CSA environmental

Land at Gosford

Ecological Impact Assessment

Prepared by
CSA Environmental

on behalf of
Barwood Development Securities Ltd

Report No: CSA/3263/09

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

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EXECUTIVE SUMMARY

Residential-led development is proposed on land at Gosford, Oxfordshire for which outline planning permission is sought. The Site is part of a larger allocation within the Cherwell Local Plan Partial Review, which includes adjoining land to the north.

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

The Site is dominated by grassland used for grazing and silage/hay. Additional habitats include a small pond, mature hedgerows and trees. Populations of the notable plants mousetail and water-crowfoot have been found on-site. The Site has also been found to be used by at least nine species of bat.

Consideration has been given to the Oxford Meadows SAC and other designated sites. The proposed development will need to be in accordance with planning policy to avoid hydrological impacts to important designations.

The development Framework Plan seeks to retain boundary and pond habitats of greatest wildlife value. Mitigation measures have been included to reduce potential impacts to these habitats and associated wildlife.

Opportunities for ecological enhancement may be secured by planning condition. An initial Biodiversity Net Gain (BNG) assessment has identified that a net gain could be achieved on-site, subject to the successful implementation of proposed habitats. The scheme is considered to accord with all relevant nature conservation legislation, as well as with local planning policy.

1.0 INTRODUCTION

1.1 This report has been prepared by CSA Environmental on behalf of Barwood Development Securities Ltd. It sets out the findings of an Ecological Impact Assessment (EcIA) of proposed development at land at Gosford in Oxfordshire (hereafter 'the Site'). Residential-led development is proposed at the Site, for which outline planning permission is sought.

1.2 It should be noted that the proposed development is allocated within the Cherwell District Local Plan Partial Review (Policy PR7a) which also includes a single field immediately to the north of the Site. That land is being brought forward for residential development by Hill Residential, with detailed planning permission sought, but this area is not included within this assessment.

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

1.4 The Site occupies an area of c. 27ha and consists of three grassland fields bound by native hedgerows and trees (see Habitats Plan in Appendix A). The Site is located around central grid reference SP 501 126, to the south-east of Kidlington. It is bounded by main roads (A4165, A34) to the south and east, with the built-up area of Kidlington to the west. The wider landscape is dominated by arable land.

1.5 An initial desk study and extended Phase 1 Habitat survey were undertaken for the Site in April 2017 as part of a Preliminary Ecological Appraisal. The data search has been updated in May 2021 and on-site habitat conditions have been verified since the initial survey through multiple site visits between 2017 and 2022. In addition, the following further survey work was undertaken between 2017 and 2022:

- Preliminary roost assessment of trees for bat roosting (July 2017, September 2019, January 2022)
- Bat activity surveys (2017, 2019/2020, 2021)
- Bat roosting surveys of key trees (May-August 2021)
- Great crested newt eDNA surveys (2018, 2020)
- Habitat condition assessments (February 2022)

1.6 A phone consultation was also held with Dr Charlotte Watkins, Ecology Officer for Cherwell and South Northants District Councils, in March 2021, regarding the scope of survey work and Habitats Regulations Assessment.

1.7 This EcIA aims to:

- Establish baseline ecological conditions at the Site.
- Determine the importance of ecological features which could be affected by the proposed scheme.
- Identify any likely significant impacts or effects of the proposed development on important ecological features, in the absence of mitigation, including cumulative impacts.
- Set out any measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
- Identify any compensation measures required to offset residual impacts.
- Set out potential ecological enhancement measures that may be secured by the proposed scheme, and quantify the overall net change in biodiversity using the Defra Metric 3.0.
- Confirm how proposed mitigation, compensation and enhancement measures could be secured.
- Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be imposed by the relevant authority.

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

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

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

- The Conservation of Habitats and Species Regulations 2017 (as amended)
- The Wildlife and Countryside Act 1981 (as amended)
- The Natural Environment and Rural Communities (NERC) Act 2006
- The Protection of Badgers Act 1992
- Environment Bill 2021

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

National Planning Policy

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

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

Local Planning Policy

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

Standing Advice

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

3.0 METHODS

Desk Study

3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in April 2017 and in May 2021, to identify the following ecological features (based on the Site's likely 'zone of influence' in respect of such features):

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

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

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

3.4 A phone consultation was held with Dr Charlotte Watkins, Ecology Officer for Cherwell and South Northants District Councils, in March 2021, to discuss the scope of survey work to be presented alongside a planning application. In this discussion it was confirmed that great crested newt eDNA surveys did not need to be repeated in 2021 as there were two negative results for recent years. It was also clarified that further information would not need to be provided to support an appropriate assessment of the proposed development in relation to the Oxford Meadows SAC.

3.5 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.

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

Field Surveys

Extended Phase 1 Habitat Survey

3.7 An extended Phase 1 Habitat survey was carried out in fine and dry weather conditions on 13 April 2017 by Kate Kibble MCIEEM, encompassing the Site and immediately adjacent habitats that could be viewed. Repeated visits to the Site were made through each subsequent year, including 2021, during which time the botanical species list (Appendix D) was added to, ensuring that the baseline information provided herein is accurate and up to date.

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

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

3.9 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

3.10 The following detailed field survey work was carried at the Site, with full methods and results provided in the relevant Appendices:

- Preliminary Roost Assessment – Trees (2017, 2019, 2022) (Appendix G)
- Bat Activity Surveys (2017, 2019/20, 2021) (Appendix G)
- Bat Roost Surveys of Trees (2021) (Appendix G)
- Great Crested Newt Habitat Suitability Index (2017) (Appendix H)
- Great Crested Newt Environmental DNA (eDNA) sampling (2018, 2020) (Appendix H)

Limitations

3.11 There were no specific limitations to the desktop study or extended Phase 1 Habitat survey, which was conducted at a suitable time of year and in good weather conditions, with several subsequent visits to the Site. Limitations to further surveys are addressed in the relevant appendix/appendices.

Evaluation and Assessment

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

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

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

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

4.2 One international statutory designation was identified within 10km of the Site: the Oxford Meadows SAC. Given the legislative frameworks underpinning international designations, the SAC considered to be important at the International level.

4.3 Six national statutory designated wildlife sites were identified within 3km of the Site as detailed within Table 1 below. These of ecological importance at the National level.

4.4 No local statutory designations were identified within 3km of the Site.

Non-Statutory

4.5 Eight non-statutory designations were identified within 2km of the Site. These include a mixture of proposed or confirmed Cherwell, Oxfordshire and Oxford City Local or District Wildlife Sites, plus two Conservation Target Areas where landscape-scale biodiversity restoration is targeted. Further details are given in Table 1 below.

4.6 As LWS's are designated according to criteria applied in a county context, these sites are considered to be ecologically important at the County level.

Table 1. Statutory and non-statutory designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Brief Description of Designated Site
International Designations within 10km		
Oxford Meadows SAC	c. 2.1km south-west	An example of traditionally managed lowland hay meadows. Designated due to the presence of creeping marshwort *Apium repens* in the UK.
National Designations within 3km		
Pixey and Yarnton Meads SSSI	c. 2.1km south-west	Unimproved floodplain meadows comprising of some of the best remaining examples of neutral grassland in lowland England. Botanically rich with notable species: green-winged orchid *Orchis morio*, autumn crocus *Colchicum autumnale*, saw-wort *Serratula tinctoria*.
Rushy Meadows SSSI	c. 2.1km north-west	Group of unimproved grassland meadows with rich meadow and fen communities. Water avens *Geum rivale* has been noted here which is uncommon in the Thames Basin.

		Notable breeding bird species (snipe *Gallinago gallinago* and grasshopper warbler *Locustella naevia*) have been recorded.
Port Meadow with Wolvercote Common and Green SSSI	c. 2.2km south	A series of neutral grassland meadows with rare creeping marshwort, tasteless water pepper *Polygonum mite*, round-fruited rush *Juncus compressus* (very uncommon in Oxfordshire) and mudwort *Limosella aquatic*.
Wolvercote Meadows SSSI	c. 2.4km south-west	Three meadows of improved and semi-improved neutral grassland. A large number of wild grasses have been recorded across the meadows alongside eight ancient woodland indicator species. Parts of the meadows border on fenland conditions.
Hook Meadow and The Trap Grounds SSSI	c. 2.6km south	A series of naturally poorly-draining unimproved neutral meadows with a fairly typical species composition. The wetter of the fields is used by wintering snipe.
Woodeaton Quarry SSSI	c. 2.8km east	Site of geological interest.
Local Designations within 3km		
-	-	-
Non-Statutory Designations within 2km		
Stratfield Brake (Woodland Trust Reserve/Cherwell District Wildlife Site)	c. 45m south	Broadleaved woodland with various grassland habitats, fen and ponds. Main area c. 180m west of the Site is a Woodland Trust reserve, whilst additional woodland extending east, south of Oxford Road is a CDWS,
Lower Cherwell Valley Conservation Target Area	c. 660m west, 1.2km north	Contains several priority habitats along the valley sides as well as a corridor along the Oxford Canal, including fen and swamp, lowland meadow, calcareous grassland, reedbed and open water. The area supports notable farmland birds and the canal is a key site for water vole.
North Meadow West of Canal (Cherwell Proposed District Wildlife Site/(Oxfordshire Other Site))	c. 850m west	Reasonably diverse unimproved grassland just north of the 'Meadows West of the Oxford Canal'. Remnant lowland meadow, fen and floodplain grazing marsh. [Appears on aerial maps to have been converted to solar panels]
Meadows West of Oxford Canal (Oxfordshire LWS)	c. 900m south-west	Two fields adjacent to Oxford canal. The fields exhibit ridge and furrow with a combination of lowland meadow and fen habitats, bordered by species-rich hedgerows.

Peartree Hill Verges (Cherwell Proposed District Wildlife Site)	c. 940m south-west	Diverse grassland along the A44, includes pyramidal orchids.
Bransons Lake and Scrub (Oxfordshire Proposed LWS)	c. 1.2km north	A lake with adjacent woodland and scrub. The site has an area of reedbed with reports of the rare bittern *Botaurus stellaris*.
Oxford Meadows and Farmoor Conservation Target Area	c. c. 1.4km south-west	Lowland meadow, floodplain grazing marsh, open water and other priority habitats within the Thames Valley west of Oxford. Includes the Oxford Meadows SAC.
Linkside Lake (Oxford City Wildlife Site)	c. 1.4km south	A small lake with a variety of aquatic and emergent vegetation recorded, including the nationally scarce fringed water-lily *Nymphoides peltata* and beetle *Peltodytes caesus*.

Habitats and Flora

Ancient Woodland

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

Notable Flora Records

4.8 A total of 56 records of 35 notable plant species were identified within the search area. Corn mint *Mentha arvensis* and dwarf gorse *Ulex minor* have been recorded within a tetrad and 1km grid-square containing the Site. Other species recorded locally which are of potential relevance to the Site include those associated with disturbed habitats (e.g. annual pearlwort *Sagina apetala* subsp. *apetala*), hedgerows (bluebell *Hyacinthodes non-scripta)* and periodically damp habitats (e.g. lesser spearwort *Ranunculus flammula*). None of the notable species recorded locally have been found on-site with the exception of bluebell which is present within hedgerow H2.

4.9 The plant species mousetail *Myosurus minimus* has been found on-site and is locally abundant within areas of bare ground near gateways and along well-worn pathways in the north of field F1 (see Habitats Plan). This is an annual species of disturbed, seasonally flooded ground which is listed on the Oxfordshire Rare Plants Register[1] and is described as Vulnerable within the Red Data List for Great Britain for the declines in its occurrence, occupancy or quality of habitat (category A2c)(Cheffings *et al*, 2005). Therefore the population of mousetail on-site is considered to be of importance at the Local level.

4.10 The on-site pond contains a small population of water-crowfoot. Whilst the exact species is uncertain, several likely species are listed on the

[1] http://www.anhso-ofg.org.uk/

Oxfordshire Rare Plant Register, though they are of Least Concern nationally (JNCC, 2020), hence it may be considered to be of importance at the Local level.

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

Habitats

4.12 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.

4.13 Baseline Habitat Biodiversity Value has been determined through assessment using the Natural England Biodiversity Metric 3.0, with full details in Appendix F.

Semi-improved grassland

4.14 The on-site habitats are dominated by species-poor, semi-improved grassland grazed by cattle (and additionally horses since 2020), with some areas rotationally cut for silage and hay. It is unknown whether additional fertilisers are used.

4.15 The grassland sward is dominated by perennial rye-grass *Lolium perenne* with relatively few herb species. Those within the main grassland include creeping buttercup *Ranunculus repens* and mouse-ear *Cerastium* sp., with greater diversity at the edges. The grassland is poorly drained in parts as indicated by the presence of occasional or patchy cuckooflower *Cardamine pratensis*, soft rush *Juncus effusus* and marsh foxtail *Alopecurus geniculatus*. A fuller species list is given in Appendix D.

4.16 The on-site grassland is considered to be of ecological importance at less than Local level.

Bare/colonising ground

4.17 Compacted bare and colonising ground is present at the Site access and along worn pathways at the edges of F1, particularly beside hedgerows H4 and H5. Mousetail *Myosurus minimus* is locally abundant in these areas plus other species of ephemeral or disturbed habitats: annual meadow-grass *Poa annua*, toad rush *Juncus bufonius*, scentless mayweed *Tripleurospermum inodorum* and hairy bittercress *Cardamine hirsuta*.

4.18 This habitat type is ephemeral and variable as a result of livestock and vehicle movements at the Site. Although found to support the notable mousetail, bare/colonising ground is not considered to be of significant ecological value within this assessment.

Hedgerows

4.19 All fields at the Site are bounded by hedgerows. These are all mature with some associated ditches and mature trees. Common hawthorn *Crataegus monogyna* was the dominant species with additional blackthorn *Prunus spinosa*, elder *Sambucus nigra*, elm *Ulmus* sp. and willows *Salix* spp. Midland hawthorn *Crataegus laevigata* was recorded within hedgerow H1. The ancient woodland indicator species bluebell *Hyacinthoides non-scripta* and lord's-and-ladies *Arum maculatum* were recorded within the hedgerow bases as detailed within Appendix D. Hedgerow H1, H2 and H6 were noted to contain six woody species over their length with five recorded in H7, H8 and H9, four within H4 and H5, and three within H3.

4.20 The hedgerows are typically outgrown and gappy, with fences to prevent access to external boundary hedgerows from livestock although there appears to be some browsing pressure (e.g. browse line). The internal hedgerows, particularly H5, are in a poorer condition where livestock have developed worn pathways through and alongside the hedgerow, or from congregating beneath the mature trees.

4.21 Native hedgerows are a Section 41 Habitat of Principal Importance. Those on-site are mature with reasonable diversity and connectivity (though this is somewhat restricted by the surrounding road network). Asa result hedgerows and their associated ditches and trees are valued to be of importance at the Local level.

Trees

4.22 Mature ash trees *Fraxinus excelsior* are frequent within several of the on-site hedgerows with occasional crack willow *Salix fragilis*, sycamore *Acer pseudoplatanus* and two mature hybrid black poplar *Populus* x *canadensis*. A line of late-mature willows are present at the eastern end of hedgerow H7. These are large with many broken limbs, fissures and cracks typical of the species.

4.23 Within the north-east corner of the Site there is a small group of mature and semi-mature hawthorn, ash and crab apple *Malus* sp.

4.24 Most of the trees are contained within hedgerows and add additional biodiversity value and structure to these features and the local green infrastructure network. These are considered to be of value at the Local level as part of the hedgerow features, as described above. The line of willows contributes to on-site green infrastructure and is likely to provide a range of opportunities for wildlife, however these and other scattered trees are valued at Site level only.

Pond

4.25 A shallow pond is present on-site along hedgerow H5. This has been found to dry out in some years and is mildly polluted/poached by

livestock. Despite this, the pond was well-vegetated with floating sweet-grass *Glyceria fluitans* and some water crow-foot.

4.26 A small area of pooling at the junction of hedgerows H4 and H5 was noted in 2017 where the land is poorly draining. Figwort *Schrophularia* sp. and water-cress *Rorippa nasturtium-aquaticum* were recorded.

4.27 Ponds are a Section 41 Habitat of Principal Importance and can provide important habitat for wildlife. The on-site pond is relatively small and isolated but supports good aquatic vegetation. It is considered to be of value at the Local level.

Ditches

4.28 A network of shallow wet and dry ditches occur at the Site as shown on Appendix A. These were generally well-shaded by hedgerows and supported limited aquatic flora at the time of survey, with the exception of fool's water-cress *Apium nodiflorum*.

4.29 Whilst they have a separate function and biodiversity value, the on-site ditches are considered to be a component of the hedgerow habitats and are valued to be of importance at the Local level accordingly.

Fauna

Bats

4.30 TVERC provided 35 bat records for the search area, comprising six species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *M. nattereri* and brown long-eared bat *Plecotus auritus*. Natterer's bat, soprano pipistrelle and unidentified pipistrelle species have been recorded roosting locally (no detailed information available) with all other records generated of bats in the field (e.g. bat detector surveys).

4.31 Preliminary roost assessments identified three trees with High bat roosting potential and 10 trees with Moderate bat roosting potential. No bat roosting was confirmed within the three trees surveyed in 2021 (see Appendix G) however, roosting suitability of trees is highly variable across the year and can change readily over time.

