descriptions within this report are based on a Phase 1 Habitat survey undertaken outside of the optimal period for botanical surveying, when some plant species may not be visible above ground. Limitations to further survey work are addressed in the relevant appendices, however, no substantive limitations to work undertaken have been identified.

Evaluation and Assessment

3.11 Ecological features are identified, evaluated and assessed in accordance with the CIEEM Guidelines for Ecological Impact Assessment (2018), with detailed methods provided in Appendix E.

3.12 It is an established principle (CIEEM, 2018) that EcIA is an iterative process. Specialist advice on the avoidance and mitigation of the potential negative effects of the proposed development has been input from an early design stage.

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

4.1 There are no statutory designations covering any part of the Site.

4.2 No international, national or local statutory designations were identified within 10km, 3km and 3km of the Site, respectively.

Non-Statutory

4.3 A total of ten non-statutory designations (County Wildlife Sites [CWSs] and Roadside Nature Reserves [RNRs]) were identified within 2km of the Site. These non-statutory designations are described in Table 1 below.

Table 1. Statutory and Non-Statutory Designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Special Interests or Qualifying Features
International Designations within 10km		
-		
National Designations within 3km		
-		
Local Designations within 3km		
-		
Non-Statutory Designations within 2km		
Northfield Wood CWS	c. 0.2km north	Area of ancient woodland with a large proportion consisting of replanted conifers (Norway spruce, western red cedar and Scots pine). Approximately 4ha has been felled and replanted with oak and cherry. A number of scarce ancient woodland indicator plants are present including pale sedge, nettle-leaved bellflower and herb-Paris. A pond in the north-eastern corner is a known habitat for breeding amphibians.
Willow Farm Riverside Woodland CWS	c. 1.3km south-east	Immediately adjacent to the River Rat, consisting of semi-natural habitat of semi-mature to mature willows, with occasional alder. The site also consists of open areas dominated by reed and sedge.
Dales Wood CWS	c. 1.3km south-east	Included in the Suffolk Ancient Woodland Inventory, this wood contains large coppice stools of ash, as well as a number of ancient woodland indicator plants such as wood millet, oxlip, nettle-leaved bellflower and small-leaved lime. The semi-natural structure of oak and ash trees with an understorey of hazel coppice has largely been retained.

Temple Grove CWS	c. 1.4km south	An area of ancient woodland, consisting of Tall ash and field maple coppice with an understorey of hazel coppice. In addition, sycamore is frequent in places. Wood anemone, an indicator of ancient woodland, also occurs frequently.
RNR 219	c. 1.4km north-east	Roadside Nature Reserve which supports populations of bee and pyramidal orchid.
Haughley Arable Field Margin, RNR 160	c. 1.6km north-east	This arable field margin is the only known site in Suffolk for a long-established and self-sustaining population of Cornflower. Cornflower has been identified as a priority species for conservation in Suffolk. This population is also thought to be unique from cornflower found in sowing mixes.
Fen Acre Meadows CWS	c. 1.6km north-east	This CWS consists of two unimproved, species-rich meadows enclosed by dense hedges of hazel, hawthorn and occasional mature alders. The meadows slope to a stream which is rich in rush and species-rich grassland. Wetland plants such as southern marsh-orchid, greater bird's foot trefoil, ragged robin, adder's tongue fern, bistort, meadow rue, meadow saxifrage and marsh valerian are also present.
Rat River Meadows CWS	c. 1.6km south-east	Linked floodplain bordering the River Rat. Meadows are composed of unimproved valley grassland/pasture. The site also contains hedges, ditches and willow pollard and a small area of alder carr wet woodland, and supports priority species such as water vole and reed bunting.
Buxhall Fen CWS	c. 1.7km south-west	Area of wetland consisting of mixed wet alder carr and tall fen vegetation, as well as areas of dense blackthorn scrub. The site provides valuable habitat for many birds such as blackcap, whitethroat, marsh tit and nightingale.
Greens Meadow CWS	c. 1.8km east	Greens Meadow is a mosaic of wetland habitats and includes areas of scrub, open water and wet grassland that support a diverse assembly of invertebrates, birds and wetland plants. The site is notable for its large populations of brown sedge and adders tongue fern. Dense thickets of willow scrub provide birds nesting and feeding opportunities for species such as blackcap, chiffchaff and whitethroat. Nightingales have also been recorded.

Habitats and Flora

Ancient Woodland

4.4 There is no ancient woodland covering any part of the Site or immediately adjacent land. No trees on or adjacent to the Site are listed on the Ancient Tree Inventory.

4.5 The closest ancient woodland is Northfield Wood which is located c. 200m directly north of the site. A number of veteran trees have been identified from the Ancient tree inventory, to the north and west of Northfield Wood. A small number of ancient semi-natural and replanted woodlands are present within the wider landscape.

Notable Flora Records

4.6 SBIS provided 39 records of 26 notable plant species from within the search area. Those of potential relevance to the Site include corn flower *Centaurea cyanus*; wood spurge *Euphorbia amygdaloides*; corn mint *Mentha arvensis*; dwarf spurge *Euphorbia exigua*, field scabious *Knautia arvensis* and bluebell *Hyacinthoides non-scripta*.

4.7 None of these species were identified within the Phase 1 Habitat survey, however, they are of potential relevance due to the habitats present on-site.

4.8 Other records of note include Japanese knotweed *Fallopia japonica* and giant hogweed *Heracleum mantegazzianum*. These species are included within the Wildlife and Countryside Act's Schedule 9 list of invasive non-native species. Giant hogweed has been recorded within Northfield Wood c. 200m north of the Site. The remaining records were provided as tetrads and therefore the precise location of these records in relation to the Site could not be identified.

Habitats

4.9 The following habitats were recorded on-site and classified in line with current Phase 1 Habitat species guidance (JNCC, 1990), as illustrated in Appendix A. Habitat descriptions were subsequently translated into the UK Habitats Classification system as required by the Biodiversity Metric 3.0. Detailed species lists for each habitat are provided in Appendix D.

4.10 No invasive non-native plant species were identified during the extended Phase 1 Habitat survey or subsequent visits to the Site.

4.11 Baseline Habitat Biodiversity Value has been determined through assessment using the Natural England Biodiversity Metric 3.0 (Appendix F).

Arable Field and Field Margins

4.12 The Site is dominated by part of an arable field which continues to the south, beyond the Site boundary. The field is in active arable rotation,

and historical imagery shows that the field has been in arable cultivation for at least the last 21 years.

4.13 The arable field is bordered by narrow field margins (c. 2m wide) along the eastern, northern, and western Site boundaries, with the eastern field margin being wider due to the presence of a public footpath. The sward within the margins is generally short (<20cm), comprising a mix of common grass and herb species. The northern Site boundary widens towards the western Site boundary, where the hedgerow (H1) ends. Here, the field margin merges with the steep bankside of the roadside ditch and the sward height of the ground flora here is taller than other on-site field margins (up to c. 50cm tall).

4.14 Grass species present within the field margins include cock's-foot *Dactylis glomerata*, perennial ryegrass *Lolium perenne*, red rescue *Festuca rubra*, and rough meadow-grass *Poa trivialis*. Herb species present include dove's-foot crane's-bill *Geranium molle*, dog's mercury *Mercurialis perennis*, groundsel *Senecia vulgaris*, lesser celandine *Ficaria verna* and cow parsley *Anthriscus sylvestris*.

4.15 Although adopted as a Habitat of Principal Importance in England under the NERC Act 2006, arable field margins on-site are narrow and dominated by common species, and therefore do not qualify under these criteria. As such this habitat is not considered to be ecologically important at the Local level, and is not considered further within this report.

Hedgerows and Trees

H1

4.16 H1 runs along much of the length of the northern Site boundary (c. 130m), adjacent to Forest Road. The hedgerow is c. 10-15m high, c. 1-1.5m wide, and does not appear to have been recently managed. A drainage ditch (which was dry in places at the time of the initial survey) is located at the base of hedgerow.

4.17 The majority of the hedgerow is comprised of a line of semi-mature and mature trees including field maple *Acer campestre*, ash *Fraxinus excelsior*, oak *Quercus* sp., and goat willow *Salix caprea*. An area of dense blackthorn *Prunus spinosa* and frequent woody shrubs including elder *Sambucus nigra*, dogwood *Cornus* sp., and field rose *Rosa arvensis* are also present.

H2

4.18 H2 forms the western Site boundary, and continues off-site to the south. This hedgerow is gappy and comprises young and semi-mature trees and shrubs including elm *Ulmus* spp., elder, rose *Rosa* sp., blackthorn, hazel *Corylus avellana*, dogwood and field maple. The on-site section of

this hedgerow is c. 70m long, c. 8m tall and c. 1m wide, and does not appear to have been recently managed.

H3

4.19 H3 forms the eastern Site boundary (separating the Site from further arable fields which continue to the east), and continues off-site to the south. The on-site section of this hedgerow is c. 50m long, c. 6-10m tall, and supports a number of mature oak trees c. 20m in height. This hedgerow also runs adjacent to a public footpath, which also continues off-site to the south. Other woody species supported within H3 include hornbeam *Carpinus betulus*; spindle *Euonymus europaeus*; elm, hazel and dogwood.

4.20 All of the on-site hedgerows comprise of 80% or more of at least one woody UK native species and therefore qualify as priority habitat under the UK Biodiversity Action Plan.

4.21 The Hedgerow Survey Handbook (Defra, 2007) defines a species-rich hedgerow as that which contains at least five native woody species. Therefore, H1, H2, and H3 are all considered species-rich given that they support 11, seven and five native woody species, respectively. H1 and H2 are also likely to be considered important under the Hedgerow Regulations (1997) as they contain seven or more native woody species.

4.22 All hedgerows on-site also have intrinsic ecological importance, with the hedgerow network as a whole providing functional importance through providing connectivity across the wider landscape. The on-site hedgerows are considered to be of ecological importance at the **Local** level.

Ditch

4.23 A partially dry ditch runs along the length of the northern Site boundary. There is a very little submerged or marginal vegetation throughout the length of the ditch, which becomes dry in the central section where it is very shaded by blackthorn scrub within H1.

4.24 The ditch appears to be very shallow along the majority of its length, however, evidence of ditch clearance works was noted at the western end of the ditch, where the channel and banksides had been cleared of vegetation and the water depth increased significantly.

4.25 This ditch is not considered intrinsically important given its current condition; however, enhancement works could improve its ecological value.

Wooded belt (off-site)

4.26 A wooded belt lies adjacent to the eastern Site boundary, mergind with H3. The wooded belt is c. 200m long, c. 15m wide, and lies adjacent to Forest Road. It is possible that canopy and root protection areas of some

trees could encroach within the Site boundary, and as such will need to be considered during development.

Pond (off-site)

4.27 A wet pond c. 110m^2 in area is located adjacent to the western Site boundary. The pond is located within the garden of a residential property and is partially shaded by the on-site hedgerow H2.

Fauna

Bats

4.28 A total of 18 bat records were identified within the search area, dating from 2001 to 2016. These include the following species: common pipistrelle *Pipistrellus pipistrellus*; soprano pipistrelle *Pipistrellus pygmaeus*; brown long-eared *Plecotus auritus* and Daubenton's *Myotis daubentonii*. The closest records are of common pipistrelle c. 0.7km south-west of the site. A brown long-eared bat roost was recorded c. 1.3km south-west of the site in 2014.

4.29 Details of European Protected Species licences obtained from Natural England are available on the MAGIC website. There are no bat licences recorded within c. 3km of the Site.

4.30 On-site, opportunities for bats are limited to the boundary hedgerows and trees, and narrow field margins, which are suitable for use during navigation and foraging by bats.

4.31 Habitats in close proximity to the Site comprise of arable fields with narrow field margins and hedgerows to the east, south and south-west. An area of ancient woodland is also present c. 0.2km north of the Site, which provides potential roosting opportunities for bats such as barbastelle. Further roosting opportunities are provided by other smaller patches of woodland scattered throughout the wider landscape.

Bat Activity

4.32 Remote monitoring of the Site for bats was undertaken in July and August 2021. A third period of monitoring is scheduled for September 2021, after which an update EcIA report including the results of the final survey will be provided.

4.33 Analysis of the first two surveys at the Site shows that bat activity was dominated by common pipistrelle (accounting for 65.7% of the total passes), followed by soprano pipistrelle - an S41 Priority Species (accounting for 24.7% of passes). The remaining calls recorded on Site were from a minimum of two other bat species. These include 46 passes of noctulid species (noctule and/or Leisler's bat), 13 passes of *Myotid* species, three passes by noctule (an S41 Priority Species) and one unidentified *Nyctalus*/*Eptesicus* sp. bat. In addition, there were 4 bat

passes from *Pipistrellus* species which were unassigned and could have been either common or soprano pipistrelles.

4.34 It should be noted that comparisons drawn of the number of passes by different species can only give an indication of relative species abundance at the Site, as detectability varies between species.

4.35 Full methods and results of the bat surveys are provided in Appendix G.

Bat Roosting – Trees

4.36 The mature trees which are present within H1 and H3 may provide some limited opportunities for roosting bats. These trees were assessed for their potential to support roosting bats and although no potential roost features (PRFs) were noted, dense ivy reduced the visibility of tree trunks/branches in some areas and therefore potentially could have concealed PRFs.

4.37 The bats found foraging and commuting on the Site are likely to roost beyond the Site within either local dwellings or trees/woodland.

Importance

4.38 Despite records of some rarer and Priority listed species using the Site on occasion, the majority of activity was of the common and widespread species 'common pipistrelle' and no bat roosts have been recorded on the Site. Therefore, based on the survey results to date, and habitats available at the Site, the Site is considered to be of ecological importance at the **Local** level in respect of bats.

[redacted]

Dormouse

4.41 No records of dormouse *Muscardinus avellanarius* were identified within the search area.

4.42 No evidence of dormouse (e.g. chewed hazel nuts) was recorded during the survey. Some vegetation present is of potential interest to dormice (i.e. hazel, elder, bramble, ash, blackthorn, field maple, dogwood, ivy and hawthorn). However, the Site is considered unlikely

suitable for this species as the boundary vegetation and hedgerows are narrow and do not provide the complex habitat structure required to support dormice throughout their active period. Dormice are therefore likely absent from the Site and are not considered a constraint to the proposed development.

