CSA environmental

Land at Tollgate Road,
Colney Heath

Ecological Impact Assessment

Prepared by
CSA Environmental

on behalf of
Vistry Group

Report No: CSA/3925/05

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

Report Reference	Revision	Date	Prepared by	Approved by	Comments
CSA/3925/05	-	29/06/2022	MD/AC	JW	
	A	04/08/2022	MD	AC	Updated to include further survey work

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EXECUTIVE SUMMARY

Residential development is proposed at Land at Tollgate Road, Colney Heath, for which outline planning permission is sought.

CSA Environmental was instructed by Vistry Group 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 comprises hedgerows and grassland habitats including the on-site Colney Heath Farm Meadows LWS alongside areas of buildings and hardstanding associated within a residential dwelling and horse stables. The scheme seeks to retain, and protect and enhance both the LWS and on-site hedgerows, as far as possible alongside development. Measures have been set out which would deliver these aims, including habitat management and education of new residents.

Habitats on-site have been found to support populations of foraging/navigating bats and grass snake. Robust safeguards and mitigation measures are proposed to avoid potential impacts to these protected species and ensure construction works are undertaken lawfully. Measures have also been proposed in respect of safeguarding badgers, riparian mammals, nesting birds and amphibians. A sensitive external lighting scheme is proposed in order to minimise adverse effects on nocturnal animals making use of the Site and surrounding habitats.

Opportunities to secure a Biodiversity Net Gain (BNG) have been explored on-site through habitat enhancement measures, with off-site habitat restoration and/or creation required to secured this objective. Any off-site requirement would be secured through the provision of an appropriate mechanism/financial contribution, subject to agreement.

Based on successful implementation of the proposed avoidance, mitigation and enhancement, the development is not anticipated to result in any significant residual negative effects on important ecological features. Subject to the implementation of the advice herein, the scheme would accord with all relevant nature conservation legislation, as well as with the provisions of City and District of St Albans District Local Plan.

1.0 INTRODUCTION

1.1 This report has been prepared by CSA Environmental on behalf of Vistry Group. It sets out the findings of an Ecological Impact Assessment (EcIA) of proposed development at Land at Tollgate Road, Colney Heath (hereafter referred to as 'the Site'). Residential development is proposed at the Site, for which for which outline planning permission is sought.

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

1.3 The Site occupies an area of c. 7.82ha and is located around central grid reference TL 20860 05495, to the south-west of Hatfield. It consists of a residential property, a riding stables with associated paddocks, areas of modified and other neutral grassland and a stable block (see Habitats Plan in Appendix A). The Site is bound by Colney Heath village to the north, with the River Colne along the south-western boundary and grassland and arable fields in the wider landscape.

1.4 An initial desk study and extended Phase 1 Habitat survey were undertaken for the Site in September 2020 as part of a Preliminary Ecological Appraisal, this was updated to include a UK Habitat Classification survey in May 2022, the findings of which are presented herein. In addition, the following further survey work was undertaken between March and July 2022

- Botanical Survey and Condition Assessment (May 2022)
- Preliminary Roost Assessment (March 2022)
- Bat Surveys (May-July 2022)
- Riparian Mammal Surveys (April and July 2022)
- Reptile Surveys (May-June 2022)

1.5 This EcIA aims to:

- Establish baseline ecological conditions at the Site.
- Determine the importance of ecological features which could be affected by the proposed scheme.
- Identify any likely significant impacts or effects of the proposed development on important ecological features, in the absence of mitigation, including cumulative impacts.
- Set out any measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
- Identify any compensation measures required to offset residual impacts.

- Set out potential ecological enhancement measures that may be secured by the proposed scheme, and quantify the overall net change in biodiversity using the Biodiversity Metric 3.1.
- Confirm how proposed mitigation, compensation and enhancement measures could be secured.
- Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be imposed by the relevant authority.

1.6 An EcIA can be used for the appraisal of projects of any scale. This is a best practice evaluation process, recommended by CIEEM (2018). It is intended that the evaluation of findings presented here-in will aid the St Albans 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
- The Wildlife and Countryside Act 1981 (as amended)
- The Natural Environment and Rural Communities (NERC) Act 2006
- The Protection of Badgers Act 1992
- The Environment Act 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.

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 An ecological desk study was undertaken in February 2022 comprising a review of online resources and biological records centre data as detailed below.

3.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed 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

3.3 Hertfordshire Environmental Records Centre (HERC) was contacted in September 2020 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.

3.4 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.

3.5 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 16 September 2020 by Alexandra Cole MCIEEM, FISC[1] Level 4, encompassing the Site and immediately adjacent habitats that could be viewed.

UK Habitat Classifications Survey

3.8 A UK Habitat Classification ('UKHab') survey was carried out in fine and dry weather conditions on 19 May 2022 by Alexandra Cole MCIEEM and Bethany Wilson ACIEEM, encompassing the Site and immediately adjacent habitats that could be viewed.

3.9 UKHab is a unified and comprehensive system for mapping and classifying habitats, designed to provide a simple and robust approach to surveying and monitoring, and replaces Phase 1 Habitat survey methods. The method allows for identification of important habitat types, including habitats of Principal Importance under Section 41 (S41) of the NERC Act (2006) and Habitats Directive Annex I habitats. This method also allows for direct translation of habitats into the current Biodiversity Metric (Natural England, version 3.1).

3.10 The following parameters were adopted for the UKHab survey undertaken for this EcIA:

- UKHab Professional edition (Butcher et al., 2020, commercial End User Licence Agreement (EULA))
- Minimum Mappable Unit (MMU):
    - 10m²/0.001ha (polygons)
    - 5m (linear)
- Primary Habitats recorded to a minimum of Level 2 (see below) with UKHab codes provided
- Mandatory secondary codes used
- Base-mapping comprising a combination of aerial imagery and topographic information

3.11 Primary Habitats are recorded to a minimum of Level 2. Where the survey is conducted at an appropriate time of year (e.g. May to July for grassland) habitats may be recorded to Level 3, 4 or 5, only if conditions and the experience of the surveyor allow.

3.12 To assist with classification of grassland habitats quadrat samples were taken during the UKHab survey on 19 May 2022 by Alexandra Cole MCIEEM, FISC Level 4 and Bethany Wilson ACIEEM. Representative sample locations were identified within each grassland parcel, spread evenly to avoid habitat transitions or ecotones, following a 'W' shape

[1] Field Identification Skills Certificate, Botanical Society of Britain and Ireland

through the parcel and a covering a minimum of five sampling locations. Both average (mean) species count per m^2 and peak species counts are reported for comparison.

3.13 Identification of habitat stands were made arbitrarily by the surveyor based upon obvious habitat structure, composition or other delineating feature (e.g. field or enclosure).

3.14 Quadrats of 1m x 1m were used, repeated four times in each sample location (i.e. 2m x 2m or $4m^2$). This technique assists, for example, with distinguishing between modified (g4) and other neutral (g3c) grasslands (using the threshold of nine species per m^2, reporting an average of the four samples) and of lowland meadows (g3a) (using the threshold of 35 species per 2m x 2m samples).

3.15 Alongside the UKHab survey, additional field survey information was collected, comprising:

- Detailed floral species lists recorded for each identified habitat/parcel
- Further habitat condition information based upon current Biodiversity Metric (Natural England, version 3.1) condition assessment guidance
- 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)
- Any other survey information relevant to ecological matters

3.16 Results of the UKHab survey are presented on the Habitats Plan in Appendix A. Appendix A also provides photographs of the habitats at the Site and Appendix D provides a list of floral species recorded in each habitat parcel. Nomenclature for higher plants within this report is consistent with the fourth edition of The New Flora of the British Isles (Stace, 2019).

Further Survey Work

3.17 The following detailed field survey work was carried out between March and July 2022, with full methods and results provided in the relevant Appendices:

- Preliminary Roost Assessment (Appendix G)
- Bat Activity Surveys (Appendix G)
- Riparian Mammal Surveys (Appendix H)
- Reptile Surveys (Appendix I)

Limitations

3.18 There were no specific limitations to the desktop study or extended UKHab survey, which was conducted at a suitable time of year and in good weather conditions.

Evaluation and Assessment

3.19 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.

3.20 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 A single international statutory designation was identified within 10km of the Site; two national statutory designations within 3km and; three local statutory designations were identified within 3km of the Site. These statutory designations are described in Table 1 below.

Non-Statutory

4.3 Thirteen non-statutory designations were identified within 1km of the Site. These non-statutory designations are described in Table 1 below.

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

Site Name & Designation	Distance & Direction from Survey Area	Special Interests or Qualifying Features
International Designations within 10km		
Wormley Hoddesdon Park Woods SAC	c. 9.7km east	Designated for its hornbeam forests with sessile oak standards. Woodlands support bluebell and great wood-rush with carpets of mosses.
National Designations within 3km		
Water End Swallow Holes SSSI	c. 2km south-east	Willow carr/swamp community adjacent to chalk sinkholes are of importance, along with semi-natural woodland, scrub and semi-improved grassland.
Redwell Wood SSSI	c. 2.4km south	Combination of ancient woodland comprising pedunculated oak and hornbeam, with heathland. Alongside well developed scrub and secondary woodland.
Local Designations within 3km		
Colney Heath LNR	c. 0.2km north-west	Acid heathland bordering River Colne. One of the few remaining acid heathlands in Hertfordshire.
Oxleys Wood LNR	c. 2.3km north-east	Woodland with pond.
Howe Dell LNR	c. 2.8km north-east	Hornbeam, oak and beech woodland with stream.
Non-Statutory Designations within 1km		
Colney Heath Farm Meadows LWS	On-site	Mosaic of unimproved neutral to acid grasslands along River Colne. Lower lying areas support a range of wetland species and a pond is present. Other habitats include a scrub-lined ditch, alder plantation and hedgerow.
Frederick's Wood LWS	c. 0.1km west	Mature mixed plantation on old heathland/acid grassland.
Colney Heath Common LWS	c. 0.2km north-west	Includes a stretch of the River Colne. The common supports a remnant of

		heathland with a mosaic of neutral, acid and marshy grasslands, heathland, scrub and riverine habitats. Species include several scarce or local distributed in the county.
Tollgate Wood LWS	c. 0.4km east	Old, secondary broadleaved woodland with a semi-natural canopy and varied structure.
North Mymms Park	c. 0.4km south-east	Parkland of semi-improved neutral grassland with frequent planted trees and small ponds along north-eastern edge.
Scrubby Grassland by Frederick's Wood LWS	c. 0.4km south-west	Unimproved acid grassland with some scattered to dense patches of hawthorn.
Walsingham Wood LWS	c. 0.5km south-west	Part ancient semi-natural pedunculated oak/hornbeam woodland with areas cleared and replanted with conifer and broadleaf species.
Coursers Farm Area LWS	c. 0.6km south-west	Building and environs important for protected species.
Sleapshyde Gravel Pit LWS	c. 0.8km north-west	Former gravel put restored to an amenity/wildlife park. Mosaic of habitats with open water, wet neutral grassland, tall herbs, scattered scrub and plantation.
Tyttenhanger Gravel Pits North LWS	c. 0.8km west	Former agricultural and park land adjacent to the River Colne supporting and area of sand and gravel pits, many of which are flooded. Sand pits form the largest and most important site for sandy ground bees and wasps in Hertfordshire with several nationally notable/rare species recorded. Flooded pits are prime regional site for breeding waders.
The New Plantation LWS	c. 1.0km south-west	Old secondary woodland with a semi-natural canopy and varied structure.
St. Mark's Churchyard and Graveyard LWS	c. 1.0km north-west	Churchyard and graveyard supporting old unimproved neutral to acid grassland with hedgerows and trees.
The Old Vicarage, St. Marks Close, Colney Heath LWS	c. 1.1km north-west	Building and environs important for protected species.

Ancient Woodland

4.4 There is no ancient woodland covering any part of the Site or immediately adjacent land. No trees on or adjacent to the Site are listed on the Ancient Tree Inventory. The closest ancient woodland is Walsingham Wood LWS, with the ancient component of this woodland c. 1.0km south-west of the Site.

Habitats and Flora

4.5 Habitats recorded on-site are illustrated in Appendix A with detailed species lists provided in Appendix D. Relevant UKHab codes are

provided within parentheses for each habitat type recorded e.g. Other Neutral Grassland (g3c).

4.6 No invasive non-native plant species were identified during the UKHab survey or subsequent visits to the Site.

4.7 The biodiversity value of baseline habitat units has been determined through assessment using the Natural England Biodiversity Metric 3.1 (Appendix F).

Notable Flora Records

4.8 The HERC provided 215 records of 60 notable plant species from within the search area. The majority of records provided are historic, including a single record for the Hertfordshire vulnerable species lady's-mantle *Alchemilla filicaulis* subsp. *vestita*, recorded within pasture habitats located to the west of the Site in 1990. Lady's-mantle was identified on-site in 2022, occurring rarely within Colney Heath Farm Meadows LWS (F2) in the south of the Site.

4.9 Also of note is Japanese knotweed *Fallopia japonica*, recorded between 2013 and 2016. Japanese knotweed is included within the Wildlife and Countryside Act's Schedule 9 list of invasive non-native species. All records provided were more than c. 1.0km from the Site to the north-west and this species was not recorded at the Site.

4.10 Other species identified within the search area include those associated with grassland and arable habitats, as reflected in the habitats both on-site and in the surrounding area, in addition to species associated with acidic/heathland habitats. The Hertfordshire Ecological Network Map provided for the Site and surrounding area suggests that grassland habitats along the western boundary of the Site could be suitable for restoration, with suggested target habitats including acidic open/neutral grassland or wetland.

Field F1 – Other neutral grassland (g3c); horse grazed (61)

4.11 Field F1 dominates the Site and is grazed on rotation. When not grazed the field is also used to ride horses and as such is subject to varying levels of disturbance throughout the year. In its un-grazed state F1 comprises an un-managed other neutral grassland with a relatively diverse range of herb species found. Perennial ryegrass *Lolium perenne* and cock's-foot *Dactylis glomerata* are abundant, with crested dog's-tail *Cynosurus cristatus*, red fescue *Festuca rubra*, Yorkshire-fog *Holcus lanatus*, common bent *Agrostis capillaris*, timothy *Phleum pratense,* soft-brome *Bromus hordeaceus* and smooth meadow-grass *Poa pratensis* also present occasionally throughout the sward.

4.12 Herb species include yarrow *Achillea millefolium*, white clover *Trifolium repens*, field speedwell *Veronica persica*, broad-leaved dock *Rumex obtusifolius*, creeping buttercup *Ranunculus repens*, bulbous buttercup

Ranunculus bulbosus, common bird's-foot trefoil *Lotus corniculatus*, meadow vetchling *Lathyrus pratensis,* goat's-beard *Tragopogon pratensis*, red clover *Trifolium pratense*, hogweed *Heracleum sphondylium*, ragwort *Senecio jacobaea*, ribwort plantain *Plantago lanceolata*, lady's bedstraw *Galium verum*, smooth sow-thistle *Sonchus oleraceus*, creeping thistle *Cirsium arvense* and creeping cinquefoil *Potentilla reptans*.

4.13 Some areas of bare ground are present along the boundaries of F1, mainly to the north, west and south-western corner of the field. These areas comprise nettle, dock *Rumex* sp., white dead-nettle *Lamium album* and fat-hen *Chenopodium album* agg.

4.14 Grassland quadrats undertaken in May 2022 identified the following species-abundance:

- Average (mean) species-richness of 8 species per m^2 (11 species per $2m^2$).
- Peak species-richness of and 12 species per m^2 (16 species per $2m^2$)

4.15 The above data accords with the species-richness typically expected for other neutral grasslands.

Field F2 – Other neutral grassland (g3c); horse grazed (61)

4.16 The entirety of F2 falls within Colney Heath Farm Meadows LWS. At the time of the initial survey in September 2020, this grassland was horse grazed with a short sward and patches of common nettle indicative of localised nutrient enrichment from the presence of manure. During the condition assessment in May 2022 the grassland was un-grazed, with grazing resuming late May 2022.