4.32 Activity surveys at the Site confirmed the presence of at least nine species, comprising: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle *Pipistrellus nathusii*, noctule, Leisler's bat *Nyctalus leisleri*, serotine *Eptesicus serotinus*, brown long-eared bat, barbastelle *Barbastella barbastellus* and unidentified species within the *Myotis* genus. Common pipistrelle was the most frequently detected species on-site with soprano pipistrelle and noctule/*Nyctalus* bats also well recorded. Foraging activity was often found to be associated with the access gateway and vegetation in the west of the Site, possibly as this

was a high-use area for livestock at the Site. Further discussion of the data is given in Appendix G.

4.33 Overall, the Site supports foraging and commuting habitat for bats, used by a range of species, including low numbers of rarer species. Barbastelle bat, brown long-eared bat, noctule and soprano pipistrelle are Section 41 (S41) species of principal importance for conservation, and all British bat species and their roosts are legally protected. The bat assemblage on-site is considered to be of importance at the Local level.

Badger

4.34 TVERC provided 14 records of badger *Meles meles* within the search area, comprising several sett records and a small number of road casualties associated with the A34 and A44. Most records are distant to the Site though there is one record from 2013, precisely located (10-figure grid reference) in the south-eastern part of the Site, close to the route of the on-site footpath. There is no additional information for the record. Badgers and their setts are legally protected under the Protection of Badgers Act 1992.

4.35 Habitats on-site are potentially suitable for badger although no evidence of badger has been found on-site over the course of several years. Badgers are scoped out of further assessment within this report, though precautionary measures for the ongoing monitoring of badger activity is recommended as it can change readily with setts created or expanded at any time, and local records indicate that badgers are present nearby.

Dormouse

4.36 Dormouse *Muscardinus avellanarius* are considered to be rare in Oxfordshire and no records were provided by TVERC for the search area. A very small number of populations have been confirmed in the county with the closest known population likely to be in woodland c. 4km west of the Site where there were records of their presence after 2006 (Newbold, 2017).

4.37 Potential dormouse habitat on-site is limited to boundary hedgerows and the Site is isolated from more distant high-quality habitat (i.e. woodland) by several major roads. With regards to this and the uncommon status of dormouse in Oxfordshire, this species is considered likely to be absence from the Site and is not considered further within this assessment.

Riparian Mammals

4.38 TVERC provided multiple records of otter *Lutra lutra* and water vole *Arvicola amphibius*. Water vole records are almost entirely associated with the Oxford Canal, and include recent results from 2017. Records of otter are more widespread, associated with both the Oxford Canal and River Cherwell. There is considered to be no constraint to the proposed

development from these species as there is no suitable habitat on-site and their presence is highly unlikely.

Other mammals

4.39 Brown hare *Lepus europaeus*, hedgehog *Erinaceus europaeus* and polecat *Mustela putorius* have been recorded locally with a road-casualty polecat recorded on the A34 adjacent to the Site and several hedgehog records within close proximity. There is considered to be potential for polecat and hedgehog (both S41 species) to use the Site. These species are not considered to be of ecological importance beyond the level of the Site, but opportunities to retain and create habitat for mammals are included below.

Birds

4.40 TVERC have provided a large number of bird records for within 2km of the Site. Several species typical of open grassland, hedgerows and scrub have been recorded locally including starling, *Sturnus vulgaris*, black-headed gull *Chroicocephalus ridibundus*, grey wagtail *Motacilla cinerea* and bullfinch *Pyrrhula pyrrhula*. Bullfinch, starling, song thrush *Turdus philomelos* and red kite *Milvus milvus* have been incidentally recorded on-site.

4.41 The Site is considered to offer typical opportunities for a range of common and widespread bird species. The hedgerows and trees are likely to support greatest bird diversity and bird nesting whilst the open grassland is valuable for foraging and roosting by certain species e.g. gulls, starling. There is negligible potential for farmland specialist species and thus compensation/mitigation for farmland birds (as per Appendix 4 of the Local Plan Partial Review) is not considered to be required. General ecological enhancement measures included within the scheme for birds are discussed below.

4.42 The bird assemblage on-site is not considered to be of ecological importance beyond Site level, however all nesting birds are legally protected in the UK and thus further consideration is given to this within the following chapters.

Reptiles

4.43 TVERC provided only one record of grass snake *Natrix natrix* (syn. *N. helvetica*) for the search area, within central Kidlington. Grass snake are a S41 species and legally protected under the Wildlife and Countryside Act, 1981 (as amended).

4.44 The on-site grassland is managed for grazing and silage/hay with a homogenous structure and limited potential for reptiles. Grass snake have large home-ranges and typically occur in low densities across a wide area. They are often associated with wetland habitats, and it is possible that the boundary hedgerows, scrub, ditches and pond could support a small number of individuals. Therefore, reptile populations, if present, are not considered to be of significant ecological value but

recommendations for precautionary working measures are included below in relation to their legal protection.

Amphibians

4.45 TVERC have provided records of common frog *Rana temporaria*, common toad *Bufo bufo* and all three native newt species. Common toad and great crested newt *Triturus cristatus* are S41 Priority Species. Great crested newts have been recorded within a golf course pond c.400m south of the Site and within a network of three ponds between c.230-420m east of the Site beyond the A34 and railway line. These latter ponds are reported to support a high population, with 141 individuals recorded in 2018. There are additional records of great crested newts more distantly (>1km) to the east, north-east and south-west of the Site.

4.46 Despite spending much of their annual lifecycle within the terrestrial environment, great crested newts are dependent upon the presence of suitable aquatic breeding habitat in order for a population to persist. A desktop study of online mapping sources identified eight ponds within 500m of the site, including four where great crested newts have been recorded (see above). However, all identified waterbodies are separated from the Site (and the on-site pond) by likely barriers to amphibian dispersal (the A34 and/or A4260) meaning that the on-site pond exists in isolation.

4.47 The on-site pond has been sampled for great crested newt DNA (eDNA sampling) in spring 2018 and spring 2020 (the pond was too dry for sampling in early June 2017). Both results were found to be negative for great crested newt and it is considered that this species is likely absent from the Site.

Invertebrates

4.48 Records of 11 notable beetle species have been provided for TVERC, mostly from the River Cherwell, as well as a record of small heath butterfly *Coenonympha pamphilus* from the Oxford Canal and the notable plant bug *Lygus pratensis* at Stratfield Brake reserve to the west. The mature trees, ditches and pond are likely to provide the most significant opportunities for invertebrates although these are not considered to be of a condition likely to support a notable assemblage of invertebrates. The Site is located within the Oxford Important Invertebrate Area (IIA) identified by Buglife though there is no information available on the key features/species of interest. It is suspected that the main invertebrate interest is associated with the Oxford Meadows and Thames Valley.

4.49 Invertebrates are not taken forward as an important ecological feature within this report but measures to avoid impacts to invertebrate habitats and to enhance opportunities are incorporated within the development proposals.

Future Baseline

4.50 The Site is under active management for grazing and silage/hay which would be likely to continue should planning permission for the proposed development not be granted. The notable mousetail would be likely to remain on-site in this eventuality as livestock movements would continue to create areas of disturbed ground. Opportunities for foraging bats and birds generated as a result of the presence of livestock would also persist. There does not appear to be any management of the hedgerows, trees and ponds and it is likely that these habitats would deteriorate over time as the shrubs and trees increase in maturity and as negative impacts from livestock to these features continue. As such, whilst there may be some change to existing habitats, the future baseline status of important ecological features is not anticipated to vary significantly from that at present.

Summary of Ecological Features

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

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

Ecological Feature	Geographic Context of Importance and/or Protection Status
Oxford Meadows SAC	International
Other statutory wildlife designations (SSSIs)	National
Non-statutory wildlife designations	County
Notable flora	Local
Hedgerows (including component trees and ditches)	Local
Pond	Local
Bats	Local, Protected (W&C Act, Conservation of Habitats & Species Regs)
Badger	Protected (Badger Act)
Nesting birds	Protected (W&C Act)
Grass snake	Protected (W&C Act)

5.0 ASSESSMENT OF EFFECTS

The Proposed Development

5.1 Outline planning permission is sought for residential-led development at the Site. The following impact assessment is based on the Development Framework Plan prepared by CSA Environmental (CSA/3263/123) on behalf of Barwood Development Securities Ltd.

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

- Removal of livestock and cessation of agricultural management
- Construction of approximately 370 residential dwellings
- Construction of internal access roads, drainage infrastructure (SuDS and swale), play areas and soft landscaping
- Construction of a 3m tall noise bund along the eastern Site boundary, with a 3m fence on top
- Provision of 4ha of sports facilities including at least one all-weather pitch with lighting, a community pavilion and car park
- Provision of community allotments
- Removal of c. 20m sections of hedgerows H1, H5, H7and H9, and up to 65m of H8 for vehicular access points, and smaller impacts (c. 2m breaks) to H1, H2, H4 and H6 for pedestrian footpaths/cycleways
- Retention and enhancement of the on-site pond
- Enhancement of hedgerows H4 and H5
- Establishment of informal open space, to include grassland, meadow, tree, scrub and woodland planting.

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

- Occupation of new residential dwellings
- Use of new recreational pitches and facilities
- Increase in human activity, including use of vehicles and presence of domestic pets
- Increased artificial lighting within development and sports pitches, and anthropogenic noise

Assumptions

5.4 The following assumptions have been made during the assessment of potential effects of the proposed development on important ecological features. Although 'assumed' and therefore taken as part of the pre-mitigation scenario, these measures are referenced in the proceeding sections where integral to the mitigation strategy.

5.5 In accordance with BS42020:2013, it is assumed that a Construction Environmental Management Plan (CEMP) will be secured by planning condition and prepared at the detailed design stage. In addition to the

construction phase impact avoidance and mitigation measures identified in the following sections, the CEMP will detail standard environmental control measures, including though not limited to the following:

- Implementation of strict protection measures for the root protection areas of retained trees and hedgerows, in accordance with BS5837:2012
- Standard best practice construction phase pollution prevention and control measures
- Sensitive working methods and timing to avoid direct impacts to nesting birds (generally vegetation removal outside nesting season of March through August),and reptiles (generally careful hand-strimming of long vegetation to be impacted, where present, during April-October)
- Precautionary survey work for badgers
- Updated bat roosting assessments of trees and roost surveys where needed, once full details and timescales for impacts to trees are known. Adherence to any derogation licence conditions if needed.

5.6 A Landscape and Ecology Management Plan has been prepared in combination with a Biodiversity Improvement and Management Plan to set out how ecological features will be protected and how retained and proposed habitats will be managed. This is indicative, as appropriate for an outline planning application, and would need to be refined at the detailed design stage to take consideration of the finalised landscaping scheme.

Potential Impacts and Ecological Effects

Oxford Meadows SAC

5.7 Oxford Meadows SAC is noted for its lowland meadow habitat and important populations of creeping marshwort (one of only two sites in the UK for this species). The SAC is reported to be vulnerable to several factors including air quality, hydrological changes, water quality impacts, inappropriate management and non-native species.

5.8 The proposed development was screened-in for Appropriate Assessment by Cherwell District Council within their Local Plan Habitats Regulations Assessment (HRA) as there was potential for the scheme to have a likely significant effect on the SAC in relation to recreational pressure, air quality and hydrological changes (Atkins, 2018). It was determined however, that alongside other local planning policies to address and mitigate these impacts, as well as general biodiversity policies, that the Local Plan (and the allocated development at Kidlington) would not have any likely significant effect on the SAC, either alone or in combination with other plans and projects. The HRA was subsequently revised in 2019 to account for modifications to the Local

Plan (and allocated sites) however there was no change in the outcome of the original HRA (Atkins, 2019).

5.9 Cherwell District Council will undertake a specific Habitats Regulations Assessment of the proposed development during the planning application process. Consultation with the Local Authority Ecologist (see 3.4) determined that no additional information would need to be provided to the council to inform this process; no form of 'shadow' HRA is therefore provided. However, as potential impacts to the SAC were identified as a result of the proposed development within the Local Plan HRA, further details of how the scheme will adhere to local planning policies intended to mitigate this effect (principally policies ESD8, ESD9, ESD10, ESD17, PR4a) are included in the following sections.

Other statutory Designated Sites

5.10 Six SSSI designations were identified during the desktop search, all located over 2km from the Site, and all (with the exception of Rushy Meadows SSSI) are associated with the Oxford Meadows SAC.

5.11 As potential for adverse impacts to the SAC designation was highlighted within the Local Plan HRA (Atkins 2018, 2019), it is reasonable to assume that such impacts could also adversely impact the overlying SSSI designations, and Rushy Meadow SSSI which lies at a similar distance from the Site, supports similar important ecological features and is likely to have the same vulnerabilities. Impacts resulting from the proposed development are likely to be very small, but have potential to be of Local level significance.

Non-statutory Designated Sites

5.12 Stratfield Brake Cherwell District Wildlife Site (CDWS) is in close proximity to the Site, beyond Oxford Road to the south. Part of the site is a dedicated nature reserve whilst the area closest to the Site does not appear to have any formal access. There is likely to be an increase in recreational pressure at Stratfield Brake nature reserve as result of the proposed development, due to its close proximity and likely use by new residents. However, any additional impacts are considered unlikely to be significant within a managed reserved. There is also considered to be limited potential for construction-related impacts to the area of Stratfield Brake south of the Site (such as from noise, lighting or dust), due to the presence of an intervening main road.

5.13 No likely significant effects to other non-statutory designations are anticipated.

Notable Flora

5.14 Mousetail is associated with seasonally-flooded, disturbed ground (in this case from livestock and farm vehicles). It is an annual plant, growing from seed each spring. The habitat conditions required by mousetail will

be lost within the new development and cannot be practically recreated within the scheme. Whilst new plants may continue to grow temporarily (such as during the construction and establishment period of the development), it is likely that the seed resource will diminish over time, leading to its extinction from the Site. This impact has potential to be significant at the Local level.

5.15 The on-site pond is due to be retained on-site and so it is expected that the population of water-crowfoot will persist however, potential impacts to the pond itself during the contraction and operational phases (see below) could affect the survival of water-crowfoot. Such impacts are not considered to be significant at the Local level or above though mitigation measures are prescribed for the pond habitat (and thus water-crowfoot) as discussed below.

Hedgerows (including component trees and ditches)

5.16 All hedgerows at the Site are due to be retained alongside the development which will help to maintain a coherent green infrastructure network. However, there will be several breaches to hedgerows for vehicular access, as well as some smaller breaks for footpaths which will result in permanent loss of hedgerow habitat and interruptions to habitat connectivity. Some impact to vegetation around the line of crack willows in the south-east of the Site may also be required for the proposed noise bund and swale though the Arboricultural Impact Assessment (Barton Hyett Associates, C.2999) indicates that impacts to the mature crack willows themselves can be avoided. These impacts are outlined in section 5.2 and will result in the net loss of c. 150m of hedgerows/lines of trees. Existing gateways and breaks have been utilised where possible to reduce the scale of impacts.

5.17 There is potential for construction activities to result in the loss of or damage to retained hedgerows and trees. Such impacts may either be permanent of short-lived depending on the nature of the incident.

5.18 These impacts combined are considered to be of less than Local significance, however mitigation measures are proposed below to avoid impacts to retained hedgerows and trees.

Pond

5.19 The on-site pond is due to be retained alongside development and incorporated into a larger area of improved semi-natural habitat. There is potential for deterioration of pond habitats to occur during the operational phase of the development e.g. from littering or dog swimming.

5.20 In the absence of mitigation there is potential for construction activities to physically damage pond habitat or to degrade water quality.

Similarly, longer-term impacts from habitat disturbance and pollution could occur during the operational phase of development.

5.21 These impacts are unlikely to have a significant ecological impact at the Local level but mitigation measures will be incorporated.

Bats

5.22 There will be a net loss of open grassland habitat seen to be used by small numbers of foraging noctule and pipistrelle bats, although most bat activity was found to be associated with the hedgerows and trees which are predominantly due to be retained. The removal of livestock from the Site will also likely alter the availability and type of insect prey utilised by bats at the Site.

5.23 Approximately 150m of hedgerow is due to be lost for access routes through the Site. As well as removing habitat used by bats, the impacts would result in fragmentation of eight hedgerows, potentially disrupting bat flight lines across the Site.

5.24 Increased artificial lighting at the operational phase may disturb sensitive species of bat (e.g. *Myotis*) and reduce the foraging/commuting suitability of bat habitats. This in turn could alter the distribution, abundance and survival of bats using the Site. Increased lighting of sports pitches would potentially degrade western boundary habitats currently well used by bats.

5.25 These impacts are considered to have potential for an effect significant at less than Local level.

Other protected species

5.26 Potential breaches of the Wildlife and Countryside Act, 1981 (as amended) and Protection of Badgers Act, 1992 could occur through site clearance works in relation to badger, nesting birds and grass snake.

Mitigation by Design

5.27 It is an established principle (CIEEM, 2018) that, wherever possible, potential negative effects should be avoided through 'Mitigation by Design', as this gives greater certainty over deliverability, demonstrates a well-designed scheme and ensures the correct application of the 'Mitigation Hierarchy' (as advocated by BS42020:2013, Defra 2019 and CIEEM, CIRIA & IEMA 2016).

