



Land off Ixworth Road,
Thurston

Ecological Impact Assessment

Prepared by
CSA Environmental

on behalf of
Gladman Developments Ltd

Report No: CSA/4164/01

July 2019

This page has been intentionally left blank

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/4164/05	22/07/2019	-	AC	JW	Draft for comment
CSA/4169/05	18/09/2019	A	AC	JW	Updated to include latest survey data.



This page has been intentionally left blank

CONTENTS	Page
Executive Summary	1
1.0 Introduction	2
2.0 Legislation, Planning Policy & Standing Advice	4
Legislation	4
National Planning Policy	4
Local Planning Policy	4
Standing Advice	4
3.0 Methods	5
Desk Study	5
Field Surveys	5
Limitations	6
Evaluation and Assessment	7
4.0 Baseline Ecological Conditions	8
Nature Conservation Designations	8
Habitats and Flora	9
Fauna	11
Summary of Ecological Features	17
5.0 Assessment of Effects	19
Assessment of Likely Significant Effects	19
Enhancement	23
6.0 Conclusions	25
7.0 References	26
 Appendices	
Appendix A: Habitats Plan & Photosheet	
Appendix B: Legislation, Planning Policy and Standing Advice	
Appendix C: Desk Study Information	
Appendix D: Habitats and Flora Species List	
Appendix E: Evaluation and Assessment Methods	
Appendix F: Bat Surveys	
Appendix G: Badger Survey	
Appendix H: Dormouse Surveys	
Appendix I: Breeding Bird Surveys	

Appendix J: Great Crested Newt Surveys

EXECUTIVE SUMMARY

Residential development is proposed at Land off Ixworth Road, Thurston, for which outline planning permission is sought.

CSA Environmental was instructed by Gladman Developments Limited to undertake an Ecological Impact Assessment (EclA) 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 dominated by a single arable field of limited ecological interest with two dry ditches to the east and discontinuous hedges to the west and south. The hedgerows and mature trees on the northern and eastern boundaries are of somewhat greater interest and will be retained and buffered, with the exception of a small loss of hedgerow for the vehicular access point in the north-west of the Site.

Habitats on-site, including hedgerows, support a range of bat species, including serotine. Mitigation measures have been proposed to retain and enhance hedgerow habitats at the Site in respect of their use by bats.

The use of the Site by farmland birds, namely skylark, has been considered in the context of current Site conditions and the effect of adjacent consented development. Measures to maintain the interest of the Site in respect of the wider breeding bird assemblage have been proposed. Surveys have also been undertaken for bats and dormice.

In addition, opportunities for ecological enhancement have been set out within open space and new buildings across the Site.

Based on successful implementation of the proposed mitigation, compensation and enhancement, the development is not anticipated to result in any residual significant negative effects to important ecological features. The scheme is considered to accord with all relevant nature conservation legislation, as well as with the provisions of Mid Suffolk Core Strategy.

This page has been intentionally left blank

1.0 INTRODUCTION

- 1.1 This report has been prepared by CSA Environmental on behalf of Gladman Developments Limited. It sets out the findings of an Ecological Impact Assessment (EclA) of proposed development at Land off Ixworth Road, Thurston (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 due consideration for 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. 8.87ha and is located around central grid reference TL 92066 65921, to the north of Thurston. It consists of a single arable field which contained a crop of winter wheat at the time of survey, with hedgerows bounding the Site to the north and east (see Habitats Plan in Appendix A).
- 1.4 An initial desk study and extended Phase 1 Habitat survey were undertaken for the Site in January 2019 as part of a Preliminary Ecological Appraisal, the findings of which are presented herein. In addition, the following further survey work was undertaken between March and September 2019:
- Bat Surveys (April-August 2019)
 - Badger Survey (April 2019)
 - Dormouse Surveys (April-September 2019)
 - Breeding Bird Surveys (June 2019)
 - Great Crested Newt Surveys (April 2019)
- 1.5 This EclA 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 could be delivered by the proposed scheme.

- 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 proposed by the relevant authority.

1.6 An EclA 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 Mid Suffolk District 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 EclA includes:

- The Conservation of Habitats and Species Regulations 2017
- 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, 2019) 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 The Government Circular 06/2005, which is referred to by the NPPF, provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

Local Planning Policy

2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Table B.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.

This page has been intentionally left blank

3.0 METHODS

Desk Study

- 3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in January 2019 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 (SBRC) 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. Other online sources were reviewed for relevant biological records, reports and background information.
- 3.3 The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land.
- 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 All 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 08 January 2019 by Alexandra Cole ACIEEM and Meaghan McBlain, 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 Priority Habitats under Section 41 of the NERC Act
- 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 April and June 2019, with full methods and results provided in the relevant Appendices:

- Preliminary Roost Assessment - Trees (Appendix F)
- Bat Remote Monitoring Surveys (Appendix F)
- Badger Survey (Appendix G)
- Dormouse Surveys (Appendix H)
- Breeding Bird Surveys (Appendix I)
- Great Crested Newt Habitat Suitability Index (Appendix J)

Limitations

3.10 There were no specific limitations to the desktop study. Initial botanical descriptions within this report are based on a survey undertaken outside of the optimal period for botanical surveying, when some plant species may not be visible above ground. However, subsequent survey visits were used to confirm the species present at the Site.

Evaluation and Assessment

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

This page has been intentionally left blank

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

- 4.1 There are no statutory designations covering any part of the Site, no international statutory designations within 10km of the Site and no local statutory designations within 3km of the Site.
- 4.2 A single national statutory designation was identified within 3km of the Site, as described in Table 1 below.

Non-Statutory

- 4.3 Two non-statutory designations were identified within 2km of the Site; Pakenham Wood CWS (c. 1.4km north-east of the Site) and Barton Shrub (c. 1.9km west 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
National Designations within 3km		
Pakenham Meadows SSSI	c. 2.7km north	Species rich meadow which is poorly drained and unimproved. The site supports a small-scale complex mosaic of vegetation types which reflect the variation in soils from loam to peat. The meadow is also herb rich and contains a number of uncommon species, with the dykes providing valuable additional habitat for invertebrates.
Non-Statutory Designations within 2km		
Pakenham Wood CWS	c. 1.4km north-east	A former SSSI, much of the wood has recently been clear-felled and replanted with Corsican pine and larch. Remnants of the woodland flora are mostly restricted to the woodland rides and include herb-Paris, early purple orchid and nettled-leaved bellflower. The wood is used for shooting.
Barton Shrub CWS	c. 1.9km west	An area of ancient woodland with conifer plantation to the west. The site has a varied structure with rides managed by mowing. The site is managed for pheasant rearing.

Ancient Woodland

- 4.4 There is no designated 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. The nearest ancient woodland is Pakenham Wood CWS, an area of ancient replanted woodland located c. 1.4km north-east of the Site.

Habitats and Flora

Notable Flora Records

- 4.5 SBRC provided 48 records of 32 notable plant species from within the search area. Those of potential relevance to the Site include annual knawel *Scleranthus annuus*, which is known to grow in free-draining arable margins, but was not recorded during the Phase 1 habitat survey or subsequent survey visits.

Habitats

- 4.6 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. Detailed species lists for each habitat are provided in Appendix D.

Arable

- 4.7 The Site is dominated by arable land under cultivation with a winter wheat *Triticum* sp. crop present at the time of survey. The field has narrow field margins of c. 1m on the northern boundary increasing to c. 3m elsewhere. The margins are dominated by annual meadow-grass *Poa annua* and perennial rye grass *Lolium perenne*, with cock's-foot *Dactylis glomerata* and common couch *Elytrigia repens* along the southern boundary public footpath. Common forb species were found within the field margins including common chickweed *Stellaria media*, cleavers *Galium aparine* and common nettle *Urtica dioica*.
- 4.8 The arable field has limited ecological interest, although margins have to potential to support some more notable species, given the free-draining dry Breckland habitats in underlying soil horizons.
- 4.9 Arable field margins under certain circumstances would qualify as a Habitat of Principle Importance in England under the NERC Act 2006. However, those 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 an important ecological feature of the Site.

Hedgerow

- 4.10 The Site is bound to the north (H1) and most of the east (H2) by continuous hedgerows, with shorter, discontinuous hedges to the south (H3) and west (H4). All hedgerows are described in turn below.

- 4.11 H1 forms the northern boundary of the Site comprising a c. 3.5m high by c. 2m wide field hedgerow, approximately 270m long. The hedgerow appears to be clipped/flailed regularly showing a uniform appearance. It is a continuous hedgerow dominated by dogwood *Cornus* sp., field maple *Acer campestre* and hawthorn *Crataegus monogyna* with single Scot's pine *Pinus sylvestris* and silver birch *Betula pendula* trees. Other woody species present are holly *Ilex aquifolium*, oak *Quercus* sp., hazel *Corylus avellana*, cherry *Prunus avium*, ash *Fraxinus excelsior* and bramble *Rubus fruticosus* agg.
- 4.12 H2 is a continuous hedgerow which runs along the eastern boundary. It is c. 2m wide, c. 230m in length and comprises primarily outgrown elm *Ulmus* sp. and field maple with varying levels of ivy *Hedera helix* coverage and shows signs of past coppicing. Other woody species include blackthorn *Prunus spinosa*, and semi-mature oak trees.
- 4.13 H3 is a c. 70m stretch of hedgerow which bounds residential properties along the southern boundary. The hedgerow runs along a public footpath and comprises a small row of mature elm trees with some ivy cover. Other species noted along this boundary were oak, bramble and a single, small walnut tree *Juglans regia*, with a low off-site conifer hedgerow present within adjacent residential gardens.
- 4.14 H4 forms three short stretches of the western Site boundary, formerly a continuous field hedge along Ixworth Road. The hedgerow sections are formed on a small bank and do not show signs of recent management. The c. 3m wide and c. 6m high hedgerow comprises a modest range of woody species, including elm, elder *Sambucus nigra*, oak, hazel and holly, along with bramble. A pile of house-hold rubbish is present adjacent to the hard-standing to the north of H1.
- 4.15 The hedgerows on-site are of ecological significance and form part of the hedgerow network within the local landscape. All hedgerows "consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species" are covered by the UK S41 Priority Habitat 'Hedgerows' and as such, all hedgerows at the Site would qualify as priority habitats. Taken together H1-4 are of ecological importance, significant at the **Local** level.

Scrub

- 4.16 Two areas of scrub are present within the Site, located in the north-west corner between H4 and H1 and also along the southern boundary. The scrub to the north-west is dense and well established, c. 1.5-2m tall comprising a mix of blackthorn, bramble, cherry and dogwood. The scrub to the east of the southern boundary is lower, c. 0.5m tall and dominated by bramble. A further strip of blackthorn scrub is present adjacent to the Site, along the western section of the southern

boundary. This habitat is common and widespread and therefore not considered to be of ecological interest.