Riparian Mammals

4.43 A total of four records of water vole *Arvicola amphibius* were identified within the search area, dating from 2000 to 2018. The closest record is c. 1.1km from the Site. A total of nine records of otter *Lutra lutra* were identified within the search area, dating from 2000 to 2013. The closest record is c. 0.7km from the Site.

4.44 The majority of the water vole and otter records provided are in relation to the Rattlesden River and/or its tributaries c. 0.8km south of the Site.

4.45 The drainage ditch which runs adjacent to the northern Site boundary could theoretically provide opportunities for dispersing water vole and otter. However, the ditch is dry in the mid-section, and very shaded for the majority of its length by H1. Further to this, the western end of the ditch appeared to have been recently dredged, with aquatic and bankside vegetation completely removed leaving bare earth in several areas.

4.46 While otter may be able to use sections of the ditch for foraging, on-site habitats are unsuitable for a resident water vole or otter population, and very unlikely to serve as overland dispersal habitats. In consideration of the above, both water vole and otter are likely absent from the Site and are not considered further within this report.

Other Mammals

Brown Hare

4.47 A single record of brown hare *Lepus europaeus* was identified within the search area. This record is 1.7km from the Site dating from 2012.

4.48 No evidence of brown hare was recorded during the survey. However, the Site does provide suitable foraging opportunities, with field margins providing possible refuge sites. Although on-site habitats are suitable to support brown hare, similar habitat and areas of woodland are present throughout the wider landscape surrounding the Site which could also support this species. Therefore, given the size and context of the Site, no significant impacts on the conservation status of brown hare in the local area are anticipated.

Hedgehog

4.49 A total of 297 records of hedgehog *Erinaceus europaeus* were identified within the search area, dating from 2004 to 2020. The closest record is c. 0.2km from the Site dating from 2014, with abundant records from the

village of Onehouse adjacent to the site. A large number of the records are in relation to Stowmarket to the east of the Site, however, at least 23 of the records are within 0.5km of the Site, within the village of Onehouse itself.

4.50 No evidence of hedgehog was recorded during the Site survey. Residential gardens adjacent to the western Site boundary and to the north of Forest Road provide suitable foraging and hibernation opportunities for hedgehog. Given the dominance of open habitat, the Site is unlikely to support a resident population of hedgehog, although some limited opportunities are provided on-site by the boundary field margins and hedgerows. As such, if present, they are likely limited to small numbers.

4.51 Hedgehogs are listed as a species of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) and ecological enhancement measures have been set out to ensure the ability of hedgehog or other small mammals to make use of garden habitats at the Site following construction. However, hedgehogs are not considered to be an important ecological feature in the context of this assessment.

Harvest Mouse

4.52 Two records of harvest mouse *Micromys minutus* were identified within the search area in 2009. The closest record is c. 1.4km from the Site, however, both records are from identified remains within owl pellets and therefore the location of the individual itself cannot be determined.

4.53 No evidence of harvest mouse was recorded during the survey. The arable land-use dominating the Site provides theoretical opportunities for this species. However, the field is in regular crop rotation and the field margins of the Site are very narrow and would not provide substantial breeding opportunities for this species. Therefore, based on current conditions and the limited extent of the Site, harvest mouse are considered likely absent from the Site and are not considered further within this report.

Birds

4.54 A total of 515 records of 75 bird species were identified within the search area, dating from 2000 to 2020. Those of potential relevance to the Site include barn owl *Tyto alba,* yellowhammer *Emberiza citronella*, peregrine *Falco peregrinus*; tawny owl *Strix aluco*, lapwing *Vanellus vanellus*; fieldfare *Turdus pilaris*; hobby *Falco subbuteo* and skylark *Alauda arvensis,* which all utilise agricultural land.

4.55 Blue tit *Cyanistes caeruleus*; coal tit *Periparus ater*, magpie *Pica pica* and skylark *Alauda arvensis* were noted on-site during the survey, along with a small number of bird nests within the boundary vegetation. The

Site provides suitable habitat for birds, with the boundary hedgerows and trees providing nesting opportunities and food sources. Furthermore, the arable field and field margins all provide seasonal foraging resources.

4.56 Habitats within the Site provide opportunities for a small range of bird species, principally within boundary habitats. However, the Site is not anticipated to support a particularly large or notable assemblage of birds. Consideration of any clearance of vegetation in respect of nesting birds is nonetheless set out herein.

Reptiles

4.57 No records of reptiles were identified within the search area from SBIS.

4.58 No evidence of reptile was recorded during the Site visit (e.g. sloughed skins). Field margins provide restricted opportunities for reptiles to forage, bask and seek refuge. The remainder of the Site provides negligible opportunities for reptiles these species are therefore considered likely absent from the Site.

Amphibians

4.59 A total of nine records of three amphibian species were identified within the search area, including common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris* and great crested newt *Triturus cristatus.*

4.60 No evidence of amphibian species was recorded during the Phase 1 Habitat survey and no ponds are present within the Site. Much of the Site provides sub-optimal terrestrial habitats for amphibians, being intensively managed arable land. The field margins and boundary hedgerows on-site provide some opportunities for amphibian refuge, foraging and dispersal.

4.61 A more detailed appraisal of the Site in respect of great crested newt is provided below.

Great Crested Newt

4.62 Despite spending much of their annual lifecycle within the terrestrial environment, great crested newts are dependent upon the presence of suitable aquatic breeding habitat in order for a population to persist.

4.63 No potential breeding ponds were identified on-site during the site survey; however, an off-site pond lies adjacent to the western Site boundary. Based on OS mapping, two ponds were present within 250mof the Site, with a further four ponds present within 500m.

4.64 SBIS provided six records of GCN, five of which are located within a known breeding pond c. 0.4km south-east of the site. As such, if GCN are still present within this pond, there is some potential for this species to utilise the Site for dispersal and resting.

Great Crested Newt Habitat Suitability Index (HSI) Assessment

4.65 Pond scoping and HSI assessments were conducted on 12 May 2021 of the two ponds within 250m of the Site (P1 and P2), with their suitability to support GCN populations as follows (HSI scores provided):

- Pond 1 –0.52 (Below average)
- Pond 2 –0.67 (Average)

4.66 Ponds outside 250m were not surveyed due to their separation and/or distance from the Site due to boundaries to dispersal such as roads and arable fields in active arable rotation.

Environmental DNA (eDNA) Sampling

4.67 Sampling of eDNA for pond 2 was conducted on 10 June 2021. The results of the eDNA survey were negative, indicating likely absence of great crested newt from pond 2. (Access for eDNA sampling was not granted for pond 1.)

4.68 Full details of the HSI assessment, eDNA survey and Pond Location Plan (CSA/5398/108) are provided in Appendix H.

Invertebrates

4.69 A total of 25 records of nine invertebrate species were identified within the search area. All nine of these species are listed as part of the UK Biodiversity Action Plan (BAP), as Priority Terrestrial Invertebrate species. Those of potential relevance to the Site include stag beetle *Lucanus cervus*; and small heath *Coenonympha pamphilus pamphilus*; white admiral *Limenitis Camilla* and white-letter hairstreak *Satyrium w-album* butterfly species. In addition, moth species of relevance to the Site include shaded broad-bar *Scotopteryx chenopodiata,* dusky thorn *Ennomos fuscantaria* and small square-spot *Diarsia rubi.*

4.70 The Site is located c. 0.5km south of an Important Invertebrate Area (IIA). IIAs are nationally or internationally significant places for the conservation of invertebrates and the habitats upon which they rely.

4.71 The arable field margins and on-site hedgerow are likely to provide the greatest opportunity for invertebrates on the Site. These habitats are however limited in extent, and there is no indication that these habitats would support a particularly large or notable invertebrate assemblage.

Biodiversity

4.72 The Site has been assessed making use of the Biodiversity Metric (version 3.0, Natural England July 2021) to determine baseline of 2.74 habitat units and 3.28 hedgerow units.

4.73 The net effect of the proposed scheme on biodiversity is set out within the assessment section herein.

Summary of Ecological Features

4.74 Table 2 below summarises all important ecological features identified within the respective zones of influence, together with the geographic context of their importance:

Table 2. Summary of important ecological features and their geographic context

Ecological Feature	Geographic Context of Importance and/or Protection Status
8 No. CWSs	County
2 No. RNRs	County
Hedgerows & Trees	Local
Bats	Local, Protected (Wildlife and Countryside Act, 1981 [as amended]; The Conservation of Habitats and Species Regulations, 2010 [as amended])
Badger	Protected (Protection of Badgers Act, 1992)
Nesting Birds	Protected (Wildlife and Countryside Act, 1981 [as amended])

5.0 ASSESSMENT OF EFFECTS

The Proposed Development

5.1 Outline planning permission is sought for residential development at the Site. The following impact assessment is based on the Illustrative Masterplan prepared by CSA Environmental (CSA/5398/107) on behalf of Harris Strategic Land.

5.2 The construction phase of the proposed development will comprise the following:

- Cessation of arable cultivation
- Construction of 20 residential dwellings
- Construction of associated gardens, parking, access infrastructure, and a children's play area
- The establishment of Public Open Space (POS) concentrated at the west of the Site, as well as recreation routes around the periphery of residential areas
- New hedgerow planting along the southern Site boundary and new tree planting throughout the developed area
- Establishment of Sustainable Urban Drainage Systems (SuDS) including a large attenuation basin (with permanently wet micro-pools) set within the east of the Site, and swales at the west of the proposed development

5.3 The operational phase of the proposed development will comprise the following:

- Occupation of new residential dwellings
- Increase in human activity, including use of vehicles and presence of domestic pets
- Increased artificial lighting and anthropogenic noise

Ecological Mitigation Approach

5.4 It is an established principle (CIEEM, 2018) that, wherever possible, potential negative effects should be avoided through 'Mitigation by Design', as this gives greater certainty over deliverability, demonstrates a well-designed scheme and ensures the correct application of the 'Mitigation Hierarchy' (as advocated by BS42020:2013, Defra 2019 and CIEEM, CIRIA & IEMA 2016). Such mitigation by design has been included within the above-described Proposed Development scheme, influencing the final design scheme.

5.5 In addition to mitigation by design, the following overarching ecological mitigation measures are proposed, and referenced where applicable through this section.

5.6 In accordance with BS42020:2013, a **Construction Environmental Management Plan (CEMP)** is proposed to be secured by planning condition and prepared at the detailed design stage. In addition to the construction phase impact avoidance and mitigation measures identified in the following sections, the CEMP will detail standard environmental control measures, including though not limited to the following:

- Implementation of strict protection measures for the root protection areas of retained trees and hedgerows, in accordance with BS5837:2012.
- Standard best practice construction phase pollution prevention and control measures.
- Sensitive working methods and timing to avoid direct impacts to nesting birds (generally vegetation removal outside nesting season of March through August).
- All working measures needed to comply with the terms of EPS derogation licencing specific to the works activity.
- Updated ecological surveys, where necessary, to identify shifts in the baseline ecological condition (such as to support EPS derogation licence applications) in order that revised impact avoidance and mitigation measures can be adopted as required.

5.7 In accordance with BS42020:2013, a Landscape and Ecology Management Plan (LEMP) will also be secured by planning condition and prepared at the detailed design stage. The LEMP will set out measures for the establishment and long-term management of newly created and retained habitats to maximise benefits for biodiversity.

Potential Impacts and Ecological Effects

County Wildlife Sites and Roadside Nature Reserves

Predicted Effects

5.8 A total of eight CWSs and two RNRs have been identified within 2km of the Site. The closest of which –Northfield Wood CWS, is located c. 0.2km north of the site and supports ancient woodland. This wildlife site is open to the public with several public footpaths running through the designation, and as such is likely to be already subject to some level of recreational pressure.

5.9 It is acknowledged that the proposed scheme has the potential to marginally increase recreational pressure within Northfield Wood CWS, and that this wildlife designation is likely to be sensitive to possible increases in recreational pressure.

5.10 The remaining seven CWSs are all located c. 1.3-1.8km from the Site. Four of these are open to public access/have public footpaths running

through/adjacent to the designated sites, and are therefore also likely to be already subject to some level of recreational pressure.

5.11 The two RNRs which have been identified within 2km of the Site are located c. 1.4-1.6km from the Site. It is likely that these RNRs are already subject to some level of disturbance from traffic/recreational pressure.

5.12 The Illustrative Masterplan demonstrates how substantial on-site Public Open Space (POS) can be accommodated alongside development of the Site, which would draw the majority of recreational pressure from new residents.

5.13 Overall, given the modest scale of the proposed development, the distance/separation from the designated sites, and lack of similar/supporting habitats found on the Site, no significant increases in pressures, or direct/indirect impacts on these designations are predicted.

Hedgerows and Trees

Predicted Effects

5.14 All existing hedgerows and trees are to be retained alongside the scheme, with Site access specifically designed to avoid severance/loss of habitats.

5.15 Retained hedgerows and trees will be vulnerable to damage during construction from passing construction traffic and ground compaction. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation Measures

5.16 Suitable protective fencing will be erected around all on-site hedgerows and trees in accordance with BS 5837:2012. Fencing will be installed for the duration of the construction phase to avoid damage to the root protection area, tree crowns and undue ground compaction. This could be secured by an appropriately worded planning condition.

5.17 Existing vegetation will be retained and enhanced where possible, with a new hedgerow to be along the southern Site boundary. Areas of POS will buffer the existing and newly created hedgerows and boundary vegetation. This achieves net gains in hedgerow coverage and connectivity across the Site.

5.18 Additional planting of trees and other habitats of ecological value will also take place within open space across the Site, with appropriate management put in place to ensure establishment and maintenance of habitats with value for biodiversity and wildlife.