4.17 Field F2 runs alongside the off-site River Colne and sits within the flood zone for this river. Perennial ryegrass and meadow foxtail is frequent in the sward with red fescue, sweet vernal-grass *Anthoxanthum odoratum*, smooth meadow-grass, rough meadow-grass *Poa trivialis,* cock's-foot, common bent, soft-brome, Yorkshire-fog and annual meadow-grass *Poa annua* also present. Hairy sedge *Carex hirta* and field wood-rush *Luzula campestris* are also present within the sward. Patches of bare ground are present, restricted to the area adjacent to the access gate.

4.18 Herb species are abundant and diverse with a total of ten species identified which are listed on the designation for Colney Heath Farm Meadows LWS, including the locally scarce species lady's mantle *Alchemilla vulgaris* agg.

4.19 Grassland quadrats undertaken in May 2022 identified the following species-abundance:

- Average (mean) species-richness of 12 species per m^2 (19 species per $2m^2$).
- Peak species-richness of and 17 species per m^2 (24 species per $2m^2$)

4.20 The above data accords with the species-richness typically expected for other neutral grasslands, albeit with some areas approaching the richness of lowland meadow grasslands.

Field F3 – Other neutral grassland (g3c); horse grazed (61)

4.21 Field F3 is a small heavily horse grazed field adjacent to the stable yard. The sward within F3 is short with bare patches. The intense grazing pressure has led to a noticeably less diverse grassland compared with F1 and F2. Species present include perennial ryegrass, yarrow, dandelion, dove's-foot crane's-bill, ribwort plantain, spurge, red dead-nettle *Lamium purpureum*, dock, white clover, bulbous buttercup and common mouse-ear.

4.22 North-east of F3 two small areas of grassland have been fenced off to provide a small area of grassland around the manège and access from the stable yard to F1. Both areas are subject to similarly intensive grazing as F3, with large patches of bare ground in the grass corridor, due to frequent footfall and poaching.

Modified grassland (g4); mown (64)

4.23 A small section of short-mown grassland to the east of the Site is utilised as an amenity area with children's play equipment and small vegetable beds present. A chicken coup is also present at the western end of this area. Grass species are dominated by false oat-grass and perennial rye-grass, with a low number of herb species including white clover, common nettle, dock sp. and ribwort plantain.

Developed land: sealed surface (u1b) & unsealed surface (u1c)

4.24 Small areas of hardstanding are present around the on-site buildings, with a manège adjacent to the stable block. Ephemeral vegetation has grown within areas of hardstanding and around the edge of the manège including shepherd's-purse *Capsella bursa-pastoris*, pineappleweed *Matricaria discoidea*, spurge, common poppy *Papaver rhoeas*, greater plantain *Plantago major*, common nettle, perennial ryegrass, annual meadowgrass, mugwort, red dead-nettle, knotgrass and mallow.

Buildings (u1b5)

4.25 A single residential building (B1), with associated garage is present within the Site. It comprises a two-storey brick built detached property with pitched roof and a pebble dashed exterior. Within the garden are four more buildings (B2-B6). B3 and B4 are garden sheds and B2 is an outhouse, all of which are single storey and of wooden construction. B6 is a standalone static home of plastic construction. B7 comprises a

single-storey brick built stable block, adjacent to the manège. A number of flat roofed metal storage containers are present either side of B7.

4.26 The on-site buildings are discussed in more detail in Appendix G.

Vegetated Garden

4.27 The on-site residential property (B1) has a long narrow garden which comprises a frequently mown lawn of limited species diversity and areas of introduced ornamental scrub. These areas largely comprise introduced garden species including montbretia *Crocosmia* × *crocosmiiflora*, bamboo *Pleioblasus* sp., spotted laurel *Aucuba japonica* and butterfly-bush *Buddleja davidii*.

Waterbodies (r2)

4.28 The River Colne runs off-site to the south-west, alongside F2. Vegetation along the eastern bank of the river comprises a range of mature trees including ash, alder *Alnus glutinosa*, poplar *Populus* sp., willow *Salix* sp., hawthorn and goat willow *Salix caprea*. Dense ivy cover is present on some trees with a sparse understorey comprising blackthorn, elder and smaller hawthorn trees. Ground flora includes a mix of ruderal, grass and herb species including common nettle, creeping thistle, bramble, false oat-grass, perennial ryegrass, meadow foxtail *Alopecurus pratensis*, meadowsweet *Filipendula ulmaria*, hogweed and herb Robert.

Hedgerows & Trees

4.29 Six hedgerows are present, mainly within the east of the Site. Hedge H1 runs along the north-western boundary of the Site and comprises hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* with elder *Sambucus nigra*. It is managed to a height of c. 1.5-2.0m and a width of c. 1.5m and has a number of gaps. Ground flora include bramble *Rubus fruticosa* agg., cow parsley *Anthriscus sylvestris*, cleavers *Galium aparine*, ivy *Hedera helix*, common nettle, garlic mustard, white dead-nettle, common toadflax *Linaria vulgaris* and red dead-nettle.

4.30 Hedge H2 is a garden privet *Ligustrum ovalifolium* boundary hedgerow which runs alongside the hardstanding at the entrance to the centre of the Site. It is c. 1.5m tall by 1.0m wide and has no gaps. Ground flora species include cow parsley and false oat-grass.

4.31 Hedge H3 runs alongside the areas of modified grassland and into F1. It is c. 2.0m tall, 1.0m wide and has been previously flailed. H3 is dominated by hawthorn with a single elder and low growing blackthorn. Ground flora includes purple toadflax *Linaria purpurea*, dandelion, false oat-grass, ribwort plantain, bramble, mugwort *Artemisia vulgaris*, common nettle, cow parsley, spurge and herb Robert *Geranium robertianum*.

4.32 Hedge H4 is a short, but well-established section of blackthorn hedgerow with ash *Fraxinus excelsior* and hawthorn. It is c. 2.0-3.0m wide and c.

6.0m tall. The width is likely managed to prevent encroachment on F1. A mature oak tree is present just off-site, at the northern end of H4.

4.33 The south-eastern edge of the Site is demarked by H5, a defunct, gappy hedgerow managed to c. 1.5m tall by c. 1.0m wide. This hedgerow comprises blackthorn, hawthorn, holly Ilex aquifolium and rose *Rosa* sp. and runs c. halfway along the south-eastern boundary.

4.34 Patchy sections of boundary hedgerows and shrubs are also present along the north-eastern boundary of the Site, where residential gardens meet F1. Species present include hawthorn, bramble, elder, firethorn *Pyracantha* sp., lilac *Syringa vulgaris*, rose, apple *Malus* sp., *Prunus* sp., beech Fagus sylvatica, holly, hazel and Leyland cypress *Leylandii x Cupressocyparis leylandii*.

4.35 Hedge H6 is a row of c. 60m of hawthorn within F2 which runs along the fence line between F1 and F2. Blackthorn and dogwood are also present. The trees are c. 6.0m tall and 2.0-3.0m wide where the width is outgrown and gaps are present. Further north of this tree line lies a single semi-mature oak *Quercus* sp. tree and a dead tree (species unidentified).

Fauna

Bats

Desk Study

4.36 A total of 321 bat records were identified within the search area, dating from 1985 to 2018. These include the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared *Plecotus auritus,* Natterer's bat *Myotis nattereri*, Daubenton's bat, *Myotis daubentonii* and three records for whiskered bat *Myotis mystacinus.* A number of records were also recorded for pipistrelle *Pipistrellus* sp. and 'bat' *Chiroptera* spp. which could not be identified to species level. The closest recent record is for soprano pipistrelle (c. 0.6km from the Site). The closest record provided for a roost is for a common pipistrelle roost c. 1.5km south-east of the Site, dating from 2016.

4.37 Details of European Protected Species licences obtained from Natural England are available on the MAGIC website. No records for bat licences were provided for within 2.0km of the Site.

Use of the Site

4.38 Grassland habitats within and around the Site provide suitable foraging habitat for bats, although this suitability is reduced when grasslands are short-grazed. Hedgerows provide connectivity across the Site, although this is again limited due to the short/gappy nature of these features. Significantly, the off-site but adjacent River Colne provides a key

navigational feature in the wider landscape. Several small woodlands are located within the area surrounding the Site, providing potential roosting opportunities for bats with larger woodland blocks c. 2.0km north-east around Hatfield House, including Milward's Park ancient replanted woodland.

4.39 Six structures are present within the Site, including a residential property and horse stables. These buildings are labelled B1-B6 (see Habitats Plan in Appendix A). All buildings were determined to have 'Negligible' roosting potential and no further precautions are required in this regard.

4.40 Remote monitoring of the Site for bats was undertaken in May, June and July 2022 and has identified a minimum of seven species using the Site including common pipistrelle, soprano pipistrelle, noctule, brown long-eared, serotine *Eptesicus serotinus* and Leisler's *Nyctalus leisleri*. Additionally, a small number of contacts (14, 10 and 24 respectively) were attributable to *Nyctalus* sp., *Myotis* sp. and *Pipistrellus* sp. which could not be identified to species level.

4.41 Bat activity was dominated by common pipistrelle (87% of total contacts), however contacts attributable to noctule bats were noted to be comparatively high, comprising 6% of the total number of contacts. The remaining contacts only comprised 7% of the total number of contacts.

4.42 Four contacts from a serotine bat and two contacts from Leisler's bat were detected. These are notable species which are rare to uncommon in England and widespread, but scarce within Hertfordshire.

4.43 See Appendix G for detailed results of the bat surveys undertaken.

Importance

4.44 The Site supports a modest number of bat species (at least seven of the 12 species known to be present in Hertfordshire). However, activity levels were low for all species with the exception of common pipistrelle and noctule, on average, less than one contact per hour per night. This reflects the broad assessment that habitats at the Site provide interest for foraging and commuting bats but that this is limited by the current management of the Site and condition of the hedgerows.

4.45 Based on the survey work undertaken, the Site is concluded to be of Local importance only in respect of bats. All habitats on-site are of importance to foraging and commuting bats, but opportunities exist to improve management and the condition of these habitats which will increase their ability to support these species. The adjacent River Colne is also of greater importance to bats.

Badger

Desk Study

4.46 The HERC have provided 20 records of badger *Meles meles* from within the search area, dating from 1960 to 2017. The closest record is c. 0.6km from the Site, however the grid reference provided is only accurate to 1.0km. No records were provided for setts within the last 25 years.

Use of the Site

4.47 Hedgerows and field margins on-site provide opportunities for badgers to dig setts, with grassland across the Site providing suitable foraging habitat. A rabbit warren was identified underneath H6 in F2, the holes were not of a size or shape suggestive of use by badger and no evidence of badger was identified around the warren.

Importance

4.48 Badgers are not of current conservation interest. However, both badgers and their setts are protected under the Protection of Badgers Act 1992 and are therefore included in the assessment of effects below in the context of this legislation.

Dormouse

Desk Study

4.49 A total of two historic records of dormouse *Muscardinus avellanarius* were identified within the search area, dating from 1975 and 1994.

Use of the Site

4.50 The Site provides very limited suitable habitat for dormice with only short sections of hedgerow present which lack the species diversity required to provide suitable foraging for dormice. Dormice are therefore considered absent from the Site and are not considered further within this report.

Riparian Mammals

Desk Study

4.51 A total of four historic records of water vole *Arvicola amphibius* were identified within the search area, dating from 1967 to 1998. No records were provided for otter *Lutra lutra*. The closest water vole record is c. 3.0km from the Site, to the north-west along the River Colne.

Use of the Site

4.52 The River Colne runs adjacent to the Site to the west and is known to historically support water vole. The river and its banks provide suitable habitat to support water vole and otter should they still be present within the surrounding area.

4.53 Two dedicated water vole and otter surveys were undertaken in April and July 2022. No signs of water vole or otter were identified despite the watercourse providing some suitable sheltering and foraging opportunities for both species. It was noted during Site visits in June and the dedicated survey in July, that the section of the River Colne adjacent to the Site was mostly dry, reducing its suitability to support these species.

4.54 See Appendix H for detailed results of the water vole and otter surveys undertaken.

Importance

4.55 Based on the survey work undertaken, lack of recent records and lack of evidence of water vole or otter using the adjacent stretch of the River Colne, these species are considered absent from the Site. However, given their legal protection they are therefore included in the assessment of effects below in the context of this legislation.

Hedgehog

Desk Study

4.56 Seventeen records of hedgehog *Erinaceus europaeus* were identified within the search area, dating from 1960 to 2015. A single record was provided from the adjacent off-site field to the north-west, from 1966. The closest recent record was from 2016, c. 0.7km north-west of the Site near Bullen's Green.

Use of the Site

4.57 Garden habitats in the surrounding area, in addition to long grassland and hedgerow habitats on-site provide suitable foraging and hibernation opportunities for this species. However, given the dominance of open habitat, the Site is unlikely to support a resident population of hedgehog, although some limited opportunities are provided on-site by the boundary field margins and hedgerows. As such, if present, they are likely limited to small numbers.

Importance

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

Birds

Desk Study

4.59 A total of 43,872 records of 165 bird species were identified within the search area, dating from 1986 to 2016.

Use of the Site

4.60 Grassland and hedgerow habitats on-site provide foraging and nesting opportunities for a range of common bird species and are not likely to support a bird assemblage of significant importance.

Importance

4.61 All wild birds are protected under the Wildlife & Countryside Act 1982 (as amended) and are therefore taken through to assessment on this basis.

Reptiles

Desk Study

4.62 A total of 25 records of three reptile species were identified within the search area including grass snake *Natrix natrix* (syn. *N. helvetica*), slow worm *Anguis fragilis*, and common lizard *Zootoca vivipara*. Records were mostly historic, with three records for grass snake from 2000-2004. The closest of these records was c. 0.2km north-west of the Site.

Use of the Site

4.63 When present, longer grassland habitats at the Site provide suitable habitat for reptile species with connectivity to suitable habitats in the surrounding area. However, frequent grazing of the grasslands reduce their suitability to support a substantial reptile population.

4.64 Survey work was undertaken at the Site in 2022 and identified a single adult grass snake along the northern Site boundary.

4.65 See Appendix I for detailed results of the reptile surveys undertaken.

Importance

4.66 A single grass snake was identified during the survey work, suggesting a small population of grass snake utilises the Site. Given that similar habitats continue off-site, this individual is likely to be part of a larger population which is present across the Site and surrounding habitats. The population of grass snake on-site is therefore anticipated to be of at least Local importance. In addition, given the legal protection afforded to reptiles, these species are taken through to the assessment section on this basis also.

Amphibians

Desk Study

4.67 A total of 117 records of two amphibian species were identified within the search area, including great crested newt *Triturus cristatus* and common toad *Bufo bufo.* Twenty-two records were historic, dating from 1902 to 2001, with 95 records dating between 2011 and 2017. All records were separated from the Site by the River Colne or the A1(M).

4.68 No potential breeding ponds were identified on-site during the site survey, although four appear to be present within a dispersible range of the Site, based on OS mapping. However, these ponds are all located beyond significant dispersal barriers. The MAGIC online database provided two records of a European Protected Species Mitigation Licence (EPSML) for GCN (EPSM2013-5578, 2015-11388-EPS-MIT) from around Coursers Farm c. 0.8km from the Site boundary, beyond the dispersal distance for this species.

Use of the Site

4.69 Tall grassland and hedgerow habitats on-site provide some limited terrestrial opportunities for amphibians to refuge and forage, and for dispersal. However, given the lack of suitable waterbodies on-site and within dispersal distance breeding opportunities are limited. Despite the distance of the Site from suitable water bodies, five toads were identified under reptile mats on 19 May 2022.

Importance

4.70 The Site does not provide any aquatic habitat for great crested newt or other amphibians, although some limited terrestrial opportunities are available. However, the Site is separated from any potential suitable aquatic habitats (i.e. ponds or other suitable waterbodies) within the surrounding areas. Accordingly, the importance of the Site for amphibians falls below the threshold for local ecological importance, and the risk of legal infringement is considered de-minimis. Significant effects upon amphibians are therefore not considered further in this assessment.

Invertebrates

Desk Study

4.71 A total of 1750 records of 141 invertebrate species were identified within the search area, including 76 species which are classified as species which are in decline or found in low numbers within Hertfordshire.

4.72 The Site is not located within an Important Invertebrate Area (IIA). However, it does fall within a 'B-line', a network of flower-rich pathways created by Buglife to benefit pollinators and other wildlife.

Use of the Site & Importance

4.73 The Site is formed of common and widespread habitat types and is therefore unlikely to support a locally important assemblage of invertebrates. As such, the invertebrate assemblage at the Site is anticipated to fall short of the criteria for Local ecological importance.