5.28 Overall, the proposed development has been designed to avoid impacts to features of ecological importance in the first instance e.g. retention of hedgerows and trees. In addition, the scheme includes a large area of open space for formal and informal use, which provided opportunities for habitat creation. New tree, scrub and woodland planting has been incorporated within the open space to meet policy

requirements in relation to green belt, landscape issues and green infrastructure, which will also provide opportunities for wildlife and built-in mitigation for habitat impacts. Policy PR7a of the Cherwell Local Plan Partial Review requires new woodland planting within the south of the Site to provide green infrastructure links and improved connectivity with Stratfield Brake wildlife site. The drainage strategy for the Site also requires the inclusion of drainage basins and a swale, which will be designed so as to provide wildlife habitat. Further details of these mitigation measures are discussed below.

Oxford Meadows SAC

5.29 The proposed development includes a significant area of formal and informal public open space which will be used by new residents of the development as well as other local people. Whilst this will not replicate the SAC in terms of naturalness or habitat-type, it is likely to absorb the majority of day-to-day recreational needs by new residents, such as dog walkers, by its proximity and ease of access. With additional consideration of the limited car parking at the SAC and its primary use by the more local residents of Oxford City (Atkins, 2018), this on-site provision is considered to reduce the potential additional recreational impact on the SAC from the development at Kidlington to an insignificant level.

5.30 Policy PR4a of the Cherwell Local Plan Partial Review requires strategic developments (including the Site) to provide financial contributions towards local infrastructure enhancements and mitigation. It was determined within the HRA of the Local Plan that, subject to the implementation of this policy, the proposed development site would not result in any significant adverse effect on the SAC (either alone or in-combination with other plans and projects).

5.31 Likewise, the development will need to be supported by adequate drainage in line with policy ESD 9 of the Cherwell Local Plan Part 1. Two SuDS basins and a swale will be provided to manage excess surface water from the development. As detailed within the Flood Risk Assessment (Brookbanks, 10669 FRA01 Rv0), there is negligible risk to the SAC from groundwater flows or contamination as the Site is located on an unproductive aquifer of "negligible significance for water supply or river base flow".

Other Statutory Designated Sites

5.32 Mitigation measures, as described above for the Oxford Meadows SAC, are considered to also address potential impacts to the component SSSIs , which are similarly vulnerable to recreational pressure, air quality and hydrological impacts.

Notable Flora

5.33 Mitigation measures relevant to water-crowfoot are discussed below for pond habitats which are being retained.

Hedgerows (including component trees and ditches)

5.34 As mentioned above, all on-site hedgerows are being retained with the exception of some breaks for access.

Pond

5.35 The pond will be retained alongside the development within an enhanced area of open space and semi-natural habitat.

Bats

5.36 The proposed development has sought to minimise effects on foraging and dispersing bat species through sensitive design, maintaining many of the green corridors currently present at the Site to allow dispersal routes and foraging habitats to be maintained as far as possible.

5.37 While the proposed development will necessitate the removal of c. 150m of hedgerow, the illustrative proposals include a total of c. 330m of new hedgerow planting. New tree, scrub and woodland planting is also proposed which will enhance habitat connectivity across the Site overall, particularly within the northern field which is currently poorly vegetated.

5.38 Further detail of the establishment and long-term management of these habitats, to maximise benefits for biodiversity, will be set out within a final Biodiversity Improvements and Landscape Management Plan (BILMP) at the detailed design stage.

Additional Mitigation

Oxford Meadows SAC

5.39 A CEMP will be prepared at the detailed design stage to ensure that the construction process does not result in any adverse effects on the water quality of on-site and surrounding ditches and watercourses which may link to the SAC. Whilst full detail will be prepared at a later stage, the CEMP will include the following:

- Identification of sensitive areas where the storage of stockpiled soil, fuel, cement mixers, machinery and other materials will be prohibited so as to minimise the risk of pollution to surface water or water courses.
- Measures to reduce soil erosion and silt run-off into surrounding ditches (e.g. covering stockpiles, silt-fencing, silt bags)
- Programme for monitoring, reporting and remediation in the event of a pollution event (including details of those responsible for each process).

5.40 The CEMP can be secured via a planning condition to be approved by the Local Authority and Natural England, ensuring that the protection measures are adequate to avoid an adverse effect on the SAC.

Other Statutory Designated Sites

5.41 Additional mitigation measures described above for the Oxford Meadows SAC are also applicable to other statutory designated sites included within this assessment.

Notable Flora

5.42 It is proposed that a simple mitigation strategy be prepared, and secured via planning condition, for the transplantation of spoil/seedbank from key areas of the Site colonised by mousetail to suitable receptor sites in the local area, in order to protect the local resource of this species.

5.43 Pollution prevention methods will be outlined in a CEMP to protect the pond habitat, and population of water-crowfoot therein.

Hedgerows (including component trees and ditches)

5.44 Construction of the development will be undertaken in-line with British Standard BS 5827 (2012): trees in relation to design, demolition and construction, to avoid damage to retained vegetation. Protective measures will also be outlined within a CEMP.

5.45 Management and maintenance of new and existing planting at the Site are included within an outline Biodiversity Improvements and Landscape Management Plan (BILP), to be finalised at the Reserved Matters stage. This will ensure ecologically sensitive practices are used and that the long-term ecological value of hedgerow and trees is a key objective.

Pond

5.46 Sensitive working methods will be employed during the construction period to avoid accidental damage or pollution to the pond and its habitats. This will include measures such as maintaining a buffer distance between the pond and any vehicle routes, stores or stockpiles; silt-control measures and monitoring prescriptions.

5.47 Ongoing management of the pond and surrounding habitats will be detailed within the BILMP to ensure that the ecological value of the pond is maintained in the long-term.

Bats

5.48 Repeat bat roosting surveys will be undertaken prior to commencement of development to ensure that impacts to trees are informed by up-to-date information. Detailed inspections and/or nocturnal surveys will be used as appropriate to provide sufficient confidence in the presence or

likely absence of a roost. In the event that bat roosting is confirmed, works to the tree would need to be permitted under a derogation licence by Natural England, where impacts to the tree/s cannot be reasonably avoided.

5.49 A detailed lighting strategy will be prepared at the detailed design stage. This will ensure that light-spill onto retained hedgerows and trees, and newly created habitats is avoided as far as possible. Reducing the number of lighting columns and sensitively located those that are needed should be a priority, with shielding used where light spill cannot be avoided. The lighting strategy should be designed in accordance with guidance from the Bat Conservation Trust and the Institution of Lighting Professionals (ILP, 2018).

Other Protected Species

5.50 A pre-commencement badger survey will be undertaken to ensure that any change in badger activity at the Site is identified and can be appropriately considered during construction works.

5.51 Prescriptions for this, and for sensitive working methods in relation to nesting birds and grass snake will be included within a CEMP, to be secured via a planning condition.

Residual Effects

5.52 Table 3 below summarises the assessment of potential impacts on each important ecological feature, proposed mitigation and the assessed residual effects.

Table 3. Summary of effects

Important Ecological Feature	Potential Impacts and Effects	Avoidance & Mitigation Measures	Mechanism by which Measures are Secured	Residual Effects
Oxford Meadows SAC	Increased recreational pressure, hydrological impacts	Provision of on-site open space, sensitive drainage scheme	Detailed elements secured as reserved matters	No significant effect
Other Statutory Designated Sites	As above	As above	As above	No significant effect
Stratfield Brake	Recreational impacts	Provision of high-quality on-site open space	Detailed development design	No significant effect
Local Flora	Mousetail: habitat loss/deterioration	Mitigation strategy to relocate key soils; pollution	Mitigation Strategy and CEMP secured through	No significant effect

Important Ecological Feature	Potential Impacts and Effects	Avoidance & Mitigation Measures	Mechanism by which Measures are Secured	Residual Effects
	Water-crowfoot: habitat deterioration	avoidance measures within CEMP	Planning Condition	
Hedgerows	Breaches to 8 hedgerows for access	New habitat creation, management of habitats for biodiversity benefit	BILMP/management plan secured through Planning Condition	No significant effect
Pond	Habitat deterioration	Habitat creation. Pollution avoidance measures within CEMP	Detailed landscape strategy, BILMP and CEMP secured through Planning Condition	No significant effect
Bats	Potential development edge effects from artificial lighting causing disturbance of foraging bats Change in foraging habitat Potential loss/disturbance to bat roosts in trees	Update tree roosting surveys. New habitat creation, management of POS for biodiversity gain, sensitive lighting strategy	Survey requirement, BILMP and Lighting Strategy secured through Planning Condition	No significant effect
Badger	Potential damage or destruction of setts	Precautionary badger survey; impact avoidance measures under CEMP	CEMP secured through Planning Condition	No significant effect
Nesting Birds	Potential damage or destruction of nests and eggs	Sensitive timing of works / nest checks by ecologist	CEMP secured through Planning Condition	No significant effect
Grass snake	Minor risk of killing/injury	Sensitive timing and working methods	CEMP secured through Planning Condition	No significant effect

5.53 Subject to the successful implementation of the above mitigation, no significant residual effects on any other important ecological features are anticipated to result from the construction or operation of the proposed development.

Cumulative Effects

5.54 The Site is allocated for development within the Cherwell Local Plan Partial Review and potential cumulative effects on statutory designated sites from the Site and other allocated developments were considered in-combination within the Habitats Regulations Assessment (Atkins, 2019). Planning policy is in place to ensure that new developments do not contribute to potential adverse effects on designated sites.

5.55 The proposed development site is being brought forward alongside an adjacent field to the north which is included within the allocation (PR7a) but is under the control of another developer and has not been assessed within this report. The development to the north will link to the Site via an access road through hedgerow H9. The development will also result in the loss of arable habitat although further ecological information is not known. Due to their proximity, the two developments will likely affect the same wildlife populations (e.g. bats) and the same habitat resource (e.g. hedgerows). Aspects of the development, such as public open space, green infrastructure and key access points were set out within a draft Development Brief prepared by Cherwell District Council for the two sites as a whole. Planning policy for the allocated site also ensures that both developments meet the same requirements with respect to the protection and enhancement of biodiversity. Subject to successful implementation, the mitigation measures herein are considered to be sufficient to address cumulative impacts arising from the two developments.

Compensation

5.56 As detailed in Appendix F, a Biodiversity Net Gain assessment has been undertaken to determine the likely impact of the development in relation to the value of on-site and proposed habitats. Based on illustrative development designs, it has been demonstrated that a biodiversity net gain could be achieved on-site of 1.01 Habitat Units and 2.03 Hedgerow Units (a 0.91% and 8.73% net gain respectively).

5.57 Compensation measures provided on-site which have been accounted for within the BNG assessment include:

- Replacement hedgerow planting to compensate for breaches to existing native hedgerow
- Provision of improved grassland habitat and habitat of higher 'distinctiveness' to compensate for grassland areas lost to the development

Enhancement

5.58 As described above, the Development Framework Plan/Landscape Strategy includes landscape planting enhancements which will make positive contributions to on-site biodiversity.

5.59 New habitat creation will provide opportunities for species confirmed to be present on-site at baseline, such as bats. In addition to these enhancements which are embedded into development proposals, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below. An outline Biodiversity Improvement and Landscape Management Plan (BILMP) has been prepared, which will be revised at the detailed design stage and secured by condition. However, as an indicative guide the development will include the following additional enhancement measures:

- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.
- Provision of new bat roosting opportunities: At least 30 bat boxes will be erected at the Site with at least 20 on new buildings, and the remainder on retained mature trees. These will be a purpose-built, durable and long-lasting variety such as available from Schwegler or Habibat. Where possible, those on buildings will be incorporated into the fabric of new walls.
- Provision of new bird nesting opportunities: At least 30 no. bird nesting boxes will be provided in new/retained planting to benefit generalist bird species. This will include boxes designed specifically for swift and house martin.
- Creation of log piles: Timber generated from tree clearance works at the Site will be used to make at least 5 log piles for wildlife benefit. These will be sited within boundary vegetation where they will be least disturbed. New material can be added as required following any future management works.
- Provision of hedgehog gaps: Hedgehogs have been scoped out of detailed assessment and no specific mitigation is proposed, however it is important that opportunities for hedgehogs to move through the landscape are preserved. Although not strictly an 'enhancement' measure, provision of hedgehog-friendly gravel boards or equivalent, providing a minimum 13 x 13 cm gap, will be used to maintain permeability for hedgehogs across the development and associated gardens. The number and location of hedgehog gaps will be determined at the detailed design stage as set out within the BILMP.

Monitoring

5.60 No post-development monitoring of important ecological features is proposed. However, there will be ongoing monitoring of newly

established and enhanced habitats as part of POS. This commitment will be made, and further detail provided, within the BILMP.

6.0 CONCLUSIONS

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

6.2 An initial Biodiversity Net Gain assessment has identified the potential to achieve a biodiversity net gain on-site. This assessment will need to be revised at the Reserved Matters stage and accounted for within a detailed landscape strategy and management plan.

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

- Construction Environmental Management Plan (CEMP): In addition to wider environmental controls and best practice construction management, the CEMP will set out construction-phase impact avoidance measures with respect to nesting birds, badgers and reptiles.
- Lighting Strategy: A sensitive lighting strategy will accompany the detailed layout, ensuring that dark corridors are maintained, and minimising light spill to retained and newly created habitats.
- Detailed Biodiversity Improvements and Landscape Management Plan (BILMP) An outline document has currently been prepared. A planning condition should be used to secure suitable updates to the report in order that it accurately reflects the consented detailed landscaping strategy.

6.4 Based on the successful implementation of avoidance, mitigation and enhancement measures set out herein, the scheme is considered to accord with all relevant nature conservation legislation as well as with the provisions of the Cherwell Local Plan (Part 1) and the Cherwell Local Plan Partial Review.

7.0 REFERENCES

Atkins 2018. *Partial Review of the Cherwell Local Plan 2011- 2031 (Part 1): Oxford's Unmet Housing Needs Proposed Submission Plan incorporating Focused Changes and Minor Modifications Habitat Regulations Assessment Stage 1 Screening Report and Stage 2 Appropriate Assessment.* Atkins Ltd

Atkins 2019. Partial Review of the Cherwell Local Plan 2011- 2031 (Part 1): Oxford's Unmet Housing Needs Proposed Main Modifications and Minor Modifications Addendum to Habitat Regulations Assessment. Atkins Ltd.

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

Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffithsm R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Oxford: Freshwater Habitats Trust.

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.

Buglife, no date. *Important Invertebrate Areas*. [online] Available at: < https://www.buglife.org.uk/our-work/important-invertebrate-areas/> [Accessed February 2022].

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

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

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

Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. 2005. The Vascular Plant Red Data List for Great Britain. Species Status **7**: 1-116. Joint Nature Conservation Committee, Peterborough.

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

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

Defra, 2019. *Natural Environment Planning Policy Guidance: Biodiversity, geodiversity and ecosystems*. [online, last updated July 2019] Available at: <https://www.gov.uk/guidance/natural-environment#biodiversity-geodiversity-and-ecosystems> [Accessed February 2022].

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

ILP, 2018. *Bats and Artificial Lighting in the UK*. Bats and the Built Environment series. Guidance Note 08/18. Coventry: Institution of Lighting Professionals.

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

JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), 2012. *UK Post-2010 Biodiversity Framework*. [pdf] Peterborough: JNCC. Available at: < http://jncc.defra.gov.uk/page-6189> [Accessed February 2022].

JNCC, 2020. *Taxon Designations*. Update Version June 2020 [online]. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdata.jncc.gov.uk%2Fdata%2F478f7160-967b-4366-acdf-8941fd33850b%2FTaxon-designations-20200622.xlsx&wdOrigin=BROWSELINK. Accessed: January 2022.

Ministry of Housing, Communities and Local Government, 2021. *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 May 2021].

Natural England and Department for Environment, Food & Rural Affairs, 2014. *Protected species and development: advice for local planning authorities*. [online, last updated January 2022] Available at:

<https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals> [Accessed February 2022].

Newbold, P., Lloyd, A., Newbold, L., Gelling, M., 2017. *Dormouse Distribution in Oxfordshire* [online]. Available at: < https://6007c505-12ab-4a84-96c7-b5598c8c3974.filesusr.com/ugd/d87e358feb29bbd96f4b86873b9ba921865f5c.pdf> [Accessed January 2022].