5.19 The above could be secured by an appropriately worded planning condition and/or intrinsic design measures.

Residual Effects

5.20 With the implementation of the above mitigation measures, no residual negative effects on the local hedgerow and tree resource are anticipated to result from the proposed development.

Bats

Predicted Effects

5.21 All on-site hedgerows are to be retained, and enhanced, with new hedgerow planting proposed along the southern Site boundary.

5.22 Given the absence of roosts identified at the Site or nearby, no breach of protective legislation is anticipated and no significant adverse effects are predicted in respect of roosts.

5.23 However, given that the Site is largely unlit, new artificial lighting of retained habitat during the construction and operational phases may lead to disturbance impacts to bats and other nocturnal wildlife making use of the Site. As such, adverse effects on foraging/commuting bats arising from the proposed development are considered, at most, to be significant at the **Local** level.

Mitigation Measures

5.24 In order to maintain the ecological functionality of new and existing hedgerows/boundary vegetation for bats, a sensitive external lighting scheme will be devised for the Site to maintain dark corridors, and to minimise adverse effects upon foraging and navigating bats (as well as other nocturnal wildlife). The future lighting scheme will be developed in consultation with a bat ecologist to avoid/minimise light spill onto retained and created habitat at the detailed design stage.

5.25 In accordance with good practice (Collins, 2016) and to avoid the accidental disturbance/destruction of bat roost(s) not previously identified, any trees which were not surveyed under the PRA and which are to be removed or undergo significant arboricultural works, will undergo a full assessment for roosting bats. The check will be carried out by a suitably qualified ecologist prior to any works to the trees in order to confirm the presence/absence of roosting bats.

5.26 The Illustrative Masterplan demonstrates how the proposed development can deliver significant habitat creation, including the provision of new hedgerow and planting, grassland habitats within public open space, and sustainable urban drainage systems (SuDS). This will provide additional foraging and roosting opportunities for bats on-site, in addition to providing new and enhancing existing connectivity across the Site.

5.27 The above would be secured by an appropriately worded planning condition and/or intrinsic design measures.

Residual Effects

5.28 Following implementation of the mitigation measures set out above, no significant residual effects are anticipated.

[redacted]

Nesting Birds

Predicted Effects

5.33 Wild birds, their active nests, and their eggs are protected under the Wildlife and Countryside Act 1981 (as amended). Throughout the construction phase there is risk to nesting birds within the boundary habitats which would result in offences being caused during the nesting bird season (March to August, inclusive).

Mitigation Measures

5.34 To avoid committing an offence under the Wildlife and Countryside Act 1981 (as amended), any vegetation clearance will take place outside

of the bird nesting period (i.e. outside of March to August inclusive), or failing that, following confirmation by a suitably qualified ecologist that nesting birds are absent from the habitats to be cleared. These mitigation measures are a legal requirement, and would therefore be secured as such.

Residual Effects

5.35 Subject to the full implementation of the above mitigation no residual effects are predicted.

Residual Effects

5.36 Subject to the implementation of the above mitigation and safeguards, no residual effects are predicted in respect of identified important ecological features. Residual effects upon biodiversity as a whole have been set out below.

Biodiversity Net Gain

5.37 As set out within Appendix F, the net effect of the scheme upon biodiversity has been predicted making use of the Biodiversity Metric (3.0). The calculation present is summarised as follows:

- Baseline habitat units = 2.74
- Post-intervention habitat units = 3.02
- Total Net habitat unit change = **0.28 units or +10.10%**
- Trading rules satisfied = Yes

- Baseline hedgerow units = 3.28
- Post-intervention hedgerow units = 4.37
- Total Net hedgerow unit change = **1.09 units or +33.31%**

5.38 Based on the prepared calculation, the proposed scheme (as shown on the Illustrative Masterplan) would result in a net gain of c. 10.10% for habitats and 33.31% for hedgerows.

5.39 To ensure such net gains are realised, the calculation would need to be re-run based upon detailed designed prepared at the Reserved Matters stage.

5.40 In the event that future detailed proposals come forward for a development scheme which does not meet trading requirements; or does not deliver the above habitat units on-site/address trading; or where future policy or legal requirements are in excess of the anticipated percentage gain, off-site compensation may be necessary to address any residual habitat units.

Enhancem ent

5.41 The proposed development includes landscape planting enhancements which will make positive contributions to on-site biodiversity.

5.42 New habitat creation will provide opportunities for species confirmed to be present on-site at baseline, such as nesting birds. In addition to these enhancements which are embedded into development proposals, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below.

5.43 Further details will be set out in a LEMP at the detailed design stage, however as an indicative guide:

- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.
- Provision of new bat roosting opportunities: Proposed 5 no. bat boxes will be erected on mature trees or new builds. These will be a purpose-built, durable and long-lasting variety such as available from Schwegler or Habibat. Where possible, these will be incorporated into the fabric of new builds.
- Provision of new bird nesting opportunities: Proposed 5 no bird nesting boxes (Swift S-bricks) will be provided in new/retained planting to benefit generalist bird species.
- Creation of log piles: Timber generated from tree clearance works at the Site will be used to make at least 2 no. log piles for wildlife benefit. These will be sited within boundary vegetation where they will be least disturbed. New material can be added as required following any future management works.
- Provision of hedgehog gaps: Hedgehogs have been scoped out of detailed assessment and no specific mitigation is proposed, however it is important that opportunities for hedgehogs to move through the landscape are preserved. Although not strictly an 'enhancement' measure, provision of hedgehog-friendly gravel boards or equivalent, providing a minimum 5 x 5 inch gap, will be used to maintain permeability for hedgehogs across the development and associated gardens. The number and location of hedgehog gaps will be determined at the detailed design stage and set out within the LEMP.

Monitoring

5.44 No specific post-development monitoring of important ecological features is proposed. However, there will be ongoing monitoring of newly established and enhanced habitats as part of POS. This commitment will be made, and further detail provided, within the LEMP to be prepared at the detailed design stage.

6.0 CONCLUSIONS

6.1 In the absence of any mitigation measures, the proposed development would have the potential to result in adverse effects significant at up to the Local level. However, with the implementation of some straightforward mitigation and precautionary measures as proposed here, the development is not anticipated to result in any significant residual adverse effects on important ecological features.

6.2 The Illustrative Masterplan demonstrates the potential to deliver net benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. A Biodiversity Impact Assessment Calculation has determined that the proposed development could secured a net gain of 10.10% for habitats and 33.31% for hedgerows (0.28 Biodiversity Habitat and 1.09 Biodiversity Linear/Hedgerow Units).

6.3 The measures set out herein can be secured through appropriate conditions attached to any planning consent, and the development may therefore be delivered without harm to nature conservation interests. Specifically, it is anticipated that planning conditions would be used to secure:

- Construction Environmental Management Plan (CEMP): In addition to wider environmental controls and best practice construction management, the CEMP will set out construction-phase impact avoidance measures with respect to ecological interests.
- Landscape and Ecology Management Plan (LEMP): The LEMP will detail the establishment and long-term management of retained and newly created habitats to maximise benefits for wildlife. It will include a graphical Ecological Enhancement Plan, setting out the number, type and position of enhancement features.
- Lighting Strategy: A sensitive lighting strategy will accompany the detailed layout, ensuring that dark corridors are maintained, and minimising light spill to retained and newly created habitats.

6.4 Measures to minimise impacts and avoid significant negative effects on bats are further assured through the applicable legislative framework, which triggers statutory derogation licencing administered by Natural England.

6.5 Based on the successful implementation of avoidance, mitigation and enhancement measures set out herein, the scheme is considered to accord with all relevant nature conservation legislation, as well as with the provisions of the identified planning policies.

7.0 REFERENCES

Baker, J., 2016. *Biodiversity Net Gain: Good practice principles for development*. CIEEM, CIRIA & IEMA.

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F. 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Oxford: Freshwater Habitats Trust.

British Standards Institution, 2013. *BS 42020:2013 Biodiversity – Code of practice for planning and development.* London: BSI.

Buglife, no date. *Important Invertebrate Areas*. [online] Available at: < https://www.buglife.org.uk/resources/important-invertebrate-areas/ > [Accessed March 2021].

Chartered Institute of Ecology and Environmental Management, 2016. *Guidelines for Assessing and Using Biodiversity Data*. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2017. *Guidelines for Ecological Report Writing*. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Version 1.1. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2020. *Guidance on Ecological Survey and Assessment in the UK During the Covid-19 Outbreak*. Version 2, published 9 June 2020. Winchester: CIEEM.

Collins, J., ed., 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd ed. London: The Bat Conservation Trust.

Defra, 2011. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*. London: Defra.

Defra, 2019. *Natural Environment Planning Policy Guidance: Biodiversity, geodiversity and ecosystems*. [online, last updated July 2019] Available at: <https://www.gov.uk/guidance/natural-environment#biodiversity-geodiversity-and-ecosystems> [Accessed March 2021].

English Nature, 2001. *Great Crested Newt Mitigation Guidelines*. Peterborough: English Nature.

Joint Nature Conservation Committee, 1990. *Handbook for Phase 1 habitat survey – a technique for environmental audit*. Revised reprint 2010. Peterborough: JNCC.

JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), 2012. *UK Post-2010 Biodiversity Framework.* [pdf] Peterborough: JNCC. Available at: < http://jncc.defra.gov.uk/page-6189> [Accessed March 2021].

Lintott, P. R., Davison, S., van Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J., Haddy, E. and Mathews, F, 2017. *Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data.* Ecology and evolution, 8(2), pp.935-941.

Ministry of Housing, Communities and Local Government, 2019. *National Planning Policy Framework (NPPF)*. London: Ministry of Housing, Communities and Local Government.

Multi-Agency Geographic Information for the Countryside (MAGIC), 2013. *Interactive Map*. [online] Available at: <http://www.magic.gov.uk/MagicMap.aspx> [Accessed March 2021].

Natural England and Department for Environment, Food & Rural Affairs, 2014. *Protected species and development: advice for local planning authorities*: [online, last updated January 2021] Available at: <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals> [Accessed March 2021].

Oldham, R. S., Keeble, J., Swan, M. J. S. & Jeffcote, M., 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal*, 10(4), pp.143-155.

Wray, S., Wells, D., Long, E. and Mitchell-Jones, T., 2010. *Valuing Bats in Ecological Impact Assessment*. In Practice, 70, pp.23-25.

The Woodland Trust, no date. *Ancient Tree Inventory.* [online] Available at: <https://ati.woodlandtrust.org.uk/ > [Accessed August 2021].

Appendix A

Habitats Plan & Photographs

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Project	Land off Forest Road, Onehouse	Date	March 2021	Drawing No.	CSA/ 5398/ 104
Drawing Title	Habitats Plan	Scale	Refer to scale	Rev	-
Client	Harris Strategic LAnd	Drawn	MD	Checked	CH

Photograph 1. The Site, dominated by arable land.

Photograph 2. Looking north-west along H1.

Photograph 3. Western end of ditch along northern Site boundary, adjacent to Forest Road. The ditch had recently been dredged and banksides cleared of vegetation.

Photograph 4. Looking west across the Site, towards H2.

Photograph 5. Looking east/south-east across the Site towards H3, adjacent to the public footpath.

Photograph 6. The northern end of H3, adjacent to the off-site wooded belt. The public footpath can also be seen.

Appendix B

Legislation and Planning Policy

1.1. The **Conservation of Habitats and Species Regulations 2017** (as amended) make prescriptions for the designation and protection of Sites of Community Importance ('European sites', i.e. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS). The latter include all native bats, great crested newts, dormice, otters and certain reptiles, listed under Annex II of the Regulations. Following the UK's departure from the European Union, the provisions of the Regulations have been retained through enactment of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which came into force on 31 December 2020.

1.2. The **Wildlife and Countryside Act 1981** (as amended, principally by the Countryside and Rights of Way Act 2000) forms the basis for protection of statutory designated sites of national importance (e.g. Sites of Special Scientific Interest; SSSIs) and native species that are rare and vulnerable in a national context. Additionally, badgers are protected under the **Protection of Badgers Act 1992**.

1.3. Section 40(1) of the **Natural Environment and Rural Communities (NERC) Act 2006** states that each 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." This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 (S41) lists of 56 habitats and 943 species of principal importance. The UK Biodiversity Action Plan (BAP) has been superseded by the Biodiversity 2020 Strategy, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.

1.4. The **National Planning Policy Framework (2019)** (NPPF) sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 170, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

1.5. Paragraph 175 sets out the principles that local planning authorities should apply when determining planning applications:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts).
- Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of

the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.

- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

1.6. Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). That relating to the protection and enhancement of the Natural Environment was most recently updated in July 2019. The Natural Environment PPG addresses principles across a broad spectrum of topics targeting biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services, and the use of local ecological networks to support the national Nature Recovery Network. In particular the PPG promotes the delivery of measurable Biodiversity Net Gain through the creation and enhancement of habitats alongside development.

1.7. The Government Circular 06/2005, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.

1.8. Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table 1 below.