Tall Ruderal

- 4.17 A single area of tall ruderal vegetation is located to the north of the eastern boundary. It is dominated by willow herb *Epilobium* sp., with some bramble and elm. This habitat is common and widespread and therefore not considered to be of ecological interest.

Dry Ditch

- 4.18 A dry ditch is found adjacent to the eastern Site boundary (c. 2m in depth) which runs parallel to a public footpath and a second ditch, both off-site. Rabbits have burrowed into the banks of the ditch at the northern end. The lack of flora present indicates the ditch remains dry throughout the year. Given its current condition, this ditch is not considered to be of substantive ecological interest.

Fauna

Bats

- 4.19 A total of 31 bat records were identified within the search area, dating from 1998 to 2017. These include the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared bat *Plecotus auritus* and Natterer's bat *Myotis nattereri*. There have been three records of brown long-eared bats provided c. 0.8km south of the Site since 2009; two records were from a roost in a nearby cottage and, one injured individual found on the Site. The closest record of a pipistrelle species bat is an individual in a roost from 2013 (c. 0.75km from the Site).
- 4.20 The Site, being a single arable field with some discontinuous hedgerow boundaries provides limited suitable foraging habitat or navigation features for bats. However, the hedgerows along the north (H1) and east (H2) boundaries provide greater interest in both these regards, with gardens to the south and woodland in the surrounding area providing further interest.

Preliminary Roost Assessment – Trees

- 4.21 A Preliminary Roost Assessment (PRA) was undertaken in April 2019 to determine the potential of semi-mature and mature trees within the Site to support roosting bats. The assessments involved ground based tree assessments of trees within the survey area which had been determined to require removal either for access or due to the health of the tree to identify any Potential Roosting Features (PRFs).
- 4.22 Two trees within G3 (Tree Survey & Constraints Plan BHA_542_01) along the eastern boundary were assessed to have "low" bat roost potential

as per the Bat Conservation Trust Guidelines (Collins, 2016). The full results of the tree inspection are provided in Table F.1 of Appendix F.

Bat Activity

- 4.23 Remote monitoring of bat activity at the Site was conducted between May and August 2019. The full results of the monitoring are provided in Appendix F.
- 4.24 A minimum of eight bat species/genera were recorded on the detector placed within the Site during the survey periods. This number of species is over half of the 12 species known to be present within the county of Suffolk, excluding lesser horseshoe bats of which only one individual was recorded between 1996 and 2016. However, the vast majority (1,499 passes; 86.6%) of total passes were attributable to pipistrelle *Pipistrellus* spp. bats across both monitoring periods, albeit with 7 passes attributable to the rarer Nathusius' pipistrelle *Pipistrellus nathusii*.
- 4.25 Notably, c. 5.95% of passes (103) were attributable to serotine bat, with all but two of these passes recorded in May. Emergence times in May were between c. 30-60 minutes after sunset.
- 4.26 A small number of passes (26; 1.5%) were identified as 'big bats'. These calls were not distinguishable to species level and could be attributable to either noctule, Leisler's *Nyctalus leisleri* or serotine bats.
- 4.27 Noctule and *Nyctalus* sp. bats were recorded in modest numbers (73 passes, 4.22% of total passes). Only a very small number of passes of remaining species: brown long-eared, barbastelle *Barbastella barbastellus*, Leisler's and unidentified *Myotis* sp. bats were recorded (c. 7.73% of total passes).

Importance

- 4.28 The majority of bat activity at the Site are for species which fall into "common" (common pipistrelle, soprano pipistrelle, brown long-eared and noctule), or the "common" to "rarer" (Nathusius, serotine, Leisler's and *Myotis* species) categories, with only barbastelle falling within the "rarest" category, based on adapted criteria for assessing rarity within range by Wray et al. (2010).
- 4.29 The relatively high number of serotine passes, most of which were recorded in May relatively shortly after sunset, suggests a roost may be located nearby. Serotine bats roost within buildings and therefore any roost would not be located on-site. Median emergence times for serotine are c. 20mins after sunset, which suggests any roost present is located a short distance from the Site but not necessarily adjacent. Hedgerows, principally to the east of the Site, are likely to provide key flight lines for dispersal and foraging opportunities for this and other bat species.

- 4.30 Given the bat activity levels on-site are typical of the habitats present (principally arable, with hedgerows) and the assemblage recorded is considered to be 'good' (minimum of nine species, dominated by two common, widespread species), it is therefore considered to be of ecological importance at the **Local** level.

Badger

- 4.31 No records of badger *Meles meles* were provided from within the search area and no evidence of badger was recorded on-site (e.g. hairs, prints, setts etc.) during the Phase 1 or badger survey. Mammal holes identified along the eastern boundary were determined to be that of rabbit and were not of a size or shape indicative of holes dug or used by badger. However, there is some limited suitable habitat on Site for badgers to create setts along the hedgerows and dry ditch. Full details of the badger survey are provided in Appendix G.
- 4.32 Badgers are common and not considered to be of conservation significance. However, badgers and their setts are protected under the Protection of Badgers Act 1992 and are therefore included in the assessment of effects below in the context of this legislation.

Dormouse

- 4.33 No records of dormouse *Muscardinus avellanarius* were provided from within the search area. Hedgerows on-site provide limited suitability for this species with some flora species present providing a food source for dormice. In their current condition and management H1 and H2 provide greater potential to support dormice, with the short sections of H3 and H4 less suitable. Areas of woodland, including some ancient (replanted), are present within the wider landscape to the north, which could potentially support dormice and these are connected to the Site via hedgerows.
- 4.34 No dormice or evidence of dormice have been identified during the dormouse nest tube surveys. Full details of the dormouse survey are provided in Appendix H.
- 4.35 Based on the lack of records provided and the results of the survey undertaken, dormice are likely absent from the Site and are therefore not considered further in this assessment.

Brown Hare

- 4.36 Two records of brown hare *Lepus europaeus* were identified within the search area, dating from 1998 to 2016. The closest record is c. 2km from the Site.
- 4.37 The Site provides suitable habitat for brown hare as they favour open, arable land with a mosaic of hedgerow and scrub, albeit with disturbance to some degree from the residential land to the south. A

single hare was seen running through the Site during the Phase 1 habitat survey.

- 4.38 With a total area of 8.87ha, it is likely that the Site only comprises a small section of home range for an individual brown hare. The suitable habitat in the surrounding area is likely to comprise the remainder of the home range which supports this individual. Given that the former arable land to the east and west of the Site both benefit from outline planning consents for residential development this land either side of the Site will be imminently unavailable to any brown hare within the vicinity. It can therefore be concluded that the construction of consented developments to the east and west are predicted to displace any brown hare from the Site through restriction to their home range, reducing the viability of the Site to support this species. Therefore, this species is not considered further in this assessment.

Other Mammals

- 4.39 A total of 129 records of hedgehog *Erinaceus europaeus* were identified within the search area, dating from 2005 to 2017. The closest record is c. 20m from the Site.
- 4.40 Whilst no specific survey was undertaken for hedgehog, no evidence of this species was recorded at the Site during the protected species/habitat surveys undertaken. However, gardens adjacent to the Site provide suitable foraging and hibernation opportunities for hedgehog. Opportunities for hedgehog on-site are limited to the hedgerows along the Site boundaries and narrow field margins.
- 4.41 There are no records of harvest mouse *Micromys minutus* within the search area. Whilst arable crops and hedgerows provide some suitable habitat for this species, intensive farming practices with unfavourable levels of crop rotation and narrow field margins reduce the availability of habitat available for harvest mice.
- 4.42 No evidence of hedgehog or harvest mouse were found during the survey however, the hedgerows have potential to support both species.
- 4.43 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.

Riparian Mammals

- 4.44 A single record of a water vole *Arvicola amphibious* was recorded in 2005 (c. 0.7km from the site). While no records of otter *Lutra lutra* were provided from within the search area.

- 4.45 No evidence of water vole or otter were recorded during the Phase 1 habitat or protected species surveys undertaken. The Site was deemed unsuitable habitat for both species due to the lack of permanent aquatic habitat on Site and in the vicinity. Therefore these species are not considered further in this assessment.

Birds

- 4.46 A total of 561 records of 84 bird species were identified within the search area, dating from 2002 to 2017. Those of potential relevance to the Site which are red listed species of conservation concern are house sparrow *Passer domesticus*, starling *Sturnus vulgaris*, and song thrush *Turdus philomelos*. While the amber listed species present are dunnoek *Prunella modularis*, common gull *Larus canus*, black-headed gull *Chroicocephalus ridibundus*, swift *Apus apus*, tawny owl *Strix aluco*, and bullfinch *Pyrrhula pyrrhula*.
- 4.47 The Site provides opportunities for a range of breeding birds associated with agricultural landscapes. Several species of bird were heard and/or seen during the Phase 1 habitat survey, these include skylark *Alauda arvensis*, blue tit *Parus caeruleus* and robin *Erithacus rubecula*. A flock of c. 40 goldfinch *Carduelis carduelis* were seen in the hedgerow and on the arable land during the survey.
- 4.48 Two breeding bird surveys were undertaken at the Site in June with the aim of identifying nesting skylark and other species which may be utilising the Site (see Appendix I).
- 4.49 A single pair of skylark were confirmed nesting within the cereal crop on-site, although additional breeding pairs of skylark may have been present earlier in the year. See Appendix I for limitations of the surveys. A list of secondary species identified on-site is provided within Appendix I.
- 4.50 The pair of skylark identified nesting at the Site were also seen utilising the rough, former arable fields to the east and west which were viewed from within the Site and/or publically accessible land. These adjacent fields currently provide significant areas of foraging habitat for the skylark pair on-site, as very little such habitat is available on-site. There are additional numbers of skylark nesting within these adjacent fields, with >7 pairs recorded off-site.
- 4.51 The former arable land to the east¹ and west² both benefit from outline planning consents for residential development, with the Site proposed to be allocated in the emerging Babergh and Mid Suffolk Local Plan³. As such, foraging habitat will be imminently unavailable to the skylark pair currently nesting at the Site, reducing their available forage significantly.

¹ 5070/16: Up to 200 dwelling and primary school

² 4963/16: Up to 250 dwellings, open space and associated infrastructure

³ 2018-2036 Ref: LA089

It is predicted therefore that the Site will be significant less suitable for breeding skylark in the future.

- 4.52 Based on the habitats present and the findings of survey work, the Site is not considered to be of significant importance in respect of breeding bird assemblage. Nonetheless, all wild birds are protected under the Wildlife & Countryside Act 1982 (as amended) and are therefore taken through to assessment on this basis.

Reptiles

- 4.53 There are no records of any reptiles present within the search area. The majority of the Site, comprising arable land with narrow margins, provides negligible opportunities for reptiles. As such, reptiles are considered likely absent from the Site.