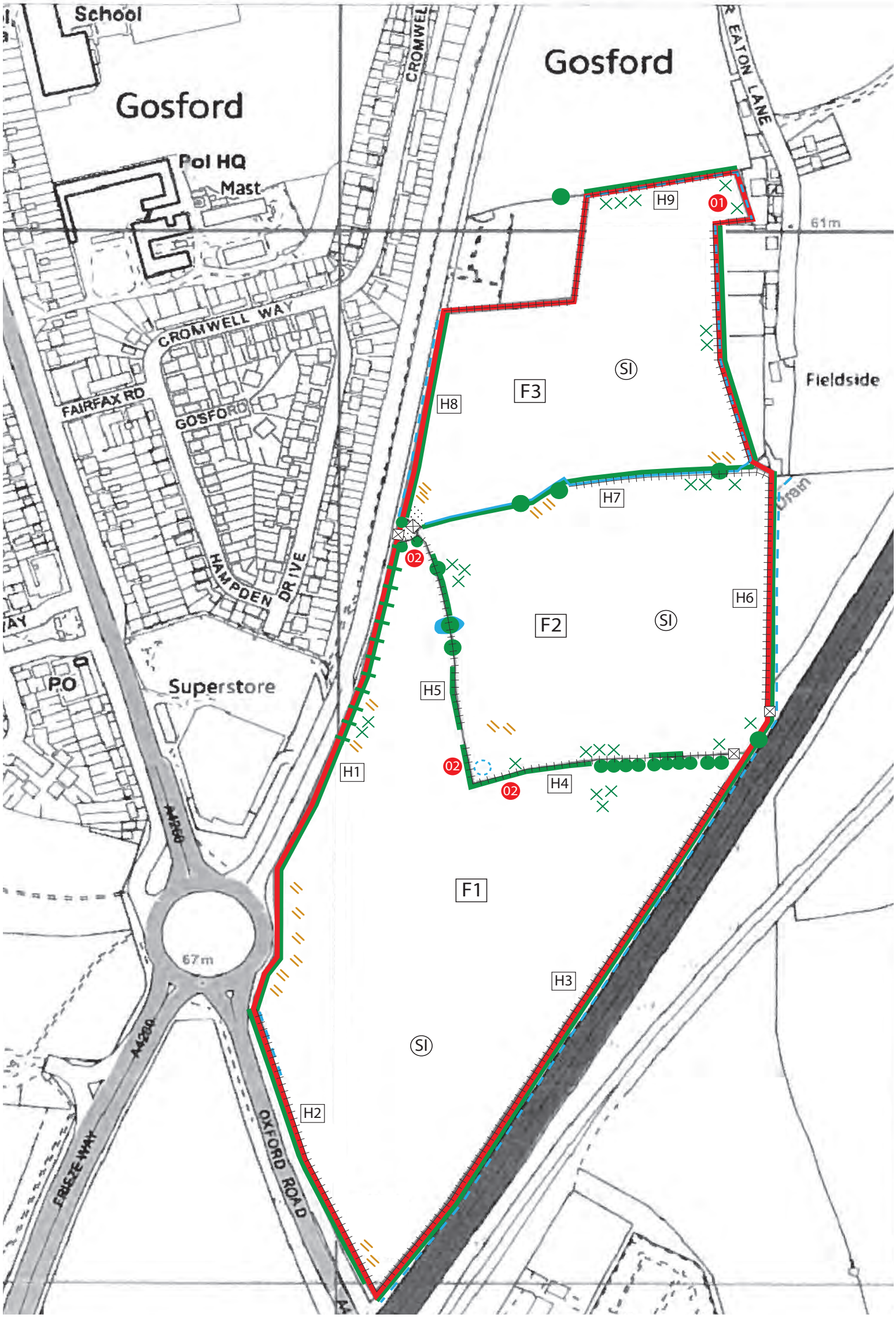
Oldham, R. S., Keeble, J., Swan, M. J. S. & Jeffcote, M., 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal*, 10(4), pp.143-155.

Stone, E.L., 2013. *Bats and lighting: Overview of current evidence and mitigation guidance*. Bristol: University of Bristol.

The Woodland Trust, no date. *Ancient Tree Inventory.* [online] Available at: <https://ati.woodlandtrust.org.uk/> [Accessed February 2022].

Appendix A

Habitats Plan & Photographs



Site boundary
Semi-improved grassland
Field number
Hedgerow number
Bare/colonising ground
Hedgerow
Hedgerow with trees
Mature tree

Scattered scrub
Tall ruderal
Fence
Gate
Dry ditch
Wet dicth
Standing water
Pooling water

Target note:
1. Small group of semi-mature trees
2. Area of mousetail *Myosurus minimus*

0 50 100meters

CSA environmental

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Project	Land East of Kidlington, Oxfordshire	Date April 2017	Drawing No. CSA/3263/102
Drawing Title	Habitats Plan	Scale @ A3 See bar	Rev -
Client	Barwood Development Securities Ltd	Drawn BGW	Checked KK

Photograph 1. Grassland in F1 (May 2020)

Photograph 2. View north along F3 and western boundary hedgerow

Photograph 3. Pond (April 2017)

Photograph 4. Line of crack willow trees (May 2020)

Photograph 5. Group of trees in north-east of Site (April 2017)

Photograph 6. Hedgerow H5 showing damage by livestock and poor condition

Appendix B

Legislation and Planning Policy

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

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

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

1.4. The **National Planning Policy Framework (2021)** (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 174, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

1.5. Paragraph 180 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 improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

1.6. Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). That relating to the protection and enhancement of the Natural Environment was most recently updated in August 2021. The Natural Environment PPG addresses principles across a broad spectrum of topics targeting biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services, and the use of local ecological networks to support the national Nature Recovery Network. In particular the PPG promotes the delivery of measurable Biodiversity Net Gain through the creation and enhancement of habitats alongside development.

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

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

1.9. It should also be noted that a draft Development Brief has been prepared by Cherwell Council. This provides a site-specific vision and sets out key principles for development addressing ecology, biodiversity and green infrastructure amongst other issues such as:

- Provision of public open space in the south of the Site comprising informal parkland, woodland and habitat areas
- Woodland habitat planting along the southern and eastern boundaries to create a habitat corridor to Stratfield Brake
- Creation of connected 'greenways' for wildlife within the developable area
- Retention of hedgerows wherever possible and provision of a grassland habitat buffer either side
- Retention of on-site watercourse, ditches and ponds, incorporation into SuDS and provision of minimum 3m buffer within POS

- Native tree planting
- Measures to minimise light spillage and noise levels on habitats/wildlife corridors
- Provision of in-built bat and bird boxes, and provision of green walls and roofs (where viable)

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

Policy	Summary
Cherwell Local Plan 2011-2031 (re-adopted 2016)	
ESD 8: Water Resources	The Council will seek to maintain water quality, ensure adequate water resources and promote sustainability in water use. Water quality will be maintained and enhanced by avoiding adverse effects of development on the water environment. Development proposals which would adversely affect the water quality of surface or underground water bodies, including rivers, canals, lakes and reservoirs, as a result of directly attributable factors, will not be permitted. Development will only be permitted where adequate water resources exist, or can be provided without detriment to existing uses. Where appropriate, phasing of development will be used to enable the relevant water infrastructure to be put in place in advance of development commencing.
ESD 9: Protection of the Oxford Meadows SAC	Developers will be required to demonstrate that: • During construction of the development there will be no adverse effects on the water quality or quantity of any adjacent or nearby watercourse • During operation of the development any run-off of water into adjacent or surrounding watercourses will meet Environmental Quality Standards (and where necessary oil interceptors, silt traps and Sustainable Drainage Systems will be included) • New development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity and quality • Run-off rates of surface water from the development will be maintained at greenfield rates
ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment	Protection and enhancement of biodiversity and the natural environment will be achieved by the following: • In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources • The protection of trees will be encouraged, with an aim to increase the number of trees in the District • The reuse of soils will be sought • If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then development will not be permitted. • Development which would result in damage to or loss of a site of international value will be subject to the Habitats

Policy	Summary
	Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated • Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity • Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity • Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity • Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value • Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution • Planning conditions/obligations will be used to secure net gains in biodiversity by helping to deliver Biodiversity Action Plan targets and/or meeting the aims of Conservation Target Areas. Developments for which these are the principal aims will be viewed favourably • A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management.
ESD 11: Conservation Target Areas	Where development is proposed within or adjacent to a Conservation Target Area biodiversity surveys and a report will be required to identify constraints and opportunities for biodiversity enhancement. Development which would prevent the aims of a Conservation Target Area being achieved will not be permitted. Where there is potential for development, the design and layout of the development, planning conditions or obligations will be used to secure biodiversity enhancement to help achieve the aims of the Conservation Target Area.
ESD 17: Green Infrastructure	The District's green infrastructure network will be maintained and enhanced through the following measures: • Pursuing opportunities for joint working to maintain and improve the green infrastructure network, whilst protecting sites of importance for nature conservation

Policy	Summary
	• Protecting and enhancing existing sites and features forming part of the green infrastructure network and improving sustainable connectivity between sites in accordance with policies on supporting a modal shift in… biodiversity and the natural environment (Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment)… • Ensuring that green infrastructure network considerations are integral to the planning of new development. Proposals should maximise the opportunity to maintain and extend green infrastructure links to form a multi-functional network of open space, providing opportunities for walking and cycling, and connecting the towns to the urban fringe and the wider countryside beyond • All strategic development sites (Section C: 'Policies for Cherwell's Places') will be required to incorporate green infrastructure provision and proposals should include details for future management and maintenance.
The Cherwell Local Plan 2011 - 2031 (Part1) Partial Review - Oxford's Unmet Housing Need	
Policy PR7a – Land South East of Kidlington	An extension to Kidlington will be developed on 32 hectares of land to the east of Bicester Road as shown on inset Policies Map PR7a. Development proposals will be permitted if they meet the following requirements:… 4. The provision of 11 hectares of land to provide formal sports facilities for the development and for the wider community and green infrastructure within the Green Belt Planning Application Requirements 9. The development Brief shall include: (g) Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with (10) below (h) An enhanced area of woodland along the south-eastern boundary of the site and the establishment of a new area of woodland planting (i) the maintenance and enhancement of the tree lines and hedgerows 10. The application(s) shall be supported by a proposed by the Biodiversity Impact Assessment (BIA) based on the DEFRA metric…, to be agreed with Cherwell District Council 11. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and submitted Tree Survey and to be agreed before development commenced… 12. The application(s) shall be supported by a phase 1 habitat survey including habitat suitability index (HSI) survey for great crested newts, and protected and notable species surveys as appropriate, including great crested newt presence/absence surveys (dependent on HSI survey), surveys for badgers, breeding birds and reptiles, an internal building assessment for roosting barn owl, a tree survey and an assessment of water bodies.

Appendix C

Desk Study Information

3263_3km Site Check

Legend

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

Projection = OSGB36
xmin = 438700
ymin = 207900
xmax = 461100
ymax = 217200

0 0.85 1.7
km

Map produced by MAGIC on 2 June, 2021.

Site Check Report Report generated on Wed Jun 02 2021
You selected the location: Centroid Grid Ref: SP50151252
The following features have been found in your search area:

Sites of Special Scientific Interest (England)

Name	Rushy Meadows SSSI
Reference	1000951
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	8.93
Citation	1001685
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001685

Name	Wolvercote Meadows SSSI
Reference	1000952
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	7.06
Citation	1001707
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001707

Name	Hook Meadow and The Trap Grounds SSSI
Reference	1000569
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	11.85
Citation	1002183
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1002183

Name	Pixey and Yarnton Meads SSSI
Reference	1000777
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	86.38
Citation	1000131
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1000131

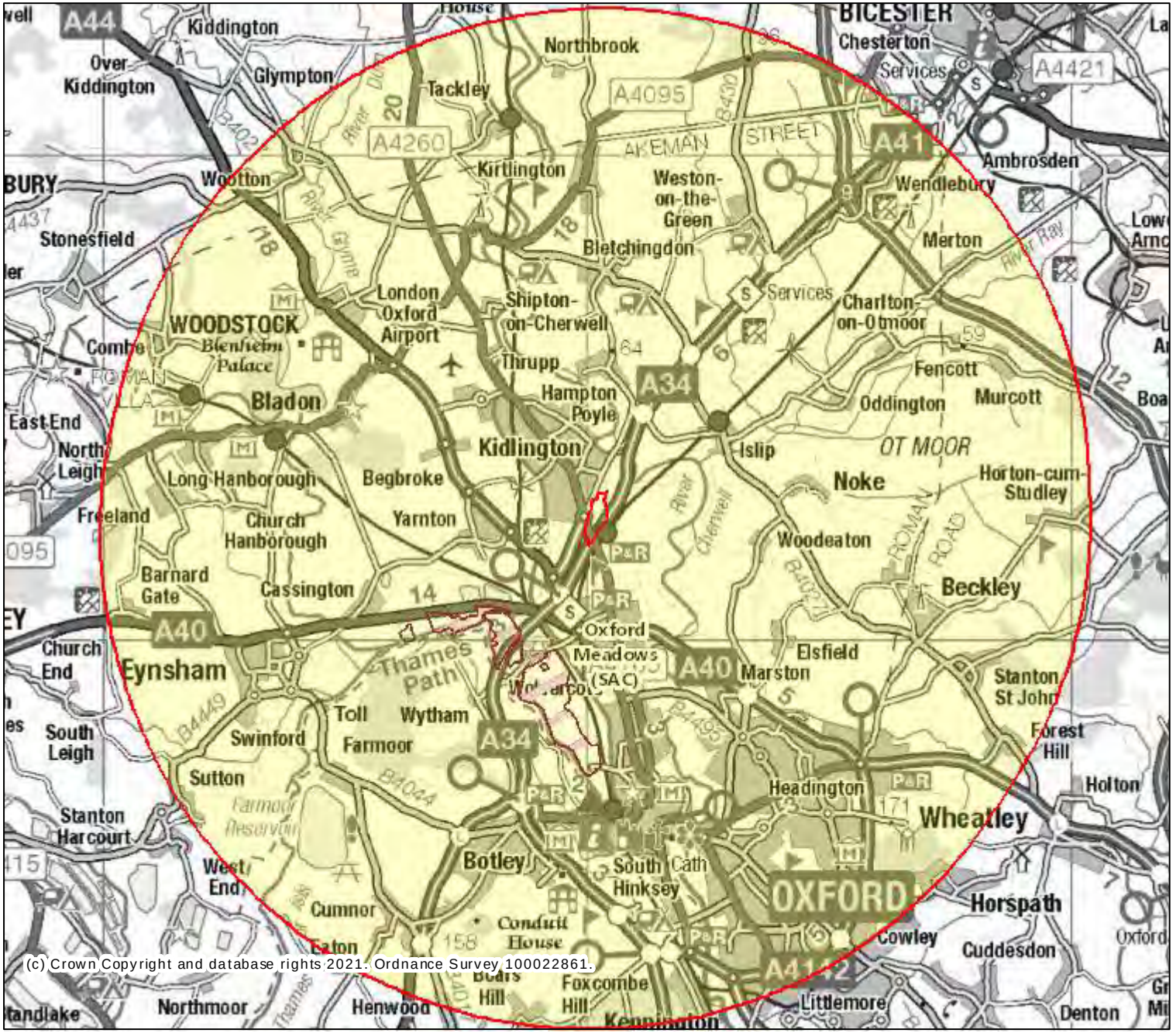
Name	Port Meadow with Wolvercote Common & Green SSSI
Reference	1000778
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	167.14
Citation	1000153
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1000153

Name	Woodeaton Quarry SSSI
Reference	1000810
Natural England Contact	Conservation Delivery Team
Natural England Phone Number	0845 600 3078
Hectares	7.3
Citation	1001234
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001234

Local Nature Reserves (England)
No Features found

National Nature Reserves (England)
No Features found

3263_**10**km Site Check



Legend

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

Projection = OSGB36
xmin = 419900
ymin = 199900
xmax = 480100
ymax = 225200

0 2 4
km

Map produced by MAGIC on 2 June, 2021.