Table 1. Summary of regional and local planning policy relating to ecology

Policy	Summary
Babergh Adopted Local Plan Alteration No 2 (2006)	
EN01 - SPAs, SACs, Ramsars, NNRs, SSSIs	Development will not be permitted which, directly or indirectly, would have a material adverse impact on existing or proposed Special Protection Areas, Special Areas of Conservation, Ramsar Sites, National Nature Reserves and Sites of Special Scientific Interest.
EN02 - CWSs, RIGGS, LNRs	Development will not be permitted which, directly or indirectly, would have a material adverse impact on existing or proposed County Wildlife Sites, Regionally Important Geological / Geomorphological Sites or Local Nature Reserves.
EN03 - Protected Species	Development will not be permitted which, directly or indirectly, would have a material adverse impact on protected species.
EN04 - Semi Natural Habitats	All development proposals must provide for the protection and, wherever possible, the retention, of existing semi-natural features on the site, including rivers, streams, ponds, marshes,

Policy	Summary
	woodlands, hedgerows, trees, features of geological interest, and also including wildlife corridors and green wedges.
EN05 - Biodiversity	Development proposals that are acceptable in principle must, wherever approved, include measures to mitigate the effects of the development on features of biodiversity interest.
EN06 - Habitat Creation	If development is proposed, the scope for habitat creation for wildlife will be actively sought. If new habitats are created, measures will be put in place to ensure suitable management and if appropriate, public access in perpetuity. The targets included in the Suffolk Biodiversity Action Plan will be taken into account.
EN07 - Local Nature Reserves	Where appropriate, when development is proposed opportunities will be sought to designate Local Nature Reserves. Where such reserves are designated steps must be taken to secure their long-term retention for the benefit of wildlife and public enjoyment.
Mid Suffolk Local Plan (1998) (saved policies)	
Policy CL1 - Countryside	The landscape quality and character of the countryside will be protected for its own sake. Proposals for development in the countryside should be sited and designed to have minimum adverse effect on the appearance of the landscape and should seek to positively contribute to its diverse character through tree planting and the creation of hedgerows, deciduous woodlands and other wildlife habitats…
Policy CL4 – Protect The River Valleys And Flood Plains	The district planning authority will encourage the conservation of the landscape and ecological qualities of mid Suffolk's river valleys.
Policy CL5 – Protecting Existing Woodland	Development which would result in the loss of or damage to woodland, particularly ancient woodland, or disruption to commercial forestry will be refused. The felling of commercial conifer woodland will be supported where it does not adversely affect the character and appearance of the landscape.
Policy CL6 - Tree Preservation Orders	Tree preservation orders will be used where the removal of trees and woodlands would be detrimental to the visual amenity of the surrounding area.
Policy CL8 – Protecting Wildlife Habitats	The district planning authority will refuse development likely to bring about:- • the loss or significant alteration of important habitats including heathland, woodland, water meadows, other permanent pasture, parkland, marches, streams, ponds, green lanes, alder carr and osier beds; • the threat to rare or vulnerable species, especially those protected by law. Where development is permitted, the retention of important wildlife habitats will be sought through planning conditions or legal agreement. The district planning authority will consider entering into management agreements under the wildlife and countryside act 1981. Which would secure a more comprehensive protection for, and management of, wildlife and ecological sites.
Policy CL9 – Recognised Wildlife Areas	Development proposals which would harm the nature conservation interest of ramsar sites, sites of special scientific interest and other nationally designated wildlife areas, will not

Policy	Summary
	be permitted except where a case of overwhelming national need has been clearly demonstrated, and there is a lack of acceptable alternative sites. Suffolk county wildlife sites and local nature reserves will also be protected from harm to their nature conservation interest arising from development proposals, and the weight attached to such harm will reflect the relative significance of these designations. The presence of a protected species under the wildlife and countryside act 1981 will be a material consideration in determining any planning application.
Policy CL10 – Wildlife Value of Rivers and Other Water Areas	Development adjacent to rivers or associated with other natural areas of water, including lakes and ponds, will be expected to conserve and enhance existing wildlife, landscape and archaeological features.
Mid Suffolk District Core Strategy –Development Plan Document (Adopted September 2008)	
Policy CS4 - Adapting to Climate Change	…Development must also seek to adapt for the anticipated negative impacts from climate change upon Biodiversity by protecting the districts natural capital and applying an ecological network approach - re-enforcing and creating links between core areas of biodiversity…
Policy CS5 – Mid Suffolks Environment	All development will maintain and enhance the environment, including the historic environment, and retain the local distinctiveness of the area. To protect, manage and enhance Mid Suffolk's biodiversity and geodiversity based on a network of: • Designated Sites (international, national, regional and local) • Biodiversity Action Plan Species and Habitats, geodiversity interests within the wider environment • Wildlife Corridors and Ecological Networks and where appropriate increase opportunities for access and appreciation of biodiversity and geodiversity conservation for all sections of the community. Emphasis will be given to the creation new habitats particularly along the Gipping, Upper Waveney and Deben river valley's in connection with flood management schemes and to contribute towards green tourism opportunities.
Babergh and Mid Suffolk Joint Local Plan - Pre-submission (Reg19) Document (Nov 2020)	
Policy LP18 - Biodiversity & Geodiversity	1) All development should follow a hierarchy of seeking firstly to; enhance habitats, avoid impacts, mitigate against harmful impacts, or as a last resort compensate for losses that cannot be avoided or mitigated for. Adherence to the hierarchy should be demonstrated. 2) Development should: a) Protect designated and, where known, potentially designated sites. Proposed development which is likely to have an adverse impact upon designated and potential designated sites, or that will result in the loss or deterioration of irreplaceable biodiversity or geological features or

Policy	Summary
	habitats (such as ancient woodland and veteran/ancient trees) will not be supported. b) Protect and improve sites of geological value and in particular geological sites of international, national and local significance. c) Conserve, restore and contribute to the enhancement of biodiversity and geological conservation interests including priority habitats and species. Enhancement for biodiversity should be commensurate with the scale of development. d) Plan positively for the creation, protection, enhancement and management of local networks of biodiversity with wildlife corridors that connect areas. Where possible, link to existing green infrastructure networks and areas identified by local partnerships for habitat restoration or creation so that these ecological networks will be more resilient to current and future pressures. e) Identify and pursue opportunities for securing measurable net gains, equivalent of a minimum 10% increase, for biodiversity. Where biodiversity assets cannot be retained or enhanced on site, the Councils will support 'biodiversity offsetting' to deliver a net gain in biodiversity off-site in accordance with adopted protocols. f) Apply additional measures to assist with the recovery of species listed on S41 of the NERC Act 2006. 3) Development which would have an adverse impact on species protected by legislation35, or subsequent legislation, will not be permitted unless there is no alternative and the local planning authority is satisfied that suitable measures have been taken to: a. Reduce disturbance to a minimum; and b. Maintain the population identified on site; c. Provide adequate alternative habitats to sustain at least the current levels of population. 4) Where appropriate, the local planning authority will use planning obligations and/or planning conditions to achieve appropriate mitigation and/or compensatory measures and to ensure that any potential harm is kept to a minimum.
Policy LP23 – Agricultural Land To Residential Garden Land	1. The change in use of agricultural land to residential garden land or land ancillary to a residential dwelling may be permitted subject to: a. The location, size and scale of the proposal would not have an adverse impact on the landscape characteristics and biodiversity of the locality; b. The proposal would not result in the irreversible loss of best and most versatile agricultural land; c. The site must not intrude into the open countryside, or result in the loss of trees and hedgerows which contribute to the character of the area; d. The site must not threaten designated or Priority Habitats Sites or threaten the viability of farm holdings due to the breaking up of agricultural land;…

Appendix C

Desk Study Information

Site Check Report Report generated on Wed Mar 03 2021
You selected the location: Centroid Grid Ref: TM02575942
The following features have been found in your search area:

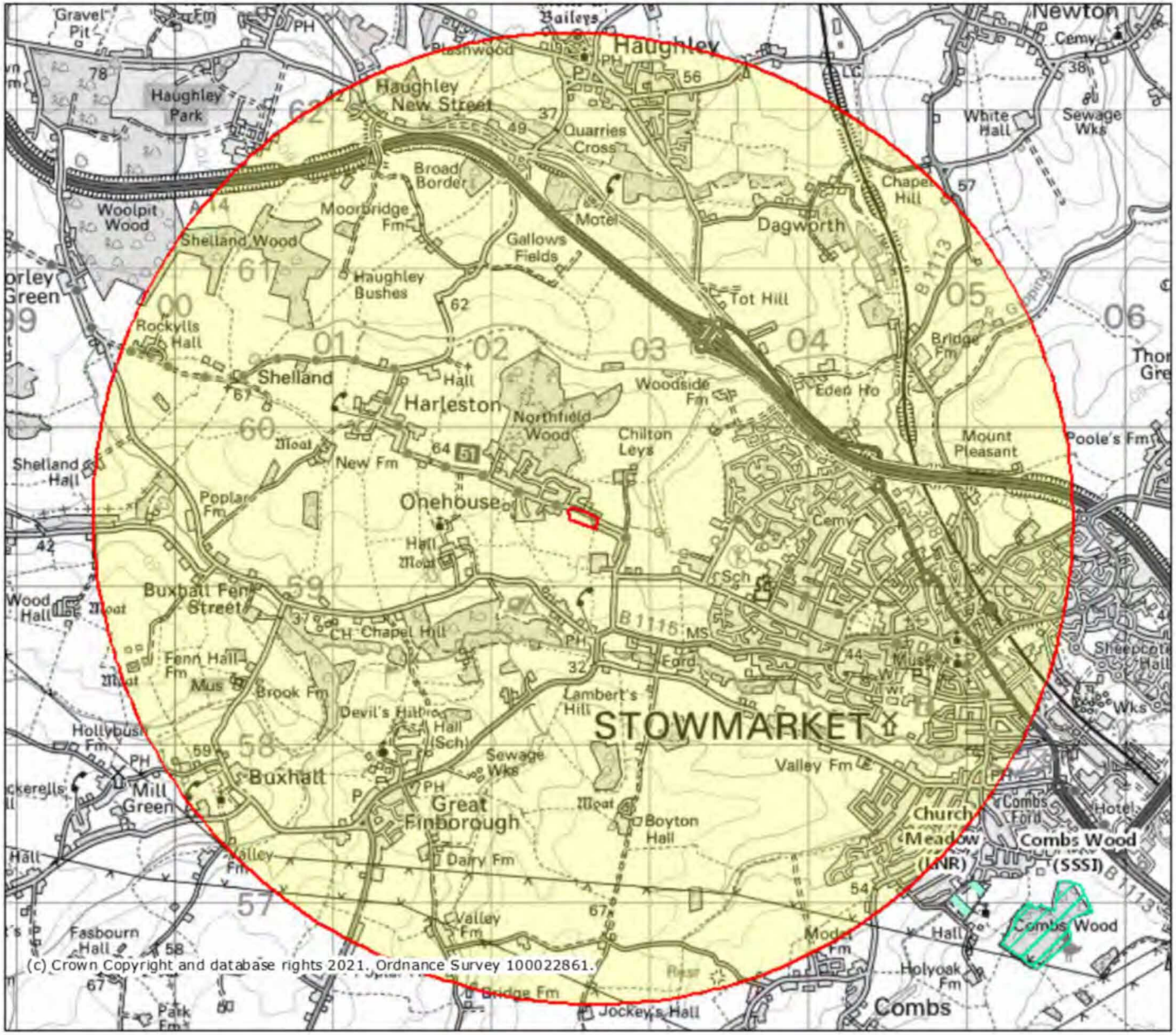
Local Nature Reserves (England)
No Features found

National Nature Reserves (England)
No Features found

Sites of Special Scientific Interest (England)
No Features found

MAGiC

5398 National Statutory Designations 3km



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Sites of Special Scientific Interest (England)

Projection = OSGB36
xmin = 596400
ymin = 256500
xmax = 608800
ymax = 262400

0 0.7 1.4
km

Map produced by MAGIC on 3 March, 2021.

Site Check Report Report generated on Wed Mar 03 2021
You selected the location: Centroid Grid Ref: TM02575943
The following features have been found in your search area:

Ramsar Sites (England)
No Features found

Proposed Ramsar Sites (England)
No Features found

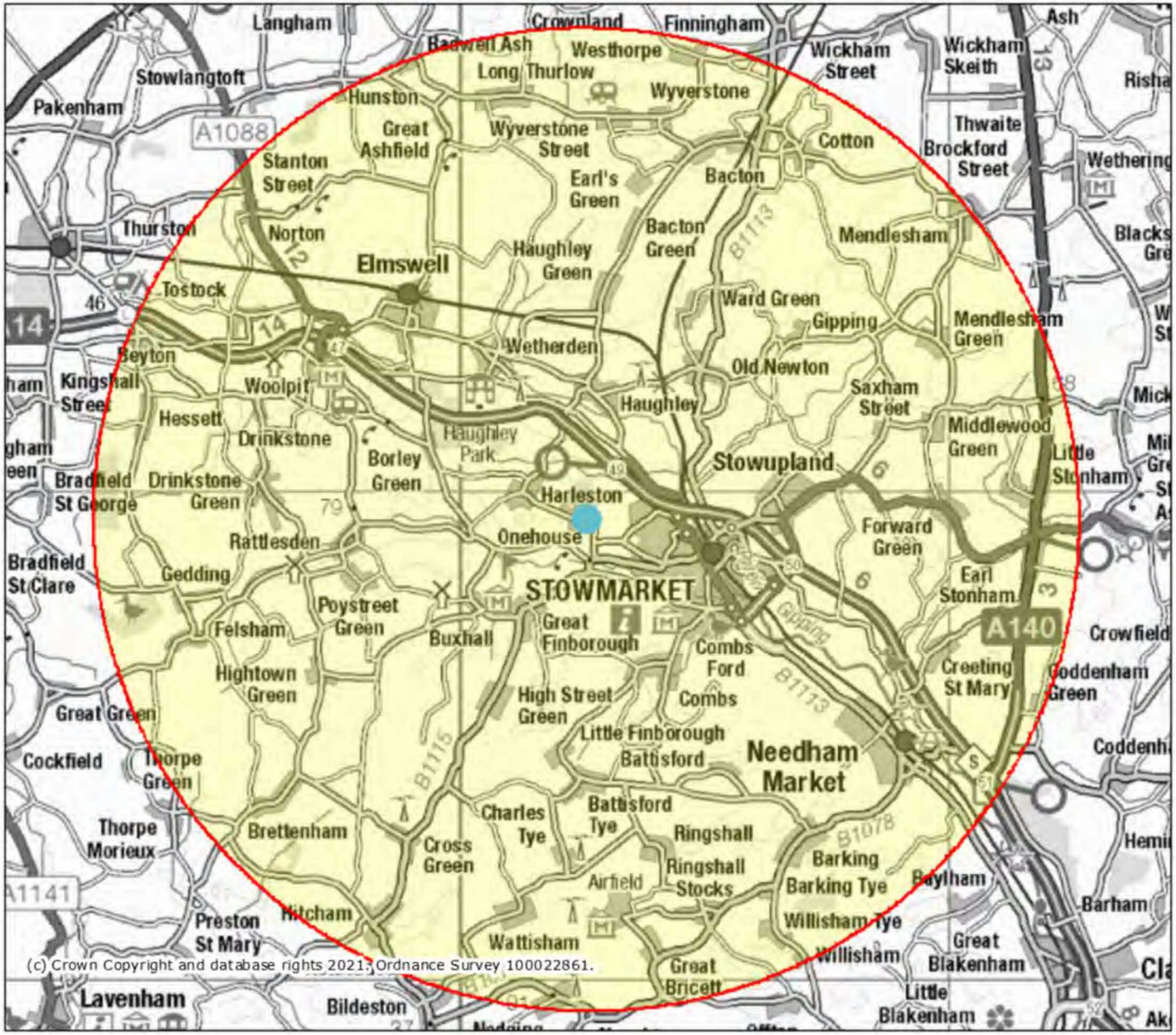
Special Areas of Conservation (England)
No Features found