Amphibians

- 4.54 A total of eight records of four amphibian species were identified within the search area, including smooth newt *Lissotriton vulgaris*, toad *Bufo bufo*, and common frog *Rana temporaria*. A single record of great crested newt *Triturus cristatus* (GCN) was provided within the search area, dating from 2004, c. 1km from the Site.
- 4.55 The majority of the Site, comprising arable land, provides limited terrestrial opportunities for amphibians, with no evidence recorded of any amphibians during the survey.
- 4.56 A review of the 1:25,000 Ordnance Survey Map and satellite imagery for the area has identified four ponds within 500m of the Site. These ponds are located within woodland blocks c. 200m-300m east to north-east, and c. 490m to the north of the Site.

Great Crested Newt Habitat Suitability Index (HSI) Assessment

- 4.57 Pond scoping was conducted in April 2019 of the four accessible ponds within 500m of the Site (P1-P4), with their suitability to support GCN populations as follows (HSI scores provided):

- P1 – Good (0.70)
- P2 – Dry
- P3 – Dry
- P4 – Dry

Great Crested Newt Environmental DNA (eDNA) Survey

- 4.58 Water samples were taken from P1 and submitted to a laboratory for testing to identify GCN eDNA. The eDNA result for P1 was negative for GCN.
- 4.59 Given the lack of evidence and suitability for this species at the Site, great crested newt are considered likely absent from the Site.

4.60 Full details of the HSI and eDNA surveys are provided in Appendix J.

Invertebrates

4.61 A total of 83 records of 51 invertebrate species were identified within the search area. Those of potential relevance to the Site include white-lettered hairstreak *Satyrium w-album* and white admiral *Limenitis camilla*.

4.62 There are several records of declining moth and butterfly species within c. 1km of the site such as the wall brown butterfly *Lasiommata megera*, small heath *Coenonympha pamphilus* and the oak hook-tip moth *Watsonalla binaria*.

4.63 It is anticipated that the combination of hedgerows, scrub and tall ruderal, will support a range of common and widespread invertebrates species. However there is no indication that the Site would support a particularly notable or large assemblage, with any arable pest control likely to reduce invertebrate interest further. As such, the likely assemblage of invertebrates present at the Site is not likely to be of substantive ecological importance.

Summary of Ecological Features

4.64 Table 2 below summarises all important ecological features identified within the respective zone of influence, along 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
Pakenham Meadows SSSI	National
Pakenham Wood CWS	County
Barton Shrub CWS	County
Hedgerows	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)

Birds	Protected (Wildlife and Countryside Act, 1981 [as amended])
-------	---

This page has been intentionally left blank

5.0 ASSESSMENT OF EFFECTS

- 5.1 Outline planning permission is sought for residential development at the Site. The following impact assessment is based on the Development Framework Plan (CSA/4164/108/K).

Assessment of Likely Significant Effects

Pakenham Meadows SSSI

Predicted Effects

- 5.2 A single SSSI, Pakenham Meadows lies c. 2.7km north of the Site, and is designated for its species-rich, unimproved and poorly drained meadow habitat. Currently the site is listed as being in 'unfavourable – recovering' condition. However, no information is provided with regard to required management and there is no identified condition threat listed.
- 5.3 These habitats may be vulnerable to pressures from increased recreation in the area (e.g. trampling of grassland flora). However, given the limited extent of public access (a single public footpath bisecting the SSSI), the walking distance from the Site and limited car parking, any increase in footfall at the SSSI is anticipated to be minimal. In addition to the above, the Site lies outside of the Impact Risk Zone (IRZ) identified by Natural England for this SSSI in respect of residential development.
- 5.4 Based on the above the scheme is not predicted to have a significant adverse effect on Pakenham Meadows SSSI, as lies outside of the IRZ and there is limited public access to the SSSI to increase recreational pressure.

County Wildlife Sites

Predicted Effects

- 5.5 Two CWSs, Pakenham Wood and Barton Shrub, are present within 2km of the Site but are sufficiently distant to avoid any direct impacts.
- 5.6 Burton Shrub CWS has no public access and as such the sensitive woodland habitats present could not be adversely effected by indirect effects from increased recreational pressure generated by the proposed scheme.
- 5.7 Neither site of the above sites are therefore considered at risk from recreational pressure from the proposed development. As such no significant effects are predicted in this regard.

Hedgerows

Predicted Effects

- 5.8 The scheme seeks to retain and enhance all hedgerows at the Site with the exception of a small section of H1 which will be removed to allow for

vehicular access to a new car park for the adjacent Thurston Rugby Club. Vehicular access to the Site from the west, along Ixworth Road will utilise an existing gap in H4 which is a 'gappy' hedgerow. Retained hedgerows will however 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

- 5.9 Suitable protective fencing will be erected around all on-site hedgerows in accordance with BS 5837:2005. This could be secured by an appropriately worded planning condition.
- 5.10 Additional planting of trees, hedgerows and other habitats of ecological value will take place across the Site, in particular within the open space to the north. All hedgerows, in particular H1-3, will be buffered from development. This will strengthen boundary vegetation and contribute towards net gains in biodiversity across the Site, as well as increasing connectivity. With appropriate management, this additional planting will ensure the establishment and maintenance of habitats with value for biodiversity and wildlife.
- 5.11 The above could be secured by an appropriately worded planning condition and/or intrinsic design measures.

Residual Effects

- 5.12 With the implementation of the above mitigation measures, no residual effects are anticipated.

Bats

Predicted Effects

- 5.13 All hedgerows which bound the Site will be retained and enhanced, with open space to include SuDS features to be provided to the north of the Site. A small section of H1 will be removed as detailed above. Given the provision of open space to the north of the Site, this small section of severed hedgerow is unlikely to reduce the connectivity of this hedgerow significantly.
- 5.14 No roosts have been identified at the Site. Two trees within G3 of H2 which were identified as having 'low' potential to support roosting bats will be retained within the proposed development.
- 5.15 The Site is currently unlit. New artificial lighting of retained habitat during the construction and operational phases may lead to adverse disturbance impacts to bats and other nocturnal wildlife, with a reduction of use and diversity in these areas.

- 5.16 Taken together, in the absence of mitigation, the overall impact upon bats is anticipated to be an adverse effect significant at the **Local** level, with the potential for legal infringements subject to any additional tree works.

Mitigation Measures

- 5.17 The proposed landscaping and habitat creation seeks to maintain opportunities for bats at the Site, with proposed buffers along hedgerows and open space enhancements to the north strengthening this approach.
- 5.18 In the event that the two trees identified as having 'low' potential to support roosting bats are to be removed or undergo significant arboricultural works, further tree climbing or emergence/re-entry surveys will be undertaken prior to the works.
- 5.19 In order to maintain ecological functionality of retained and proposed habitats for bats, a sensitive external lighting scheme will be prepared. The future lighting scheme will be developed in consultation with a bat ecologist to avoid/minimise light spill onto retained and created habitat. This is to maintain dark corridors available for bats and other nocturnal wildlife.
- 5.20 Provision of 5no. 1WI Schwegler integrated bat boxes within new builds will ensure roosting opportunities for serotine bats are available within the Site.
- 5.21 The above would be secured by an appropriately worded planning condition and/or intrinsic design measures.

Residual Effects

- 5.22 Subject to the inclusion of proposed planting and the implementation of a bat-sensitive lighting scheme, no significant effects are anticipated with regards to bats.

Badger

Predicted Effects

- 5.23 Badgers are protected under the Protection of Badgers Act (1992). Killing or injury of a badger or interference with a sett is prohibited.
- 5.24 Whilst no evidence of badgers or badger setts were identified on-site there remains the possibility of badgers being present within the wider landscape. Therefore, during the construction phase there is a risk of badgers falling into and becoming trapped within open excavations or entering open ended pipework (above 150mm diameter), risking an offence under the above legislation.
- 5.25 Given the protection badgers receive under the Protection of Badgers Act 1992, appropriate mitigation measures have been set out below.

Mitigation Measures

- 5.26 To safeguard badgers (and other small mammals), any open excavations must be covered with wooden boards, or fit with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.

Residual Effects

- 5.27 With the implementation of the above mitigation measures, no residual effects are anticipated.

Birds

- 5.28 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 the risk offences in respect of any birds nesting in boundary vegetation during the nesting bird season (March to August, inclusive).

Mitigation Measures

- 5.29 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.

Summary of Effects

- 5.30 Table 3 below summarises the assessment of effects, including any mitigation and subsequent residual effects.

Table 3. Summary of effects

Important Ecological Feature	Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
Pakenham Meadows SSSI	No significant adverse effect	-	-	-
Pakenham Wood CWS	No significant adverse effect	-	-	-
Barton Shrub CWS	No significant adverse effect	-	-	-
Hedgerows	Adverse effect significant at the local level	Protective fencing, appropriate management of retained hedgerows, new planting	Appropriately worded planning condition and/or intrinsic design measures	No significant effect
Bats	Adverse effect significant at the local level, artificial	New habitat creation, management of POS for	Appropriately worded planning condition	No significant effect

Important Ecological Feature	Likely Significant Effect and/or Legal Implication (before mitigation)	Avoidance & Mitigation Measures	Mechanism by which Mitigation is Secured	Residual Effects (after mitigation)
	lighting, potential offences caused	biodiversity gain, sensitive lighting strategy, provision of bat boxes	and/or intrinsic design measures	
Badger	Potential offences caused	Protection measures during construction	Legal requirement/ planning permission	No significant effect
Nesting birds	Potential offences during construction	Sensitive timing of works	Legal requirement	No significant effect

Enhancement

5.31 The Development Framework Plan includes new landscaping and open space at the Site with opportunities to provide a range of ecological enhancement measures. Full details of such measures will be set out at the detailed design stage, but opportunities exist to deliver the following secured by an appropriately worded planning condition:

- Creation/restoration of habitats at the Site, including species-rich grassland characteristic of the local Breckland landscape within open space and SuDS features to the north of the Site.
- Reinforcement of existing hedgerows along the Site boundaries which will provide enhanced foraging and commuting opportunities for bats, and additional habitat and foraging resources for birds.
- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.
- Wetland Features: a wet SuDS basin will be provided as part of the scheme which will be appropriately profiled and planted with native species to provide habitat for amphibians and other wildlife.
- Provision of new bat roosting opportunities: In addition to the 5no. 1W1 Schwegler bat boxes to be provided for serotine bats, integrated Habitat or Schwegler bat boxes will be installed into new buildings to provide roosting opportunities for the crevice dwelling bat species identified utilising the Site. Location of boxes will be focused on buildings which border open space and hedgerows. The quantum and location of boxes will be agreed at the detailed design stage.

- Provision of new bird nesting opportunities: integrated bird nesting boxes will be installed into new buildings, to include 'Swift Bricks' by Ibstock or Schwegler. The quantum and location of boxes will be agreed at the detailed design stage. However, it should be noted that 'Swift Bricks' should be placed in threes due to the colonial nature of swifts.
- Hedgehog: cut-outs at ground level (c. 150x150mm) will be incorporated into garden fences to ensure hedgehog and other wildlife are able to move freely between new gardens within the proposed development.