Site Check Report Report generated on Wed Jun 02 2021
You selected the location: Centroid Grid Ref: SP50151251
The following features have been found in your search area:

Special Areas of Conservation (England)

Name	OXFORD MEADOWS
Reference	UK0012845
Hectares	265.31
Hyperlink	http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0012845

Ramsar Sites (England)
No Features found

Proposed Ramsar Sites (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

Appendix D

Habitats and Flora Species List

Flora Species List

SITE ref. & NAME	3263, Land East of Kidlington
DATES OF SURVEY AND SURVEYORS	**14/04/2017 KK, 01 May 2020 KK, 18/01/2022 KK**

Note: Species with a * have been recorded incidentally at field edges and are not assigned to a particular area

Latin name	Common Name	HABITAT TYPE			
		F1	F2	F3	Pond
Herb species					
Alliaria petiolata	Garlic mustard*				
Anthriscus sylvestris	Cow parsley	x	x	x	
Apium nodiflorum	Fool's watercress*				
Arctium sp.	Burdock	x	x	x	
Bellis perennis	Daisy	x	x	x	
Capsella bursa-pastoris	Shepherd's purse		x	x	
Cardamine hirsuta	Hairy bitter-cress	x	x	x	
Cardamine pratensis	Cuckooflower*				
Cerastium sp.	Mouse-ear	x	x	x	
Cirsium arvense	Creeping thistle	x	x	x	
Cirsium vulgare	Spear thistle	x	x	x	
Conium maculatum	Hemlock*				
Ficaria verna	Lesser celandine	x	x	x	
Galium aparine	Cleavers*				
Geranium dissectum	Cut leaved crane's-bill	x	x	x	
Geranium molle	Dove's-foot crane's-bill	x			
Glechoma hederacea	Ground-ivy*				
Helminthotheca echiodes	Bristly ox-tongue		x	x	
Heracleum sphondylium	Hogweed	x	x	x	
Jacobaea sp.	Ragwort			x	
Lamium album	White dead-nettle		x	x	
Lamium purpureum	Red dead-nettle		x	x	
Lepidium sp.	Swine-cress*				
Leucanthemum vulgare	Oxeye daisy			x	
Myosurus minimus	Mousetail	x	x	x	
Plantago major	Greater plantain	x	x	x	
Ranunculs acris	Meadow buttercup*				
Ranunculus repens	Creeping buttercup	x	x	x	
Ranunculus sp.	Water-crowfoot				x
Rumex acetosa	Common sorrel	x	x	x	
Rumex sp.	Dock	x	x	x	
Senecio vulgaris	Groundsel			x	
Sonchus oleraceus	Smooth sow-thistle			x	
Stellaria media	Common chickweed		x	x	
Taraxacum officinale agg.	Dandelion	x	x	x	
Trifoliumsp.	Clover	x	x	x	
Urtica dioica	Common nettle	x	x	x	
Veronica hederifolia	Ivy-leaved speedwell	x	x	x	
Veronica serpyllifolia	Thyme-leaved speedwell	x	x	x	
Vicia spp.	Vetch	x	x	x	
Grasses, Sedges and Rushes					
Agrostis sp.	Bent grasses	x		x	
Alopecurus geniculatus	Marsh foxtail*				
Alopecurus pratensis	Meadow foxtail*				
Bromus hordeaceus	Soft brome*				
Bromus sterilis	Barren brome*				
Dactylis glomerata	Cock's-foot	x	x	x	
Deschampsia cespitosa	Tufted hair-grass		x		
Festuca rubra	Red fescue		x	x	
Glyceria sp.	Sweet-grass	x	x		x
Holcus lanatus	Yorkshire fog	x	x	x	
Hordeum murinum	Wall barley	x	x	x	
Juncus bufonius	Toad rush	x			
Juncus effusus	Soft rush	x			
Lolium perenne	Perennial rye grass	x	x	x	
Poa annua	Annual meadow-grass	x	x	x	
Poa pratensis	Smooth meadow grass	x	x	x	
Poa trivialis	Rough meadow grass*				

Latin name	Common Name	HABITAT TYPE								
		H1	H2	H3	H4	H5	H6	H7	H8	H9
Herb species										
Alliaria petiolata	Garlic mustard	x	x							
Arum maculatum	Lords-and-ladies	x	x	x	x		x	x		
Hyacinthoides non-scripta	Bluebell		x							
Primula veris	Cowslip		x							
Woody species										
Acer campestre	Field maple			x			x			
Acer pseudoplatanus	Sycamore		x							
Crataegus monogyna	Hawthorn	x	x	x	x	x	x	x	x	x
Fraxinus excelsior	Ash	x				x		x	x	x
Prunus spinosa	Blackthorn				x	x	x	x	x	x
Rosa arvensis	Field rose	x	x							
Rosa spp.	Rose								x	x
Rubus fruticosus agg.	Bramble	x		x	x	x	x	x	x	x
Salix caprea	Goat willow						x			
Salix fragilis	Crack willow				x		x			
Salix spp.	Willow sp.					x		x		
Sambucus nigra	Elder	x	x							
Tilia sp.	Lime		x							
Ulmus glabra	Wych elm	x	x		x		x	x		
Ulmus spp.	Elm								x	x

Appendix E

Evaluation & Assessment Methods

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

Establishing Potentially Important Ecological Features

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

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

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

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

Establishing Likely Zone of Influence

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

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

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

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

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

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

Geographic Context and Significance Criteria

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

- International
- National
- Regional
- County
- Local

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

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

Characterising Ecological Impacts and their Effects

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

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

Appendix F

Biodiversity Net Gain Assessment

Biodiversity Net Gain Assessment

Land at Gosford. Feburary 2022 (Rev B, November 2022)

This note has been prepared by CSA Environmental on behalf of Barwood Development Securities Ltd to support a Biodiversity Net Gain Assessment (BNGA) undertaken with respect to proposed development at Gosford.

1.0 Introduction

1.1 Residential development of up to 370 dwellings is proposed for Land at Gosford, to the south-east of Kidlington, Oxfordshire. Planning permission is sought, with all matters reserved except for access. The Site comprises three grassland fields bound by native hedgerows.

1.2 Local planning policy for Cherwell District Council states that "In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources".

1.3 This report provides supporting information to the BNGA in order that the results are clear and transparent for Cherwell District Council in their consideration of the development proposals. An extract of the Metric 3.0 calculator is included at the end of this report, whilst the full Metric will be available on request.

2.0 Assessment Methodology

2.1 Information used to assess baseline habitats was informed by an extended Phase 1 Habitat Survey initially undertaken in April 2017 but supported by multiple repeat visits to the Site up until February 2022. Formal condition assessments for the grassland, pond, hedgerows and trees were made in February 2022 to reflect the revised Biodiversity Metric 3.0 guidance. This is outside the optimal time for completing condition assessments of these habitat types however, prior knowledge of habitats has been used where appropriate, and a precautionary approach has been applied.

2.2 Baseline habitat areas have been mapped using the Habitats Plan (CSA/3263/100). Proposed habitats were measured using the Development Framework Plan (DFP) (CSA/3263/123). An iterative process was used to inform additional landscape/biodiversity enhancements that could be created at the Site and these have been illustrated on the Landscape Strategy Plan (CSA/3263/124) and

incorporated within the metric. Areas have been measured using QGIS and AutoCAD, respectively.

2.3 Calculation of biodiversity net gain units has been undertaken using the Natural England Biodiversity Metric 3.0 (July 2021, JP039); and follows guidance set out within the Biodiversity Net Gain: Good practice principles for development (Baker *et al.*, 2019).

3.0 Assumptions and Limitations

3.1 It is important to note that the development details and landscaping proposals are indicative at this stage. Several assumptions have been made to populate the metric, such as the composition of generic planting blocks or the target condition of new habitats. These are listed below for clarity along with any assumptions or decisions made with respect to baseline habitats and impacts:

Baseline habitats

- The on-site grassland is managed as permanent grassland, for grazing and hay/silage. The southern field has clearly been improved and all areas are species-poor, with some additional diversity at the boundaries.
- Minute areas of bramble scrub or tall ruderal vegetation have been considered as a component of the grassland, rather than measured as discrete habitats. Likewise, areas of bare/disturbed ground around gateways are not sufficiently large to classify separately.
- Recent impacts from archaeological investigations (bare ground over trenches or vehicle routes) have not been considered within the baseline
- Ditches are generally of low quality and considered to be supporting features to the on-site hedgerows - their value has been accounted for within the Hedgerows section of the metric.
- Several on-site hedgerows may fail condition criteria relating to the presence of undesirable species indicative of nutrient enrichment. Dense nettles are a feature of many of the hedgerows but this criterion has been passed on a precautionary basis as the assessment was made in the winter months and the amount of cover by undesirable species could not be accurately determined.

Proposed habitats

- Proposed development parcels are assumed to be a ratio of 70:30 built development to gardens as per guidance within the published Metric 3.0.
- As precise details of grassland areas aren't known it is assumed that most of the modified (amenity) grassland area within the sports pitch areas will be of poor condition though more general areas around the development could realistically achieve moderate condition.

- Larger areas of open space in the south of the Site can be retained and managed more favourably to target an improved grassland type and condition. Areas shown as wildflower grassland will target high-quality species-rich 'meadow' of good condition whilst more general areas used for dog walking etc will target moderate condition. Differing prescriptions for these grassland types have been outlined within a Biodiversity Improvements and Landscape Management Plan (BILMP) accordingly.
- Hedgerow enhancements will take the form of in-fill native planting and improved management for gappy hedgerows. The condition of all hedgerows at the Site is likely to improve as a result of the removal of livestock and improved management however this cannot reflected in the metric where the baseline condition already scores 'good'.
- There will be a range of tree planting across the development, to suit both urban/streetside and more naturalistic settings.
- SuDS basins and swales have been categorised as grassland, reedbed and scrub habitats as this is what will be implemented and managed. Specific drainage details will be available at the reserved matters stage but it is understood that there cannot be a permanently wet core to the basins.

3.2 The Biodiversity Metric and BILMP will be updated at the reserved matters stage to reflect the final detail of the development.

4.0 Baseline Assessment Criteria

Habitat Condition

4.1 Condition assessments for each baseline habitat type are detailed within Tables 1-5 in Appendix F.1 below and summarised within the Biodiversity Metric.

Strategic Significance

4.2 No strategic environmental policies were found to be of relevance to the on-site habitats or proposals. The proposed woodland planting along the southern boundaries of the Site has been assigned an increased strategic significance due to local policy (PR7a, Cherwell Local Plan 2011-2031 Partial Review) for woodland planting in this area, so as to create habitat connections with the nearby Stratfield Brake nature reserve.

5.0 Results

5.1 The Site currently contains **111.72** habitat units and **23.28** hedgerow units. All existing habitats are of either Low or Medium distinctiveness, with Modified grassland the dominant habitat type.

5.2 Hedgerow impacts are also indicative, but entail the loss of c. 150m hedgerow habitat across six hedgerow features, equating to a loss of 1.52 Hedgerow Units.

5.3 The proposed development scheme delivers **112.73** habitat units and **25.31** hedgerow units, resulting in a small net gain in units for both sectors (0.91% and 8.73%, respectively). This has been achieved through the following measures:

- Retention of boundary hedgerows wherever possible and improvements to hedgerows H4, H5 and the line of willows
- Implementation of new hedgerow planting, to comprise a hedgerow type of high quality and medium distinctiveness
- Retention, enhancement or creation of large areas of open space, including provision of wildflower meadow, native scrub, woodland, reedbed and trees, mostly habitats of increased distinctiveness, condition and wildlife value than the existing grassland.

5.4 Although not currently shown within the DFP, the final agreed layout will include additional formal landscaping such as ornamental shrub/flower beds which will have additional wildlife value. The detailed landscaping strategy will ensure incorporation of native plant species or varieties of known wildlife value. These will be included within the update BNG assessment at the reserved matters stage.

5.5 The habitat types being created have been designed to ensure ecological functionality is maintained. There is greatly increased tree provision across the Site to provide a net gain in habitat type and enhance connectivity across the formerly open site. Strategically valuable woodland planting along the southern boundaries is also valuable as an extended wildlife corridor with Stratfield Brake nature reserve. Proposed formal habitats will include a range of native plant species to maximise value to foraging and sheltering wildlife, alongside retained vegetation.

5.6 Proposed habitat conditions are ambitious yet achievable, with respect to likely future use and constraints at the Site. Most habitat types are assigned as poor condition within the metric on a precautionary basis though higher quality grassland, scrub and woodland areas are targeted. The likelihood of being able to achieve higher condition scores has been determined with regard to habitat-specific guidance within the Technical Supplement to Metric 3.0.

5.7 There will be a net loss of grassland habitat at the Site though this is balanced by the provision of improved quality grassland and other habitat types of higher distinctiveness (scrub, trees, woodland) which mean that the Habitat Trading scenario is acceptable.

5.8 In summary, the proposed development is calculated to provide a net gain of 1.01 habitat units and 2.03 hedgerow units, equating to a **0.91% net gain** in Habitat Units and a **8.73% net gain** in Hedgerow Units.

6.0 Conclusion

6.1 A Biodiversity Net Gain Assessment has been undertaken for the proposed development at Gosford.

6.2 Habitat losses on-site are limited to grassland of low-distinctiveness with some breaks to native hedgerows. Through provision of high quality natural habitats on-site, it has been demonstrated that a biodiversity net gain could be achieved on-site.

6.3 The assessment has been undertaken using indicative development proposals. A revised Metric would need to be completed at the detailed design stage, with associated landscape management plans amended accordingly to demonstrate how the target habitat conditions will be achieved. Post-development monitoring will also be secured to ensure that the proposed habitats have established, or are establishing, successfully to the required standard.

Appendix F.1

Habitat Condition Assessment Tables

Table 1: Hedgerow Condition Assessment

Hedge Ref	Condition Criteria										Comment	Condition
	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2		
H1	✓	✓	×	✓	✓	✓	✓	✓	×	✓	Outgrown native hedgerow with ditch and few trees. Scattered semi-mature/mature ash and field maple. Trees mostly clustered at south end.	Good
H2	✓	✓	×	✓	✓	×	✓	✓	✓	✓	Scrubby outgrown native hedgerow. Located behind fence so hasn't been grazed (more prominent nettles and ruderals). Three trees, 2 x field maple and 1 dead. Small amount of litter from footpath. Generally gappy but not significantly so. Would benefit from infill planting and management.	Good
H3	✓	×	×	✓	✓	✓	✓	✓	-	-	Young, tall hawthorn planted behind fence on road embankment, Line of semi-mature planted field maple behind not included as hedgerow. Partial ditch alongside road but this is not thought to be associated with the hedgerow. Much litter from roadside, particularly where Site runs alongside layby.	Good
H4	✓	✓	×	×	✓	✓	✓	✓	×	✓	Variable hedgerow with line of mature willow trees at east end. These may have once been part of the hedgerow though there is now limited scrub. They have been assessed separately as a Line of Trees. The remainder of the hedge has two mature, fallen willow trees. Water is held along the hedgerow in what is likely a filled-in ditch. There are multiple gaps and the canopy is high off the ground if low bramble is discounted. Trees are considered to be in good health as although they are fallen, this is typical of the species.	Moderate
H5	✓	✓	×	×	✓	×	✓	×	-	-	Native, gappy hedge, only one tree in poor health. Very heavily poached from cattle beneath hedgerow plants which have a high canopy, also much erosion at gateways. No ditch though pooling water suggests a ditch may have been present in the past and has filled in. Much nettle previously recorded.	Moderate
H6	✓	✓	✓	×	✓	✓	✓	✓	×	✓	Hedge with ditch and willow trees at south end, behind fence. Couple of wide gaps for telegraph/electrical pole support cables.	Good
H7	✓	✓	✓	(✓)	✓	✓	✓	✓	×	✓	Hedge with ditch and small number of trees. Double hedgerow, gaps present on either side of ditch though vegetation cover is mostly continuous as a while. Poaching by cattle severe in a small area (<10%)	Good
H8	✓	✓	×	✓	✓	✓	✓	✓	×	✓	Outgrown hedgerow with ditch and trees (semi-mature ash trees at north end).	Good

H9	✓	✓	✓	×	✓	✓	✓	✓	-	-	Short-section of mature shrubs with bramble along most of rest of length and only scattered taller shrubs. Recent manmade ditch north of hedgerow is not considered to be an associated feature.	Good

✓: Passes condition criteria, ×: Fails condition criteria

Note: As the condition assessment was made in winter, it is assumed on a precautionary basis that there is not significant cover by plants indicating nutrient enrichment (criterion D1) unless it was apparent at the time of visit from remnant stems.

Table 2: Line of Trees Condition Assessment

Pond Ref	Condition Criteria					Comment	Condition
	1	2	3	4	5		
-	✓	×	✓	✓	✓	Line of mature crack willows at east end of H4 where there are no/minimal hedgerow shrubs. Although the trees are fallen with much damage, these are classified as emerging veteran specimens. The 'damage' is also typical of the species rather than resulting from adverse impacts.	Moderate

Table 3: Grassland Condition Assessment (low distinctiveness grassland)

Field Ref	Condition Criteria							Comment	Condition
	1	2	3	4	5	6	7		
F1	×	×	✓	✓	✓	✓	✓	Largest field, managed for silage. Perennial rye-grass dominant with Yorkshire fog becoming more prevalent towards wetter eastern areas. Repeat visits to the site between 2017 and 2021 have confirmed few broadleaved-herb species, with a small number of common grasses. <4species/m2 recorded on average across the field in January 2022 though this is likely to be a slight under-representation given the winter conditions. Mousetail present in barer ground. Significant poaching and disturbance at gateway but this constitutes a small percentage of field area overall. Fewer undesirable species apparent in this field compared to others which may be related to management for silage rather than permanent grazing	Moderate
F2	×	×	✓	✓	✓	✓	×	Grazed grassland, perennial rye-grass dominant with few herbs. Patchy distribution by other grasses (bent, Yorkshire fog, cock's-foot, sweet-grass). Abundant thistles. Poaching at gateway and under hedgerows but relatively small area	Moderate
F3	×	×	✓	✓	✓	✓	×	Abundant thistle with docks and nettle, small areas of damage by cattle/bare ground. Perennial rye-grass dominated with patchy other grass species and common herbs (mainly creeping buttercup)	Moderate

Note: *Recent bare ground/disturbance created by trial trenching excavations have been ignored with respect to condition criteria 4 (physical damage) and 5 (bare ground) as this is a temporary impact relating to development activities and not a true reflection of the grassland condition*

Table 4: Pond Condition Assessment

Pond Ref	Condition Criteria									Comment	Condition
	1	2	3	4	5	6	7	8	9		
-	✓	×	✓	✓	✓	✓	✓	✓	✓	Unshaded field pond, accessible by cattle. Good vegetation cover (mostly *Glyceria* as well as small amounts of water-crowfoot). Water turbidity/quality likely to be affected by cattle though it was not obviously poor at the time of visit in Jan 2022. Surrounded by low distinctiveness grassland habitat. Good opportunities for enhancement.	Moderate

Table 5: Urban Tree Condition Assessment

Pond Ref	Condition Criteria						Comment	Condition
	1	2	3	4	5	6		
-	✓	✓	×	✓	✓	✓	Group of 11 crab apple, hawthorn and ash in north-east corner of Site. Heavily poached beneath by cattle. Small diameter, mostly continuous canopy. No apparent management: various deadwood for invertebrates	Good

Appendix F.2

Extract of Biodiversity Metric 3.0

(CSA version 1.4.1)

Land East of Kidlington

Headline Results

Return to results menu

On-site baseline	*Habitat units*	111.72
	Hedgerow units	23.28
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	112.73
	Hedgerow units	25.31
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	0.91%
	Hedgerow units	8.73%
	River units	0.00%

Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00

Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	1.01
	Hedgerow units	2.03
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	0.91%
	Hedgerow units	8.73%
	River units	0.00%

Trading rules Satisfied?	Yes

Appendix G

Bat Survey Report

1.0 Introduction

1.1 This report summarises the methods and results of bat survey work undertaken on land east of Kidlington between July 2017 and January 2022 by CSA Environmental on behalf of Barwood Development Securities Ltd.