Possible Special Areas of Conservation (England)
No Features found

Special Protection Areas (England)
No Features found

Potential Special Protection Areas (England)
No Features found

MAGiC 5398 International Statutory Designation 10km



Legend

- Ramsar Sites (England)
- Proposed Ramsar Sites (England)
- Special Areas of Conservation (England)
- Possible Special Areas of Conservation (England)
- Special Protection Areas (England)
- Potential Special Protection Areas (England)

Projection = OSGB36
xmin = 582600
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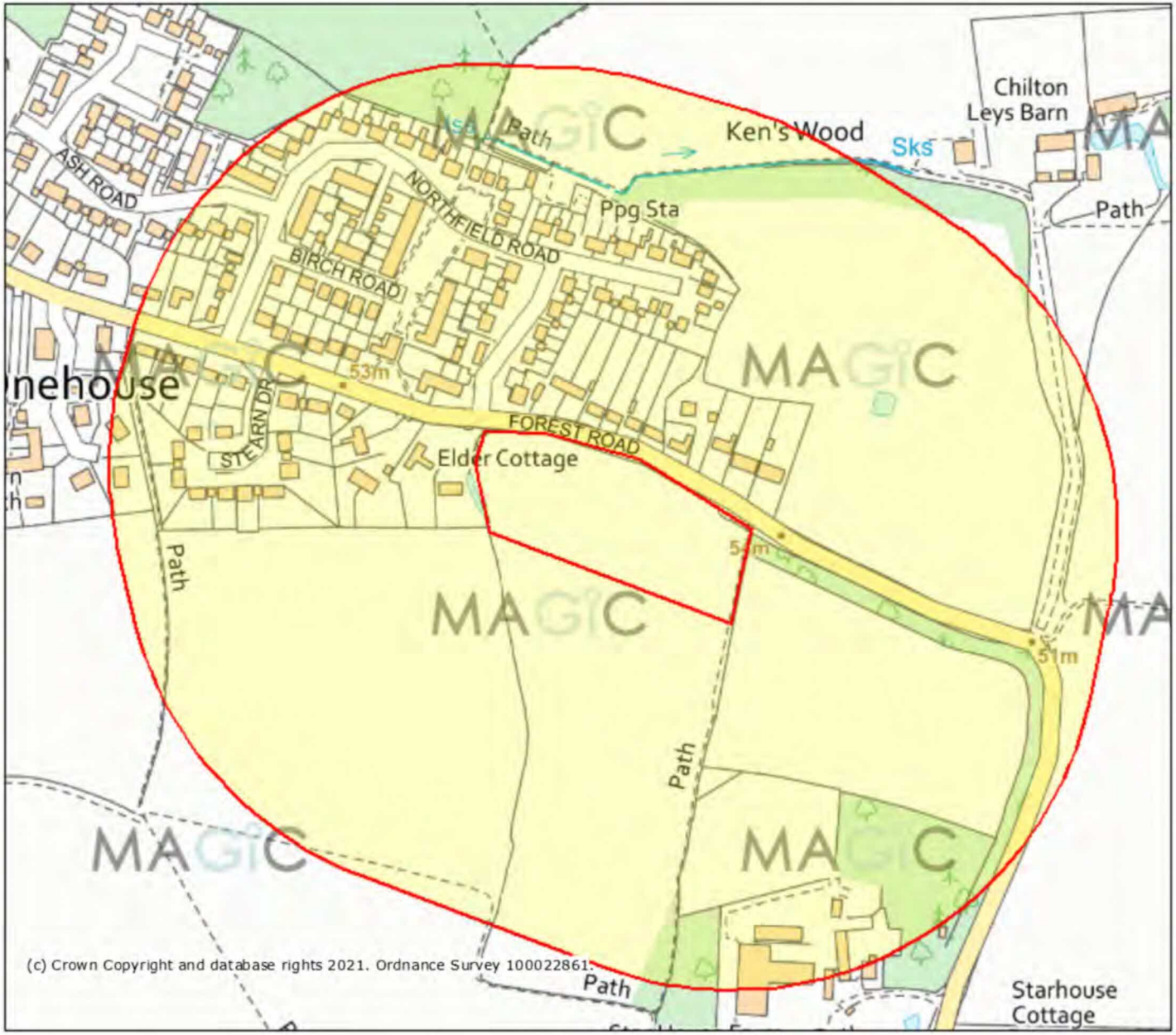
ymax = 269100

0 2 4
km

Map produced by MAGIC on 3 March, 2021.

MAGiC

5398 Pond Search 250m



Projection = OSGB36
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xmax = 603200
ymax = 259800

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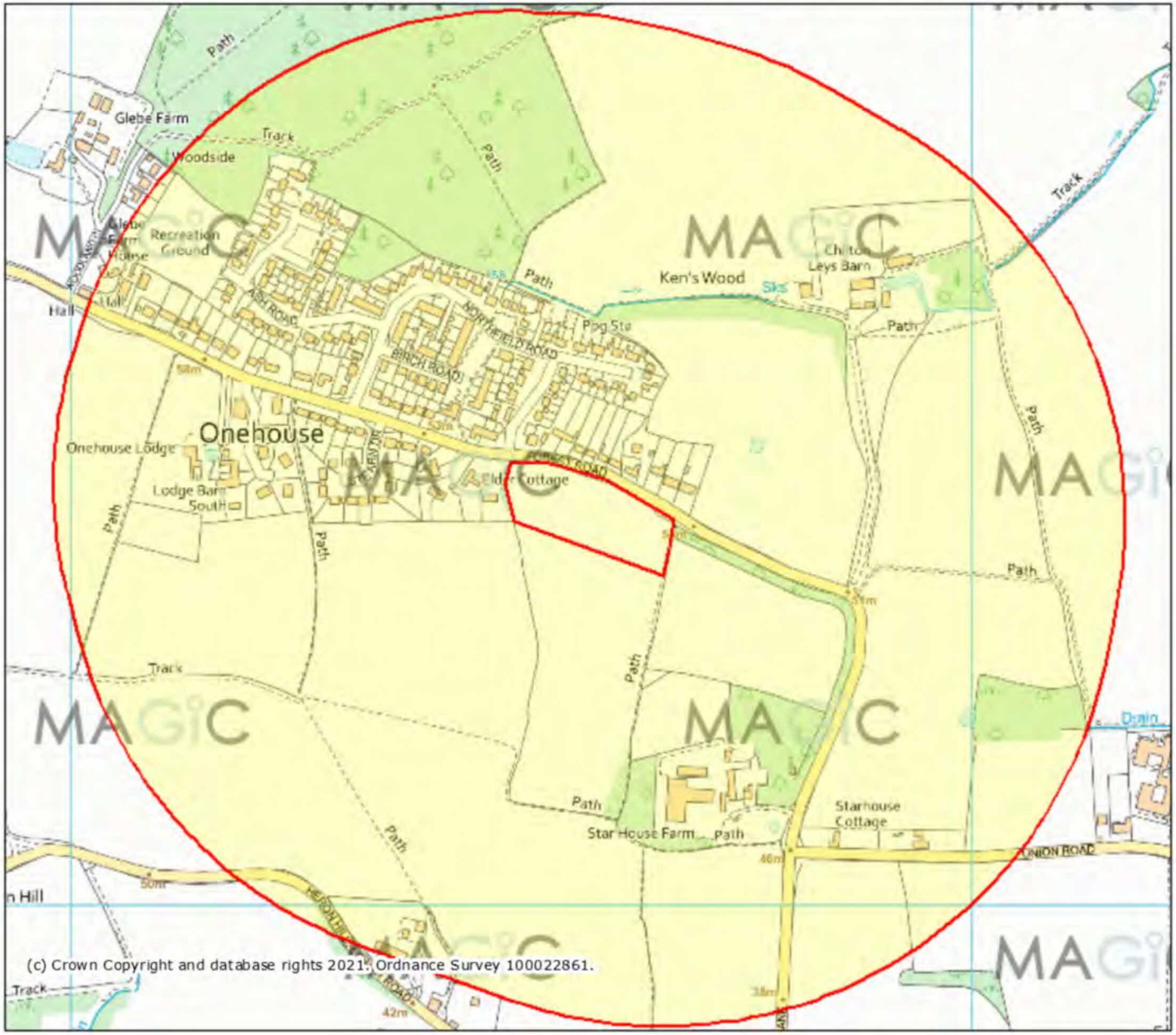
km

Map produced by MAGIC on 5 March, 2021.

5398 Pond Locations 500m



Legend

Projection = OSGB36
xmin = 601500
ymin = 258900
xmax = 603700
ymax = 260000

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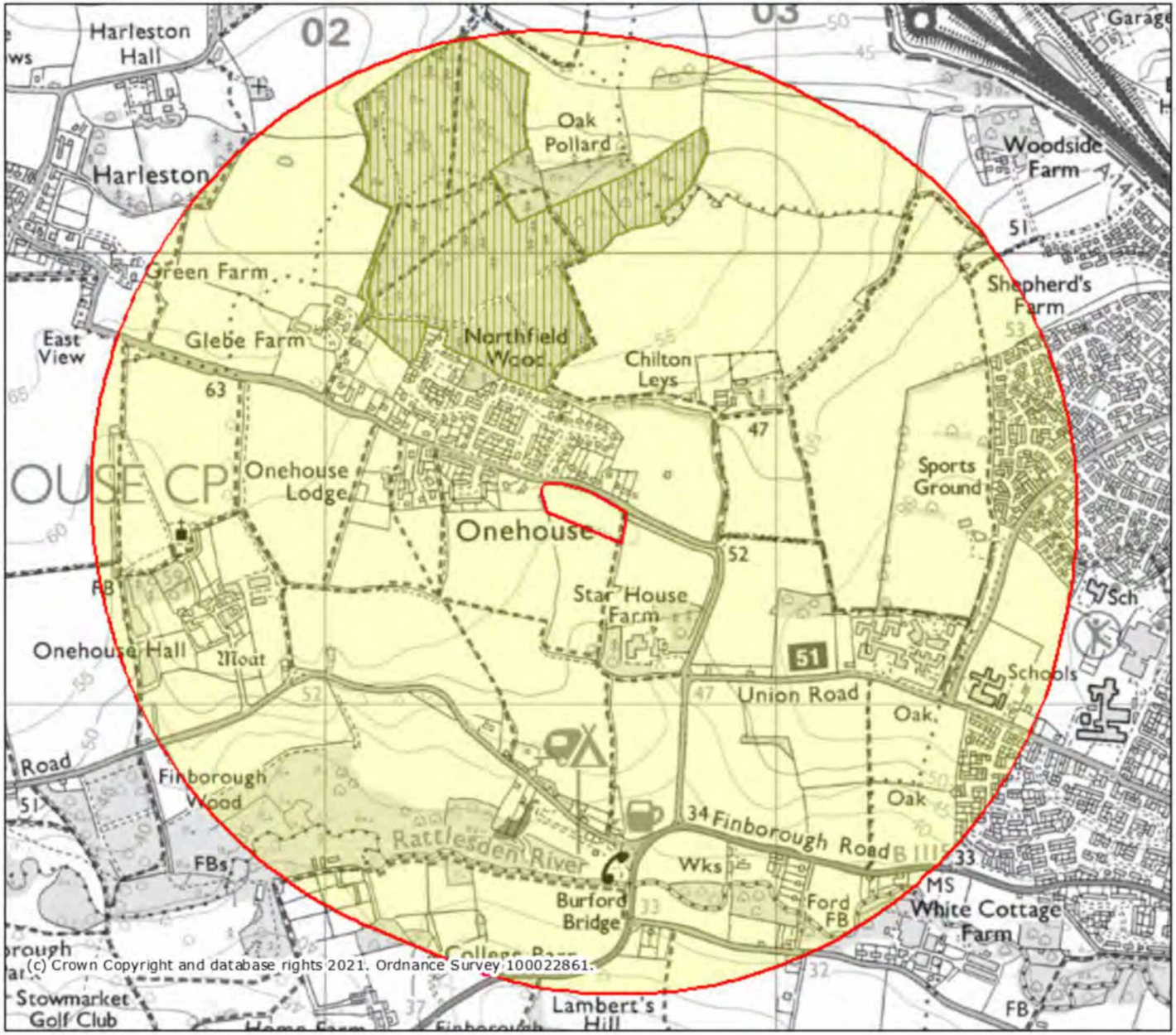
km

Map produced by MAGIC on 3 March, 2021.