Future Baseline

4.74 The Site is currently under active management with all fields frequently horse-grazed, on rotation throughout the year. The remaining habitats on-site are associated with the residential property including a garden and area of amenity grassland.

4.75 There is no known intention to cease the current management of the Site, other than to accommodate the proposed development should planning permission be granted. As such, the future baseline status of important ecological features is not anticipated to vary significantly from that at present.

Summary of Ecological Features

4.76 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
Wormley Hoddesdon Park Woods SAC	International
Water End Swallow Holes SSSI	National
Redwell Wood SSSI	National
Colney Heath LNR	Local/County
Oxleys Wood LNR	Local/County
Howe Dell LNR	Local/County
Colney Heath Farm Meadows LWS	County
Colney Heath Common LWS	County
11No. LWS	County
Hedgerows	Local
River Colne	Local
Bats	Local Protected (Wildlife and Countryside Act, 1981 [as amended]; The Conservation of Habitats and Species Regulations, 2010 [as amended])
Badger	Protected (Protection of Badgers Act, 1992)
Water Vole	Protected (Wildlife and Countryside Act, 1981 [as amended])
Otter	Protected (Wildlife and Countryside Act, 1981 [as amended]; The Conservation of Habitats and Species Regulations, 2010 [as amended])

Nesting Birds	Protected (Wildlife and Countryside Act, 1981 [as amended])
Reptiles	Local Protected (Wildlife and Countryside Act, 1981 [as amended])

5.0 ASSESSMENT OF EFFECTS

The Proposed Development

5.1 Outline planning permission is sought for residential development at the Site. The following impact assessment is based on the Development Framework Plan prepared by CSA Environmental (CSA/3925/117/A) on behalf of Vistry Group.

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

- Cessation of grazing
- Removal hedgerows H2 and H3 for vehicular access and development parcels
- Construction of up to 150 dwellings, including affordable and custom-build properties
- Construction of associated gardens, parking, access infrastructure, Local Area of Play and pump station
- The establishment of Public Open Space (POS) including recreational routes and Trim-Trail stations
- Establishment of Sustainable Drainage Systems (SuDS) including two attenuation basin and associated swales

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

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

Ecological Mitigation Approach

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

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

5.6 In accordance with BS42020:2013, a Construction Environmental Management Plan (CEMP) will be secured by planning condition and prepared at the detailed design stage for each phase of development. In addition to the construction phase impact avoidance and mitigation

measures identified in the following sections, the CEMP will detail standard environmental control measures, including though not limited to the following:

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

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

Designations

Wormley Hoddesdon Park Woods SAC

5.8 Woodland habitats present at the SAC are sensitive to a combination of recreational pressures (i.e. trampling of woodland flora) and nitrogen deposition (i.e. from vehicle emissions). Public access has been identified as a threat to the SAC, with proposals to monitor site features sensitive to disturbance and take remedial action. Actions are also proposed with regard to air pollution and nitrogen deposition.

5.9 Whilst the proposed development will result in a modest increase in population (up to 150 dwellings), the closest part of the SAC is located c. 9.7km from the Site. Therefore it is considered unlikely that new residents will make regular visits to the SAC and a small increase in recreational pressure and/or vehicle emissions from the Site is considered unlikely to result in likely significant adverse effects on the integrity of the SAC and its qualifying features.

5.10 Overall, no significant adverse effects are predicted upon Wormley Hoddesdon Park Woods SAC as a result of the proposed development based upon the current scheme design.

Water End Swallow Holes SSSI

5.11 Water End Swallow Holes SSSI comprises willow carr and swamp communities in association with chalk sinkholes, along with semi-natural woodland, scrub and semi-improved grassland. The SSSI is c. 2.0km from the Site with no car park available. The SSSI can be accessed from the Site via public footpaths, with a walk of c. 2.7km or c. 30 minutes. Public footpaths run around and through the SSSI of which 100% is currently listed as in favourable condition with no identified condition threats. Given the presence of existing footpaths and lack of identified threats to the SSSI it is not considered that the slight potential increase in footfall at the Site as a result of the proposals will result in significant adverse effects.

5.12 Overall, no significant adverse effects are predicted upon Water End Swallow Holes SSSI as a result of the proposed development based upon the current scheme design.

Redwell Wood SSSI

5.13 Redwell Wood SSSI is an ancient woodland site with pedunculate oak and hornbeam in addition to heathland, well developed scrub and secondary woodland. The site is divided into two units, the first of which is currently listed as being in favourable condition with no identified condition threat. The second is in unfavourable-recovering condition, again with no identified condition threat. Deer browse damage appears to be the main cause of the unfavourable condition, with no comments regarding recreational pressures. Public footpaths run along the exterior of this site, with permissible paths through the centre of the site. It is acknowledged that the proposals will likely result in a small increase in footfall at the site. However, given the small increase and current condition of the site it is not considered that this will result in significant adverse effects.

5.14 Overall, no significant adverse effects are predicted upon Redwell Wood SSSI as a result of the proposed development based upon the current scheme design.

Colney Heath LNR

5.15 Colney Heath LNR is one of the few remaining acid heathlands in Hertfordshire and is listed as a key heathland site within the Biodiversity Action Plan (BAP) for Hertfordshire. The BAP lists recreational pressures, including trampling which can inhibit the growth of scarce plants, in addition to accidental fires as a threat to heathlands. Nutrient enrichment is another threat to heathlands, with dog fouling having a negative contribution to this threat.

5.16 Colney Heath LNR is located within walking distance of the Site and is publicly accessible via footpaths.

5.17 Areas of public open space, including recreational routes and Trim-Trail stations are proposed at the Site which will reduce the impact of recreational pressure on the LNR. In addition to this appropriate signage encouraging the use of open space at the Site and information leaflets should be provided to educate new residents on the sensitive habitats within the LNR and how to minimise their impacts. Dog waste bins could be provided both within areas of open space/walking routes at the Site and at entrances to the LNR to prevent dog fouling and build-up of nutrients. These mitigation and management interventions would be secured by an appropriately worded planning condition, with management set out within a LEMP.

5.18 Subject to the above mitigation, secured appropriately by condition, no significant adverse effects are predicted upon the LNR as a result of the proposed development based upon the current scheme design.

Local Nature Reserve (2No.)

5.19 Oxleys Wood LNR and Howe Dell LNR are located c. 2.3km and c. 2.8km from the Site, respectively. Whilst it is acknowledged that woodland habitats at these sites are vulnerable to an increase in recreational pressure, it is considered that the distance and lack of accessibility of these LNRs from the Site will prevent a significant increase in recreational pressure to these LNRs as a result of the proposals at the Site.

Colney Heath Farm Meadows LWS

5.20 Approximately 40% (1.91ha of 4.95ha) of Colney Heath Farm Meadows LWS falls within the boundary of the Site, with the remaining LWS extending over and along the River Colne to the south-west, and additional fields to the north-west.

5.21 The LWS is stated to be "*a mosaic of old unimproved neutral to acid grasslands along the River Colne*" along with wetland habitats and a pond. Detailed botanical surveys have been carried out and the grassland has been classified as 'other neutral grassland' in 'moderate' condition. It is acknowledged that the condition of the grassland may have declined due to management/land use since the designation was established. No pond was found within the on-site section of the LWS or on OS mapping.

5.22 The proposals include the retention and protection of the LWS with limited, controlled public access. The hedgerow between fields F1 and F2 will be reinstated to separate the LWS from the residential development and associated open space. A small number of sensitively mown paths will be provided within the sward, but access for other recreational activities will not be actively encouraged. In addition to this interpretation boards/signage and information leaflets will be provided to educate the new residents on the importance of the habitats within the LWS and how to limit negative impacts on these habitats.

5.23 It is recommended that habitats be restored through appropriate management interventions to their former condition, along with reinstatement of any features previously lost (i.e. wetland habitats). These mitigation and management interventions would be secured by an appropriately worded planning condition, with management set out within a LEMP.

5.24 Cessation of grazing and improved management with an ecological focus to restore the condition of the grassland within the LWS should result in a betterment of this habitat. However, it is acknowledged that there will be some, albeit limited, impacts from recreational impact. It is therefore likely that the overall condition of the grassland will be slightly enhanced without significant improvement.

5.25 Subject to the above mitigation, secured appropriately by condition, no significant adverse effects are predicted on Colney Heath Farm Meadows LWS as a result of the proposed development based upon the current scheme design.

Colney Heath Common LWS

5.26 Colney Heath Common LWS falls within Colney Heath LNR and therefore should be taken into consideration as per Colney Heath LNR above.

Other LWSs (11No.)

5.27 The remaining local wildlife sites within the surrounding area are all acknowledged to be sensitive to a range of factors, including potential recreational pressure (i.e. trampling of grassland flora and woodland understorey) and increase in cat predation (on birds and other wildlife). However, the measures listed above are anticipated to also relieve any potential pressures in respect of these designations.

Habitats & Flora

Hedgerows

5.28 The scheme would result in the direct loss of c. 0.8km of hedgerow, restricted to the loss of hedgerow H2 and H3. These hedgerows are garden hedgerows with limited species diversity, although are acknowledged to contribute to the function of the hedgerow network across the Site.

5.29 Damage of any retained hedgerows could also occur due to construction works located close to hedgerows or within Root Protection Areas.

5.30 Overall, the scheme is anticipated to result in direct loss of hedgerows at the Site, resulting in an adverse effect, significant at the Local level.

5.31 Retained hedgerows and mature trees will be protected in line with standard arboricultural practice (BS5837:2012).

5.32 To compensate for the loss of hedgerows H2 and H3 existing retained hedgerows will be reinforced and 'gapped up' with new shrub and tree planting comprising native species of local provenance, and subject to appropriate ongoing management. This includes the extension of defunct hedgerow H6 along the boundary between the on-site LWS and proposed development parcels and associated POS. The aim of this enhancement and management work is to increase the extent of species-rich hedgerows, as well as increase the condition of retained hedgerows to 'good' condition, to maximise their contribution to biodiversity at the Site. This habitat creation would be secured by an appropriately worded planning condition and control of detailed landscape design.

5.33 Subject to the above mitigation, secured appropriately by condition, no significant adverse effects are predicted upon the hedgerows at the Site as a result of the proposed scheme.

River Colne (r2) (off-site)

5.34 The River Colne lies off-site and will be retained in its entirety as part of the proposals. It will also be separated from the proposed development through the retention and protection of the adjacent Colney Heath Farm Meadows LWS. However, the proposed SuDS system will drain into the river via swales and a pipe outfall.

5.35 Both the construction and operational phases of a new development pose a risk to the River Colne due to the potential for pollution from surface water run-off which may contain sediment and chemical pollutants. Conversely, development would result in the cessation of some agricultural inputs (i.e. livestock) from the Site and its potential associated adverse effects on the river system.

5.36 The scheme includes a surface water treatment train through the proposed SuDS system, which will limit the risk of adverse effects upon water quality during occupation of dwellings.

5.37 In the absence of any additional controls upon run-off from the Site during construction, and treatment of surface water in occupation, there remains some risk for the scheme to contribute to the unfavourable status of the SSSI watercourse, resulting in an adverse effect significant at the Local level.

5.38 Standard pollution control measures would be implemented during construction and would be set out in detail within the proposed CEMP document, secured by condition.

5.39 SuDS basins and the wider surface water treatment train would be subject to ongoing maintenance and management as set out in more detail within the proposed LEMP, secured by condition.

5.40 Subject to the above mitigation, secured appropriately by condition, no significant adverse effects are predicted upon the River Colne as a result of the proposed scheme.

Fauna

Bats

5.41 The proposed development will result in the permanent loss of grassland and hedgerow habitats at the Site resulting in a reduction in foraging opportunities and connectivity at the Site. It should be noted that given the lack of diversity of hedgerows H2 and H3 and their location perpendicular to Tollgate Road, the loss of these hedgerows is not anticipated to result in significant adverse effects to bats.

5.42 Overall, given the impacts to the grassland on-site and in the absence of mitigation, the scheme would result in an adverse effect upon the local bat population significant at the Local level.

5.43 Retained hedgerows will be gapped up with new tree and thicket planting to maximise their navigational ('flight-line') interest for bats. No artificial lighting will be installed along these retained hedgerows. Improved management of the grassland within the on-site Colney Heath Farm Meadows LWS and cessation of grazing will increase the invertebrate interest of this grassland and increase on-site foraging opportunities for bats Enhancement measures will include integrated roosting features into new buildings across the Site.

5.44 The River Colne which provides a notable navigational feature for bats in the wider area will be suitably buffered from development and any associated lighting or disturbance by the retention of the on-site LWS.

5.45 These measures would be secured by an appropriately worded planning condition and control of detailed landscape design, with management set out within the LEMP.

5.46 The lighting scheme for the Site will be sensitively designed so as to avoid light spill onto the on-site Colney Heath Farm Meadows LWS, existing hedgerows and retained vegetation, thereby maintaining these habitats as foraging/commuting features for bats. This would be secured via control of detailed lighting designs and/or a suitably worded planning condition.

5.47 Subject to the full implementation of the above mitigation no significant effects are predicted.

Badger

5.48 Badgers are protected under the Protection of Badgers Act (1992). Killing or injury of a badger or interference with a sett is prohibited. No evidence of badgers or sett digging was identified during the survey.

However, habitats at the Site provide potential for foraging and dispersing badgers which may pass through the Site. Therefore, during the construction phase, badgers are at risk of falling into open excavations or entering open ended pipework (above 150mm diameter), risking an offence under the above legislation.

5.49 The Site is currently unlit. New artificial lighting of retained habitat during the construction and operational phases may lead to adverse disturbance impacts to bats and other nocturnal wildlife, with a reduction of use and diversity in these areas.

5.50 Given the protection badgers receive under the Protection of Badgers Act 1992, the following precautionary measures will be implemented which could be secured via a Planning Condition:

- Pre-construction badger survey and monitoring for signs of new sett digging.
- Covering any open excavations with wooden boards, or fitting them with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Monitoring of site for any new sett excavation during prolonged remediation, construction or landscaping works.

5.51 To minimise disturbance to badgers and other nocturnal animals arising from the operational phase of the development the lighting scheme for the Site will be sensitively designed so as not to illuminate retained vegetation or features which are likely to function as 'corridors' such as hedgerows.

5.52 These measures would be secured by an appropriately worded planning condition and control of detailed landscape design, with management set out within the LEMP.

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

Riparian Mammals

5.54 Water vole and otter are protected under the Wildlife and Countryside Act 1981 (as amended), otters are also protected under the Conservation of Habitats and Species Regulation 2010. This legislation protects water vole and otter from deliberate capture, killing and injury, intentional or reckless disturbance, damage or destruction of a resting site (or breeding place - otter only) and obstruction of access to a resting or sheltering place (or place of protection - water vole).

5.55 The River Colne runs along the western boundary of the Site. Whilst no evidence of water vole or otter has been identified within the section of watercourse adjacent to the Site, historic records confirm water vole were previously present on the River Colne.

5.56 Proposals include the retention and protection of the on-site Colney Heath Farm Meadows LWS which buffers the River Colne from the development. However, the proposed SuDS basins will drain into the River Colne via swales and associated pipelines. During the construction of outfalls to this watercourse and in the absence of safeguards, there is a minor risk of potential impacts to these riparian mammals, should they be present, and therefore some minor risk of offences being caused under their protective legislation.

5.57 To safeguard water vole and otter during construction and avoid committing an offence relevant legislation, the following measures will be implemented which could be secured via an appropriately worded Planning Condition:

- Pre-construction water vole and otter survey and monitoring for signs of new water vole burrow digging/otter holts.
- Standard safeguards against pollution events (in accordance with best management practice) will be adhered to during construction and operational phases (see details in River Colne section above).
- Ecological Clerk of Works (ECoW) of any sensitive works.

5.58 The retention and protection of the Colney Heath Farm Meadows LWS will provide an additional buffer between the River Colne and the proposed development.

5.59 Subject to the adherence to standard pollution control measures (to be set out in detail within the proposed CEMP document and secured by condition) no adverse effects are considered likely to water vole or otter using the River Colne.