2.0 Legislation

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

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

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

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

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

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

3.0 Methods

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

Preliminary Roost Assessment (PRA) of Trees

3.2 All trees on-site were inspected from ground level, using binoculars and high-powered torches as appropriate. Particular attention was given to woodpecker holes, limb splits, lifting bark, mature ivy stems.

3.3 An initial assessment was completed by Kate Kibble MCIEEM in July 2017. An update assessment was undertaken in September 2019 by Tom Hicks and Myles Sedgewick with a subsequent inspection of all accessible features made by Kate Kibble (licence no: CL18-12857) using an endoscope. A further update was then made by Kate Kibble in January 2022 to confirm the previous results were still appropriate.

3.4 A description of each tree was made, including the species, height, diameter at breast height and condition.

3.5 The aim of this inspection was to record direct (i.e. actual roosting bats) or indirect evidence of roosting bats (e.g. droppings), as well as the nature and number of features with 'potential' to support roosting bats. This includes consideration of trees to support bats whilst in hibernation.

Assessing 'Potential' of Trees to Support Roosting Bats

3.6 All trees were assigned to one of four categories in respect of their 'potential' to support roosting bats, or the confirmation of any bat roosts identified. 'Potential' in this context is taken to be the broad suitability of features to support roosting bats, based upon the nature, condition or structure of such features, in the absence of confirmed evidence of roosting.

3.7 Assigning the following categories is intended to determine the effort of any further targeted survey or inspections which are necessary to prove presence or likely absence of roosting bats, rather than to assign importance to such features.

3.8 The following categories are assigned to structures and/or trees herein, Either:

- ***Confirmed roost*** – where one or more bat roosts are identified during PRA inspections, either through direct sightings of bats, and/or indirect evidence such as bat droppings, Or;
- ***High*** – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

- ***Moderate*** – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, assessments at this stage are made irrespective of species conservation status).
- ***Low*** – A structure or tree with one or more potential roost sites 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 or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- ***Negligible*** – Negligible habitat features on site likely to be used by roosting bats.

Roost Surveys

3.9 Three trees identified to have high bat roosting potential were subject to further roost surveys in 2021 as the arboricultural consultant identified the likely need for future management of these trees, which could impact any bat roosts if present.

3.10 Two dusk emergence surveys and a dawn return-to-roost survey were undertaken to confirm the presence/likely absence of roosting bats in association with a mature ash tree (reference number T20 on the bat Roost Potential Plan in Appendix G.1) and two mature hybrid black poplar (T24 and T26).

3.11 The dusk emergence/pre-dawn re-entry surveys were undertaken for approximately 1.5 hours following British Summer Time (BST) sunset and 1.5 hours prior to BST sunrise respectively, with due consideration for the BCT good practice guidelines. The survey was/surveys were led on each occasion by Kate Kibble MCIEEM. Survey conditions are detailed in Table 1 below.

3.12 A combination of human surveyors and infrared cameras were used to survey the trees. For the poplar tree T24, a camera was used to film the complicated trunk and lower canopy features with a human surveyor watching the south aspect (survey #1) or the north aspect (surveys #2 and 3) when there were issues with livestock. The western poplar tree (T26) was viewed from the south only during the first survey and the north only on the final dawn survey (camera plus surveyor on both occasions). During the second emergence survey, a human surveyor was positioned to watch the north aspect of T26, with the camera on the south aspect, again because of disruption from livestock.

3.13 As the potential roosting features on ash tree (T20)(east aspect) were better defined and uncluttered by foliage, it was surveyed using either a single surveyor (second survey) or an unattended infrared camera set-up with Batlogger M bat detector.

3.14 During the surveys, the surveyors watched for any bats emerging or returning to roost within the trees, or using key flight lines. Surveyors were equipped with Batlogger M detectors to assist in determining species of bat and any associated behaviour. A note was made of all bat passes, along with the time, species and any information regarding behaviour, including direction of flight, and activity e.g. foraging/commuting.

3.15 Following the survey all bat calls were downloaded from the detectors and analysed using BatExplorer software to enable species identification, where possible, and quantitative analysis of the data. All camera footage was manually reviewed to identify any roosting behaviour.

Limitations

3.16 The first survey on 10 May was undertaken in marginal weather conditions with lower temperatures (12 -10°C) and a strong breeze. The survey had been rescheduled to avoid prolonged wet and cold conditions in late April/early May, though the weather remained suboptimal. It is likely that these conditions will have influenced general bat activity observed at the Site though it is expected that any roosting bats will still have emerged from the trees and thus been recorded, given the run of bad weather preceding the survey.

3.17 As described above, disruption from cattle meant that the poplar trees were not consistently surveyed on both sides. This means it's possible that some bat activity could have been missed however, as very little bat activity was recorded overall, and any bats that were detected were identified as non-roosting (e.g. they were seen to leave or arrive from areas away from the trees), the surveys are considered to provide an accurate representation of roosting status at the present time.

<u>Activity Surveys</u>

Historic Data

3.18 Transect and remote monitoring surveys were completed by CSA Environmental at the Site in July, August and September 2017. As a slightly different methodology was used compared with more recent (2019/2020/2021) activity surveys, it is not appropriate to combine the data or make robust inferences about the different datasets. As a result, subsequent sections within this report provide full details of the 2019-2021 data only, with a summary of findings from 2017 given in the Results section.

Transect Surveys

3.19 Transect surveys were undertaken in September 2019, May 2020 and July 2020 to cover the spring, summer and autumn periods. On each occasion a single transect route aimed to cover all accessible areas, features and habitats at the Site. Each transect route was repeated several times during each survey to minimise temporal bias.

3.20 An additional survey was completed in September 2021 to provide updated activity data.

3.21 Each transect was walked at a moderate and consistent speed with qualitative observations of bat behaviour made by the surveyor. Each survey commenced at sunset (British Summer Time), continuing for the following two hours.

3.22 Bat calls were recorded using Elekon Batlogger M detectors. This detector automatically records ultrasonic signals with a one second delay between recordings. Recordings of bat contacts were subsequently analysed using BatExplorer software, with sonograms reviewed to confirm bat identification to genera, or where possible, species level.

3.23 Each of the recorded files, which contain a variable number of call 'pulses', was designated a 'bat contact'. At the point of contact, each sound file is assigned a GPS location.

3.24 Transect surveys are intended to gather data on the spatial distribution of bat activity across the Site, identifying areas of relative importance for bats, including key flight lines. In addition direct observation of bats allows for qualitative assessments of how bats use the Site to be made complementing quantitative data collected through remote monitoring.

Remote Monitoring

3.25 Four Wildlife Acoustics Songmeter (SM2+/SM4) detector was deployed during in September 2019, May and July 2020, and September 2021 for at least five consecutive nights each month. The location of these Monitoring Locations (ML) are shown in Figure 1 below.

Figure 1. The locations of each Monitoring Location (ML) surveyed during remote monitoring surveys in September 2019, May 2020, July 2020 and September 2021. *(Note: No data was recorded for ML1 in May 2020)*

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

3.27 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 Brize Norton. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, (see Table 2) were taken forward for analysis.

3.28 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call pulses by a bat/s is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if

echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.

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

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

Limitations

3.31 Due to the presence of livestock on-site, the transect survey route was altered on occasion to avoid animals, particularly after dark although all areas were covered during the surveys.

3.32 The remote monitoring detector was damaged by horses during the May 2020 monitoring period and no data was recorded in that month at that location. This has been taken into account during the analysis.

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

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

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

4.0 Results

Preliminary Roost Assessment (PRA) of Trees

4.1 A total of 28 trees, one tree group and eight hedgerows were assessed for their bat roosting potential. A full table of results is provided in Appendix G.1. In summary, three trees of high roosting potential (T20, 24 and 26) and ten trees of moderate potential were identified. These are identified on the Bat Roost Potential Plan (CSA/3263/108) in Appendix G.1.

4.2 As detailed in Appendix G.1, T20 is a mature ash tree with several woodpecker holes, whilst T24 and T25 are mature hybrid black poplar trees with various damage and areas of decay. Trees assessed to have Moderate bat roosting potential were predominantly mature crack willows. These had assorted cracks, splits and hollows typical of the species. Many of the features were shallow, exposed or offered limited roosting potential, whilst others led to more significant crevices. No evidence of bat roosting was found using the endoscope but roosting features within these trees are likely to change regularly as the tree heals or new damage occurs.

Roost Surveys

4.3 During the first survey, four bat species were recorded. These comprise 11 common pipistrelle *Pipistrellus pipistrellus* bat contacts, three contacts from a noctule *Nyctalus noctula* (a single bat flying overhead) and two contacts from a soprano pipistrelle *Pipistrellus pygmaeus*. A single pass from a brown long-eared bat *Plecotus auritus* was recorded in the vicinity of tree T20 (ash tree). The earliest bat recorded was a soprano pipistrelle bat at 21:12 (29 minutes after sunset) near T26. No bats were observed to emerge from any of the surveyed trees, either by the observers or recorded camera footage.

4.4 The second dusk emergence survey recorded several passes by noctule bats commuting overhead as well as some foraging/commuting activity by common and soprano pipistrelle. Some foraging activity by soprano pipistrelle was recorded in association with the pond. The earliest bat recorded was a noctule at 21:54 (31 minutes after sunset) with the first pipistrelle bat not recorded until 22:23. No bats were seen or suspected to have emerged from any of the trees.

4.5 Bat activity during the dawn survey was dominated by continuous foraging activity along the northern side of hedgerow H7 and western end of field F3 by a single soprano pipistrelle bat (between 04:30 and 04:58). The bat was seen to leave the area to the west before a noctule bat commenced continuous foraging in the same location between 05:03 and 05:21. At the ash tree foraging activity was represented by common pipistrelle rather than soprano pipistrelle. No bats were seen or suspected to return to roost.

Table 1. Bat roost presence/absence survey timings and weather conditions

Survey Date	Sunset/ Sunrise Time	Start Time	End Time	Temp. (°C)		Cloud Cover (oktas)		Wind (Beaufort Scale)		Precipitation
				Start	End	Start	End	Start	End	
10/5/21	20:43	20:43	22:13	12	10	0	0	4	4	None
14/06/21	21:25	21:23	22:55	18	15	7	6	2	4	None
10/08/21	05:41	04:30	05:56	16	14	7	8	1	1	None

Activity Surveys

Transect Surveys

4.6 The weather conditions experienced during the transect surveys are provided in Table 2 below.

Table 2. Bat transect survey timings and weather conditions

Survey Date	Sunset Time	Start Time	End Time	Temp. (°C)		Cloud Cover (oktas)		Wind (Beaufort Scale)		Precipitation
				Start	End	Start	End	Start	End	
19/09/19	19:11	19:11	21:11	17	12	0	0	1	1	Dry
07/05/20	20:40	20:40	22:40	18	15	4	1	1	1	Dry
20/07/20	21:11	21:00	23:11	21	11	1	0	1	1	Dry
29/09/21	18:46	18:46	20:46	13	10	2	0	2	1	Dry

4.7 A minimum of six species were recorded during the transect surveys, comprising common pipistrelle, soprano pipistrelle, noctule, serotine *Eptesicus serotinus*, barbastelle *Barbastellus barbastellus* and unidentified species within the *Myotis* and *Nyctalus* genera.

4.8 The number of bat contacts recorded for each species are summarised in Table 3 below. The locations of each bat contact and the overall distribution of activity across the Site are illustrated in Figures 2 and 3.

Table 3. Summary of bat contacts recorded during transect surveys

Month	Barba-stelle	Common pipistrelle	Myotis species	Noctule	Nyctalus species	Serotine	Soprano pipistrelle
Sep19	2	182	1	1	0	4	51
May20	0	92	6	19	6	0	28
July20	0	42	0	0	10	0	5
Sep21	0	11	0	2	0	0	1
Total	**2**	**327**	**7**	**22**	**16**	**4**	**85**
%of Total	0.43	70.63	1.51	4.75	3.46	0.86	18.36

4.9 As pipistrelle activity dominated the transect surveys, Figures 2 and 2 have been split to show the distribution of non-pipistrelle contacts more clearly.

Figure 2. Locations of pipistrelle bat contacts recorded across all transect surveys

4.10 As can be seen from Table 3 and Figure 2, common pipistrelle make up the greatest proportion of bat activity recorded at the Site, accounting for c. 70% of all recorded bat contacts. This is likely to be a reflection of both greater abundance and prolonged foraging activity, which was particularly concentrated around the gateway near the centre of the Site's western boundary. Common pipistrelle were recorded on all boundaries of the Site, though there were fewer contacts in the north. This may be linked to the reduced boundary vegetation.

4.11 Figure 3 shows non-pipistrelle contacts recorded at the Site. Regular activity by noctule and/or Leisler's bat *Nyctalus leisleri* was recorded along the Site's western boundary which was well lit by the adjacent supermarket. Some of the contacts could be attributed to commuting bats passing over the Site though foraging activity was also observed. Earliest activity was mostly recorded between 20 and 30 minutes after sunset.

4.12 Other species were recorded in low numbers with a more easterly direction, though it should be noted that contacts by serotine *Eptesicus serotinus*, barbastelle *Barbastella barbastellus* and *Myotis* bats were mainly recorded on a single survey (see Table 3).

Figure 3. Locations of non-pipistrelle bat contacts recorded across all transect surveys

4.13 Figure 4 below provides an indicative illustration of 'hotspots' in bat activity recorded across all transect surveys undertaken at the Site (all species combined). A 'hotspot' of activity was recorded around the entrance gateway in the west of the Site, with multiple common pipistrelle (up to four) and noctule (two) seen foraging in this area during the surveys. This activity is consistent with observations from the 2017 surveys (see section 4.28) and it is suspected that heavy poaching/congregation of livestock in this area results in higher insect density. The bare ground may also generate warmer conditions for flying insects.

Figure 4. Indicative 'Utilisation Distribution' (UD) of all bat species/genera at the Site estimated from all transect data combined. The UD illustrates the relative probability of a bat in flight being present at a given point at the Site, with higher/central contours having a greater probability, and lower/peripheral contours having less probability.

Remote monitoring

4.14 The weather conditions experienced during the five nights where data was analysed are provided in Appendix G.2 at the end of this report.

4.15 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 5 below.

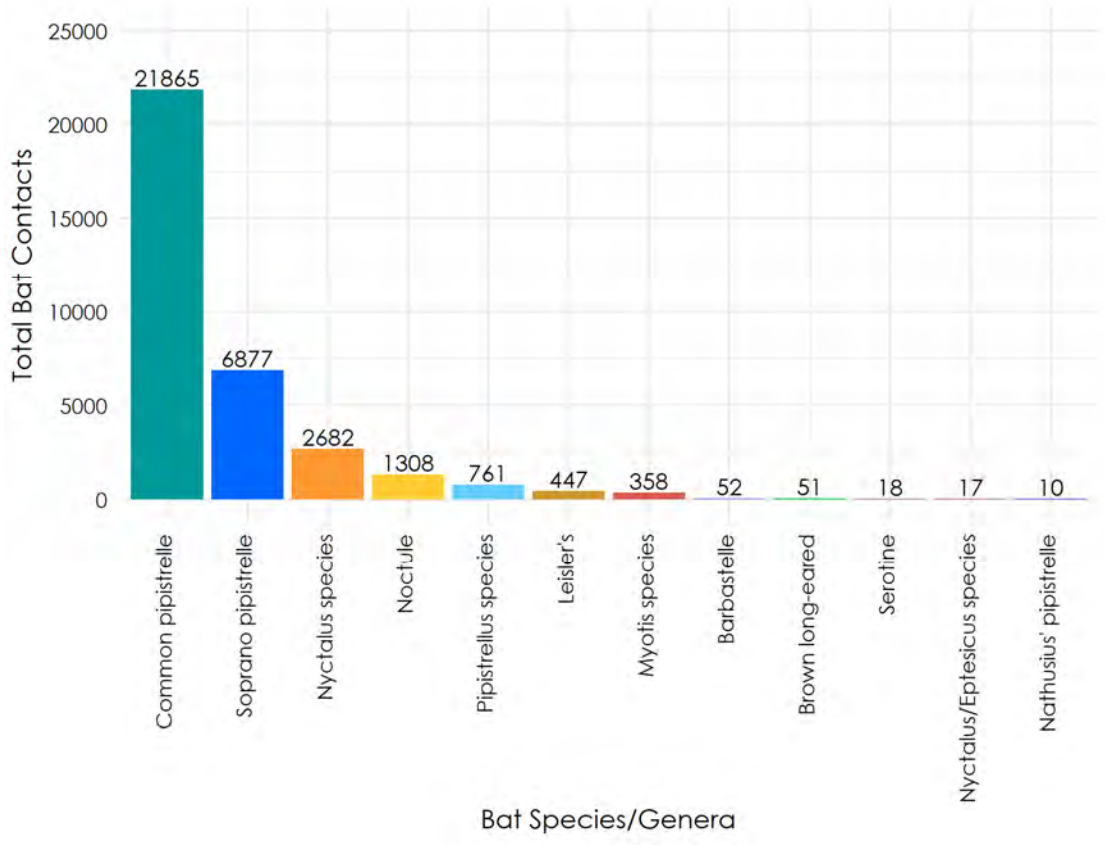


Figure 5. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations

4.16 Common pipistrelle bat was recorded in significantly greater numbers than other species at the Site, representing 63% of total bat contacts recorded. Most of activity was detected during the July monitoring period, with contacts by most other species also greatest at this time, at ML2 in the west of the Site (7,524 contacts recorded). This is consistent with continuous foraging activity by pipistrelle bats observed during the transect surveys.