MAGiC

5398 Ancient Woodland 1km



Legend

Ancient Woodland (England)

- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland

Projection = OSGB36
xmin = 600400
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xmax = 604800
ymax = 260500

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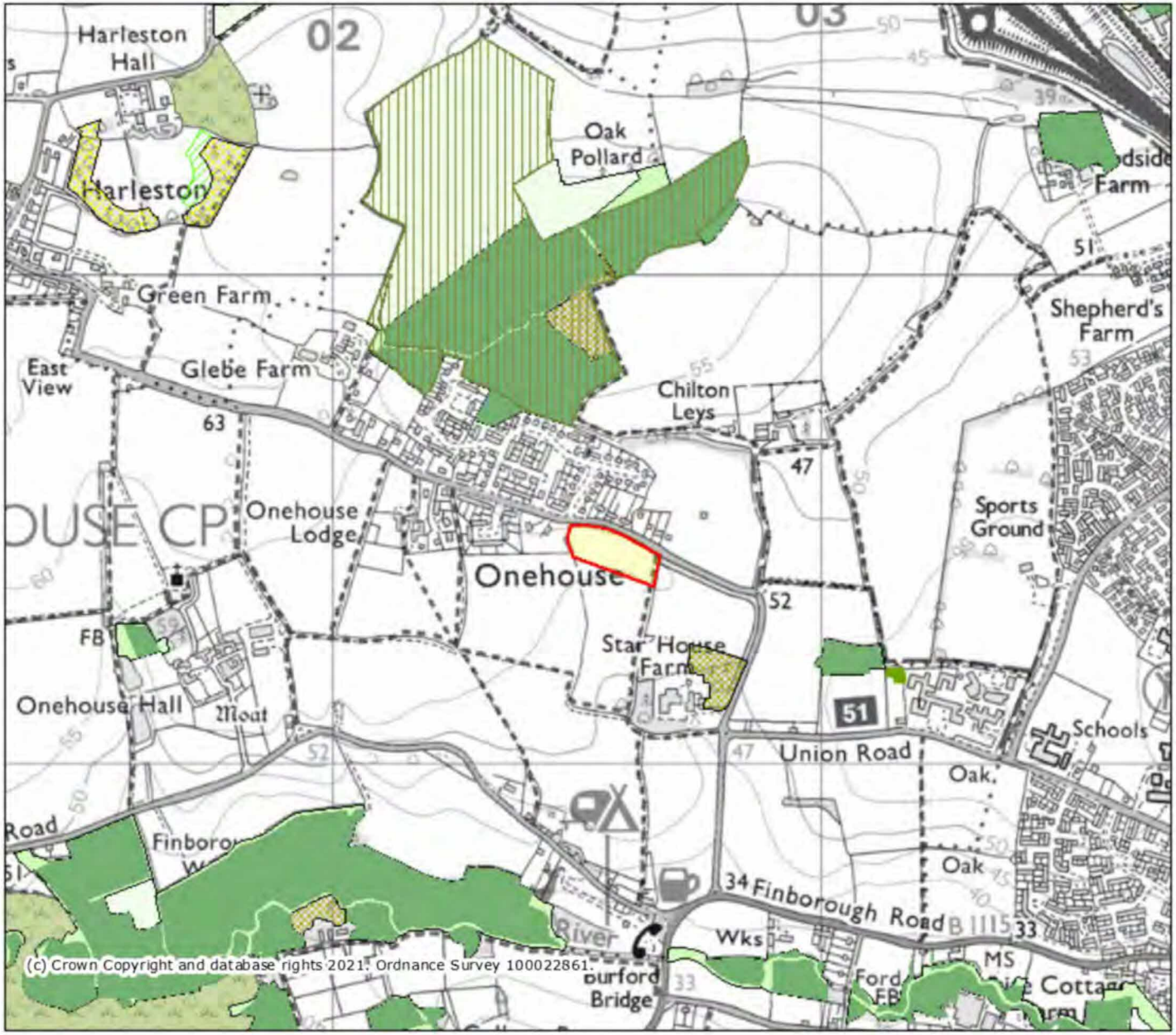
km

Map produced by MAGIC on 3 March, 2021.

MAGiC

5398 Priority Habitat Search



Legend

Ancient Woodland (England)

- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland
- Priority Habitat Inventory - Deciduous Woodland (England)

National Forest Inventory (GB)

- Assumed woodland
- Broadleaved
- Cloud \ shadow
- Conifer
- Coppice
- Coppice with standards
- Felled
- Ground prep
- Low density
- Mixed mainly broadleaved
- Mixed mainly conifer
- Shrub
- Uncertain
- Windthrow
- Young trees
- Priority Habitat Inventory - Traditional Orchards (England)
- Woodpasture and Parkland BAP Priority Habitat (England)

Projection = OSGB36
xmin = 600500
ymin = 258500
xmax = 604500
ymax = 260500

0 0.2 0.4
km

Map produced by MAGIC on 5 March, 2021.

Appendix D

Habitats and Flora Species List

Table D.1 Habitats and Flora Species List

Site name	Land off Forest Road, Onehouse				
Survey date and surveyor	11/03/2021 - CH & MD				
Scientific name	Common name	Arable Field Margins	H1	H2	H3
Herb species					
Achillea millefolium	Yarrow	x			
Anthriscus sylvestris	Cow parsley	x			
Arum maculatum	Lords-and-ladies	x			
Bellis perennis	Daisy	x			
Centaurea nigra	Common knapweed	x			
Cirsium arvense	Creeping thistle	x			
Ficaria verna	Lesser celandine	x			
Galium aparine	Cleavers	x			
Geranium molle	Dove's-foot crane's-bill	x			
Glechoma hederacea	Ground ivy	x			
Helminthotheca echiodes	Bristly oxtongue	x			
Heracleum sphondylium	Hogweed	x			
Iris sp.	Iris		x		
Lamium album	White dead-nettle	x			
Lamium purpureum	Red dead-nettle	x			
Mercurialis perennis	Dog's mercury	x			
Narcissus sp.	Daffodil	x			
Ranunculus repens	Creeping buttercup	x			
Rumex crispus	Curled dock	x			
Rumex obtusifolius	Broad-leaved dock	x			
Senecio vulgaris	Groundsel	x			
Taraxacum officinale agg.	Dandelion	x			
Urtica dioica	Common nettle	x			
Viscum album	Mistletoe		x	x	
Sedges and rushes					
Carex pendula	Pendulous sedge		x		
Juncus inflexus	Hard rush		x		
Grasses					
Dactylis glomerata	Cock's-foot	x			
Festuca rubra	Red fescue	x			
Lolium perenne	Perennial ryegrass	x			
Poa trivialis	Rough meadow-grass	x			
Woody species					
Broadleaved					
Acer campestre	Field maple		x	x	
Carpinus betulus	Hornbeam				x
Cornus sp.	Dogwood		x	x	x
Corylus avellana	Hazel		x	x	x
Crataegus monogyna	Hawthorn		x		
Euonymus europaeus	Spindle				x
Fraxinus excelsior	Ash		x		
Hedera helix	Ivy	x	x	x	
Lonicera periclymenum	Honeysuckle		x		
Prunus spinosa	Blackthorn		x	x	
Prunus spp.	Prunus (domesticated)			x	
Quercus robur	Pedunculate oak				x
Quercus sp.	Oak		x		x
Rosa sp.	Rose			x	
Rosa arvensis	Field rose		x		
Rosa canina spp.	Dog rose		x		
Rubus fruticosus agg.	Bramble		x	x	x
Salix caprea	Goat willow		x		
Sambucus nigra	Elder		x	x	
Ulmus spp.	Elm			x	x

Appendix E

Evaluation & Assessment Methods

1.1. Ecological features are evaluated and assessed in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) 2018 Guidelines for Ecological Impact Assessment (EcIA). For clarity, the evaluation and assessment process adopted within this EcIA is set out below.

Establishing Potentially Important Ecological Features

1.2. Ecological features are assessed where they are considered to be important, and where they may be impacted by a proposed development. A feature may be considered important for a variety of reasons, such as quality, extent, rarity and/or statutory protection. Table 1 below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table 1. Potentially important ecological features (adapted from CIEEM 2018)

Potentially Important Ecological Features	Typical examples
Statutory designated sites under international conventions or European Legislation	Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA)
Statutory designated sites under national legislation	Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR, Local Nature Reserves (LNR)
Non-statutory, locally designated wildlife sites	Local Wildlife Sites (LWS), County Wildlife Sites (CWSs), Sites of Importance for Nature Conservation (SINCs)
National biodiversity lists	Habitats or Species of Principal Importance for the Conservation of Biodiversity (Section 41, NERC Act 2006), Ancient Woodland Inventory
Local biodiversity lists	Local Biodiversity Action Plan (BAP) priority species or habitats
Red Listed / Rare Species	Species of conservation concern, Red Data Book (RDB) species, Birds of Conservation Concern, nationally rare and nationally scarce species
Legally Protected Species	E.g. species listed under Sch.5 of the W&C Act 1981, or Sch.2 of the Hag. Regs. 2017
Legally Controlled Species	E.g. species listed under Sch.9 of the W&C Act 1981

1.3. It should also be noted that the social, community, economic or multi-functional importance attributed to ecological features are not assessed as they fall outwith the scope of this assessment.

Establishing Likely Zone of Influence

1.4. The ‘zone of influence’ for a project is the area over which ecological features may be subject to significant effects as a result of the project and associated activities. The project’s zone of influence varies across different ecological features, which have different vulnerabilities and

sensitivities. For the purposes of this assessment, the following zones were considered:

- International statutory nature conservation designations up to 10km from the Site
- National and local statutory nature conservation designations up to 3km from the Site
- Non-statutory locally designated wildlife sites up to 1km from the Site

1.5. These arbitrary distances are considered sufficient for identifying the nature conservation designations which could be subject to significant effects. However, it is acknowledged that in certain circumstances effects beyond these distances are possible and should be considered as far as is reasonably practicable to do so.

1.6. For other ecological features, such as habitats and species, the appropriate zone of influence is described and justified as appropriate within the report, depending on their respective sensitivity to an environmental change.

1.7. The results of professionally accredited or published scientific studies have been used and referenced, where available, to establish the spatial and temporal limits of the biophysical changes likely to be caused by specific activities, and to justify decisions about the zone of influence.

Geographic Context and Significance Criteria

1.8. The importance of ecological features, as well as the significance of any likely impacts and their effects, are considered here within a defined geographic context:

- International
- National
- Regional
- County
- Local

1.9. The size, conservation status and the quality of features are all relevant in determining their importance and assigning this to the geographic scale. Where the importance of a feature is considered to fall below the Local scale, they are scoped out of detailed assessment.

1.10. Impacts and their effects are taken to be significant where they support or undermine biodiversity conservation objectives, with the scale of significance defined according to the above geographic context. Where an impact or effect is unlikely to be perceptible at a Local scale, this is taken to be not significant.

Characterising Ecological Impacts and their Effects

1.11. Where likely significant ecological impacts and effects are identified in connection with the proposed project, these are considered and described with reference to the following characteristics (where this is helpful in accurately portraying the ecological effect and determining the scale of significance):

- Positive or negative (i.e. does the anticipated change accord with nature conservation policies and objectives?)
- Extent (i.e. the spatial area over which the impact or effect may occur)
- Magnitude (i.e. the quantified size, amount, intensity or volume)
- Duration (i.e. the timeframe over which the impact or effect may occur, in both human and ecological terms)
- Frequency and timing (i.e. the number of times an activity occurs, where this is likely to influence the effect)
- Reversibility (i.e. is spontaneous recovery possible or may the effect be counteracted by mitigation?)

Appendix F

Biodiversity Metric

The Biodiversity Metric 3.0 - Calculation Tool
Start page

Project details	
Planning authority:	Mid Suffolk District Council
Project name:	Land off Forest Road, Onehouse
Applicant:	Harris Strategic Land
Application type:	Outline
Planning application reference:	
Assessor:	Carly Howes (ACIEEM)
Reviewer:	
Metric version:	3
Assessment date:	27/08/2021
Planning authority reviewer:	

Instructions

Main menu

Results

Land off Forest Road, Onehouse

Headline Results

Return to results menu

On-site baseline	*Habitat units*	2.74
	Hedgerow units	3.28
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	3.02
	Hedgerow units	4.37
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	10.10%
	Hedgerow units	33.31%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	0.28
	Hedgerow units	1.09
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	10.10%
	Hedgerow units	33.31%
	River units	0.00%
Trading rules Satisfied?		Yes

Return to results menu

Trading Summary

Distinctiveness Group	Trading Rule	Trading Satisfied?
Very High	Bespoke compensation likely to be required	Yes
High	Same habitat required	Yes
Medium	Same broad habitat or a higher distinctiveness habitat required	Yes
Low	Same distinctiveness or better habitat required	Yes

Very High Distinctiveness

Habitat group	Group	On Site Unit Change	Off Site Unit Change	Project wide Unit Change	Unit Losses
Grassland - Lowland dry acid grassland	Grassland	0.00	0.00	0.00	
Grassland - Lowland meadows	Grassland	0.00	0.00	0.00	
Grassland - Upland hay meadows	Grassland	0.00	0.00	0.00	
Heathland and shrub - Mountain heaths and willow scrub	Heathland and shrub	0.00	0.00	0.00	
Lakes - Aquifer fed naturally fluctuating water bodies	Lakes	0.00	0.00	0.00	
Sparsely vegetated land - Calaminarian grasslands	Sparsely vegetated land	0.00	0.00	0.00	
Sparsely vegetated land - Limestone pavement	Sparsely vegetated land	0.00	0.00	0.00	
Wetland - Blanket bog	Wetland	0.00	0.00	0.00	
Wetland - Depressions on Peat substrates (H7150)	Wetland	0.00	0.00	0.00	
Wetland - Fens (upland and lowland)	Wetland	0.00	0.00	0.00	
Wetland - Lowland raised bog	Wetland	0.00	0.00	0.00	
Wetland - Oceanic Valley Mire[1] (D2.1)	Wetland	0.00	0.00	0.00	
Wetland - Purple moor grass and rush pastures	Wetland	0.00	0.00	0.00	
Wetland - Transition mires and quaking bogs (H7140)	Wetland	0.00	0.00	0.00	
Woodland and forest - Wood-pasture and parkland	Woodland and forest	0.00	0.00	0.00	
Rocky shore - High energy littoral rock - on peat, clay or chalk	Rocky shore	0.00	0.00	0.00	
Rocky shore - Moderate energy littoral rock - on peat, clay or chalk	Rocky shore	0.00	0.00	0.00	
Rocky shore - Low energy littoral rock - on peat, clay or chalk	Rocky shore	0.00	0.00	0.00	
Rocky shore - Features of littoral rock - on peat, clay or chalk	Rocky shore	0.00	0.00	0.00	
Intertidal sediment - Littoral seagrass on peat, clay or chalk	Intertidal sediment	0.00	0.00	0.00	
		0.00	0.00	0.00	0.00