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

Nesting Birds

5.61 Wild birds, their active nests, and their eggs are protected under the Wildlife and Countryside Act 1981 (as amended). Throughout the construction phase there is the risk of offences in respect of any birds nesting in boundary vegetation during the nesting bird season (March to August, inclusive).

5.62 To avoid committing an offence under the Wildlife and Countryside Act 1981 (as amended), any vegetation clearance will take place outside of the bird nesting period (i.e. outside of March to August inclusive), or failing that, following confirmation by a suitably qualified ecologist that nesting birds are absent from the habitats to be cleared.

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

Reptiles

5.64 All British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded protection against killing and injury under parts of sub-section 9(1) of the Act. In addition, all British reptile species are S41 priority species in England.

5.65 A small population (peak count of 1) of grass snake has been identified at the Site. Proposals at the Site require the removal of grassland habitats used by grass snake in the north of the Site to allow for the residential development parcels and POS; resulting in an adverse effect at the Local level. In the absence of mitigation there is the potential to kill or injure grass snake and therefore result in offences being caused under their protective legislation.

5.66 The following mitigation strategy is designed to avoid contravening the Wildlife and Countryside Act (1981, as amended) which protects grass snake against intentional killing.

5.67 Any grassland habitats to be lost or damaged by construction works will be subject to precautionary clearance works to allow reptiles to disperse safely into adjacent retained habitat, avoiding any direct impact to individual reptiles.

5.68 Vegetation clearance will ideally take place during the period March to September, during warm and dry conditions when reptiles will be active and able to disperse safely, subject to nesting bird constraints.

5.69 Clearance will be completed in a staged manner, comprising gradual vegetation height reduction from 200mm to ground level. All arisings will be removed to prevent use as refugia.

5.70 Directional cutting will be undertaken strategically at the furthest point from the retained suitable reptile habitats, moving gradually towards the retained Colney Heath Farm Meadows LWS. Suitably experienced persons will move ahead of the clearance works, conducting a hand search of any potential refugia for reptiles. Any reptiles found will be captured and relocated to an adjacent area of retained habitat.

5.71 Prior to the onset of construction vegetation height will be maintained below 150mm to maintain habitat as unsuitable for reptiles and prevent the dispersal of reptiles into phase one of the development during construction.

5.72 Improved management of the grassland within the retained LWS and cessation of grazing will ensure retention of suitable habitat for grass snake within the Site.

5.73 These measures would be secured by an appropriately worded planning condition and control of detailed landscape design, with management set out within the LEMP.

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

Residual Effects

5.75 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
Wormley Hoddesdon Park Woods SAC	No significant adverse effect	-	-	-
Water End Swallow Holes SSSI	No significant adverse effect	-	-	-
Redwell Wood SSSI	No significant adverse effect	-	-	-
Colney Heath LNR	Local, adverse	Provision of POS inc. Trim-Trail stations, signage and provision of dog waste bins	LEMP and detailed design secured through Planning Condition	No significant effect
Oxleys Wood LNR	No significant adverse effect	-	-	-
Howe Dell LNR	No significant adverse effect	-	-	-
Colney Heath Farm Meadows LWS	Local, adverse	Retention and protection of on-site habitats, management of existing habitats to return to favourable condition	LEMP and detailed design secured through Planning Condition	No significant effect
Colney Heath Common LWS	Local, adverse	Provision of POS inc. Trim-Trail stations, signage and provision of dog waste bins	LEMP and detailed design secured through Planning Condition	No significant effect

Important Ecological Feature	Potential Impacts and Effects	Avoidance & Mitigation Measures	Mechanism by which Measures are Secured	Residual Effects
11No. LWS	No significant adverse effect	-	-	-
Hedgerows	Local, adverse	Compensatory hedgerow and tree planting, strengthening of boundary vegetation	Detailed design secured through Planning Condition	No significant effect
River Colne	Local, adverse	SuDS strategy	CEMP/LEMP and detailed drainage design secured through Planning Condition	No significant effect
Bats	Local, adverse	Improved management of retained habitats, new hedgerow/infill planting, lighting scheme, provision of integrated bat boxes	Detailed design secured through Planning Condition	No significant effect
Badger	Potential offences caused	Pre-commencement badger survey; precautionary working methods; lighting scheme	Legal requirement/ planning condition	No legal infringement
Riparian Mammals	Potential offences (killing and/or injury)	Precautionary working methods	Legal requirement/ planning condition	No legal infringement
Nesting Birds	Potential offences during construction (damage or destruction of nests and eggs)	Nesting bird avoidance measures; habitat creation; provision of integrated bird boxes	Legal requirement/ planning condition	No legal infringement
Reptiles	Potential offences	Precautionary working methods; management of existing habitats on-site	LEMP/detailed design secured through Planning Condition/legal requirement	No legal infringement

5.76 Residual effects are predicted in respect of loss of grassland. Residual effects upon biodiversity as a whole, have also been set out below.

Biodiversity Net Gain

5.77 As set out within Appendix F, the net effect of the scheme upon biodiversity has been predicted making use of the Biodiversity Metric (3.1). Results of the calculation are summarised as follows:

- Baseline habitat units = 39.47
- Post-intervention habitat units = 30.23
- Total net habitat unit change = -9.24 (-23.41%)

- Baseline hedgerow units = 19.27
- Post-intervention hedgerow units = 55.08
- Total net hedgerow unit change = +35.81 (+185.84%)

- Trading rules satisfied = No

5.78 Based on the prepared calculation the proposed scheme (as shown on Development Framework Plan CSA/3925/117/D) would result in a net loss of habitat units of -23.41%, with a significant gain in respect of hedgerows units of +185.84%. It should be noted that these outcomes cannot be summed. The majority of this loss comes from the loss of grassland habitats (F1 and F3) in the north of the Site, with LWS grassland (F2) retained and enhanced (as far as possible) in its entirety.

5.79 Based on this breakdown of losses, off-site compensation would need to be targeted at 'medium' distinctiveness grassland, or higher distinctiveness habitat, with sufficient units provided to address both the deficit identified, and to satisfy trading rules.

5.80 To confirm the final net effect (loss) of biodiversity, the calculation would need to be re-run based upon detailed designs prepared at the Reserved Matters stage.

Biodiversity Offsetting

5.81 In respect of mechanisms by which off-site compensation would be secured, there are a number of options such as a monetary contribution or provision of enhancement of off-site habitats with on-going management for a minimum of 30 years. These options would be secured through an appropriate legal framework (i.e. as part of an agreement pursuant to Section 106 of the Town & Country Planning Act). The contribution/habitat creation would require appropriate agreements to be in place for the delivery of habitat units, broadly in line with the calculations presented, but subject to the final detailed design secured through subsequent Reserved Matters applications.

Compensation

5.82 No additional compensation measures are proposed in respect of individually important ecological features set out herein.

5.83 The proposed development, which is the subject of this planning application, has been comprehensively planned. The strategy in terms of biodiversity net gain comprises maximising the retention and enhancement of habitats on-site, with the delivery of off-site biodiversity enhancements to ensure an overall net gain in biodiversity. The latter element will be secured through the provision of an appropriate mechanism/financial contribution, subject to agreement.

Enhancement

5.84 Improved management of retained habitats on-site will provide opportunities for species confirmed to be present on-site at baseline, such as bats and reptiles. 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. Further details will be set out in a LEMP at the detailed design stage, however as an indicative guide:

- Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.
- Integrated Ecological Niches: dwellings across the scheme will integrate features to benefit birds (swift 'S-bricks'), bats (bat boxes) and invertebrates (bee-bricks) at a provision rate of 1 feature per 10 dwellings. The final quantum and locations of these niches will be determined at the detailed design stage and set out within the LEMP.
- Creation of log piles: to enhance habitats on-site for reptiles and amphibians during the terrestrial stages of their lifecycle, log piles will be provided within the retained Colney Heath Farm Meadows LWS.
- Provision of hedgehog gaps: hedgehogs have been scoped out of detailed assessment and no specific mitigation is proposed, however it is important that opportunities for hedgehogs to move through the landscape are preserved. Although not strictly an 'enhancement' measure, provision of hedgehog-friendly gravel boards or equivalent, providing a minimum 5 x 5 inch gap, will be used to maintain permeability for hedgehogs across the development and associated gardens. The number and location of hedgehog gaps will be determined at the detailed design stage and set out within the LEMP.

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 here, the development is not anticipated to result in any significant residual negative effects on important ecological features.

6.2 The Development Framework Plan demonstrates the potential to deliver net benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. A Biodiversity Impact Assessment Calculation has determined that the proposed development could secure a net gain of 185.84% with regard to hedgerow units, but would result in loss of -18.74% habitat units. Proposals for offsetting will be secured through the provision of an appropriate mechanism/financial contribution, subject to agreement.

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:

- Off-site Biodiversity Enhancements: to ensure an overall net gain in biodiversity.
- 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, riparian mammals, reptiles and amphibians.
- Landscape and Ecology Management Plan (LEMP): the LEMP will detail the establishment and long-term management of retained and newly created habitats to maximise benefits for wildlife. It will include a graphical Ecological Enhancement Plan, setting out the number, type and position of enhancement features.
- Lighting Strategy: a sensitive lighting strategy will accompany the detailed layout, ensuring that dark corridors are maintained, and minimising light spill to retained and newly created habitats.

6.4 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 City and District of St Albans District Local Plan.

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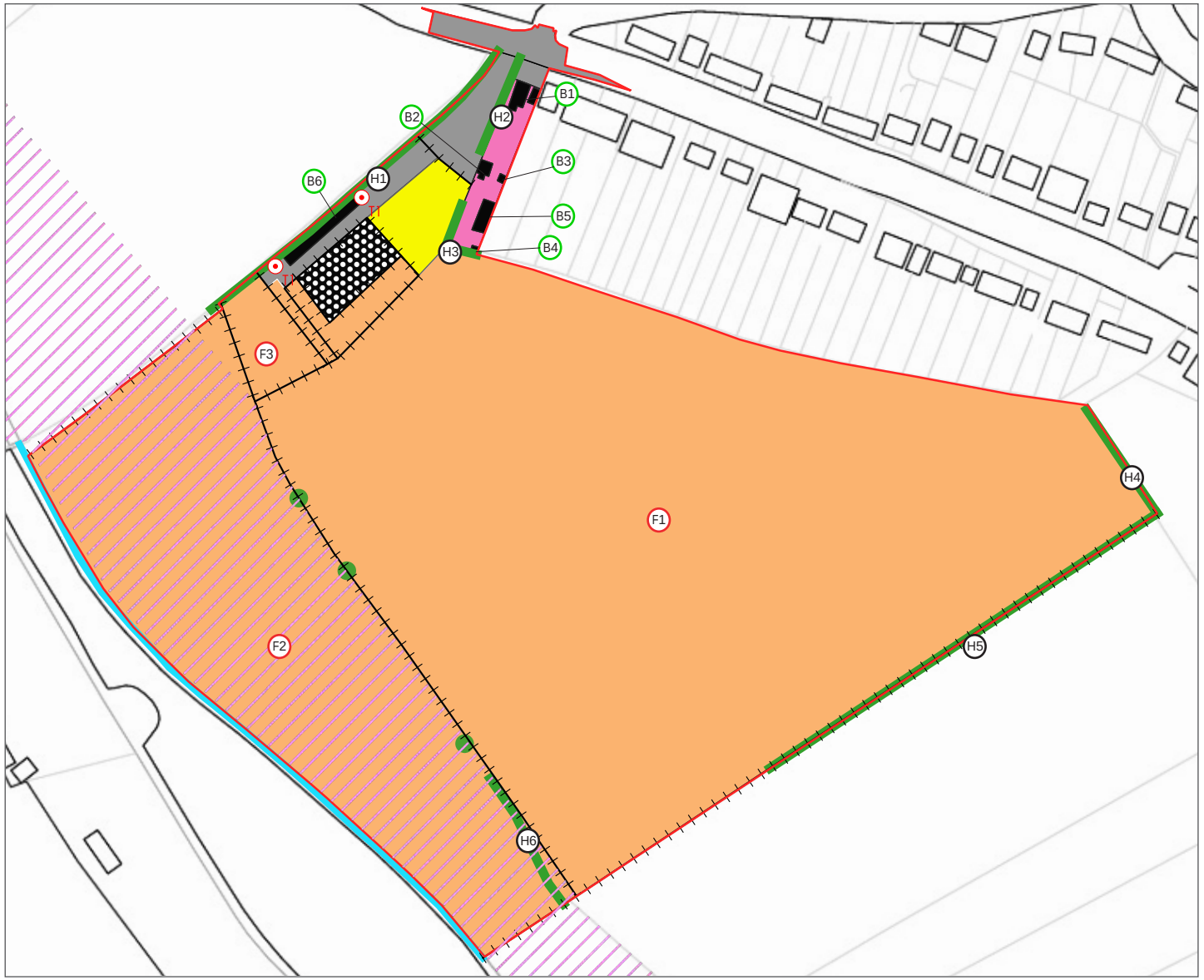
Appendix A

Habitats Plan & Photographs



- Site boundary
- Other neutral grassland (g3c)
- Modified grassland (g4)
- Vegetated garden
- Developed land. sealed surface (u1b)
- Buildings (u1b5)
- Manège/bare ground
- Fence
- Hedgerows (h2)
- River (r1)
- Hedgerow numbers
- Field numbers
- Building numbers
- Trees
- Target note
- T1 - Metal Containers
- Colney Heath Farm Meadows LWS

0 50 100metres

CSA environmental
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Ashwell, Hertfordshire SG7 5NT
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Project	Land south of Tollgate Road, Colney Heath	Date June 2022	Drawing No. CSA/3925/107
Drawing Title	Habitats Plan	Scale Refer to scale	Rev B
Client	Vistry Group	Drawn MD	Checked AC

© CSA Landscapes Ltd. Do not scale from this drawing. Refer to figured dimensions only.

Photograph 1. F1, looking towards F2 and the River Colne.

Photograph 2. F2 Looking towards the River Colne.

Photograph 3. F3 with grass 'corridor' to the north.

Photograph 4. Field surrounding manège and B6 in distance.

Photograph 5. River Colne water course (April 2022).

Photograph 6. Garden habitats in association with residential property.

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.

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

Policy	Summary
City and District of St Albans District Local Plan Review 1994 (Adopted 30 November 1994) Saved and Deleted Policies Version (July 2020)	
Policy 106: Nature Conservation	"The Council will take account of ecological factors when considering planning applications and will refuse proposals which could adversely affect: (i) Sites of Special Scientific Interest (ii) Nature Reserves (iii) other sites of wildlife, geological or (iv) any site supporting species protected by the Wildlife and Countryside Act 1981; geomorphological importance; (v) the natural regime of either surface or ground waters in river valleys and their wetlands. If planning permission is granted for development which could affect a site of conservation interest, it will normally be subject to conditions aimed at protecting the special features of the

Policy	Summary
	site. The Council will also seek a Section 106 Agreement to ensure the appropriate management of the site."
Policy Intention 28: Wildlife Habitat Creation and Management	"The District Council will encourage the creation of wildlife habitats and promote the enhancement of sites through sympathetic management."
St Albans City and District Local Plan 2020-2036 (Publication Draft, 2018)	
Policy L29 – Green and Blue Infrastructure, Countryside, Landscape and Trees	"…<u>Biodiversity</u> Identified and designated areas, sites and networks of importance for biodiversity including sites of local importance will be conserved, enhanced and managed. Opportunities to link or reconnect wildlife habitats will be taken, along with provision of green infrastructure in new developments. The objectives of current Hertfordshire-wide and local habitat and biodiversity studies and strategies will be implemented. Areas of importance for geodiversity in the District will be conserved and managed. The needs of protected and other important species will be fully considered. Development will be refused if harmful to: 1) Sites of Special Scientific Interest 2) Nature Reserves (international, national, regional and local) 3) Any other sites of wildlife, geological or geomorphological importance 4) Any site supporting species protected by UK or European law 5) The natural regime of either surface or ground waters in river valleys and their wetlands. Opportunities to improve the ecological value and quality of the District through development, particularly by maintaining, improving and extending defined habitat areas, will be managed in accordance with current advice from the Local Nature Partnership (LNP) supported by the Environmental Records Centre or any successor bodies. Where development that affects biodiversity is unavoidable, a net gain in biodiversity should be achieved on site. Exceptionally, off site proposals for a net gain through habitat creation and / or improvement may be considered, (as an 'offset' to loss and damage caused by the development). Offset values and the acceptability of such proposals will be determined according to national policy and guidance. I Information on landscapes, habitats and sites of particular importance will be maintained and regularly updated as a current GIS data set…."