6.0 CONCLUSIONS

- 6.1 In the absence of any mitigation measures, the proposed development is anticipated to have, at most, adverse effects significant at the **Local** level. However, through the implementation of standard mitigation and precautionary measures as proposed with this scheme, the development is not anticipated to result in any significant residual negative effects to important ecological features.
- 6.2 Based on 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 Mid Suffolk Core Strategy.
- 6.3 The Development Framework will deliver net benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. The measures set out herein can be secured through appropriate conditions imposed upon any planning consent, and the development may therefore be delivered without harm to nature conservation interests.

This page has been intentionally left blank

7.0 REFERENCES

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.

Baker, J., 2016. *Biodiversity Net Gain: Good practice principles for development*. [pdf] CIEEM, CIRIA & IEMA. Available at: https://www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf [Accessed 21 January 2019].

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

British Standards Institution, 2012. *BS 5837:2012 Trees in relation to design, demolition and construction: Recommendations*. London: BSI.

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*. Winchester: CIEEM.

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

Cresswell, P., Harris, S. and Jeffries, D.J., 1990. *The History, Distribution, Status and Habitat Requirements of the Badger in Britain*. Peterborough: Nature Conservancy Council.

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

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

Harris, S., Cresswell, P., and Jefferies, D.J., 1989. *Surveying badgers*. London: Mammal Society.

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* [online]. Available at: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf [Accessed 21 January 2019].

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 21 January 2019].

Natural England and Department for Environment, Food & Rural Affairs, 2014. *Protected species and sites: how to review planning proposals*. [online, last updated August 2016] Available at: <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals> [Accessed 21 January 2019].

Natural England, 2006. *The Dormouse Conservation Handbook 2nd edition*. [online] Available at: <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects> [Accessed 12 July 2019].

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 21 January 2019].














Wilson, G., Harris, S. & McLaren, G., 1997. *Changes in the British Badger Population, 1988±1997*. London: People's Trust for Endangered Species.

Appendix A

Habitats Plan & Photosheet

This page has been intentionally left blank



-  Site boundary
-  Arable
-  Hedgerow & trees
-  Dense scrub
-  Tall ruderal
-  Fence
-  Dry ditch
-  Public footpath
-  Pond with number
-  Hardstanding
-  Hedgerow number
-  Field number
-  Target note:
 - 1. Household rubbish in hedgerow
 - 2. Post and rail fence around manhole cover
 - 3. Rabbit warren



Dixies Barns, High Street,
Ashwell, Hertfordshire SG7 5NT

 01462 743647
 ashwell@csaenvironmental.co.uk
 csaenvironmental.co.uk

Project	Ixworth Road, Thurston, Suffolk	Date	April 2019	Drawing No.	CSA/4164/104
Drawing Title	Habitats Plan	Scale	Refer to scale	Rev	B
Client	Gladman Developments Limited	Drawn	LW	Checked	AC

This page has been intentionally left blank



Plate 1. View along H1 on the western boundary, adjacent to Ixworth Road.



Plate 2. View to the east, with H2 which runs along the northern boundary on the left of the photo.



Plate 3. View to the north, with H3 which runs along the eastern boundary on the right of the photo.



Plate 4. View along the public footpath and H4 on the southern boundary of the Site.



Plate 5. Hard standing and low wall in the north-west of the Site.



Plate 6. Target Note 1 - rubbish which has been dumped on the Site.

This page has been intentionally left blank

Appendix B

Legislation and Planning Policy

This page has been intentionally left blank

The **Conservation of Habitats and Species Regulations 2017** transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and aspects of Council Directive 79/409/EEC on the Conservation of Wild Birds, into UK domestic law. The Regulations make prescriptions for the designation and protection of Sites of Community Importance ('European sites', e.g. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS).

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**.

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, which continues to prioritise the S41 lists, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.

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.

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.

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.

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

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

Policy	Summary
Mid Suffolk Core Strategy (adopted 2008) with amendments from Core Strategy Focused Review (adopted 2012) (Mid Suffolk District, no date)	
Policy CS 5: Mid Suffolk's Environment	<p><i>"...To protect manage and enhance Mid Suffolk's biodiversity and geodiversity based on a network of:</i></p> <ul style="list-style-type: none"> • <i>Designated Sites (international, national, regional and local)</i> • <i>Biodiversity Action Plan Species and Habitats, geodiversity interests within the wider environment</i> • <i>Wildlife Corridors and Ecological Networks</i> <p><i>and where appropriate increase opportunities for access and appreciation of biodiversity and geodiversity conservation for all sections of the community."</i></p>
The Local Plan (2006) (Mid Suffolk Local Plan, 1998)	
Policy CL5: Protecting existing woodland	<p><i>"Development which would result in the loss of or damage to woodland, particularly ancient woodland, or disruption to commercial forestry will be refused..."</i></p>
Policy CL8: Protecting wildlife habitats	<p><i>"The District Planning Authority will refuse development likely to bring about-</i></p> <ul style="list-style-type: none"> • <i>The loss of significant alternation of important habitats...</i> • <i>The threat to rare or vulnerable species especially those protected by law."</i> <p><i>Where development is permitted, the retention of important wildlife habitats will be sought through planning conditions or legal agreement."</i></p>

Policy	Summary
Policy CL9: Recognised wildlife areas	<p><i>“Development proposals which would harm the nature conservation interest of ...nationally designated wildlife areas will not be permitted except where a case of overwhelming national need has been clearly demonstrated, and there is a lack of acceptable alternative sites.</i></p> <p><i>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.</i></p> <p><i>The presence of a protected species under the wildlife and countryside act 1981 will be material conservation in determining any planning application.”</i></p>
Policy CL10 Wildlife value of rivers and other water areas	<p>“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.”</p>

This page has been intentionally left blank

Appendix C

Desk Study Information

This page has been intentionally left blank

1/2/2019

Site Check Report Report generated on Wed Jan 02 2019
You selected the location: Centroid Grid Ref: TL92066592
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

1/2/2019

Site Check Report Report generated on Wed Jan 02 2019
You selected the location: Centroid Grid Ref: TL92076592
The following features have been found in your search area:

Sites of Special Scientific Interest (England)

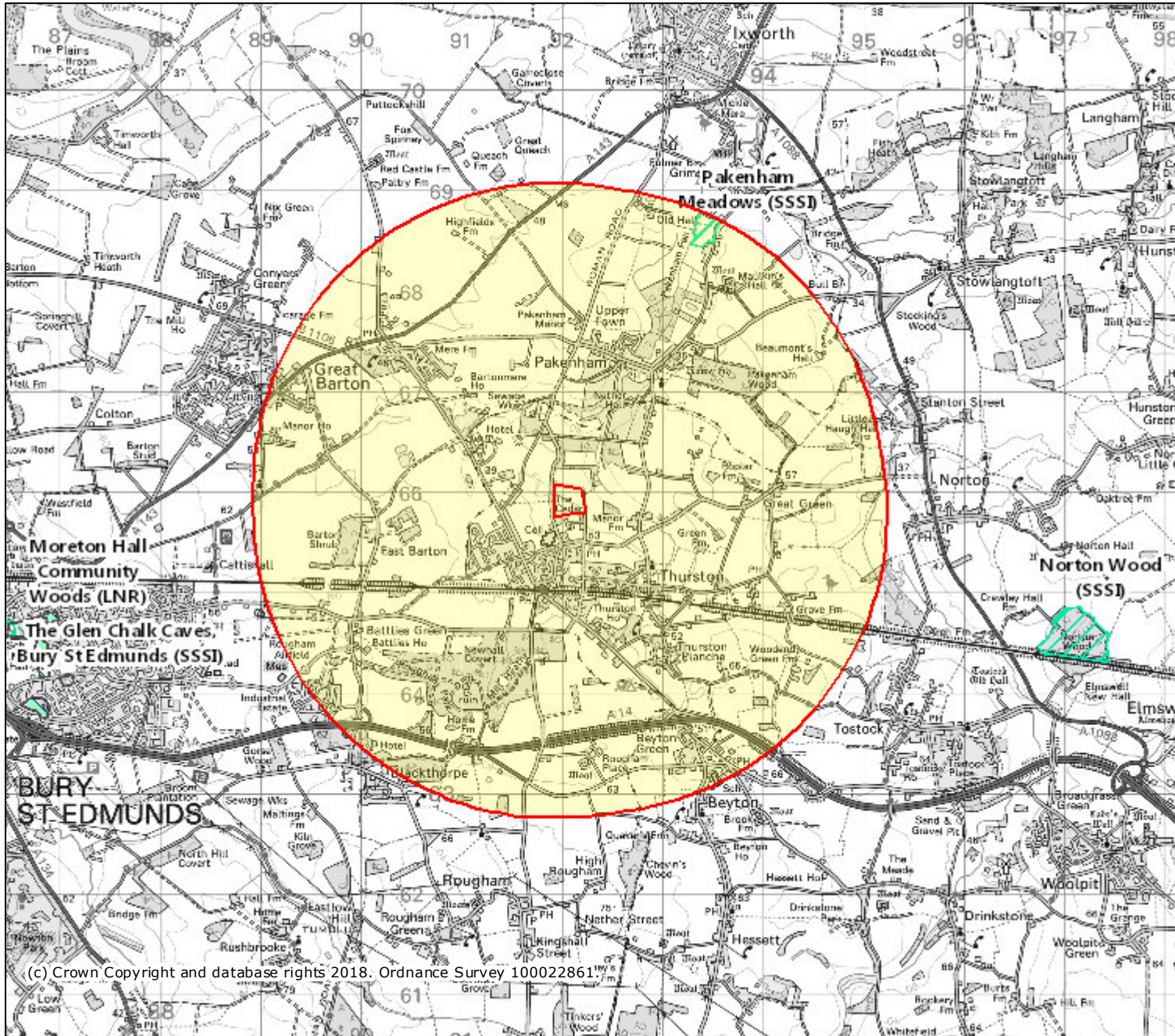
Name	Pakenham Meadows SSSI
Reference	1001985
Natural England Contact	
Natural England Phone Number	0845 600 3078
Hectares	5.84
Citation	1005849
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1005849

Local Nature Reserves (England)


No Features found

National Nature Reserves (England)

No Features found



Legend

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

Projection = OSGB36

xmin = 577400

ymin = 258600

xmax = 607200

ymax = 272900



Map produced by MAGiC on 2 January, 2019.

Copyright resides with the data suppliers and the map must not be reproduced without their permission. Some information in MAGiC is a snapshot of the information that is being maintained or continually updated by the originating organisation. Please refer to the metadata for details as information may be illustrative or representative rather than definitive at this stage.