Very High Distinctiveness Summary

Very High Distinctiveness Units available to offset lower distinctiveness defecit	0.00

High Distinctiveness

Habitat group	Group	On Site Unit Change	Off Site Unit Change	Project wide Unit Change	Losses not yet accounted for
Grassland - Traditional orchards	Grassland	0.00	0.00	0.00	
Grassland - Floodplain Wetland Mosaic (CFGM)	Grassland	0.00	0.00	0.00	
Grassland - Lowland calcareous grassland	Grassland	0.00	0.00	0.00	
Grassland - Tall herb communities	Grassland	0.00	0.00	0.00	
Grassland - Upland calcareous grassland	Grassland	0.00	0.00	0.00	
Heathland and shrub - Lowland Heathland	Grassland	0.00	0.00	0.00	
Heathland and shrub - Sea buckthorn scrub (Annex 1)	Heathland and shrub	0.00	0.00	0.00	
Heathland and shrub - Upland Heathland	Heathland and shrub	0.00	0.00	0.00	
Lakes - High alkalinity lakes	Lakes	0.00	0.00	0.00	
Lakes - Low alkalinity lakes	Lakes	0.00	0.00	0.00	
Lakes - Marl Lakes	Lakes	0.00	0.00	0.00	
Lakes - Moderate alkalinity lakes	Lakes	0.00	0.00	0.00	
Lakes - Peat Lakes	Lakes	0.00	0.00	0.00	
Lakes - Ponds (Priority Habitat)	Lakes	0.29	0.00	0.29	
Lakes - Temporary lakes, ponds and pools	Lakes	0.00	0.00	0.00	
Sparsely vegetated land - Coastal sand dunes	Sparsely vegetated land	0.00	0.00	0.00	
Sparsely vegetated land - Coastal vegetated shingle	Sparsely vegetated land	0.00	0.00	0.00	
Sparsely vegetated land - Inland rock outcrop and scree habitats	Sparsely vegetated land	0.00	0.00	0.00	
Sparsely vegetated land - Maritime cliff and slopes	Sparsely vegetated land	0.00	0.00	0.00	
Urban - Open Mosaic Habitats on Previously Developed Land	Urban	0.00	0.00	0.00	
Wetland - Reedbeds	Wetland	0.00	0.00	0.00	
Woodland and forest - Felled	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Lowland beech and yew woodland	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Lowland mixed deciduous woodland	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Native pine woodlands	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Upland birchwoods	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Upland mixed ashwoods	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Upland oakwood	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Wet woodland	Woodland and forest	0.00	0.00	0.00	
Coastal lagoons - Coastal lagoons	Coastal lagoons	0.00	0.00	0.00	
Rocky shore - High energy littoral rock	Rocky shore	0.00	0.00	0.00	
Rocky shore - Moderate energy littoral rock	Rocky shore	0.00	0.00	0.00	
Rocky shore - Low energy littoral rock	Rocky shore	0.00	0.00	0.00	
Rocky shore - Features of littoral rock	Rocky shore	0.00	0.00	0.00	
Intertidal sediment - Littoral mud	Intertidal sediment	0.00	0.00	0.00	
Intertidal sediment - Littoral mixed sediments	Intertidal sediment	0.00	0.00	0.00	
Coastal saltmarsh - Saltmarshes and saline reedbeds	Coastal Saltmarsh	0.00	0.00	0.00	
Intertidal sediment - Littoral biogenic reefs - Mussels	Intertidal sediment	0.00	0.00	0.00	
Intertidal sediment - Littoral biogenic reefs - Sabellaria	Intertidal sediment	0.00	0.00	0.00	
Intertidal sediment - Features of littoral sediment	Intertidal sediment	0.00	0.00	0.00	
Intertidal sediment - Littoral muddy sand	Intertidal sediment	0.00	0.00	0.00	
		0.29	0.00	0.29	0.00

High Distinctiveness Summary

High Distinctiveness Units available to offset lower distinctiveness defecit	0.29
Unit Defecit; Like for like not satisfied	0.00

Medium Distinctiveness

Habitat Group	Group	On site unit change	Off Site Unit Change	Project wide unit change	Cumulative Broad Habitat Change
Cropland - Arable field margins cultivated annually	Cropland	0.00	0.00	0.00	0.00
Cropland - Arable field margins game bird mix	Cropland	0.00	0.00	0.00	
Cropland - Arable field margins pollen & nectar	Cropland	0.00	0.00	0.00	
Cropland - Arable field margins tussocky	Cropland	0.00	0.00	0.00	
Cropland - Cereal crops winter stubble	Cropland	0.00	0.00	0.00	
Grassland - Other lowland acid grassland	Grassland	0.00	0.00	0.00	0.40
Grassland - Other neutral grassland	Grassland	0.40	0.00	0.40	
Grassland - Upland acid grassland	Grassland	0.00	0.00	0.00	
Heathland and shrub - Blackthorn scrub	Heathland and shrub	0.00	0.00	0.00	0.67
Heathland and shrub - Bramble scrub	Heathland and shrub	0.00	0.00	0.00	
Heathland and shrub - Gorse scrub	Heathland and shrub	0.00	0.00	0.00	
Heathland and shrub - Hawthorn scrub	Heathland and shrub	0.00	0.00	0.00	
Heathland and shrub - Hazel scrub	Heathland and shrub	0.00	0.00	0.00	
Heathland and shrub - Mixed scrub	Heathland and shrub	0.67	0.00	0.67	
Lakes - Ponds (Non- Priority Habitat)	Lakes	0.00	0.00	0.00	0.00
Lakes - Reservoirs	Lakes	0.00	0.00	0.00	
Sparsely vegetated land - Other inland rock and scree	Sparsely vegetated land	0.00	0.00	0.00	0.00
Urban - Brown roof	Urban	0.00	0.00	0.00	0.00
Urban - Cemeteries and churchyards	Urban	0.00	0.00	0.00	
Urban - Intensive green roof	Urban	0.00	0.00	0.00	
Woodland and forest - Other Scot's Pine woodland	Woodland and forest	0.00	0.00	0.00	0.00
Woodland and forest - Other woodland; broadleaved	Woodland and forest	0.00	0.00	0.00	
Woodland and forest - Other woodland; mixed	Woodland and forest	0.00	0.00	0.00	
Intertidal sediment - Littoral coarse sediment	Intertidal sediment	0.00	0.00	0.00	0.00
Intertidal sediment - Littoral sand	Intertidal sediment	0.00	0.00	0.00	
Intertidal Hard Structures - Artificial hard structures with Integrated Greening of Grey Infrastructure (IGGI)	Intertidal	0.00	0.00	0.00	
		1.07	0.00	1.07	

Medium Distinctiveness Summary

Medium Distinctiveness Units available to offset lower distinctiveness defecit	1.07
Medium Distinctiveness Broad Habitat Deficit to be offset by trading up	0.00
Higher distinctiveness surplus units miunus Medium Distinctivenss Broad Habitat Defecit	0.29
Cumulative surplus of units	1.36

Low Distinctiveness

Habitat group	Group	On site unit change	Off Site Unit Change	Project wide unit change
Cropland - Cereal crops	Cropland	-2.74	0.00	-2.74
Cropland - Cereal crops other	Cropland	0.00	0.00	0.00
Cropland - Horticulture	Cropland	0.00	0.00	0.00
Cropland - Intensive orchards	Cropland	0.00	0.00	0.00
Cropland - Non-cereal crops	Cropland	0.00	0.00	0.00
Cropland - Temporary grass and clover leys	Cropland	0.00	0.00	0.00
Grassland - Modified grassland	Grassland	0.95	0.00	0.95
Grassland - Bracken	Grassland	0.00	0.00	0.00
Heathland and shrub - Rhododendron scrub	Heathland and shrub	0.00	0.00	0.00
Lakes - Ornamental lake or pond	Lakes	0.00	0.00	0.00
Sparsely vegetated land - Ruderal/Ephemeral	Sparsely vegetated land	0.00	0.00	0.00
Urban - Bioswale	Sparsely vegetated land	0.00	0.00	0.00
Urban - Allotments	Urban	0.00	0.00	0.00
Urban - Facade-bound green wall	Urban	0.00	0.00	0.00
Urban - Ground based green wall	Urban	0.00	0.00	0.00
Urban - Ground level planters	Urban	0.00	0.00	0.00
Urban - Extensive green roof	Urban	0.00	0.00	0.00
Urban - Introduced shrub	Urban	0.00	0.00	0.00
Urban - Rain garden	Urban	0.00	0.00	0.00
Urban - Sand pit quarry or open cast mine	Urban	0.00	0.00	0.00
Urban - Urban Tree	Urban	0.31	0.00	0.31
Urban - Sustainable urban drainage feature	Urban	0.00	0.00	0.00
Urban - Vacant/derelict land/ bareground	Urban	0.00	0.00	0.00

Low Distinctiveness Summary

Low Distinctiveness Net Change in Units	-1.08
Cumulative surplus of units	0.28

Urban - Vegetated garden	Urban	0.41	0.00	0.41
Woodland and forest - Other coniferous woodland	Woodland and forest	0.00	0.00	0.00
Coastal saltmarsh - Artificial saltmarshes and saline reedbeds	Coastal saltmarsh	0.00	0.00	0.00
Intertidal sediment - Artificial littoral coarse sediment	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral mud	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral sand	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral muddy sand	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral mixed sediments	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral seagrass	Intertidal sediment	0.00	0.00	0.00
Intertidal sediment - Artificial littoral biogenic reefs	Intertidal sediment	0.00	0.00	0.00
Intertidal Hard Structures - Artificial hard structures	Intertidal	0.00	0.00	0.00
Intertidal Hard Structures - Artificial features of hard structures	Intertidal	0.00	0.00	0.00
Heathland and shrub - Sea buckthorn scrub (other)	Heathland and shrub	0.00	0.00	0.00
		-1.08		-1.08

Appendix G

Bats

1.0 Legislation

1.1 All British bat species are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:

- Deliberately capture, injure, or kill a bat
- Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young, or which significantly affects the local distribution or abundance of the species
- Damage or destroy a breeding site or resting place used by bats

1.2 All bats and their roosts in the UK were previously fully protected under the Wildlife & Countryside Act 1981 (as amended). Amendments to the Act have removed most provisions as they relate to bats, however it remains an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection

1.3 It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Regulations, the offence of damaging or destroying a breeding site or resting place is subject to ‘strict liability’, i.e. an offence is commented irrespective of whether the causal act was deliberate or otherwise.

1.4 Where development is proposed that would result in an offence under the Regulations, a European Protected Species (EPS) statutory derogation licence (often termed ‘EPS Mitigation Licence’) will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

2.0 Methods

2.1 The following survey methods, design, data analysis and interpretation have been undertaken with due consideration of the Bat Conservation Trust (BCT) guidelines 3rd Edition (Collins, 2016).

Activity Surveys

Remote Monitoring

2.2 A single Wildlife Acoustics Songmeter (SM4) detector was deployed during July and August to provide two data-sets. The location of this Monitoring Location (ML) is shown on Figure 1 below.

Figure 1. The locations of each Monitoring Location (ML) surveyed during remote monitoring surveys in July and August.

2.3 The detector was setup to automatically record ultrasonic signals for the period from half an hour before sunset to half an hour after sunrise each night, with each monitoring period spanning at least five consecutive nights.

2.4 Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather observations taken from the nearest weather station in Wattisham. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, see Table 1) were taken forward for analysis.

2.5 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call pulses by a bat/s is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.

2.6 Recorded bat calls were analysed using the specialist software AnalookW to identify the species present. Quantitative analysis of bat activity was then undertaken by calculating the average bat contacts per hour on each night monitored, for each species.

2.7 Bat activity can show considerable inter-night variability and is dependent on a number of variables, including temperature, wind, and seasonality, amongst others. To account for this variability the median values for the average hourly bat contacts per night are reported, rather than a mean value which would misrepresent the average activity.

Limitations

2.8 It should be noted that the findings described herein for remote monitoring surveys are based on the bat activity recorded at the location immediate to each detector, and therefore only describe localised activity at the Site.

2.9 In addition, comparisons drawn on the number of detector activations by different species/genera can only give an indication of relative species abundance at the Site, as detectability varies between species.

2.10 It is acknowledged that the quantum of bat contacts recorded during a survey may not give a true reflection of the abundance of bats using the Site. For example, a single bat foraging close to a detector may trigger several hundred activations in the course of one night. However, this activity level does provide a proxy for the level of use by bats, and therefore its relative importance.

3.0 Results

Activity Surveys

Remote monitoring

3.1 The weather conditions experienced during the five nights where data was analysed are provided in Table 1 below.

Table 1. Overnight weather conditions during remote monitoring

Survey Month	Dates Sampled (2021)	Temp. (°C)		Cloud Cover (%)		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
July	19/07	13	15	17	28	2	5	No rain
July	20/07	15	17	7	80	4	6	Light rain at 00:00
July	21/07	14	18	11	53	7	10	No rain
July	22/07	14	18	0	29	6	8	No rain
July	23/07	16	17	32	70	12	13	Moderate rain at 06:00
August	13/08	14	17	4	80	8	10	Very light rain 00:00
August	14/08	17	19	28	80	8	9	No rain
August	15/08	13	18	4	15	11	13	No rain
August	16/08	11	17	32	87	6	11	Very light rain 00:00
August	17/08	12	15	23	76	3	9	No rain

3.2 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 2 below.