Appendix C

Desk Study Information

Site Check Report Report generated on Fri Feb 18 2022
You selected the location: Centroid Grid Ref: TL20870550
The following features have been found in your search area:

Special Areas of Conservation (England)

Name	WORMLEY-HODDESDONPARK WOODS
Reference	UK0013696
Hectares	335.99
Hyperlink	http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0013696

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

MAGIC International Statutory Designations (10km)

Legend

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

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km

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Site Check Report Report generated on Fri Feb 18 2022
You selected the location: Centroid Grid Ref: TL20870549
The following features have been found in your search area:

Local Nature Reserves (England)

Reference	1009336
Name	COLNEY HEATH
Hectares	22.54
Hyperlink	https://designatedsites.naturalengland.org.uk/SiteLNRDetail.aspx?SiteCode=L1009336

Reference	1460435
Name	HOWE DELL
Hectares	3.98
Hyperlink	https://designatedsites.naturalengland.org.uk/SiteLNRDetail.aspx?SiteCode=L1460435

Reference	1460436
Name	OXLEYS WOOD
Hectares	1.23
Hyperlink	https://designatedsites.naturalengland.org.uk/SiteLNRDetail.aspx?SiteCode=L1460436

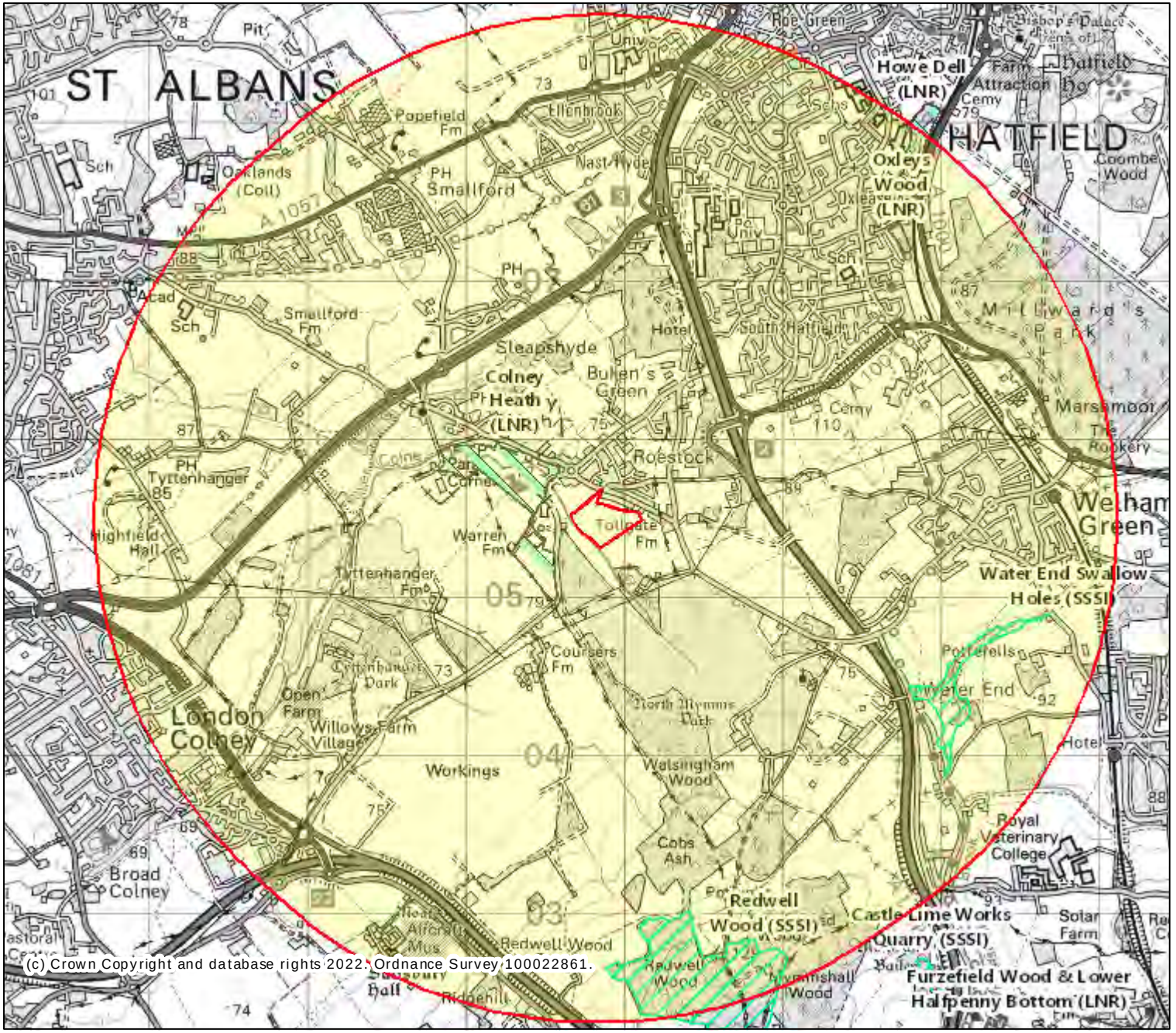
Sites of Special Scientific Interest (England)

Name	Redwell Wood SSSI
Reference	1002727
Natural England Contact	ANDREW MILLS
Natural England Phone Number	0845 600 3078
Hectares	52.57
Citation	1001716
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001716

Name	Water End Swallow Holes SSSI
Reference	1002742
Natural England Contact	SONJA KAUPE
Natural England Phone Number	0845 600 3078
Hectares	11.12
Citation	1002507
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1002507

National Nature Reserves (England)
No Features found

MAGIC National/Local Statutory Designations (3km)



Legend

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

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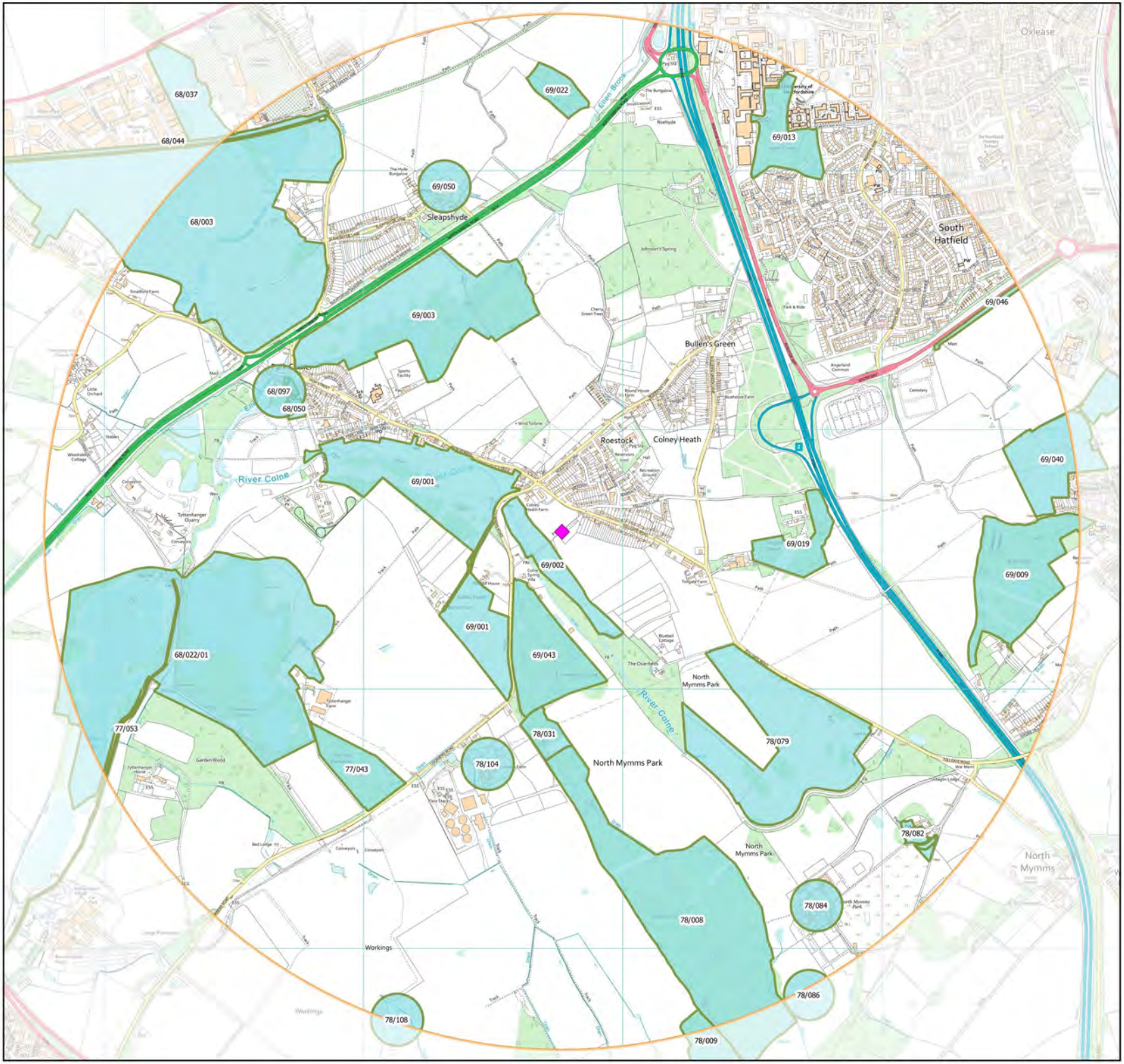
Local Sites Map 1



Search Information

- Search point
- Search area

Local Sites

- Local Wildlife Sites

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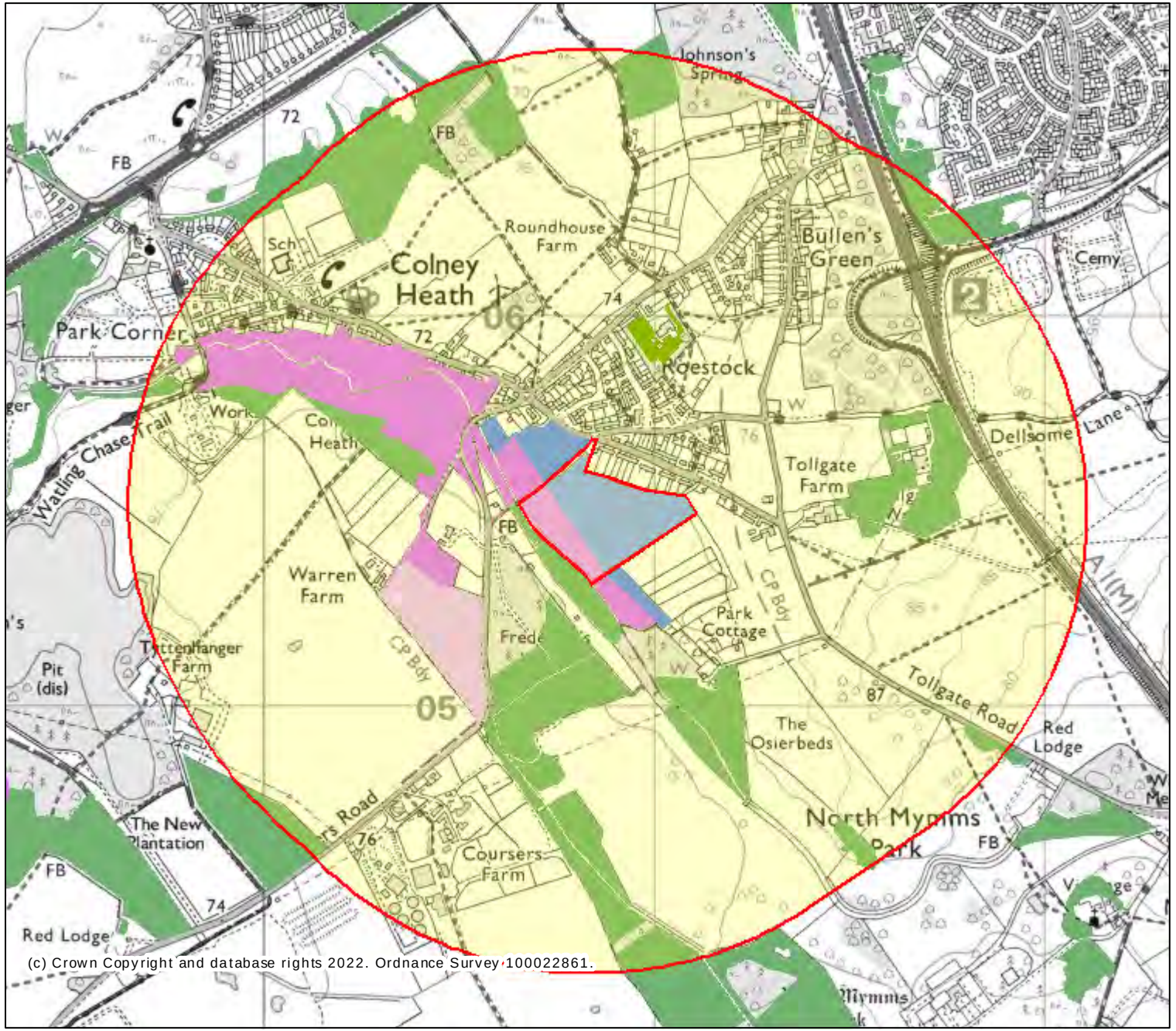
HERC
Herts Environmental Records Centre

25/09/2020

Priority Habitats (1km)



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Legend

- Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)
- Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)
- Priority Habitat Inventory - Lowland Calcareous Grassland (England)
- Priority Habitat Inventory - Lowland Heathland (England)
- Priority Habitat Inventory - Deciduous Woodland (England)
- Priority Habitat Inventory - Traditional Orchards (England)

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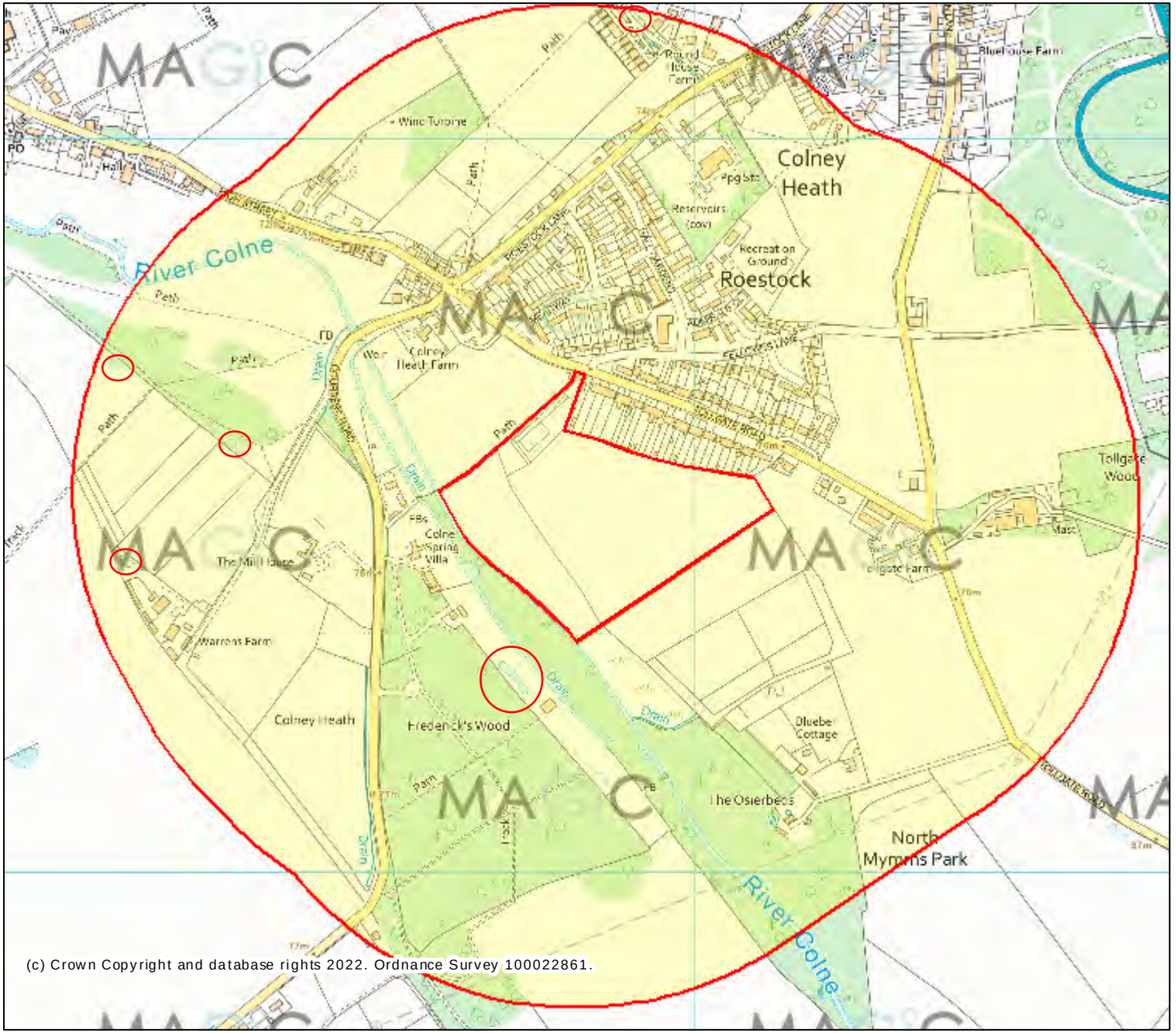
Pond Locations (500m)