This page has been intentionally left blank

Appendix D

Habitats and Flora Species List

This page has been intentionally left blank

Flora Species List									
SITE ref. & NAME		4164, Ixworth Road, Thurston							
DATE OF SURVEY AND SURVEYORS		08/01/2019 AC/MM							
Latin name		Common Name		HABITAT TYPE					
		F1	Public Footpath	H1	H2	H3	H4	Scrub	Tall Ruderal
Herb species									
<i>Achillea millefolium</i>	Yarrow							X	
<i>Anthriscus sylvestris</i>	Cow parsley	X	X					X	
<i>Arctium</i> sp.	Burdock sp.							X	
<i>Artemisia vulgaris</i>	Mugwort		X					X	
<i>Cirsium arvense</i>	Creeping thistle	X						X	
<i>Epilobium</i> sp.	Willowherb sp.		X					X	X
<i>Euphorbia lathyris</i>	Capers spurge							X	
<i>Gallium aparine</i>	Cleavers	X	X		X			X	
<i>Geranium molle</i>	Dove's foot crane's-bill	X	X				X		
<i>Glechoma hederacea</i>	Ground ivy	X							
<i>Heiminthotheca echinodes</i>	Bistly ox-tongue							X	
<i>Lamium album</i>	White dead-nettle						X		
<i>Plantago lanceolata</i>	Ribwort plantain	X							
<i>Senecio vulgaris</i>	Groundsel	X						X	
<i>Sonchus</i> sp.	Sow-thistle sp.	X							
<i>Stellaria media</i>	Common chickweed						X		
<i>Taraxacum officinale</i> agg.	Dandelion	X							
<i>Urtica dioica</i>	Common nettle	X	X		X		X		
Grasses									
<i>Dactylis glomerata</i>	Cock's-foot		X						
<i>Elytrigia repens</i>	Common couch		X						
<i>Poa annua</i>	Annual meadow-grass	X	X						
<i>Lolium perenne</i>	Perennial rye grass	X	X		X				
Woody species									
Coniferous									
<i>Pinus sylvestris</i>	Scot's pine			X					
Broadleaved									
<i>Acer campestre</i>	Field maple			X	X				
<i>Betula pendula</i>	Silver birch			X					
<i>Clematis</i> sp.	Clematis					X			
<i>Cornus</i> sp.	Dogwood			X				X	
<i>Corylus avellana</i>	Hazel			X	X		X	X	
<i>Crataegus monogyna</i>	Hawthorn			X					
<i>Fraxinus excelsior</i>	Ash			X					
<i>Hedera</i> spp.	Ivy				X	X	X		
<i>Ilex aquifolium</i>	Holly			X			X		
<i>Juglans regia</i>	Walnut		X						
<i>Malus</i> sp.	Apple				X				
<i>Prunus avium</i>	Cherry			X				X	
<i>Prunus spinosa</i>	Blackthorn				X			X	
<i>Quercus</i> sp.	Oak sp.			X	X	X	X		
<i>Rubus fruticosus</i> agg.	Bramble			X	X	X	X	X	X
<i>Sambucus nigra</i>	Elder						X		
<i>Ulmus</i> spp.	Elm			X	X	X	X		X
<i>Prunus</i> sp.	Laurel					X			

This page has been intentionally left blank

Appendix E

Evaluation & Assessment Methods

This page has been intentionally left blank

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

Establishing Potentially Important Ecological Features

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 E.1 below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table E.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

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

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

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.

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.

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

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

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.

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

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?)

This page has been intentionally left blank

Appendix F

Bat Surveys

This page has been intentionally left blank

Legislation

All species of British bats are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017. 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;
- Damage or destroy a breeding site or resting place used by bats; or
- Be in possession of, transport, sell, exchange or offer to sell/exchange a bat (dead or alive) or any part of a bat.

All bats and their roosts in England, Scotland and Wales were originally protected under the Wildlife & Countryside Act 1981. Subsequent amendments to the legislation for England and Wales has removed bats from most of the provisions of the Act, 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; or
- Intentionally or recklessly obstruct access to any structure or place that a bat uses for shelter or protection.

Disturbance of bats 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 disturbance of individual bats within roosts is covered by the Act.

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 Conservation of Habitats and Species Regulations the offence of damaging or destroying a breeding site or resting place of bats is not subject to any legal defence, i.e. an offence will have been committed even if the damage or destruction occurs accidentally.

Licensing

Where development is proposed that would result in an offence under the Habitats and Species Regulations a European Protected Species (EPS) licence needs to be granted by Natural England to permit an act that would otherwise be unlawful. This provides for a specific derogation from the legislation, to prevent a legal infringement occurring. 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)).

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

- “There is no satisfactory alternative” (Regulation 55(9)(a)); and
- “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)).

Methods

Preliminary Roost Assessment

The aim of the preliminary roost assessment is to determine the suitability of a tree for roosting bats. Where significant potential for, or evidence of, roosting bats is identified, further bat roost surveys are generally necessary to determine the presence or likely absence of a roost, and to characterise any roost present. The methods described below have been followed with due consideration of the current guidelines (BCT, 2016).

Evaluation

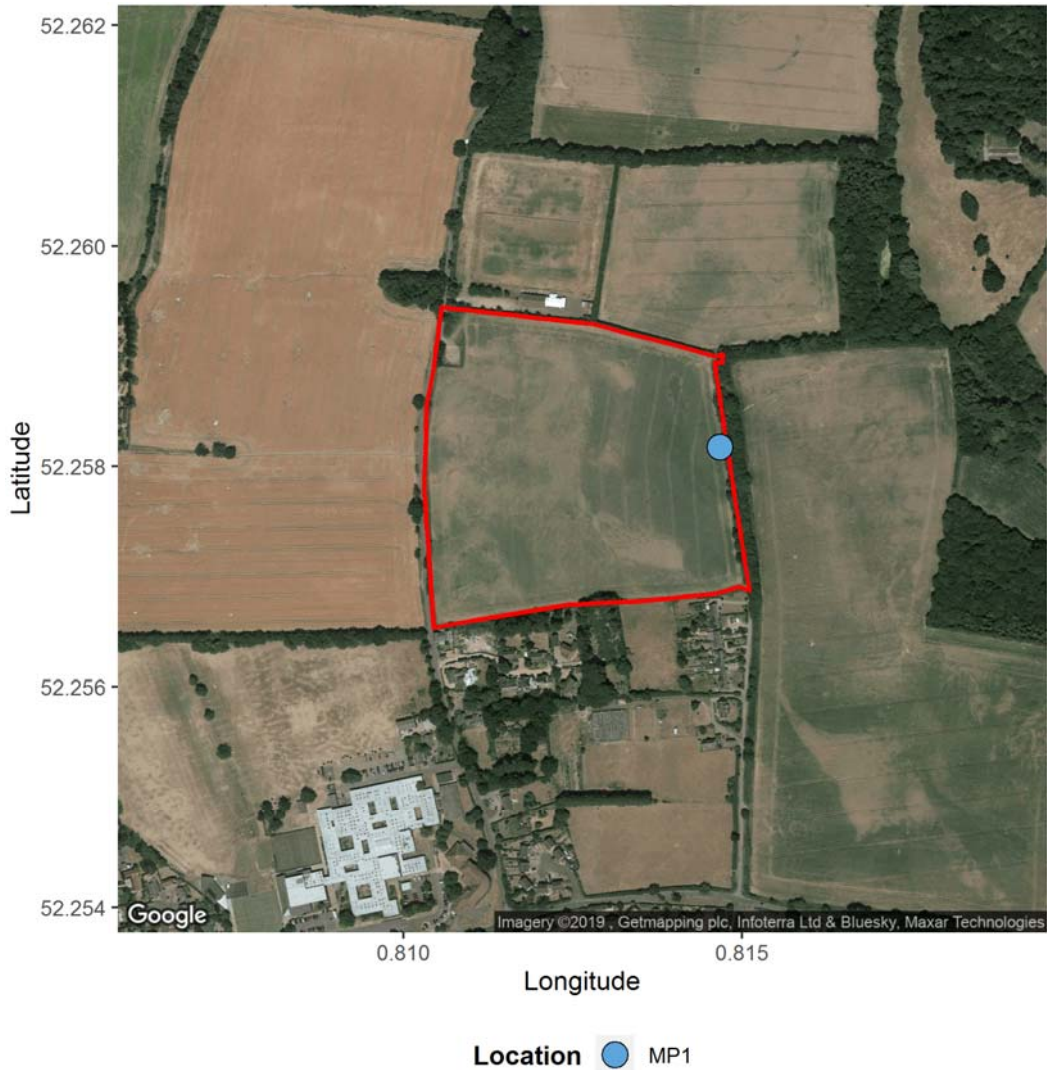
Following the assessments, each tree was assigned one of the following categories in respect of its potential to support roosting bats (adapted from Collins, 2016):

- *Negligible*: Negligible habitat features on site likely to be used by roosting bats
- *Low*: a structure with one or more potential roost sites (PRSs) that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis by large numbers of bats. A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
- *Moderate* – a structure or tree with one or more PRSs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat; but unlikely to support a roost of high conservation status.
- *High* – a structure or tree with one or more PRSs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Remote Monitoring

A single Wildlife Acoustics Songmeter (SM4) static detector was deployed on three occasions between May and August 2019 to provide three data-sets. The location of the Monitoring Point (MP) is shown in Figure F.1 below.

Figure F.1. The location of the Monitoring Point (MP) surveyed during static monitoring surveys undertaken in May, June and August.



The detector was installed on-site and setup to record bat activity automatically for the period from half an hour before sunset until half an hour after sunrise each night. Each monitoring period spanned at least five consecutive nights.

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 Lakenheath. The five nights showing the most optimal weather conditions (in terms of

temperature, precipitation and wind speed) were taken forward for analysis.

Recorded bat calls were analysed using the specialist software AnalookW to identify the species present. Each recorded file is considered to represent a single bat 'pass'. Quantitative analysis of bat activity levels is then undertaken by calculating the mean number of bat passes per hour.

Limitations

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

Results

Preliminary Roost Assessment

The results of the ground level roost assessment of on-site trees are presented in Table F.1 below.

Table F.1. Tree inspection results

Tree Ref.	Species	Evidence/Features	Bat roost potential
T1 (Group 3 of the Tree Survey Plan)	Unknown (dead)	Semi-mature, dead tree with decay, c. 10 m in height with a trunk diameter of c. 50 cm. There are two noticeable roosting features, the first is loose bark c. 1.5m in length and c. 1.5m from the ground. The second feature is a broken limb (c. 4 m from the ground) and c. 15 x 15 cm. Both roost features have low suitability for bats.	Low
T2 (Group 3 of the Tree Survey Plan)	Field Maple	A semi-mature field maple tree with decay, c. 12 – 15 m in height with diameter of c. 70 cm. The potential roost feature of this tree is c. 5m from the ground, c. 6 x 30 cm and is a rot hole of low bat suitability.	Low

Remote Monitoring

The weather conditions experienced during the five nights where data was analysed are provided in Table F.2 below.