4.17 Soprano pipistrelle was the next most frequently detected species at the Site. Greatest activity was regularly recorded at ML4, as well as at ML2 during the September 2021 monitoring period. Closer analysis of the data indicates this activity is likely to be associated with foraging behaviour (continuous contacts over discrete time periods).

4.18 Confirmed Nathusius' pipistrelle *Pipistrellus nathusii* contacts were recorded in low numbers at ML1, ML2 and ML4 during September 2019 and May 2020. Contacts were recorded sporadically over five nights during these periods, suggesting occasional use of the Site by Nathusius' pipistrelle.

4.19 A proportion of pipistrelle bat contacts were not confidently assigned to species level as had peak frequencies within the overlap range

between the three species. This are referred to as *Pipistrellus* sp. but are most likely to be either common or soprano pipistrelle bat contacts.

Table 4. Total bat contacts by species/genera recorded across all monitoring locations for each monitoring period

MONTH/ YEAR	Barbastelle	Brown long-eared	Common pipistrelle	Leisler's bat	Myotis species	Nathusius' pipistrelle	Noctule	Nyctalus species	Nyctalus/Eptesicus species	Pipistrellus species	Serotine	Soprano pipistrelle
Sep 19	43	20	5304	6	199	5	296	543	0	172	0	2112
May 20	0	2	2554	5	10	5	158	592	0	215	0	662
Jul 20	2	17	11867	436	96	0	804	1360	15	366	18	2350
Sep 21	7	12	2140	0	53	0	50	187	2	8	0	1753
Total	**52**	**51**	**21865**	**447**	**358**	**10**	**1308**	**2682**	**17**	**761**	**18**	**6877**

4.20 Noctule bat calls are variable and can overlap in their characteristics with the rarer Leisler's bat. Where calls fell clearly within the typical range for either species, they were assigned as such, with all other ambiguous contacts assigned as *Nyctalus* sp. There is also some overlap with serotine bat, hence the classification of some contacts as *Nyctalus/Eptesicus*. This group of bats were recorded at all parts of the Site, with highest levels of activity at ML2 and ML4. This is somewhat consistent with observations of foraging and commuting bats recorded during transect surveys (see Figures 3 and 4). It should be noted that these bats have a loud echolocation call and bats may be recorded from some distance away. Noctule bat contacts were predominantly recorded around dawn and dusk, which would indicate detection of bats passing overhead and foraging at these times. Leisler's bat contacts on the other hand, were mostly recorded during the night with almost continuous activity recorded at ML4 on the nights of 17-19 July 2020. The calls indicate foraging behaviour and multiple species were present during this time (recording files contained a common pipistrelle, soprano pipistrelle and Leisler's bat) suggesting exploitation of a temporarily abundant food resource associated with the hedgerow or grassland (as calls can be recorded from some distance away).

4.21 *Myotis* recordings are likely to relate to several species of bat. These have not been classified any further than genus level as the calls exhibit significant overlap and cannot be confidently identified. *Myotis* bats were recorded at all monitoring locations in similarly low numbers. Greatest activity (65 contacts) was recorded at ML1 in September 2019.

4.22 Barbastelle bat are considered to be nationally rare although they are widespread in England. The species was detected at all four monitoring locations though almost all activity (29 contacts of a total 52 contacts) was recorded at ML1 in September 2019. Recordings were made over

several nights with short bouts of activity suggesting foraging behaviour, likely by a single individual.

4.23 Very low activity was recorded by brown long-eared bat and serotine during the surveys although it should be noted that brown long-eared bats are typically under-recorded due to their quiet echolocation call. Serotine were recorded during July 2020 only, with all contacts at ML4 except for one contact recorded at ML2.

4.24 Figure 6 and Figure 7 below shows the variance in nightly activity levels for each of these bat species recorded on-site. The data has been split between the two graphs to prevent the much higher pipistrelle bat data from obscuring the other results.

4.25 The activity data is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 15-20 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.

4.26 More detailed data describing these graphs are provided in Table 5.

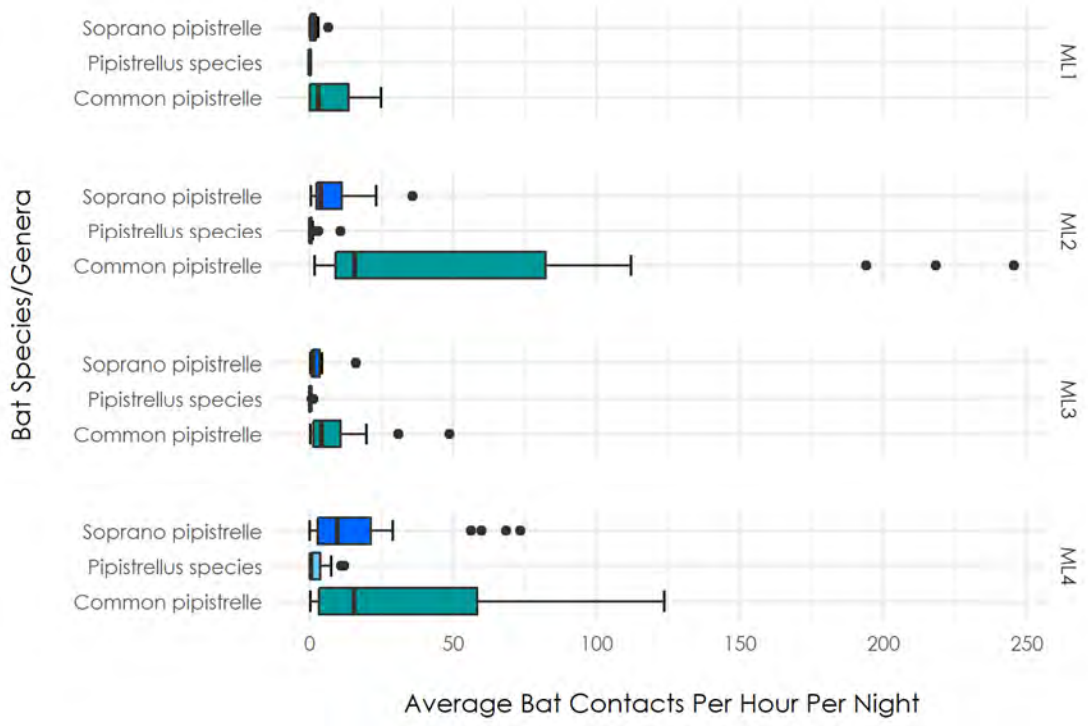


Figure 6. Average bat contacts per hour per night for common and soprano pipistrelle bats recorded across all remote monitoring periods

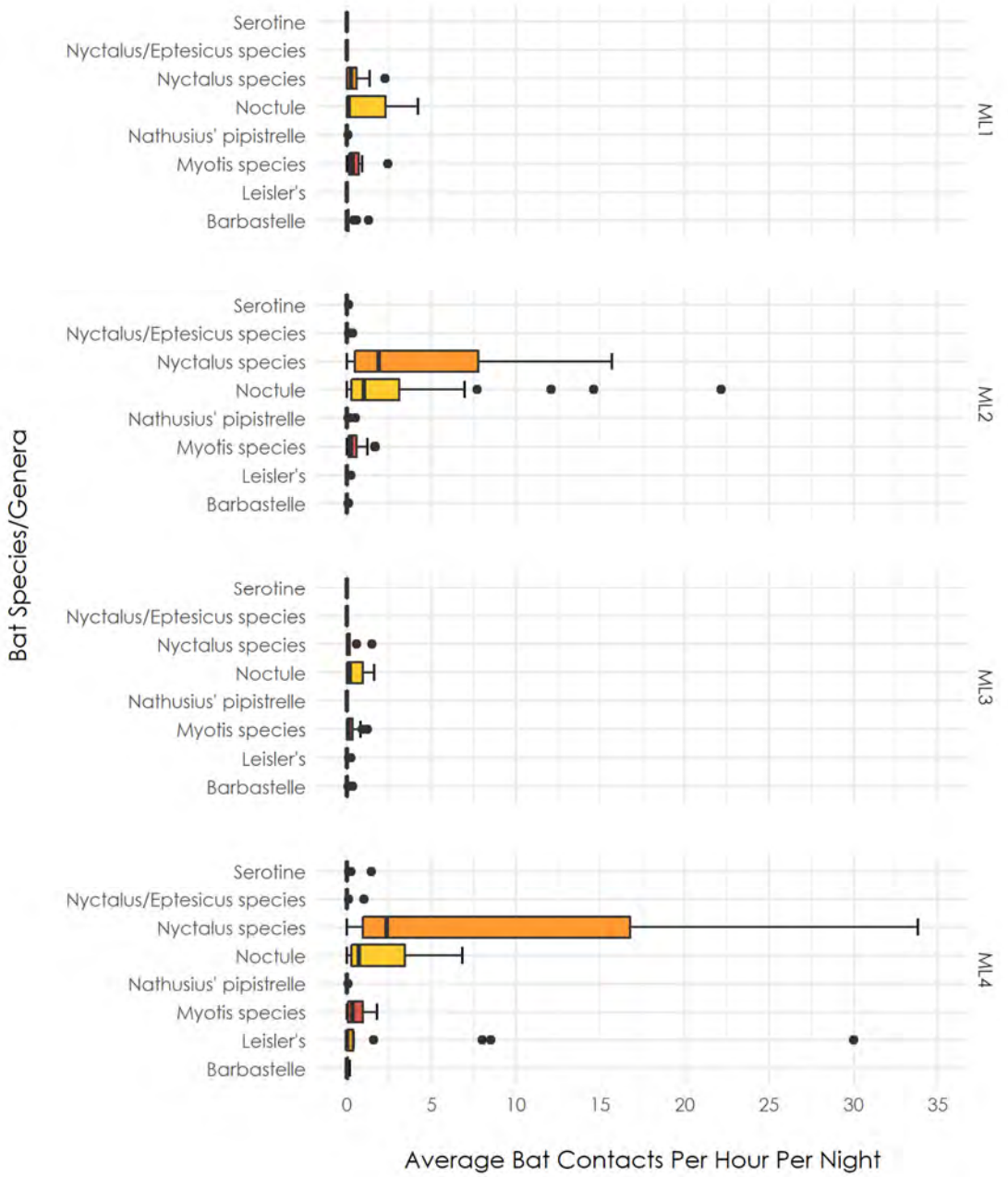


Figure 7. Average bat contacts per hour per night for each bat species/genera recorded across all remote monitoring periods (excluding common and soprano pipistrelle).

4.27 This data shows that whilst there is considerable overlap in the average bat contacts per hour per night at each location, higher levels of bat activity were most commonly found at monitoring points ML2 and ML4. These two locations are linked by the western Site boundary hedgerow and it is possible that this hedgerow forms a key foraging area or commuting route. This south-west area of the Site was seen to be well-lit by the adjacent Sainsbury's supermarket although the species that appear to make most use of this area are those known to be less sensitive to light-spill (Stone, 2013).

Table 5. Average bat contacts per hour per night recorded during remote monitoring surveys

ML	SPP	Average bat contacts per hour per night				Total Contacts	Number of Nights Monitored
		Min	Max	Median	IQRange		
ML1	Barbastelle	0.000	1.290	0.000	0.112	31	15
ML1	Brown long-eared	0.000	0.449	0.000	0.112	15	15
ML1	Common pipistrelle	0.000	24.839	2.951	13.431	1080	15
ML1	Leisler's	0.000	0.000	0.000	0.000	0	15
ML1	Myotis species	0.000	2.419	0.341	0.564	87	15
ML1	Nathusius' pipistrelle	0.000	0.081	0.000	0.000	1	15
ML1	Noctule	0.000	4.205	0.111	2.301	182	15
ML1	Nyctalus species	0.000	2.260	0.242	0.568	61	15
ML1	Nyctalus/Eptesicus species	0.000	0.000	0.000	0.000	0	15
ML1	Pipistrellus species	0.000	0.341	0.000	0.138	13	15
ML1	Serotine	0.000	0.000	0.000	0.000	0	15
ML1	Soprano pipistrelle	0.000	6.290	1.604	1.628	257	15
ML2	Barbastelle	0.000	0.081	0.000	0.000	2	20
ML2	Brown long-eared	0.000	0.227	0.037	0.112	14	20
ML2	Common pipistrelle	1.619	245.506	15.603	73.319	11381	20
ML2	Leisler's	0.000	0.246	0.000	0.000	5	20
ML2	Myotis species	0.000	1.695	0.226	0.460	105	20
ML2	Nathusius' pipistrelle	0.000	0.504	0.000	0.000	8	20
ML2	Noctule	0.000	22.159	1.009	2.837	697	20
ML2	Nyctalus species	0.000	15.706	1.870	7.290	809	20
ML2	Nyctalus/Eptesicus species	0.000	0.341	0.000	0.000	7	20
ML2	Pipistrellus species	0.000	10.734	0.176	0.645	183	20
ML2	Serotine	0.000	0.112	0.000	0.000	1	20
ML2	Soprano pipistrelle	0.305	35.714	3.900	8.819	2030	20
ML3	Barbastelle	0.000	0.323	0.000	0.019	11	20
ML3	Brown long-eared	0.000	0.373	0.000	0.121	15	20
ML3	Common pipistrelle	0.075	48.710	3.943	9.424	1976	20
ML3	Leisler's	0.000	0.225	0.000	0.000	4	20
ML3	Myotis species	0.000	1.217	0.112	0.329	58	20
ML3	Nathusius' pipistrelle	0.000	0.000	0.000	0.000	0	20
ML3	Noctule	0.000	1.611	0.158	0.935	94	20
ML3	Nyctalus species	0.000	1.469	0.078	0.152	36	20
ML3	Nyctalus/Eptesicus species	0.000	0.000	0.000	0.000	0	20
ML3	Pipistrellus species	0.000	1.129	0.091	0.173	35	20
ML3	Serotine	0.000	0.000	0.000	0.000	0	20
ML3	Soprano pipistrelle	0.151	15.977	1.015	2.713	544	20
ML4	Barbastelle	0.000	0.149	0.000	0.076	8	20
ML4	Brown long-eared	0.000	0.224	0.000	0.076	7	20
ML4	Common pipistrelle	0.151	123.483	15.321	55.101	7428	20
ML4	Leisler's	0.000	30.000	0.000	0.355	438	20
ML4	Myotis species	0.000	1.798	0.320	0.869	108	20
ML4	Nathusius' pipistrelle	0.000	0.080	0.000	0.000	1	20
ML4	Noctule	0.000	6.848	0.705	3.141	335	20
ML4	Nyctalus species	0.000	33.820	2.369	15.847	1776	20
ML4	Nyctalus/Eptesicus species	0.000	1.008	0.000	0.000	10	20
ML4	Pipistrellus species	0.000	11.982	0.444	3.615	530	20
ML4	Serotine	0.000	1.461	0.000	0.000	17	20
ML4	Soprano pipistrelle	0.000	73.446	9.489	18.606	4046	20

Historic Data

4.28 Whilst not directly comparable, monitoring data was collected from the same locations in 2017 as described above. The same species assemblage was recorded on-site and activity patterns were broadly similar, in that bat contacts were dominated by common and soprano pipistrelle and noctule/*Nyctalus* bats. Greater foraging activity by serotine was recorded during the transect survey of July 2017, with bat/s seen frequently around the western access gateway and hedgerow. As in 2019-21, bat activity was greatest along this western boundary compared with other areas of the Site.