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Appendix D

Habitats and Flora Species List

Table 1. Habitats Species List

Site Name	3925 Land at Colney Heath								
Survey Date and Surveyor(s)	16/09/2020, 09/03/2022 and 19/05/2022 Alexandra Cole								
Scientific Name	Common Name	LWS Indicator Species	Habitat Parcel Number/Habitat Type						
			F1	F2	F3	Modified grassland	Garden Habitats	River Colne	Colonising Bare Ground
Herb Species									
Chenopodium album	Fat-hen				X				
Achillea millefolium	Yarrow		X	X	X	X			X
Alchemilla vulgaris agg.	Lady's-mantle	* *(scarce in Hertfordshire)*		X					
Alliaria petiolata	Garlic mustard				X			X	
Angelica sylvestris	Wild angelica							X	
Anthriscus sylvestris	Cow parsley			X				X	
Aquilegia sp.	Columbine						X		
Arctium sp.	Burdock							X	
Artemisia vulgaris	Mugwort		X						X
Bellis perennis	Daisy		X	X	X	X	X		
Bryonia dioica	White bryony							X	
Calystegia arvensis	Field bindweed		X		X				
Calystegia sp.	Bindweed					X			
Capsella bursa-pastoris	Shepherd's-purse			X					X
Centaurea nigra	Common knapweed		X	X					
Cerastium sp.	Common mouse-ear		X	X	X				
Chenopodium sp.	Goosefoot		X						
Cirsium arvense	Creeping thistle		X	X				X	
Cirsium vulgare	Spear thistle		X	X	X				
Conopodium majus	Pignut	*		X					
Crocosmia × crocosmiiflora	Montbretia						X		
Crocus sp.	Crocus						X		
Epilobium montanum	Broad-leaved willowherb								X
Euphorbia sp.	Spurge				X				X
Ficaria verna	Lesser celandine						X		
Filago sp.	Cudweed		X	X					
Filipendula ulmaria	Meadowsweet							X	
Galanthus nivalis	Snowdrop						X		
Galium aparine	Cleavers						X	X	
Galium sp.	Bedstraw			X					
Galium verum	Lady's bedstraw	*	X	X					
Geranium molle	Dove's-foot crane's-bill		X		X	X			X
Geranium pyrenaicum	Hedgerow crane's-bill		X						
Geranium robertianum	Herb Robert							X	

Helminthotheca echioides	Bristly oxtongue				X				
Heracleum sphondylium	Hogweed		X					X	
Hieracium pilosella	Mouse-ear-hawkweed		X						
Hyacinthoides non-scripta	Bluebell			X					
Lamiastrum galeodbolon	Yellow archangel			X					
Lamium purpureum	Red dead-nettle				X				X
Lapsana sp.	Nipplewort		X		X				X
Lathyrus nissolia	Grass vetchling			X					
Lathyrus pratensis	Meadow vetchling	*	X		X				
Lemnaceae sp.	Duckweed			X					
Lepidium ruderale	Narrow-leaved pepperwort			X					
Leucanthemum vulgare	Oxeye daisy	*	X						
Linaria purpurea	Purple toadflax			X					
Lotus corniculatus	Common bird's-foot-trefoil	*	X						
Malva sp.	Mallow		X		X	X			X
Malva sylvestris	Common mallow			X					
Matricaria discoidea	Pineappleweed		X						X
Mycelis muralis	Wall lettuce			X					
Narcissus sp.	Daffodil						X		
Papaver rhoeas	Common poppy								X
Plantago coronopus	Buck's-horn plantain			X					
Plantago lanceolata	Ribwort plantain		X	X	X	X	X		
Plantago major	Greater plantain		X						X
Plantago media	Hoary plantain			X					
Polygonum sp.	Knotgrass		X						X
Potentilla indica	Yellow-flowered strawberry			X					
Potentilla reptans	Creeping cinquefoil		X	X	X		X		
Prunella vulgaris	Selfheal				X				
Pyracantha sp.	Firethorn			X					
Ranunculus acris	Meadow buttercup	*	X	X					
Ranunculus bulbosus	Bulbous buttercup		X	X	X				
Ranunculus repens	Creeping buttercup		X		X		X		
Rumex crispus	Curled dock			X					
Rumex obtusifolius	Broad-leaved dock		X		X			X	
Rumex sp.	Dock				X	X			
Senecio erucifolius	Hoary ragwort			X					
Senecio jacobaea	Common ragwort		X		X				
Silene dioica	Red campion			X					
Silene latifolia	White campion				X				
Solanum dulcamara	Bittersweet							X	
Sonchus oleraceus	Smooth sowthistle		X						
Stellaria media	Common chickweed				X				
Symphytum sp.	Comfrey		X					X	
Tamus communis	Black bryony			X					
Taraxacum agg.	Dandelion		X		X	X	X		X
Tragopogon pratensis agg.	Goat's-beard		X	X					

Trifolium dubium	Lesser trefoil			X					
Trifolium sp.	Trefoil		X	X	X				
Trifolium pratense	Red clover		X						
Trifolium repens	White clover		X		X	X	X		
Tripleurospermum inodorum	Scentless mayweed			X					
Urtica dioica	Common nettle		X		X	X		X	X
Veronica filiformis	Slender speedwell			X					
Veronica persica	Common field-speedwell		X	X					
Veronica serpyllifolia	Thyme-leaved speedwell		X						
Vicia sativa	Common vetch		X						
Sedges and Rushes									
Juncus effusus	Soft-rush			X					
Typha latifolia	Common reedmace			X					
Grasses									
Agrostis capillaris	Common bent		X		X				
Agrostis stolonifera	Creeping bent			X					
Alopecurus pratensis	Meadow foxtail		X	X				X	
Anisantha sterilis	Barren brome		X						
Arrhenatherum elatius	False oat-grass		X		X	X		X	X
Avena fatua	Wild-oat			X					
Bromus hordeaceus	Soft-brome		X						
Carex pendula	Pendulous sedge			X					
Dactylis glomerata	Cock's-foot		X		X			X	
Elytrigia repens	Common couch			X					
Festuca rubra	Red fescue		X	X					
Holcus lanatus	Yorkshire-fog		X					X	
Hordeum murinum	Wall barley			X					
Lolium perenne	Perennial rye-grass		X		X	X	X	X	X
Phleum pratense	Timothy			X					
Pleioblasus sp.	Bamboo						X		
Poa annua	Annual meadow-grass		X	X	X				
Poa pratensis	Smooth meadow-grass		X	X					
Poa trivialis	Rough meadow-grass		X						
Woody Species									
Broadleaved									
Aucuba japonica	Spotted laurel						X		
Alnus glutinosa	Common alder							X	
Buddleja davidii	Butterfly-bush						X		
Corylus avellana	Hazel							X	
Crataegus monogyna	Hawthorn						X	X	
Fagus sylvatica	Beech								
Fraxinus excelsior	Ash							X	
Hedera helix	Ivy							X	
Lonicera periclymenum	Honeysuckle						X		
Malus sp.	Apple								

Populus sp.	Poplar sp.							X	
Prunus cerasifera	Cherry plum							X	
Prunus laurocerasus	Cherry laurel						X		
Prunus spinosa	Blackthorn		X					X	
Quercus sp.	Oak							X	
Rosa sp.	Rose							X	
Rubus fruticosus agg.	Bramble		X					X	
Salix caprea	Goat willow							X	
Salix sp.	Willow							X	
Sambucus nigra	Elder				X		X	X	

Table 2. Field F1 Species List

Site Name	3925 Land at Colney Heath																						
Survey Date and Surveyor(s)	19/05/2022 Alexandra Cole																						
Scientific Name	Common Name	LWS Indicator Species	Habitat Parcel Number/Habitat Type																				
			F1 All Species	F1: Q1.1	F1: Q1.2	F1: Q1.3	F1: Q1.4	F1: Q2.1	F1: Q2.2	F1: Q2.3	F1: Q2.4	F1: Q3.1	F1: Q3.2	F1: Q3.3	F1: Q3.4	F1: Q4.1	F1: Q4.2	F1: Q4.3	F1: Q4.4	F1: Q5.1	F1: Q5.2	F1: Q5.3	F1: Q5.4
Herb Species																							
Achillea millefolium	Yarrow		X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X
Bellis perennis	Daisy		X																X				
Calystegia arvensis	Field bindweed		X																				
Cerastium sp.	Common mouse-ear		X		X																		
Chenopodium sp.	Goosefoot		X																				
Cirsium arvense	Creeping thistle		X																				
Filago sp.	Cudweed		X																				
Galium verum	Lady's bedstraw	*	X																				
Geranium molle	Dove's-foot crane's-bill		X													X		X	X				
Geranium pyrenaicum	Hedgerow crane's-bill		X																				
Heracleum sphondylium	Hogweed		X																				
Hieracium pilosella	Mouse-ear-hawkweed		X																				
Lathyrus pratensis	Meadow vetchling	*	X																				
Leucanthemum vulgare	Oxeye daisy	*	X																				
Lotus corniculatus	Common bird's-foot-trefoil	*	X		X	X	X																
Matricaria discoidea	Pineappleweed		X																				
Plantago lanceolata	Ribwort plantain		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plantago major	Greater plantain		X												X								
Polygonum sp.	Knotgrass		X																				
Potentilla reptans	Creeping cinquefoil		X																				
Ranunculus acris	Meadow buttercup	*	X	X	X	X	X																
Ranunculus bulbosus	Bulbous buttercup		X					X	X	X	X	X	X	X	X	X	X		X				
Ranunculus repens	Creeping buttercup		X																				
Rumex crispus	Curled dock		X																				
Rumex obtusifolius	Broad-leaved dock		X																				
Senecio jacobaea	Common ragwort		X			X																	
Sonchus oleraceus	Smooth sowthistle		X																				
Symphytum sp.	Comfrey		X																				
Taraxacum agg.	Dandelion		X																				
Tragopogon pratensis agg.	Goat's-beard		X	X	X	X	X																
Trifolium sp.	Trefoil		X					X	X	X	X					X		X					
Trifolium pratense	Red clover		X	X	X	X	X						X		X								
Trifolium repens	White clover		X	X	X	X	X					X	X	X		X	X		X				
Urtica dioica	Common nettle		X										X										

Veronica persica	Common field-speedwell		X																					
Veronica serpyllifolia	Thyme-leaved speedwell		X							X						X								
Vicia sp.	Vetch		X																					
Grasses																								
Agrostis capillaris	Common bent		X				X	X		X		X									X			
Alopecurus pratensis	Meadow foxtail		X					X										X						
Bromus hordeaceus	Soft-brome		X					X	X	X	X	X				X	X	X	X	X		X	X	
Cynosurus cristatus	Crested dog's-tail		X																					
Dactylis glomerata	Cock's-foot		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	
Festuca rubra	Red fescue		X	X			X	X	X	X	X						X							
Holcus lanatus	Yorkshire-fog		X		X	X																		
Lolium perenne	Perennial rye-grass		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Phleum pratense	Timothy		X																					
Poa annua	Annual meadow-grass		X																					
Poa pratensis	Smooth meadow-grass		X			X				X	X	X	X									X		
Woody Species																								
Broadleaved																								
Prunus spinosa	Blackthorn		X																					
Rubus fruticosus agg.	Bramble		X																					
TOTAL Number of species		5	49																					
TOTAL Number of species (1x1m quadrat)				9	11	12	11	10	8	11	9	9	8	6	7	10	7	7	9	5	5	6	5	
TOTAL Number of species (2x2m quadrat)				16				11				12				12				6				

Table 3. Field F2 Species List

Site Name	3925 Land at Colney Heath																							
Survey Date and Surveyor(s)	19/05/2022 Alexandra Cole																							
			Habitat Parcel Number/Habitat Type																					
Scientific Name	Common Name	LWS Indicator Species	F2 All Species	F2: Q1.1	F2: Q1.2	F2: Q1.3	F2: Q1.4	F2: Q2.1	F2: Q2.2	F2: Q2.3	F2: Q2.4	F2: Q3.1	F2: Q3.2	F2: Q3.3	F2: Q3.4	F2: Q4.1	F2: Q4.2	F2: Q4.3	F2: Q4.4	F2: Q5.1	F2: Q5.2	F2: Q5.3	F2: Q5.4
Herb Species																								
Achillea millefolium	Yarrow		X	X			X	X	X	X		X			X		X						
Alchemilla vulgaris agg.	Lady's-mantle	* (scarce in Hertfordshire)	X																					
Anthriscus sylvestris	Cow parsley		X																					
Bellis perennis	Daisy		X			X			X								X							
Capsella bursa-pastoris	Shepherd's-purse		X																					
Centaurea nigra	Common knapweed		X															X						
Cerastium sp.	Common mouse-ear		X		X	X	X		X	X	X	X	X	X	X	X	X		X	X				X
Cirsium arvense	Creeping thistle		X																					
Cirsium vulgare	Spear thistle		X																					
Conopodium majus	Pignut	*	X					X	X	X	X	X	X		X									
Filipendula ulmaria	Meadowsweet		X																					
Galium verum	Lady's bedstraw	*	X									X												
Geranium dissectum	Cut-leaved crane's-bill		X																					
Geranium molle	Dove's-foot crane's-bill		X																					
Helminthotheca echioides	Bristly oxtongue		X			X																		
Hypericum perforatum	Perforate St John's-wort		X																					
Lamium album	White dead-nettle		X																					
Lathyrus pratensis	Meadow vetchling	*	X																	X			X	
Leontodon sp.	Hawkbit		X							X				X										
Leucanthemum vulgare	Oxeye daisy	*	X												X						X			
Lotus corniculatus	Common bird's-foot-trefoil	*	X			X														X				
Matricaria discoidea	Pineappleweed		X																					
Myosotis arvensis	Field forget-me-not		X																					
Plantago lanceolata	Ribwort plantain		X																		X			
Plantago major	Greater plantain		X														X		X					
Polygonum sp.	Knotgrass		X																					
Potentilla reptans	Creeping cinquefoil		X																					
Poterium sanguisorba sp. sanguisorba	Salad burnet	*	X					X		X	X													
Prunella vulgaris	Selfheal		X			X																		
Ranunculus acris	Meadow buttercup	*	X	X												X					X		X	
Ranunculus bulbosus	Bulbous buttercup		X					X	X	X	X	X	X	X	X		X	X	X					
Ranunculus repens	Creeping buttercup		X	X	X	X	X		X							X		X		X	X		X	
Rumex obtusifolius	Broad-leaved dock		X		X																			
Senecio jacobaea	Common ragwort		X					X																