Table F.2. Overnight weather conditions during remote monitoring

Survey Month	Dates Sampled	Temperature (°C)		Precipitation	Cloud Cover (%)		Wind (mph)	
		Min	Max		Min	Max	Min	Max
May	02/05/19	5	10	V. light rain at 9pm & 12am	63	100	4	10
May	03/05/19	2	5	Light rain at 9pm & 12am	7	88	10	17
May	04/05/19	3	5	No rain	12	53	15	19
May	05/05/19	1	4	Light rain at 9pm & 12am	14	89	8	14
May	06/05/19	5	7	V. light rain at 9pm, light rain at 12am	70	100	8	10
June	05/06/19	10	12	Moderate rain at 12am & light rain at 6am	75	54	6	14
June	06/06/19	9	13	No rain	15	100	10	13
June	07/06/19	10	11	Light rain at 9pm	77	100	10	35
June	08/06/19	7	11	No rain	8	71	16	19
June	09/06/19	10	11	Moderate rain at 6am	65	100	2	9
August	02/08/19	13	15	Dry	17	100	5	9
August	03/08/19	15	16	Dry	12	54	10	12
August	04/08/19	15	19	Dry	34	63	12	17
August	05/08/19	15	16	Dry	44	99	13	17
August	06/08/19	14	16	Light rain at 9pm	9	71	15	21

The total number of bat passes recorded across all monitoring locations for each bat species are provided in Figure F.2 and Table F.3 below. Markedly higher pass numbers of common pipistrelle *Pipistrellus pipistrellus* were recorded alongside lower numbers of soprano pipistrelle *Pipistrellus pygmaeus*, serotine *Eptesicus serotinus*, noctule *Nyctalus noctula*, brown long-eared *Plecotus auritus*, Myotis species, barbastelle *Barbastella barbastellus*, Nathusius pipistrelle *Pipistrellus Nathusii*, and Leisler's bat *Nyctalus leisleri*.

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.

Figure F.2. Bat passes per species recorded in total during remote monitoring

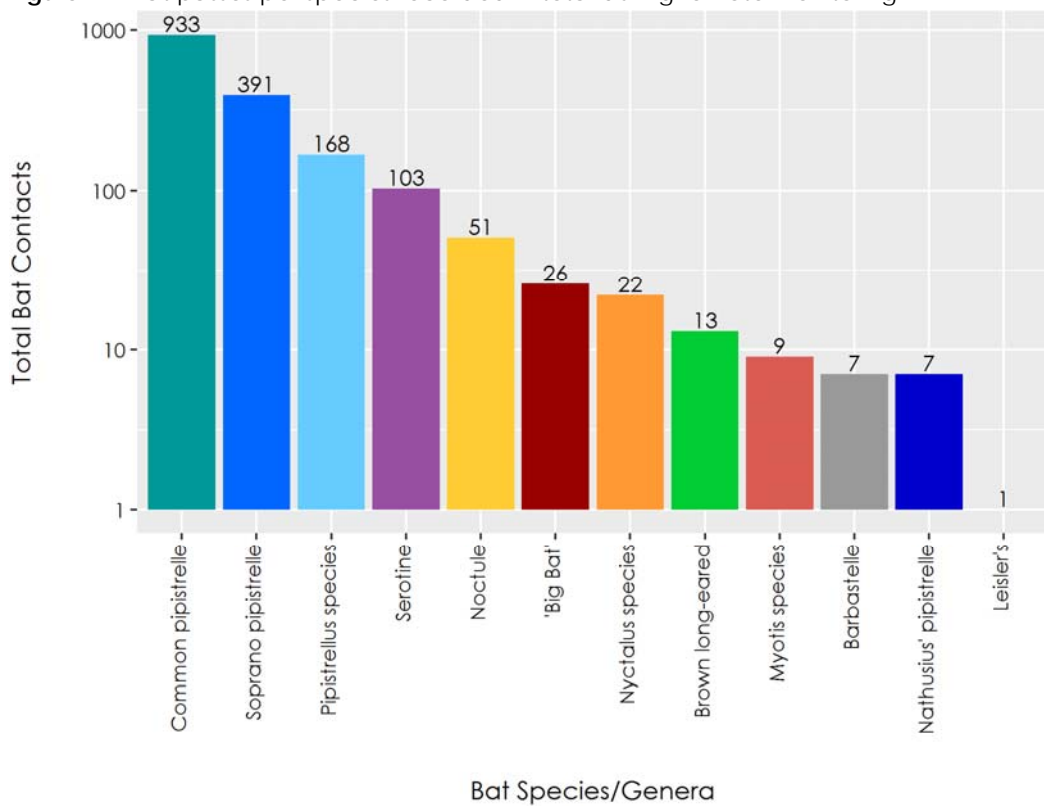


Table F.3. Bat passes per species recorded in total during remote monitoring

	Common pipistrelle	Soprano pipistrelle	Pipistrellus species	Serotine	Noctule	'Big Bat'	Nyctalus species	Brown long-eared	Myotis species	Barbastelle	Nathusius' pipistrelle	Leister's
Number Of Passes	933	391	168	103	51	26	22	13	9	7	7	1
%	53.90	22.59	9.71	5.95	2.95	1.50	1.27	0.75	0.52	0.40	0.40	0.06

Figure F.3 and Table F.4 show the bat passes per hour recorded at the monitoring point surveyed.

Figure F.3. Bat passes per hour recorded for each bat species at the remote monitoring point

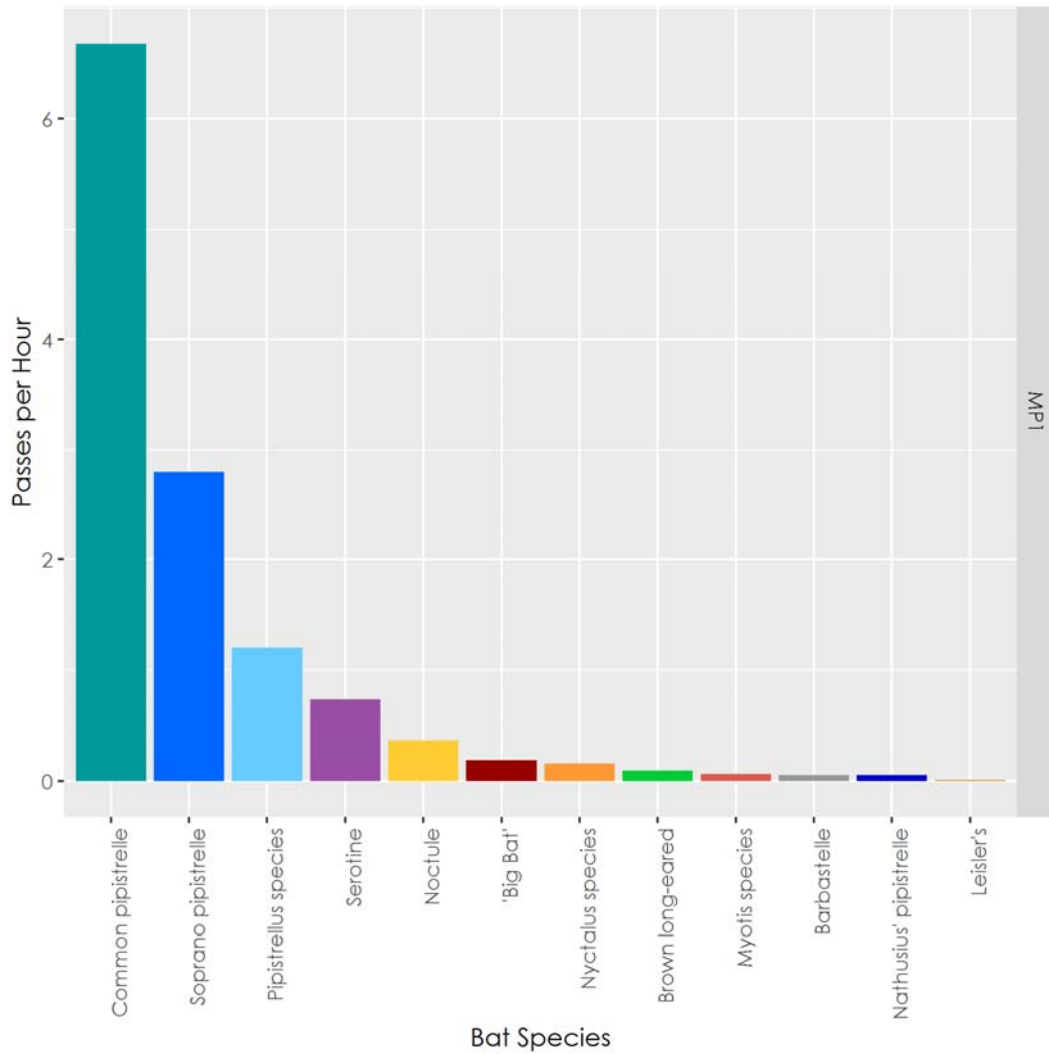


Table F.4. Bat passes per hour recorded for each bat species at the remote monitoring point

MP	Common pipistrelle	Soprano pipistrelle	Pipistrellus species	Serotine	Noctule	'Big Bat'	Nyctalus species	Brown long-eared	Myotis species	Barbastelle	Nathusius' pipistrelle	Leisler's
MP1	6.68	2.8	1.2	0.74	0.37	0.19	0.16	0.09	0.06	0.05	0.05	0.01

Appendix G

Badger Surveys

This page has been intentionally left blank

Legislation

Badgers and their setts are protected under the Protection of Badgers Act 1992 therefore a Natural England licensing system exists to permit certain works that would otherwise be illegal. Works that require a license include direct impacts to badger entrances and certain works within close proximity to a badger sett that may disturb badgers.

Methods

A dedicated badger survey was conducted on 04 April 2019 by Carly Howes GradCIEM using standard survey methods, searching the Site and immediately adjacent areas for field signs of badger and mapping any present such as:

- Feeding signs such as snuffle entrances made during foraging.
- Hairs caught on vegetation or fences.
- Latrines, usually positioned on territorial boundaries.
- Foraging tracks through vegetation or under fences.
- Badger setts.

When badger setts are found the number of entrances are recorded as well as the level of usage. Recording this information gives an indication of the type of sett by categorising it according to the criteria listed in Table 2 below (Harris *et al.* 1989, Cresswell *et al.* 1990, Wilson *et al.* 1997).

Table G.1. Criteria used to determine sett type.

Sett Type
Main Setts - These usually have a large number of entrances with large spoil heaps, and the sett generally looks well used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to excessive digging or some other reason; it should be recorded as a disused main sett. In the first survey, the average size of an active main sett was twelve entrances (including all categories of use).
Annexe setts - They are often close to a main sett, usually less than 150 metres away, and are usually connected to the main sett by one or more obvious well-worn paths. They usually have several entrances, but may not be in use all the time even if the main sett is very active. In the first survey the average size was five entrances (including all categories of use).
Subsidiary setts - These often only have a few; four (including all categories of use) was the average number in the first survey. They are usually at least 50 metres from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.
Outlying setts - These usually have only one or two entrances, often have little spoil outside the entrance, have no obvious path connecting with another sett, and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance entrance), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape. Fox and rabbit tunnels are smaller and often taller than broad.