5.0 Summary

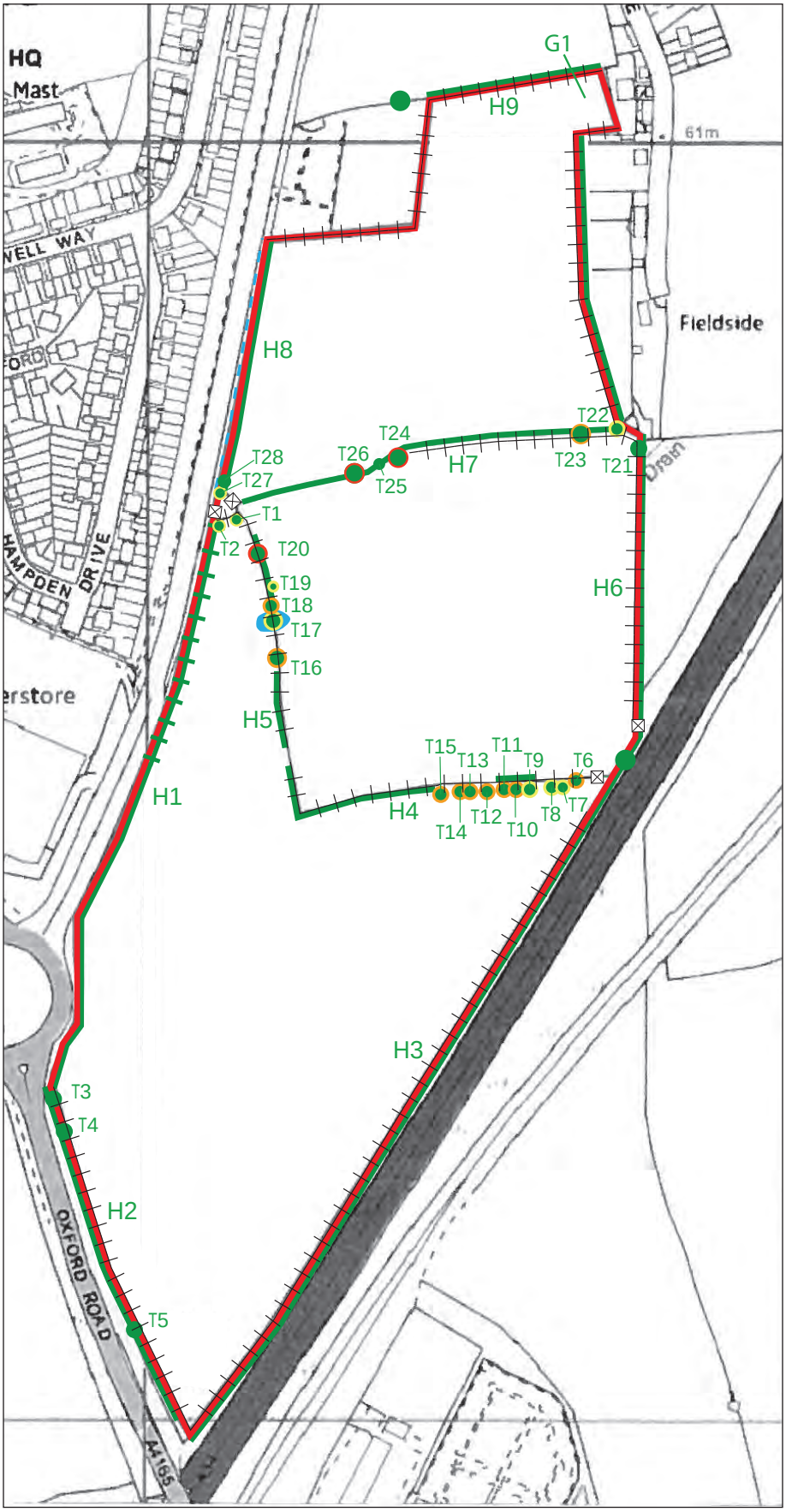
5.1 A minimum of nine species of bat have been recorded at the Site, with evidence of commuting and foraging behaviour. No bat roosting has been confirmed although trees on-site do have potential for this and further precautionary surveys should be undertaken prior to commencement of works.

5.2 Activity was dominated by common and widespread species including common and soprano pipistrelle and noctule bat, although the rarer barbastelle and Leisler's bat were also recorded.

5.3 Monitoring locations in the west of the Site were found to support greatest bat activity. Foraging behaviour is likely to have been influenced to some degree by the presence of livestock.

Appendix G.1

Preliminary Roost Assessment of Trees: Detailed Results and Plan



Legend

- Survey area
- Hedgerow
- Hedgerow with trees
- G1 — Tree group reference no.
- Hx/Tx — Hedgerow/Tree reference no.
- Tree with Negligible bat roosting potential*
- Tree with Low bat roosting potential
- Tree with Moderate bat roosting potential
- Tree with High bat roosting potential

As per the Bat Survey Guidelines, 3rd edition (Collins, 2016)

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Project	Land East of Kidlington, Oxfordshire	Drawing No. CSA/3263/108	Rev -
Drawing Title	Bat Roost Potential Plan: Trees	Scale @ A4 Not to scale	Drawn KK
Client	Barwood Development Securities Ltd	Date August 2017	Checked AM

Project No.	3263	**Project Name**		Land East of Kidlington
Date	19/09/2017, updated 18/01/2022	**Surveyor**		TH / MS / KK

Suitability	**Description Roosting Habitats**
Roost	A known or confirmed tree roost present.
High	Trees with one or more potential roosting features (PRFs) 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.
Moderate	Trees with one or more potential PRF's 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.
Low	Trees of sufficient size and age to contain PRFs but none seen from the ground or features seen only with very limited roost potential.
Negligible	Negligible habitat features likely to be used by roosting bats.

Tree ID No.	**Species**	**Pruning/ Breakout wounds**	**Cracks/splits**	**Woodpecker Holes**	**Loose Bark**	**Ivy Cover**	**Description of features (including aspect of feature)**	**Bat Roost Suitability (28/07/17)**
H1	Various					++	Mature hedge with some ash, poplar and sycamore. No PRFs seen. Viewed from east side only	Low
H2	Various						Gappy mature hedge with three trees. No PRFs observed	Negligible
H3	Various						Offsite hedgerow with some mature shrubs. No PRFs observed. Only visible from west side	Negligible
H4	Various						Old hedgerow with no PRFs observed	Negligible
H5	Various					+	Gappy old hedgerow, some trees with dead ivy stems	Low
H6	Various						Offsite hedgerow with some mature shrubs. No PRFs observed. Only visible from west side	Negligible
H7	Various					+	Semi mature hedgerow with trees and some older shrubs with mature ivy stems and small splits	Low

H8	Various						Dense hedgerow with some semi mature and mature ash trees. No PRFs seen. Viewed from east side	Negligible
G1	Various						Small group of hawthorn, ash and apple trees with no PRFs observed	Negligible
T1	Ash					+++	Semi mature, multi-stemmed tree with dense ivy obscuring trunk. No PRFs seen	Low
T2	Ash					+++	Semi mature tree with thick ivy stems covering trunk	Low
T3	Sycamore						Mature tree in good condition. No PRFs observed	Negligible
T4	Sycamore						No PRFs seen	Negligible
T5	Sycamore						No PRFs seen	Negligible
T6	Willow		+				Hollow in trunk at 1m which extends up to c. 30cm but small in diameter. Several fused branches at 0.5-1m with roosting potential.	Moderate
T7	Willow		++				Collapsed mature tree with shallow bark fissures. Split/collapsed branch with possible unseen cavities	Low
T8	Willow		+				Leaning tree with small holes at the base extending into trunk	Low
T9	Willow		++				Mature tree with vertical crack but which is mostly exposed and does not appear to extend into a cavity	Low
T10	Willow		++		+		Dead wood and several cavities each with low potential. Loose bark where splitting. Potential split and cavity features below 2m where limbs collapsing	Moderate
T11	Willow		++				Partially collapsed tree with multiple potential cavities.	Moderate
T12	Willow		+	+(dropped)	+		Collapsing tree with multiple potential cavities. Loose bark where rotting. Old woodpecker hole. Other potential cavities and channels inside main stem.	Moderate

T13	Willow		+				Cavity in branch inspected with endoscope but contained lots of rot and debris- not currently used for roosting. Low, spreading large limb with at least one large central cavitiy c.1m above ground(inside hedge)	Moderate
T14	Willow		+		+		Tree collapsed and twisted creating fissures leading to potential crevices. Exposed heartwood with roosting potential for small numbers of bats. Open wounds.	Moderate
T15	Willow		++				Large, collapsed and twisting tree with broken and snapped branches containing horizontal splits. Some cavities but nothing of high suitability observed	Moderate
T16	Willow		++		++		Collapsed tree with lots of dead wood. Heartwood mostly exposed but some cavities and splits with roosting potential low to the ground and exposed	Moderate
T17	Willow						Fallen tree with broken branches. No PRFs observed	Low
T18	Willow		++				Small tree with cracked and exposed trunk but low potential. Cavity present behind heartwood on west branch which has roosting potential	Moderate
T19	Willow		+				Fallen tree with cracked trunk and small cavity with low potential.	Low
T20	Ash		+++	+++			Mature tree with some dead branches, branch snag at c. 6m and a snapped branch. Several woodpecker holes on east side in addition to a vertical cavity extending into the trunk	**High**
T21	Ash						Tall tree appearing to be in good condition. No PRFs observed. Visible only from west side	Negligible
T22	Ash						Tree within hedgerow, appears to be in good condition. No PRFs observed. Viewed only from south side	Low

T23	Ash	+	++				Mature tree in hedgerow. Fissure on east side extending from base with decay and possible cavity. Possible cavity on south-east aspect of south leader	Moderate
T24	Poplar		+++		+	++	Large tree with a diameter of 1.2m. Thick ivy stems and extensive bark plates, some dead wood with possible cavities behind at c. 3m on the south side. Basal split with crevices extending and lots of cavities within.	**High**
T25	Poplar						Semi mature tree. No PRF seen	Negligible
T26	Poplar	++			+	++	Large tree with a diameter of 1.5m. Young ivy cover and snagged branch with several cavities including three rot holes in upper branches on north-east side, hazard beam/tear our on north aspect of north branch. Assorted hollows at broken ends of branches on north and south aspect. Horizontal crevice on south-west aspect of upper north-west leader	**High**
T27	Dead		+				Dead tree with a hole that has low potential.	Low
T28	Ash						No PRFs observed, view obscured by hedgerow.	Negligible

Appendix G.2

Remote Monitoring Weather Conditions

Survey Month	Dates Sampled	Temperature (°C)		Precipitation	Cloud Cover (%)		Wind (km/hr)	
		Min	Max		Min	Max	Min	Max
September	13/09/19	10	13	Dry	0	7	2	9
September	14/09/19	10	14	Dry	0	0	8	10
September	15/09/19	0	16	Light freezing rain at 06:00	44	100	6	8
September	16/09/19	-4	10	Dry	14	65	7	10
September	17/09/19	7	9	Dry	5	14	4	13
May	02/05/20	6	8	Dry	7	83	1	4
May	03/05/20	7	9	Dry	87	100	1	9
May	04/05/20	5	11	Dry	5	58	19	24
May	05/05/20	1	6	Dry	9	22	12	18
May	06/05/20	6	11	Dry	0	8	4	11
July	15/07/2020	13	14	Dry	32	90	12	15
July	16/07/2020	14	16	Light rain at midnight	36	93	6	10
July	17/07/2020	13	15	Dry	42	83	13	16
July	18/07/2020	11	16	Moderate rain at 03:00, heavy rain from 06:00	82	100	7	13
July	19/07/2020	8	14	Dry	1	28	12	15
September	29/09/2021	7	9	Dry	11	100	12	20
September	30/09/2021	13	14	Light rain until 03:00	100	100	27	31
September	01/10/2021	8	9	Dry	13	100	13	17
September	02/10/2021	9	11	Rain from 03:00	74	100	7	37
September	03/10/2021	9	10	Light rain shower at 03:00	34	86	17	20

Appendix H

Great Crested Newt Survey Report

1.0 Introduction

1.1 This report has been prepared by CSA Environmental on behalf of Barwood Development Securities Ltd. It sets out the findings of a great crested newt Habitat Suitability Index (HSI) and eDNA survey undertaken at Land East of Kidlington, Oxfordshire (hereafter 'the site'). Residential-led development is proposed at the Site, for which outline planning permission is sought.

2.0 Legislation

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

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

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

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

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

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

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

Licensing

2.6 Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence

may be granted by Natural England to permit an act that would otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:

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

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

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

3.0 Methods

Desktop Study

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

3.2 The on-site pond was subject to a Habitat Suitability Index (HSI) assessment in 2017, using the standard approach set out by Oldham et al (2000). The 'pond permanence' score was subsequently altered after it was noted that the pond didn't fully dry out in subsequent years. These assessments were undertaken by Kate Kibble MCIEEM (Class Survey Licence CL08 – Registration number: 2015-16710-CLS-CLS).

3.3 Other ponds identified during the desktop search were scoped out of further assessment as they are separated from the Site by at least one major road (A34, A4260) which would form a barrier to great crested newts.

Environmental DNA (eDNA) Sampling

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

3.5 Water samples were collected from the on-site pond on 4 May 2018 by Kate Kibble MCIEEM with an update sample taken on 22 May 2020 by

Alex Perry ACIEEM (Class Survey Licence CL08 – Registration number: 2015-18118-CLS-CLS). Appropriate biosecurity measures were taken to avoid cross contamination of great crested newt eDNA and the samples were taken according to methodology provided by FERA and ADAS, he laboratories which subsequently analysed the samples using Polymerase Chain Reaction (PCR) analysis.

4.0 Results

Desktop Study

4.1 The desk-based search for ponds identified one pond on-site and eight water bodies occurring within 500m of the Site. These comprise:

- Three ponds alongside the eastern embankment of the railway line c. 230, 250m and 420m east of the Site (*great crested newt present)*
- A linear pond at Stratfield Farm c. 320m west of the Site
- A small field pond c. 350m south-east of the Site*)*
- Two ponds within the Oxford Parkway Park and Ride site, c. 380-400m south-east of the Site
- A large golf course pond c. 400m south of the Site (*great crested newt present)*

4.2 Great crested newts have been recorded within the golf course pond c.400m south of the Site and within the network of ponds alongside the railway, east of the A34. Whilst these ponds are located within the typical dispersal distance for great crested newts, they are separated from the Site (and the on-site pond) by likely barriers to amphibian dispersal (the A34 and/or A4260) meaning that the on-site pond is considered to be isolated from potential colonisation by this species.

Habitat Suitability Index (HSI) Assessment

4.3 The primary HSI Assessment was carried out of the on-site pond in 2017, where the pond was considered to provide 'poor' suitability for breeding great crested newts (HSI score 0.45). However, the 'pond permanence' score was subsequently altered from 'dries annually to 'sometimes dries' after several years of visiting the Site. The revised HSI score is 0.54, suggesting a 'below average' suitability for breeding great crested newts.

4.4 Full results of the HSI assessment are provided in Table 1 below.

Table 1. HSI survey results (2018 and 2020)

SI No.	**SI Description**	***SI Value***
1	Geographic location	*1.00*
2	Pond area	*0.10*
3	Pond permanence	*0.50*
4	Water quality	*0.67*
5	Shade	*1.00*

6	Water fowl effect	*1.00*
7	Fish presence	*1.00*
8	Pond Density	*0.10*
9	Terrestrial habitat	*0.67*
10	Macropyhyte cover	*0.90*
HSI Score		***0.54***
Pond suitability		***Below Average***

Environmental DNA (eDNA) Sampling

4.5 eDNA samples taken in 2018 and 2020 were both found to be negative for great crested newt by the testing laboratory. Neither sample was reported to be inhibited or degraded in any way which might otherwise cast doubt on the negative result.

4.6 Full results of the eDNA analysis are provided within the laboratory reports appended to this document.

5.0 Summary

5.1 Great crested newts have been found to be absent from the on-site pond. Due to the presence of major roads surrounding the Site, there is also considered to be negligible likelihood of great crested newts making use of on-site habitats or colonising the on-site pond.

Appendix H.1

eDNA Laboratory Reports

DNA Analysis Report - Commercial in Confidence

Customer:	CSA Environmental
Address:	Unit 1, Deer Park Business Centre Woollas Ha Pershore Pershore Worcestershire WR10 3DN
Contact:	[redacted]
Email:	[redacted]
Tel:	[redacted]
Report date:	04-May-2018
Order Number:	GCN18-0811
Samples:	Pond Water
Analysis requested:	Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:
The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (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. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive:	DNA from the species was detected.
eDNA Score:	Number of positive replicates from a series of twelve.
Negative:	DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive:	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

DNA Analysis Report - Commercial in Confidence

CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
-	S18-003878	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in the sample submitted. Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

Issuing officer: Steven Bryce
Tel: 01904 462 070
Email: e-dna@fera.co.uk

DNA Analysis Report - Commercial in Confidence

Customer:	CSA Environmental
Address:	Unit 1, Deer Park Business Centre Woollas Ha Pershore Pershore Worcestershire WR10 3DN
Contact:	[redacted]
Email:	[redacted]
Tel:	[redacted]
Report date:	22-May-2020
Order Number:	GCN20-1247
Samples:	Pond Water
Analysis requested:	Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (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. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive:	DNA from the species was detected.
eDNA Score:	Number of positive replicates from a series of twelve.
Negative:	DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive:	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

DNA Analysis Report - Commercial in Confidence

CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
-	S20-012933	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in the sample submitted. Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

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