Scientific Name	Common Name	LWS Indicator Species	Habitat Parcel Number/Habitat Type																				
			F2 All Species	F2: Q1.1	F2: Q1.2	F2: Q1.3	F2: Q1.4	F2: Q2.1	F2: Q2.2	F2: Q2.3	F2: Q2.4	F2: Q3.1	F2: Q3.2	F2: Q3.3	F2: Q3.4	F2: Q4.1	F2: Q4.2	F2: Q4.3	F2: Q4.4	F2: Q5.1	F2: Q5.2	F2: Q5.3	F2: Q5.4
Silene latifolia	White campion		X																				
Taraxacum agg.	Dandelion		X	X	X	X	X	X	X	X	X					X	X	X	X	X			X
Trifolium campestre	Hop trefoil		X					X	X	X	X					X	X		X				
Trifolium pratense	Red clover		X						X	X	X		X		X						X		
Trifolium repens	White clover		X					X		X	X					X	X	X	X				
Urtica dioica	Common nettle		X																				
Veronica persica	Common field-speedwell		X						X	X		X		X	X					X	X		
Veronica serpyllifolia	Thyme-leaved speedwell		X		X	X	X	X	X		X	X	X	X		X				X	X	X	
Sedges and Rushes																							
Carex hirta	Hairy sedge		X					X		X													
Luzula campestris	Field wood-rush	*	X						X	X	X	X			X								
Grasses																							
Agrostis capillaris	Common bent		X		X			X	X		X					X	X	X	X	X		X	X
Alopecurus pratensis	Meadow foxtail		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Anthoxanthum odoratum	Sweet vernal-grass	*	X					X	X	X	X						X						
Bromus hordeaceus	Soft-brome		X																				
Dactylis glomerata	Cock's-foot		X										X	X									
Festuca rubra	Red fescue		X					X	X	X		X	X	X	X		X	X		X			X
Holcus lanatus	Yorkshire-fog		X												X							X	
Lolium perenne	Perennial rye-grass		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Poa annua	Annual meadow-grass		X								X	X					X	X	X				
Poa pratensis	Smooth meadow-grass		X					X	X		X	X	X	X			X			X	X		
Poa trivialis	Rough meadow-grass		X	X	X	X	X							X	X	X			X			X	X
TOTAL Number of species		10	55																				
TOTAL Number of species (1x1m quadrat)				7	9	11	8	16	17	17	16	12	10	11	13	11	15	10	11	12	10	6	10
TOTAL Number of species (2x2m quadrat)				15				24				19				20				18			

Table 4. Linear Habitats

Site Name	3925 Land at Colney Heath						
Survey Date and Surveyor(s)	19/05/2022 Alexandra Cole						
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type					
		H1	H2	H3	H4	H5	H6
Herb Species							
Alliaria petiolata	Garlic mustard	X		X			
Anthriscus sylvestris	Cow parsley	X	X	X			
Artemisia vulgaris	Mugwort	X		X			
Bryonia dioica	White bryony	X		X			
Galium aparine	Cleavers	X		X			
Geranium robertianum	Herb Robert			X			
Lactuca serriola	Prickly lettuce			X			
Lamium album	White dead-nettle	X					
Lamium purpureum	Red dead-nettle	X					
Linaria vulgaris	Common toadflax	X					
Malva sp.	Mallow	X		X			
Plantago lanceolata	Ribwort plantain	X		X			
Ranunculus repens	Creeping buttercup			X			
Rumex obtusifolius	Broad-leaved dock			X			
Silene dioica	Red campion			X			
Silene latifolia	White campion	X					
Sonchus asper	Prickly sowthistle			X			
Tanacetum parthenium	Feverfew			X			
Taraxacum agg.	Dandelion	X					
Urtica dioica	Common nettle			X			
Grasses							
Anisantha sterilis	Barren brome	X					
Arrhenatherum elatius	False oat-grass	X	X	X			
Dactylis glomerata	Cock's-foot	X		X			
Elytrigia repens	Common couch			X			
Holcus lanatus	Yorkshire-fog			X			
Lolium perenne	Perennial rye-grass	X					
Phleum pratense	Timothy	X					
Woody Species							
Broadleaved							
Cornus sp.	Dogwood					X	X
Crataegus monogyna	Hawthorn	X		X	X	X	X
Fraxinus excelsior	Ash				X		
Hedera helix	Ivy	X		X			
Ilex aquifolium	Holly					X	
Ligustrum ovalifolium	Garden privet		X				
Prunus spinosa	Blackthorn	X		X	X	X	X
Prunus sp.	Prunus (domesticated)					X	
Rosa sp.	Rose sp.	X				X	
Rosa canina sp.	Dog-rose				X		
Rubus fruticosus agg.	Bramble			X		X	
Sambucus nigra	Elder	X		X			

Appendix E

Evaluation & Assessment Methods

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

Establishing Potentially Important Ecological Features

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

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

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

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

Establishing Likely Zone of Influence

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

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

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

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

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

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

Geographic Context and Significance Criteria

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

- International
- National
- Regional
- County
- Local

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

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

Characterising Ecological Impacts and their Effects

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

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

Appendix F

Biodiversity Metric

The Biodiversity Metric 3.1 - Calculation Tool
Start page

Project details	
Planning authority:	City and District Council of St Albans
Project name:	Land at Tollgate Road, Colney Heath
Applicant:	Vistry
Application type:	Outline
Planning application reference:	TBC
Assessor:	Alexandra Cole MCIEEM
Reviewer:	Jamie Woollam CEcol
Metric version:	3.1
Assessment date:	29/06/2022
Planning authority reviewer:	TBC

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Headline Results

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On-site baseline	*Habitat units*	39.47
	Hedgerow units	19.27
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	30.23
	Hedgerow units	55.08
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	-23.41%
	Hedgerow units	185.84%
	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*	-9.24
	Hedgerow units	35.81
	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*	-23.41%
	Hedgerow units	185.84%
	River units	0.00%
Trading rules Satisfied?	No - Check Trading Summary ▲	

Land at Tollgate Road, Colney Heath

A-1 Site Habitat Baseline

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	Habitats and areas			Distinctiveness		Condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline
Ref	Broad Habitat	Habitat Type	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic Significance multiplier		Total habitat units
1	Grassland	Modified grassland	0.1	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	0.40
2	Grassland	Other neutral grassland	5.35	Medium	4	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (≥)	21.40
3	Grassland	Other neutral grassland	1.91	Medium	4	Moderate	2	Formally identified in local strategy	High strategic significance	1.15	Same broad habitat or a higher distinctiveness habitat required (≥)	17.57
4	Urban	Artificial unvegetated, unsealed surface	0.1	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00
5	Urban	Developed land; sealed surface	0.31	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00
6	Urban	Vegetated garden	0.05	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	0.10
7												
8												
9												
10												
11												
		Total habitat area	7.82									39.47

Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comments	
Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area habitat lost	Units lost		Assessor comments	Reviewer comments
		0.00	0.00	0.10	0.40		Area of modified grassland associated with residential property and stables. Assumed all lost to development.	
		0.00	0.00	5.35	21.40		F1 & F3. Condition limited to "poor" due to presence of lolium at approximately >30%, amount of bare ground and cover of species indicative of sub-optimal condition. Assumed all lost to development.	
	1.91	0.00	17.57	0.00	0.00		F2 = Colney Heath Farm Meadows LWS. Similarly to F1 & F3, condition somewhat limited to frequency of lolium in sward. However, species diversity and indicator species of higher distinctiveness/condition present and therefore 'moderate' has been selected. Retain entirely and enhanced alongside development.	
		0.00	0.00	0.10	0.00		Manège. Fixed condition. Assumed all lost to development.	
		0.00	0.00	0.31	0.00		Buildings and hardstanding. Fixed condition. Assumed all lost to development.	
		0.00	0.00	0.05	0.10		Residential garden. Fixed condition. Assumed all lost to development.	
0.00	1.91	0.00	17.57	5.91	21.90			

Total area lost (excluding area of Urban trees and Green walls)	5.91

Land at Tollgate Road, Colney Heath

A-2 Site Habitat Creation

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			Post development/ post intervention habitats																					
			Distinctiveness		Condition		Strategic significance			Temporal multiplier						Difficulty multipliers				Habitat units delivered	Comments	
Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard time to target condition/years	Habitat created in advance/years	Delay in starting habitat	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied		Assessor comments	Reviewer comments
Urban	Developed land; sealed surface	2.72	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	Residential (Total 3.88ha) - Buildings & Hardstanding (70%), assumed 70:30 ratio. Condition Fixed	
Urban	Vegetated garden	1.16	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1			Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	2.24	Residential (Total 3.88ha) - Gardens (30%), assumed 70:30 ratio. Condition fixed	
Urban	Developed land; sealed surface	0.04	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	Remaining infrastructure (pump station, LAP). Condition fixed.	
Grassland	Other neutral grassland	0.34	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	2.28	SuDS basins (dry). Assuming subsoil exposed to establish low-nutrient substrate & sown with appropriate wildflower seedmix. Targetting moderate condition.	
Urban	Bioswale	0.07	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1			Standard time to target condition applied	1	0.965	Medium	Standard difficulty applied	Medium	0.67	0.18	Swales, sown with appropriate wildflower seedmix, Targetting moderate condition.	
Heathland and shrub	Mixed scrub	0.34	Medium	4	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1			Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	1.31	Proposed native shrub and tree planting, targetting moderate condition.	
Grassland	Modified grassland	1.04	Low	2	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1			Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	2.01	Amenity grassland with recreational use within POS	
Grassland	Other neutral grassland	0.2	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	1.34	Wildflower grassland ecotone edge to hedgerow planting, targetting moderate condition.	
	Total habitat area	5.91																Total Units	9.35			

Site Area (Excluding area of Urban trees and Green walls)	5.91

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A-3 Site Habitat Enhancement

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Baseline habitats										Proposed Habitat (Pre-populated but can be overridden)		Change in distinctiveness and condition		Area (hectares)	Post development/ post intervention habitats													Habitat units delivered	Comments
															Distinctiveness	Score	Condition	Score	Strategic significance			Temporal risk multiplier				Difficulty risk multipliers					
Baseline ref	Baseline habitat	Total habitat area	Baseline distinctiveness band	Baseline distinctiveness score	Baseline condition category	Baseline condition score	Baseline strategic significance category	Baseline strategic significance score	Baseline habitat units	Suggested action to address habitat losses	Proposed Broad Habitat	Proposed habitat	Distinctiveness change	Condition change						Strategic significance	Strategic significance	Strategic position multiplier	Standard time to target condition/years	Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of enhancement	Applied difficulty multiplier	Final difficulty of enhancement	Difficulty multiplier applied		Assessor comments
3	Grassland - Other neutral grassland	1.91	Medium	4	Moderate	2	High strategic significance	1.15	17.57	Same broad habitat or a higher distinctiveness habitat required (1)	Grassland	Other neutral grassland	Medium - Medium	Moderate - Fairly Good	1.91	Medium	4	Fairly Good	2.5	Formally identified in local strategy	High strategic significance	1.15	8			Standard time to target condition applied	8	0.752	Low	Standard difficulty applied	Low	1	20.88	Cessation of grazing and introduction of favourable management to be balanced against controlled recreational access to LW (ie "good" condition target reasonably reduced to 'fairly good'). Management prescriptions designed to seek further aspirational restoration of LWS grassland to lowland meadow priority habitat where possible.

B-1 Site Hedge Baseline

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	UK Habitats - existing habitats			Habitat distinctiveness		Habitat condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Comments	
Baseline ref	Hedge number	Hedgerow type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier		Total hedgerow units	Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost	Assessor comments	Reviewer comments
1	H1	Native Hedgerow	1.5	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	6.00		1.5	0.00	6.00	0.00	0.00		
2	H2	Hedge Ornamental Non Native	0.05	V.Low	1	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.05			0.00	0.00	0.05	0.05	Garden hedgerow, privet	
3	H3	Native Hedgerow	0.03	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.12			0.00	0.00	0.03	0.12		
4	H4	Native Hedgerow	0.05	Low	2	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.30		0.05	0.00	0.30	0.00	0.00		
5	H5	Native Hedgerow	1.8	Low	2	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	10.80		1.8	0.00	10.80	0.00	0.00		
6	H6	Native Hedgerow	0.5	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	2.00		0.5	0.00	2.00	0.00	0.00		
7																				
8																				
9																				
10																				
11																				
			3.93									19.27	0.00	3.85	0.00	19.10	0.08	0.17		

B-2 Site Hedge Creation

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		Proposed habitats		Habitat distinctiveness		Habitat condition		Strategic significance			Temporal multiplier					Difficulty risk multipliers				Hedge units delivered	Comments	
Baseline ref	New hedge number	Habitat type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard Time to target condition/years	Habitat created in advance/years	Delay in starting habitat	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Standard difficulty of creation	Applied difficullty multiplier	Final difficulty of creation	Difficulty multiplier applied		Assessor comments	Reviewer comments
1	H1b	Native Species Rich Hedgerow	0.7	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	12			Standard time to target condition applied	12	0.652	Low	Standard difficulty applied	Low	1	5.48	New species rich native hedgerow planting to extend H1 along site boundary	
2	H5b	Native Species Rich Hedgerow	1	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	12			Standard time to target condition applied	12	0.652	Low	Standard difficulty applied	Low	1	7.83	New species rich native hedgerow planting to extend H5 along site boundary	
3	H6b	Native Species Rich Hedgerow	2.1	Medium	4												Low		Low	1		New species rich hedgerow planting to extent H6 along boundary to LWS	
4																							
5																							
6																							
7																							
8																							
			3.80																		13.30		

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B-3 Site Hedge Enhancement

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	Baseline Habitats									
Baseline ref	Baseline habitat	Length (km)	Baseline distinctiveness band	Baseline distinctiveness score	Baseline condition category	Baseline condition score	Baseline strategic significance category	Baseline strategic significance score	Baseline habitat units	Suggested action
1	Native Hedgerow	1.5	Low	2	Moderate	2	Low Strategic Significance	1	6	Same distinctiveness band or better
4	Native Hedgerow	0.05	Low	2	Good	3	Low Strategic Significance	1	0.3	Same distinctiveness band or better
5	Native Hedgerow	1.8	Low	2	Good	3	Low Strategic Significance	1	10.8	Same distinctiveness band or better
6	Native Hedgerow	0.5	Low	2	Moderate	2	Low Strategic Significance	1	2	Same distinctiveness band or better

	Post development/ post intervention habitats																						
		Change in distincitiveness and condition			Distinctiveness		Condition		Strategic significance			Temporal multiplier						Difficulty risk multipliers					
Baseline ref	Proposed (Pre-populated but can be overridden)	Distinctiveness movement	Condition movement	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Standard Time to target condition/years	Habitat enhanced in advance/years	Delay in starting habitat enhancement/years	Standard or adjusted time to target condition	Final time to target condition/years	Final Time to target multiplier	Standard difficulty of enhancement	Applied difficullty multiplier	Final difficulty of enhancement	Difficulty multiplier applied	Hedge units delivered
1	Native Species Rich Hedgerow	Low - Medium	Lower Distinctiveness Habitat - Good	1.5	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	16.04
4	Native Species Rich Hedgerow	Low - Medium	Lower Distinctiveness Habitat - Good	0.05	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	0.55
5	Native Species Rich Hedgerow	Low - Medium	Lower Distinctiveness Habitat - Good	1.8	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	19.84
6	Native Species Rich Hedgerow	Low - Medium	Lower Distinctiveness Habitat - Good	0.5	Medium	4	Good	3	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	5.35
				3.85																		41.78

	Comments	
Baseline ref	Assessor comments	Reviewer comments
1	Existing retained hedgerow to be reinforced and 'gapped up' with new shrub and tree planting comprising native species of local provenance, and subject to appropriate ongoing management	
4	Existing retained hedgerow to be reinforced and 'gapped up' with new shrub and tree planting comprising native species of local provenance, and subject to appropriate ongoing management	
5	Existing retained hedgerow to be reinforced and 'gapped up' with new shrub and tree planting comprising native species of local provenance, and subject to appropriate ongoing management	
6	Existing retained hedgerow to be reinforced and 'gapped up' with new shrub and tree planting comprising native species of local provenance, and subject to appropriate ongoing management	

Appendix G

Bats

1.0 Legislation

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

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

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

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

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

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

2.0 Methods

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

Preliminary Roost Assessment (PRA)

Structures

2.2 A detailed external and internal inspection of all buildings on-site was completed on 09 March 2022, using high-powered torches, binoculars, and ladder as appropriate. The survey was carried out by Alexandra

Cole MCIEEM (Bat Class Survey Licence WML-CL18, Registration Number 2016-25563-CLS-CLS) and Matthew Dale.