Entrance Type
Well used entrances - These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.
Partially used entrances - These are not in regular use and have debris such as leaves and twigs in the entrance, or have moss and/or other plants growing in or around the entrance. Partially used entrances could be in regular use after a minimal amount of clearance.
Disused entrances - These have not been in use for some time, are partially or completely blocked, and could not be used without a considerable amount of clearance. If the entrance has been disused for some time, all that may be visible is a depression in the ground where the entrance used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Limitations

No were no limitations to the survey.

Results

No badger activity or evidence of badger setts was identified during the badger survey.

There is a large rabbit warren on the eastern boundary of the Site along the bank of the dry ditch.

Appendix H

Dormouse Surveys

This page has been intentionally left blank

Legislation

The hazel dormouse *Muscardinus avellanarius* is legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded significant further protection as a European Protected Species under the Conservation of Habitats and species Regulations 2010 (as amended).

Collectively and in summary, this legislation inter alia makes it an offence to:

- Intentionally or deliberately kill, injure or capture dormice;
- Intentionally, deliberately or recklessly disturb dormice in such a way as to be likely to significantly affect the ability of any significant group of dormice to survive, breed, or rear or nurture their young or the local distribution of or abundance of the species;
- Intentionally or recklessly damage, destroy or obstruct access to places used by Dormice for shelter or protection (whether occupied or not) or intentionally or recklessly disturb a dormouse whilst it is occupying such a place;
- Damage or destroy a breeding site or resting place of a dormouse;
- Possess or transport a dormouse (or any part thereof) unless under licence; and
- Sell or exchange dormice.

Development proposals affecting the dormouse require a European Protected Species licence from Natural England.

Methods

Dormouse nest tubes were installed at the site on 29 March 2019 by Carly Howes GradCIEEM. The intention of these surveys is to determine the presence or likely absence of dormice within suitable habitat within all areas that will be impacted. A total of 50 dormouse nest tubes were distributed across the Site, along boundary vegetation, including hedgerows, woodland edges and scrub. The location of these nest tubes is shown in the Dormouse Survey Plan (CSA/4164/107).

Nest tubes are made from stiff, double-walled black plastic sheets or similar material, 25cm long with a 5cm x 5cm cross-section. A thin plywood tray is inserted into the tube with a short projection at one end and an end block at the other which seals the tube. The tubes are then tied in a suitable location along a horizontal branch in vegetation. Dormice are known to readily use these tubes to build their nests (Natural England, 2006).

The tubes were checked monthly from April to September 2019 for the presence of dormice and/or their nests. The checks were undertaken by Carly Howes (Natural England Class Survey Licence WML-CL10a – Registration number: 2017-28220-CLS-CLS). Bird droppings and other material such as wood mouse nests were cleaned out if found, to maintain the potential of each tube to be used by dormice.

In accordance with current guidance, assumed absence of dormice from a site should not be based on a search effort score of less than 20 (see Table H.1 below). Monthly visits were undertaken from April-September which equates to a survey effort of 21 (1+4+2+2+5+7). The minimum search effort score of 20 has therefore been achieved.

Table H.1 Index of probability of finding dormice present in nest tubes in any one month (reproduced from English Nature)

Month	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7



Limitations

There were no limitations to the survey.

Results

No dormouse, or evidence of dormouse, were found on the Site.



-  Site boundary
-  Dormouse tube locations (50 in total)



Dixies Barns, High Street,
Ashwell, Hertfordshire SG7 5NT
t 01462 743647
e ashwell@csaenvironmental.co.uk
w csaenvironmental.co.uk

Project	Ixworth Road, Thurston, Suffolk	Date	July 2019	Drawing No.	CSA/4164/107
Drawing Title	Dormouse Survey Plan	Scale	NTS	Rev	-
Client	Gladman Developments Limited	Drawn	CH	Checked	AC

This page has been intentionally left blank

Appendix I

Breeding Bird Surveys

This page has been intentionally left blank

Legislation

All wild birds, their nests and eggs are protected under subsection 1(1) of the Wildlife and Countryside Act 1981. It is an offence to kill or injure any wild bird, to take or destroy their eggs, or to take, damage or destroy their nests while in use or being built.

In addition, certain species of wild bird, listed within Schedule 1 of the Wildlife and Countryside Act, receive additional protection under subsection 1(5) of the Act. This makes it an offence to disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young. It is also an offence to disturb the dependent young of such a bird.

Consideration is also taken of Birds of Conservation Concern ('BoCC'). These are species which are declining or appear to be in need of concentrated conservation actions (Eaton et al, 2009). Certain criteria are used to place birds on a Red-list, Amber-list or Green-list and these are outlined in Table I.1. below.

Table I.1. Criteria for red, amber and green listed birds

Red listed	<ul style="list-style-type: none">• those that are globally threatened according to The World Conservation Union(IUCN) criteria;• historical decline in breeding population and not shown substantial recent recovery those that have shown a severe breeding decline over 25 years/longer term;• those that have shown a severe breeding range decline over 25 years/longer term;• species whose non-breeding population has declined over 25 years/longer term.
Amber listed	<ul style="list-style-type: none">• species of European Conservation Concern;• those whose population has declined historically but made a substantial recent recovery;• those whose breeding population has declined moderately over 25 years /longer term;• those that have shown a moderate breeding range decline over 25 years/longer term;• those whose non-breeding population has declined moderately over 25 years/longer term;• rare breeders; or non-breeding rarity species with internationally important or localised populations.
Green listed	<ul style="list-style-type: none">• species that fulfil none of the criteria above.

Methods

Breeding Bird Survey

Breeding bird surveys were carried out by Jamie Dunning over two visits in June 2019 to gain an understanding of the farmland bird assemblage, particularly skylark at the Site. Surveys were conducted with the following aims:

- To determine the potential for breeding species of birds across the survey area;
- To review the rarity status and conservation of each species found, including levels of national protection, National and Local BAP and Birds of Conservation Concern (BoCC);
- To review the likely breeding potential within the habitats present;
- To assess the impacts of the proposed developments with regards to the species/ likely species determined; and
- To recommend appropriate mitigation and protection measures where necessary.

Common Birds Census (CBC) uses registration mapping based on bird breeding behaviour, which allows the number and distribution of territories to be determined for each species. The survey area included all accessible areas of the Site, with references made to locations of identified species where possible.

Two survey visits were made on the following dates; 03 and 18 June 2019.

On each survey visit the following objectives were met:

- Identification of likely breeding farmland species within the habitats present;
- Identification of all birds seen and heard; and
- Total numbers of birds, including juveniles recorded.

Limitations

Two surveys were carried out during the late breeding season (June - July), and as a result, no data was collected during the early part of the survey season (March - May). However, this is unlikely to affect skylark detection rates, which remain high during first and second brood nest cycles between April and early July.

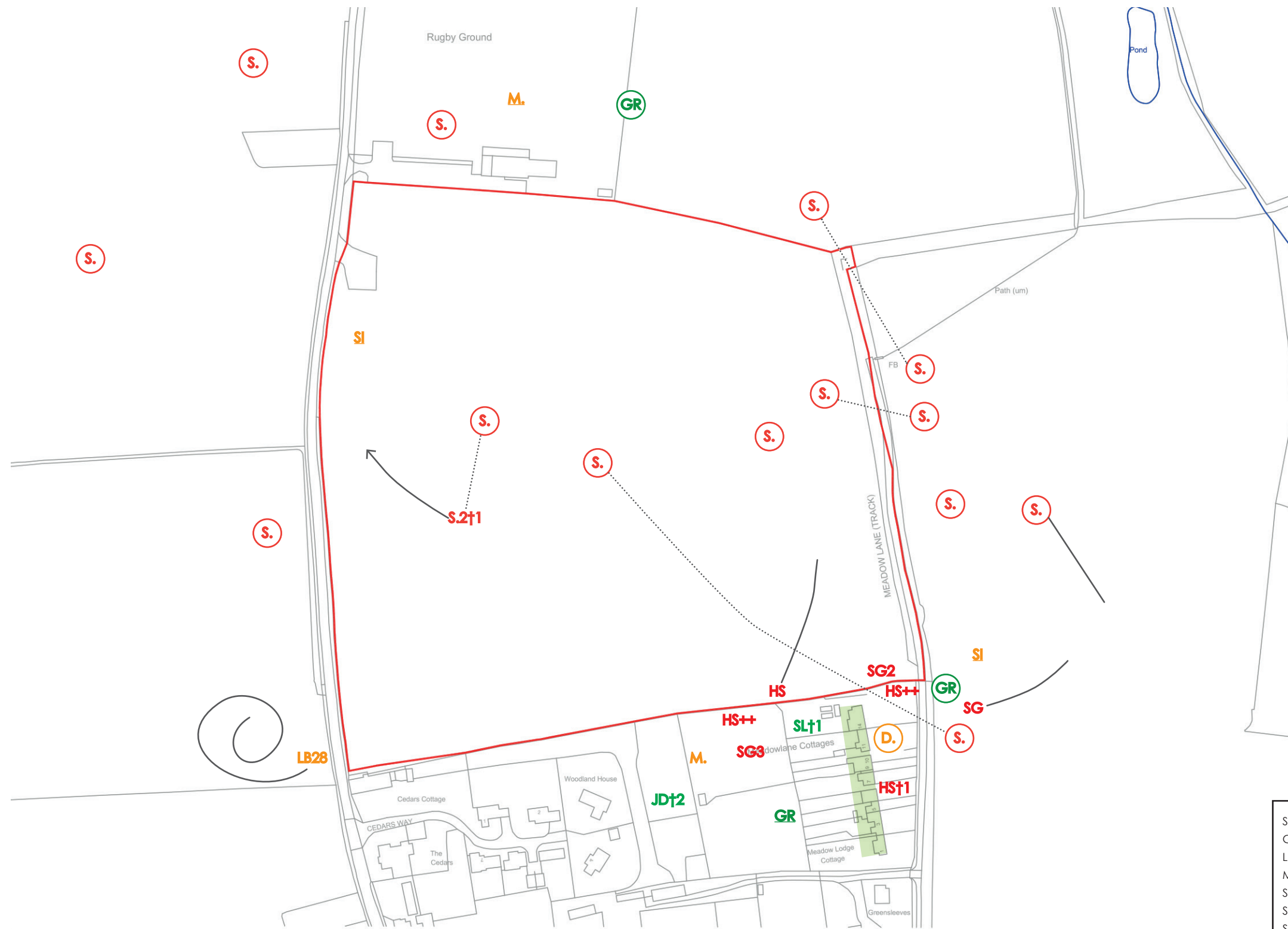
Results








The results of the Breeding Bird Survey are presented below in Table I.2. The Breeding Bird Survey Plan CSA/4164/11 shows the location of each sighting and activity observed, along with a list of secondary species.