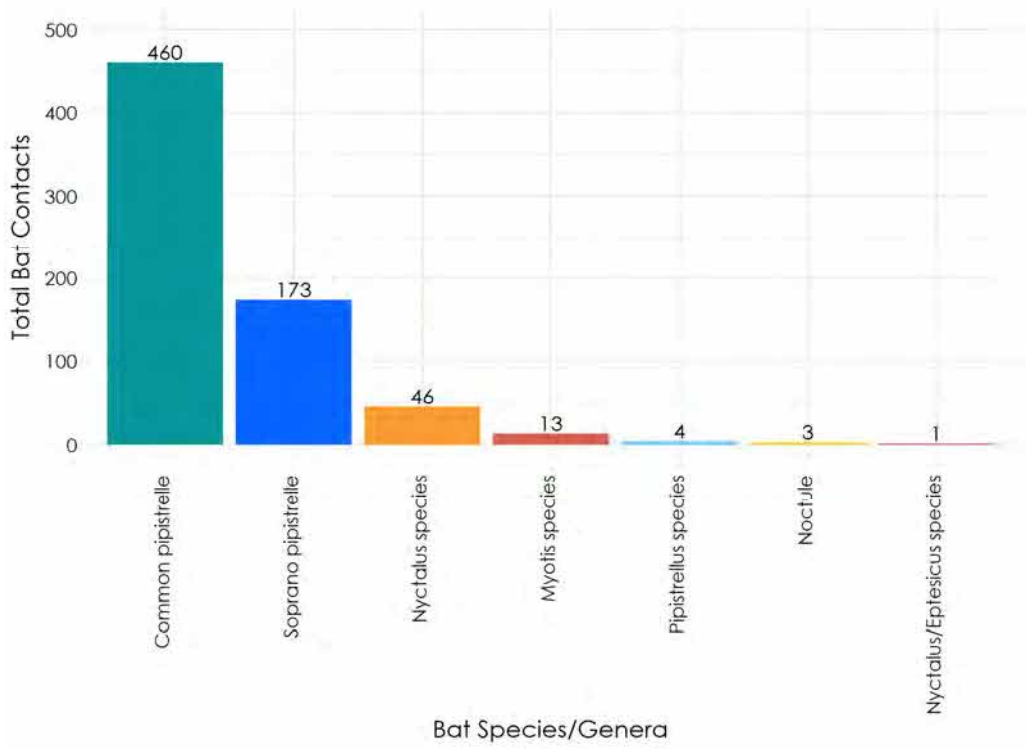


Figure 2. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations

3.3 The bat activity detected was dominated by common pipistrelle and soprano pipistrelle, which constituted to 90% of all passes during the two monitoring periods. In addition to this there was found to be a number of passes of unidentified *Nyctalus* species, which constituted 6.5% of passes.

3.4 Lower levels of *Myotis* bat species were recorded, with lower still unidentified *Pipistrellus* species, noctule *Nyctalus noctula* and unidentified *Nyctalus*/*Eptesicus* bats.

3.5 Figure 3 below shows the variance in nightly activity levels for each of these bat species recorded on-site. More detailed data describing Figure 3 are provided in Table 2. The activity data in Figure 3 is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 10 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.

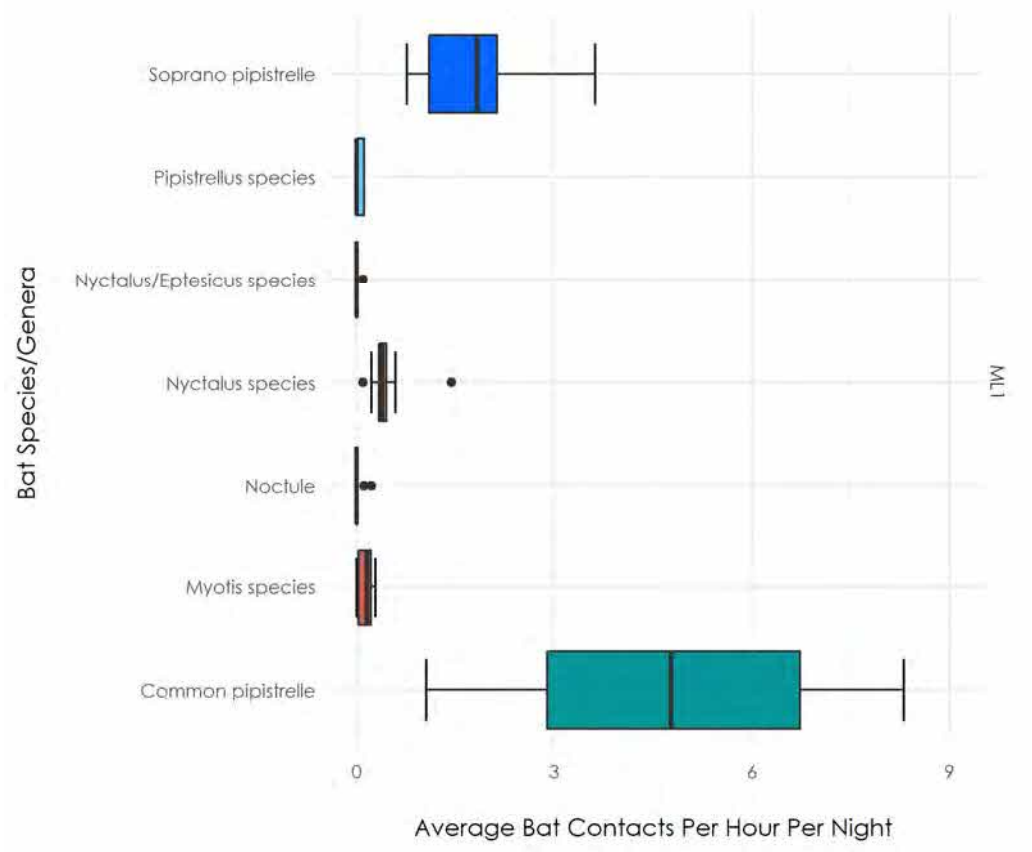


Figure 3. Average bat contacts per hour per night for each bat species/genera recorded across all remote monitoring

Table 2. Average bat contacts per hour per night recorded during remote monitoring surveys

Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
	Minimum	Maximum	Median	IQ range		
Common pipistrelle	1.056	8.306	4.769	3.836	460	10
Myotis species	0.000	0.288	0.151	0.190	13	10
Noctule	0.000	0.223	0.000	0.000	3	10
Nyctalus species	0.096	1.433	0.388	0.112	46	10
Nyctalus/ *Eptesicus* species	0.000	0.097	0.000	0.000	1	10
Pipistrellus species	0.000	0.112	0.000	0.111	4	10
Soprano pipistrelle	0.764	3.617	1.829	1.030	173	10

Appendix H

Great Crested Newt

1.0 Legislation

1.1 Great crested newts *Triturus cristatus* are legally protected as European Protected Species (EPS) under Regulation 43 of the Conservation of Habitats and Species Regulations 2017. These Regulations make it an offence to:

- Deliberately capture, injure, kill or capture a great crested newt
- Deliberately disturb great crested newts, impairing their ability to survive, breed, reproduce or rear/nurture their young
- Damage or destroy a breeding site or resting place used by a great crested newt

1.2 Great crested newts are also fully protected under the Wildlife & Countryside Act 1981 (as amended), making it an offence to:

- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place of shelter or protection
- Intentionally or recklessly obstruct access to any structure or place of shelter or protection

1.3 Disturbance of great crested newts is covered by both the 2017 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while less significant acts of disturbance may only be covered by the Act.

1.4 It is important to note that great crested newts and their habitats (such as breeding ponds) are protected throughout the year, regardless of whether or not newts are present at the time.

1.5 Great crested newts are also listed as a species of principal importance for the conservation of biodiversity in England, under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 species list is used to guide decision-makers, including planning authorities, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Licensing

1.6 Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence may be granted by Natural England to permit an act that would otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:

- "preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 55(2)(e))

1.7 In addition, Natural England will not grant an EPS licence unless they are satisfied that:

- "There is no satisfactory alternative" (Regulation 55(9)(a))
- "The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" (Regulation 55(9)(b))

2.0 Methods

Desktop Study

2.1 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography. 500m is the generally accepted typical maximum dispersal range of this species, with great crested newt most likely to use terrestrial habitat within 250m of breeding ponds.

Habitat Suitability Index (HSI) Assessment

2.2 Where ponds were situated within an 250m radius and connected to the Site by traversable terrestrial habitats, access permission was requested to undertake a Habitat Suitability Index (HSI) assessment, using the standard approach set out by Oldham et al (2000). These assessments were undertaken on 12 May 2021 by Carly Howes ACIEEM (Class Survey Licence CL08 –Registration number: 2017-32238-CLS-CLS).

Environmental DNA (eDNA) Sampling

2.3 Environmental DNA (eDNA) sampling was used to determine the presence/ likely absence of great crested newts from pond 2. This method has been shown to be a highly effective in detecting the presence of great crested newts (Biggs et al. 2014).

2.4 Water samples were collected from pond 2 on 10 June 2021 by Carly Howes and Katie Hepburn following the recommended procedure. Appropriate biosecurity measures were taken to avoid cross contamination of great crested newt eDNA. Subsequently the samples were sent to ADAS for DNA analysis.

Limitations

2.5 There were no limitations to the desktop study.

2.6 The HSI Assessment of Pond 1 (adjacent to the western Site boundary) was undertaken by viewing the pond from within the Site boundary and therefore the entire perimeter of the pond was not traversed. However, given that the entire pond could be viewed from within the Site boundary, the results of the HSI Assessment would not have been impacted as a result.

2.7 Access to undertake an eDNA survey of Pond 1 was requested from the owners of the property, but permission was not granted.

3.0 Results

Desktop Study

3.1 The desk-based search for ponds and subsequent site visits identified two water bodies occurring within 250m of the Site, with a further four ponds located within 500m of the Site.

3.2 The two ponds located within 250m were included within the further survey work (see Pond Location Plan CSA/5398/108 below). All ponds outside of this radius were excluded from further investigation given their distance and/or separation from the Site due to boundaries to dispersal such as roads and arable fields in active arable rotation.

3.3 Pond 1 is a garden pond located adjacent to the western Site boundary. Pond 2 is located in the centre of an arable field c. 115m north-east of the Site.

Habitat Suitability Index (HSI) Assessment

3.4 The HSI Assessment produced the following scores:

- Pond 1 –0.52/'Below Average'
- Pond 2 –0.67/'Average'

3.5 See Tables 1 and 2 for full HSI Assessment results.

Environmental DNA (eDNA) Sampling

3.6 The eDNA water samples for Pond 2 tested negative, indicating likely absence of great crested newts in Pond 2.

3.7 The full results of the eDNA analysis are provided on the proceeding pages.

N

- Site boundary
- Pond
- Pn — Pond number
- 250m buffer
- 500m buffer

P1: HSI Score = 0.52/'Below Average'
P2: HSI Score = 0.67/'Average'
eDNA result = Negative (2021)
P3: Not surveyed
P4: Not surveyed
P5: Not surveyed
P6: Not surveyed - Small GCN population recorded in 2016

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Project	Land off Forest Road, Onehouse	Date	August 2021	Drawing No.	CSA/5398/108
Drawing Title	Pond Location Plan	Scale	Refer to scale	Rev	-
Client	Harris Strategic Land	Drawn	MD	Checked	CH

Table 1. Habitat Suitability Index (HSI) Assessment for Pond 1

Site	**5398 - Land off Forest Road, Onehouse**
Pond number	**Pond 1 (P1) - TM 02488 59436**

Habitat Suitability Index

				SI value
SI1. Map location	A/B/C		A	1.00
SI2. Surface area	rectangle/ellipse/irregular		ellipse	
		length (m)		
		width (m)		
		area (m^2) =	113	0.23
SI3. Dessication rate	never/rarely/sometimes/frequently		rarely	1.00
SI4. Water quality	good/moderate/poor/bad		poor	0.33
SI5. Shade	% of margin shaded 1m from bank		100	0.20
SI6. Waterfowl	absent/major/minor		absent	1.00
SI7. Fish population	absent/possible/minor/major		absent	1.00
SI8. Pond density	number of ponds within 1km		18	1.00
SI9. Terrestrial habitat	good/moderate/poor/isolated		poor	0.33
SI10. Macrophyte cover	%		0	0.31
		HSI=		**0.52**
		Pond Suitability*		**Below average**
		HSI assessment date		12/05/2021

**Following the Lee Brady system*

Photo/sketch

Table 2. Habitat Suitability Index (HSI) Assessment for Pond 2

Site	**5398 - Land off Forest Road, Onehouse**
Pond number	**Pond 2 (P2) - TM 02766 59510**

Habitat Suitability Index

				SI value
SI1. Map location	A/B/C		A	1.00
SI2. Surface area	rectangle/ellipse/irregular		rectangle	
		length (m)		
		width (m)		
		area (m²) =	217	0.43
SI3. Dessication rate	never/rarely/sometimes/frequently		never	0.90
SI4. Water quality	good/moderate/poor/bad		moderate	0.67
SI5. Shade	% of margin shaded 1m from bank		75	0.70
SI6. Waterfowl	absent/major/minor		absent	1.00
SI7. Fish population	absent/possible/minor/major		absent	1.00
SI8. Pond density	number of ponds within 1km		13	1.00
SI9. Terrestrial habitat	good/moderate/poor/isolated		poor	0.33
SI10. Macrophyte cover	%		0	0.31
			HSI=	**0.67**
			Pond Suitability*	**Average**
			HSI assessment date	12/05/2021

**Following the Lee Brady system*

Photo/sketch

Client: Bethany Wilson,
CSA Environmental

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Tel: 01159 516747
Email: Helen.Rees@adas.co.uk

www.adas.uk

Sample ID: ADAS-2278	Condition on Receipt: High Sediment	Volume: Passed
Client Identifier: Pond 2 Onehouse 5398	Description: pond water samples in preservative	
Date of Receipt: 14/06/2021	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control[†]	2 of 2	Real Time PCR	15/06/2021
Degradation Control[§]	Within Limits	Real Time PCR	15/06/2021
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	16/06/2021
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	16/06/2021	Date of issue:	16/06/2021

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

**If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] *Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

[§] *No degradation is expected within time frame of kit preparation, sample collection and analysis.*

[#]*Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.*

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

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