Table I.2. Breeding Bird Survey Results

Priority Species	Survey 1	Survey 2	Breeding Status On-site	BoCC Status
Skylark	At least ten singing birds on-site and adjacent land. Readily moving between fields, likely nesting and foraging	At least six singing birds on-site and on adjacent land. Pair flushed from assumed nest site during survey on Site interior	Confirmed	Red
Lesser redpoll	A single bird called from small wooded area at northern extent	Not recorded	Possible	Red
Greenfinch	Three singing males	Not recorded	Probable	Green
Swift	Recorded foraging over site, likely nesting in surrounding buildings	As opposite	Probable off-site	Amber
Starling	Recorded around buildings to the north-east	As opposite	Probable off-site	Red
Dunnock	A late singing male recorded in gardens of building to north-east	Not recorded	Probable	Amber
Mistle thrush	Recorded in paddock to north-west of site and, rugby pitch to the west	As opposite – juvenile observed	Confirmed	Red
House sparrow	Recorded along eastern edge, breeding under eaves of buildings	As opposite – watched entering nest hole in house in north-east corner	Confirmed	Red
Lesser black-backed gull	Not recorded	Circling over site – likely loafing in arable fields surrounding the Site	Unlikely	Amber

This page has been intentionally left blank








-  Site boundary
-  Singing
-  Calling
-  Flight path/observed in flight
-  Flushed from ground
-  Two observations of same individual
-  Number of individuals

Secondary Species List

- Goldfinch - (5)
- Long Tailed Tit - (4)
- Buzzard - (1)
- Blockcap - (3)
- Goldcrest - (1)
- Wood Pigeon - (15+)
- Chaffinch - (1)
- Great Spotted Woodpecker - (1)
- Blackbird - (3)
- Coal Tit - (1)
- Chiffchaff - (2)
- Great Tit - (10+)
- Blue Tit - (10+)
- Jackdaw - (10+)
- Carrian Crow - (1)
- Magpie - (4+)
- Indian Peafowl - (1)

Target notes

-  Probable nest site
-  Mixed rookery, mostly JD
-  Flock uncounted but several birds present
-  Under estimate (on secondary sp. list)
-  HS Nesting area

- S - Skylark
- GR - Greenfinch
- LB - Lesser Black-backed Gull
- M - Mistle Thrush
- SI - Swift
- SG - Starling
- SL - Swallow
- JD - Jackdaw
- HS - House Sparrow
- D - Dunnock

Note that only those species identified as being red or amber listed (BoCC, 2015), schedule 1, or, those deemed of site specific, local or regional importance are mapped. All other species, including those green listed species, are included on a separate secondary species list.



Dixies Barns, High Street,
Ashwell, Hertfordshire SG7 5NT

 01462 743647
 ashwell@csaenvironmental.co.uk
 csaenvironmental.co.uk

Project	Ixworth Road, Thurston	Date	June 2019	Drawing No.	CSA/4164/111
Drawing Title	Breeding Bird Survey Summary Plan	Scale @ A3	1:2500	Rev	-
Client	Gladman Developments Ltd	Drawn	BRY	Checked	JW

This page has been intentionally left blank

Appendix J

Great Crested Newt Surveys

This page has been intentionally left blank

Legislation

Great crested newts 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

Great crested newts are also fully protected under the Wildlife & Countryside Act 1981, 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

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.

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.

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

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))

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))*

Methods

Desktop Study

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. 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

Where ponds were situated within a 500m 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 by Carly Howes (Class Survey Licence CL08 – Registration number: 2017-32238-CLS-CLS).

Limitations

Ponds P2-4 were dry at the time of survey and as such a HSI Assessment could not be undertaken.

Environmental DNA (eDNA) Sampling

Environmental DNA (eDNA) sampling was used to determine the presence/likely absence of great crested newts from pond P1. This method has been shown to be a highly effective in detecting the presence of great crested newts (Biggs et al. 2014).

Water samples were collected from pond P1 on 10 April 2019 by Alexandra Cole ACIEEM (Class Survey Licence CL08 – Registration number: 2015-16726-CLS-CLS) 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

The pond surveyed was not accessible around its full perimeter. However, samples collected were sufficiently spaced to have obtained a representative sample.

Results

Desktop Study

The desk based search for ponds and subsequent site visits identified four water bodies occurring within 500m of the Site. These ponds are all identified on the Pond Plan (CSA/4164/106).

Habitat Suitability Index (HSI) Assessment

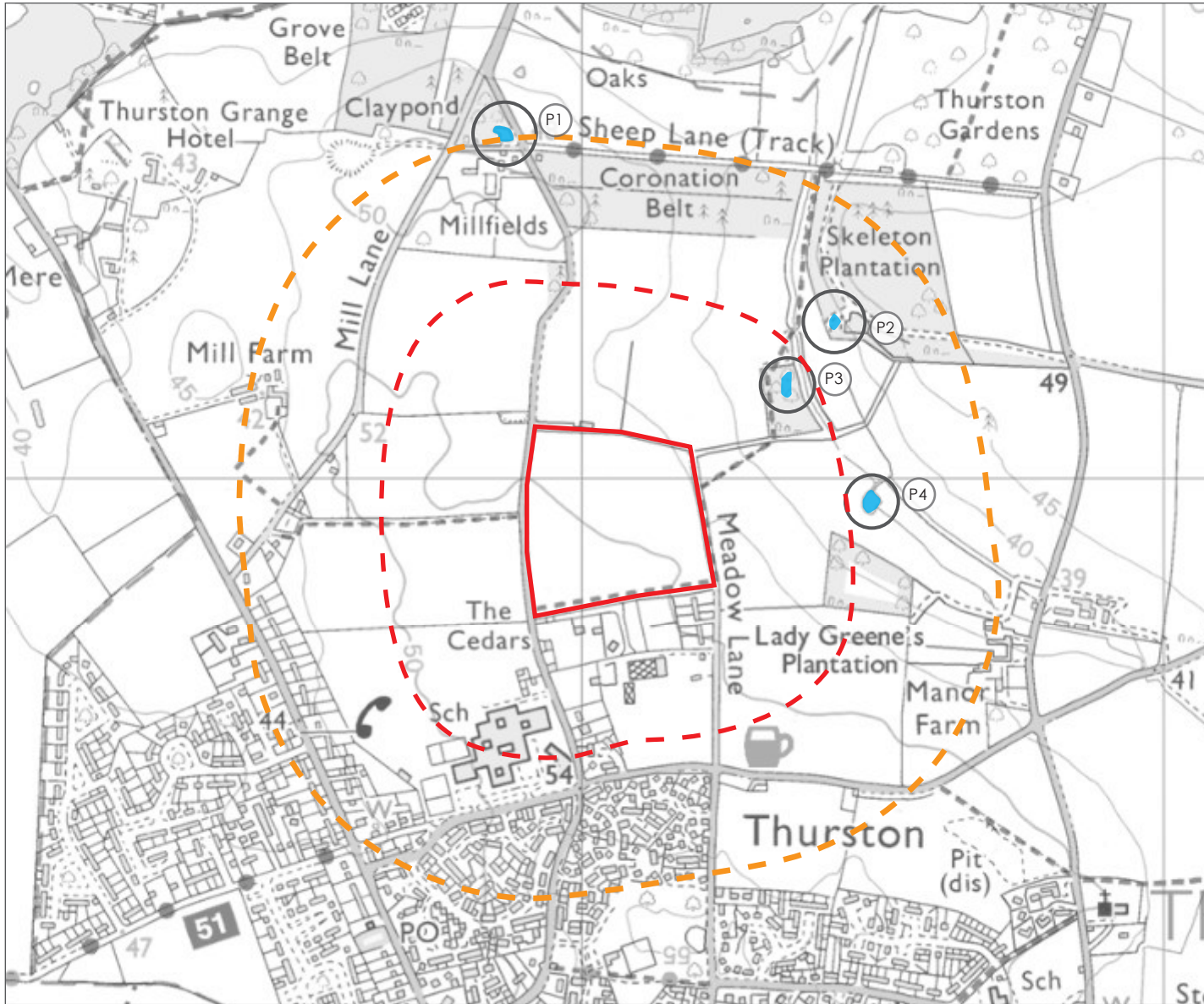
The four accessible ponds within 500m of the Site (P1-P4) were surveyed, with their suitability to support GCN populations as follows (HSI scores provided):






- P1 – Good (0.70)
- P2 – Dry
- P3 – Dry
- P4 – Dry

Environmental DNA (eDNA) Sampling

The eDNA result for P1 was negative for GCN.

This page has been intentionally left blank



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



Dixies Barns, High Street,
Ashwell, Hertfordshire SG7 5NT

† 01462 743647
 e ashwell@csaenvironmental.co.uk
 w csaenvironmental.co.uk

Project Inxworth Road, Thurston, Suffolk

Drawing Title Pond Plan

Client Gladman Developments Ltd

Date February '19

Scale Refer to scale

Drawn LW

Drawing No. CSA/4164/106

Rev -

Checked AC

This page has been intentionally left blank

Site	4164 Thurston
Pond number	P4: TL 91872 66582

Habitat Suitability Index			SI value	
S11. Map location	A/B/C		A	1.00
S12. Surface area	rectangle/ellipse/irregular		irregular	
		OR estimate (m2) if irregular area (m ²) =	666.8	1.00
S13. Dessication rate	never/rarely/sometimes/frequently		never	0.90
S14. Water quality	good/moderate/poor/bad		poor	0.33
S15. Shade	% of margin shaded 1m from bank		80	0.60
S16. Waterfowl	absent/major/minor		minor	0.67
S17. Fish population	absent/possible/minor/major		possible	0.67
S18. Pond density	number of ponds within 1km		7	0.86
S19. Terrestrial habitat	good/moderate/poor/isolated		good	1.00
S110. Macrophyte cover	%		10	0.41
			HSI=	0.70
			Pond Suitability*	Good
*Following the Lee Brady system			HSI assessment date	04/04/2019



This page has been intentionally left blank

Client: Meaghan McBlain,
CSA Environmental,
Dixies Barn,
High Street,
Ashwell,
SG7 5NT



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR



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

www.adas.uk

Sample ID: 2019-0112 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: P1 Description: pond water samples in preservative
Date of Receipt: 12/04/2019 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	17/04/2019
Degradation Control [§]	Within Limits	Real Time PCR	17/04/2019
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	17/04/2019
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: 18/04/2019 Date of issue: 18/04/2019

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)

This page has been intentionally left blank



Dixies Barns, High Street, Ashwell,
Hertfordshire SG7 5NT

t 01462 743647

e ashwell@csaenvironmental.co.uk

w csaenvironmental.co.uk

Suite 1, Deer Park Business Centre, Eckington,
Pershore, Worcestershire WR10 3DN

t 01386 751100

e persshore@csaenvironmental.co.uk

w csaenvironmental.co.uk

Office 20, Citibase, 95 Ditchling Road,
Brighton BN1 4ST

t 01273 573871

e brighton@csaenvironmental.co.uk

w csaenvironmental.co.uk