2.3 External inspection focused on identifying potential bat access points to the interior of each structure and any external features that could potentially be used by crevice-dwelling species. Particular attention was given to window sills, window panes, weatherboarding, and pitch/ridge tiles; as evidence is typically found in these locations.

2.4 The internal inspection involved a systematic search for bats or any evidence of their activity, in particular droppings and/or feeding remains within the buildings/loft spaces of the buildings.

2.5 A description of the structures was made, including construction, condition (in respect of roosting, rather than building or structural integrity) and age (where known).

2.6 The aim of this inspection is 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 structures to support bats whilst in hibernation.

Assessing 'Potential' of Buildings to Support Roosting Bats

2.7 All structures 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.

2.8 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.

2.9 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.

2.10 The potential of a tree or structure to support roosting bats is often influenced by its age and construction, thermal stability, lighting and levels of human activity. Furthermore, the proximity to foraging habitat - particularly woodland, parkland and wetland- as well as the presence of navigational routes (e.g. hedgerows, treelines and watercourses) influence both the potential for bats to roost, as well as the species which may roost. Professional judgement is therefore applied, based upon known factors which effect the potential of features to support roosting bats, insofar as determining the need or scope of further surveys or inspections.

Limitations

2.11 No limitations were identified during this survey.

Activity Surveys

Remote Monitoring

2.12 A single Wildlife Acoustics Songmeter (SM4) detector was deployed during May, June and July 2022 to provide three data-sets. The Monitoring Location (ML) is shown on Figure 1 below.

Figure 1. The Monitoring Location (ML) surveyed during remote monitoring surveys.

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

2.14 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. 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.

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

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

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

Limitations

2.18 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 the detector, and therefore only describe localised activity at the Site.

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

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

3.0 Results

Preliminary Roost Assessment (PRA)

Structures

3.1 Descriptions and results of the PRA are presented within Table 1 below.

Table 1. Preliminary Roost Assessment Results

Structure reference and photograph	Description, bat roosting features and evidence	Bat roost suitability
B1  Exterior - northern elevation (with detached garage)  Exterior – southern elevation (with conservatory)  Interior roof void	Two storey brick-built detached property with pebble dashing across much of the exterior. A detached brick-built garage with a flat corrugated composite roof is present along the eastern elevation. The hipped roof of the main building is comprised of clay tiles which are mostly intact, with the occasional slipped tile on the ground floor extension of the southern elevation. Plastic soffit is mostly intact with no obvious ingresses. The pitched roof is comprised of wooden rafters and is lined with bitumen felt. A small number of holes were identified in the bitumen felt, with the clay roof tiles evident behind these gaps. However, as was evident from the exterior, all tiles appeared intact with no significant light ingress. Fibreglass insulation was present on the floor of the void. The void is used for storage, forming a cluttered environment. No evidence of bats e.g. droppings was identified within the void.	Negligible

Structure reference and photograph	Description, bat roosting features and evidence	Bat roost suitability
B2  Exterior  B2 – lean to at northern end of B2  B2 – potting shed at southern end of B2	Outbuilding with an exterior of wooden weatherboarding. Weatherboarding is tightly fitting with no gaps. Pitched, corrugated composite roof. A small gap was identified underneath the wooden barge, however this did not provide a gap/crevice suitable to support a roosting bat. Wooden lean to at the north of B2 with single pitch roof. Structure is open and draughty. A glass potting shed is also present on the southern aspect of B2.	Negligible
B3 	Garden shed; timber construction with pitched felt roof and windows. No obvious access points or crevices were noted. Windows allow light into the interior.	Negligible

Structure reference and photograph	Description, bat roosting features and evidence	Bat roost suitability
B4 	Garden shed; timber construction with pitched felt roof and windows. No obvious access points or crevices were noted. Windows allow light into the interior.	Negligible
B5 	Stand alone static home of plastic construction. The pitched roof is made of metal, which lacks the thermal stability favoured by roosting bats. Very light fitting, no obvious ingresses or entry points for roosting bats.	Negligible
B6 	Stable block. Pitched roof with bitumen felt. Corrugated metal sheeting on top of bitumen in places. Pitched roof lined with chipboard. Outer structure wood panelling. Stable doors partially/fully open along the eastern elevation; allowing extensive light ingress and leading to lack of thermally stability reducing suitability for roosting bats.	Negligible
Target Note 1 	Metal shipping containers all of which have flat roofs, some with addition of bitumen felt. No obvious access points for bats. Metal construction lacks the thermal stability favoured by roosting bats.	Negligible

Activity Surveys

Remote monitoring

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

Table 2. Overnight weather conditions during remote monitoring

Survey Month	Dates Sampled (2022)	Temp. (°C)		Cloud Cover (%)		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
May	08/05	6.00	8.00	2%	6%	6.00	12.00	None
May	09/05	11.00	13.00	49%	100%	15.00	24.00	None
May	10/05	10.00	11.00	31%	100%	12.00	25.00	None
May	11/05	6.00	9.00	5%	20%	10.00	12.00	None
May	12/05	8.00	9.00	2%	67%	13.00	22.00	None
June	02/06	7.00	11.00	18%	93%	9.00	13.00	None
June	03/06	9.00	12.00	12%	46%	18.00	24.00	None
June	04/06	11.00	12.00	67%	100%	20.00	21.00	Very light rain at 21:00 and moderate rain at 24:00, 03:00 and 06:00
June	05/06	9.00	10.00	100%	100%	8.00	11.00	Very light rain at 21:00 and 03:00
June	06/06	10.00	12.00	46%	100%	1.00	4.00	Very light rain at 21:00
July	03/07	10.00	14.00	5%	20%	9.00	13.00	None
July	04/07	9.00	13.00	4%	22%	10.00	13.00	None
July	05/07	12.00	15.00	15%	98%	10.00	14.00	None
July	06/07	14.00	19.00	51%	67%	18.00	23.00	None
July	07/07	12.00	15.00	3%	32%	8.00	12.00	None

3.3 The total number of bat contacts recorded for each bat species/genera are provided in Figure 2 below.

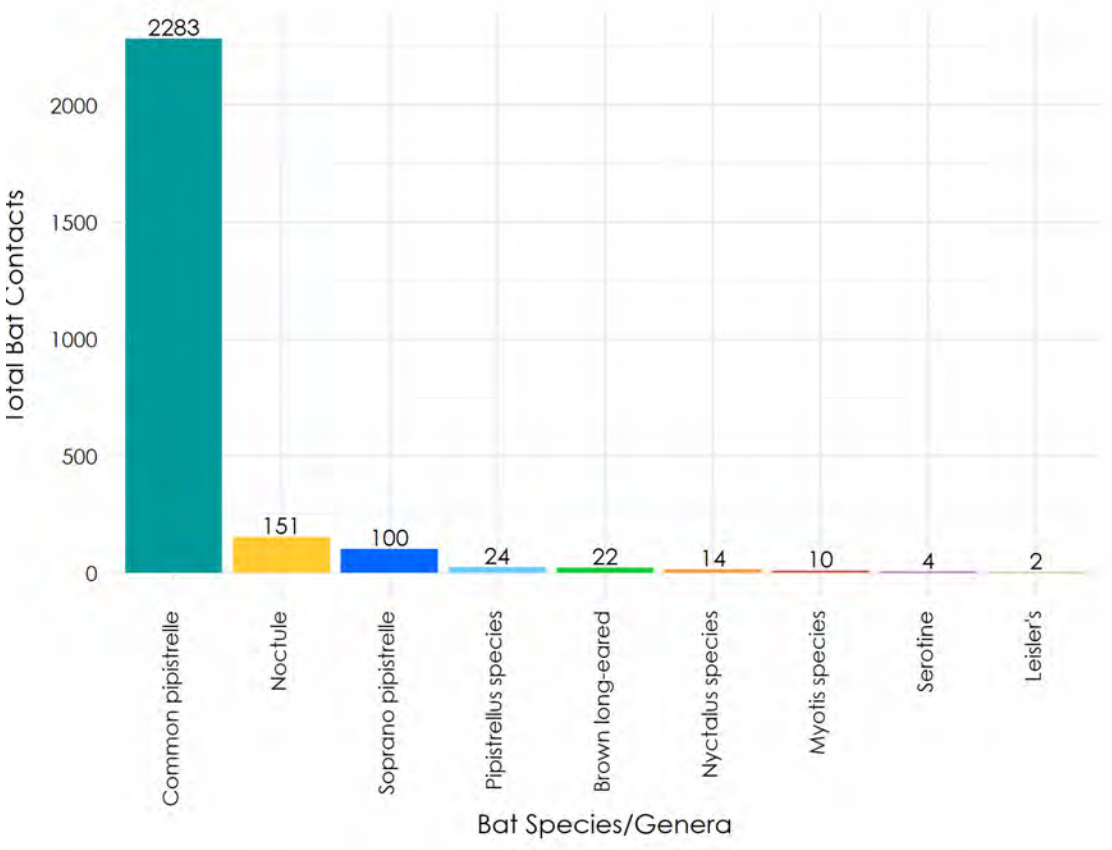

Figure 2. Total bat contacts by species/genera recorded across all remote monitoring periods

3.4 At least seven species of bat were identified during the monitoring periods. In addition to this, a number of contacts were recorded for bats which fall within the genera of *Myotis* and *Nyctalus* but were unidentifiable to species level.

3.5 A total of 2610 bat contacts were detected during the 15 nights analysed. The majority of contacts were dominated by common pipistrelle which accounted for 87% of total contacts recorded. Noctule represented the second most recorded species, accounting for 6% of all contacts.

3.6 Lower levels of soprano pipistrelle, brown long-eared, *Myotis* species, *Pipistrellus* species, serotine, Leisler's and *Nyctalus* species were also detected. Notably 100 contacts by soprano pipistrelle, 22 contacts by brown long-eared and 10 contacts by *Myotis* species.

3.7 Figures 3 and4 below show the variance in nightly activity levels for each of these bat species recorded on-site. More detailed data describing Figures 3 and 4 are provided in Table 3. The activity data in Figures 3 and 4 is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 15 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the

variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.

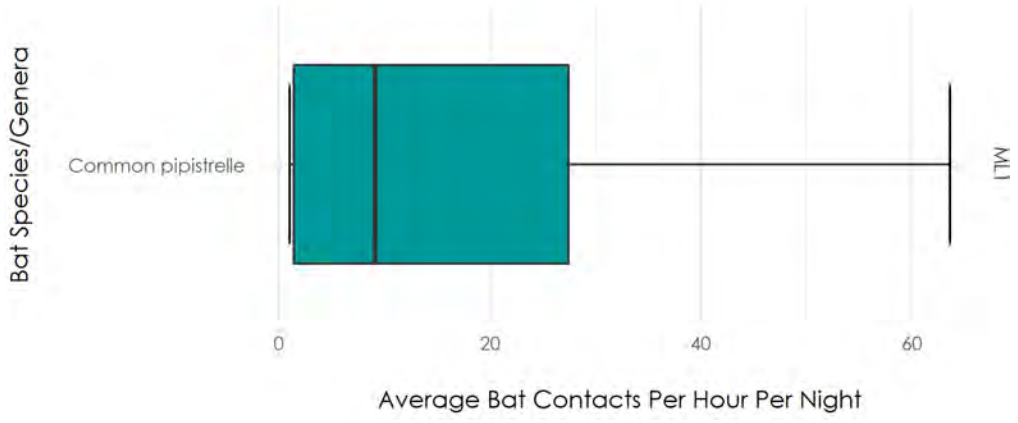

Figure 3. Average bat contacts per hour per night for common pipistrelle recorded across all remote monitoring

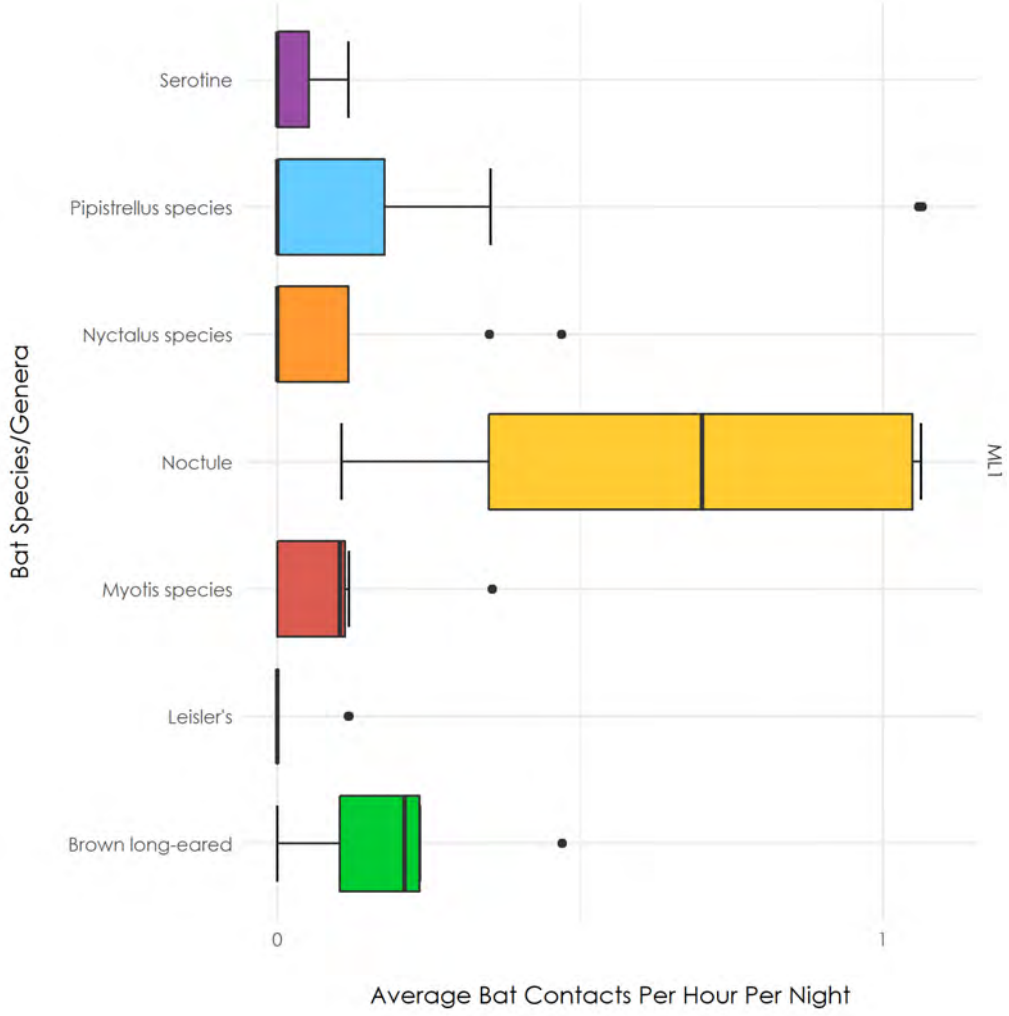

Figure 4. Average bat contacts per hour per night for each bat species/genera (excluding common pipistrelle) recorded across all remote monitoring

3.8 The frequency of bat contacts suggests relatively low levels of bat activity. All species, except noctule and common pipistrelle have a median of less than one contact every hour, with noctule and common pipistrelle at a median of 1.050 and 9.119 contact per hour per night, respectively. This indicates that the hedgerow where the static detector was located is not frequently used by foraging or commuting bats. However, the maximum number of contacts per hour per night for common pipistrelle (63.636) are indicative of sporadic periods of increased activity across the survey period.

Table 3. Average bat contacts per hour per night recorded during remote monitoring surveys

ML	Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
		Minimum	Maximum	Median	IQ range		
ML1	Brown long-eared	0.000	0.471	0.210	0.131	22	15
ML1	Common pipistrelle	1.031	63.636	9.119	26.082	2283	15
ML1	Leisler's	0.000	0.118	0.000	0.000	2	15

ML1	Myotis species	0.000	0.355	0.103	0.111	10	15
ML1	Noctule	0.105	3.176	1.050	1.121	151	15
ML1	Nyctalus species	0.000	0.469	0.000	0.117	14	15
ML1	Pipistrellus species	0.000	1.065	0.000	0.177	24	15
ML1	Serotine	0.000	0.117	0.000	0.052	4	15
ML1	Soprano pipistrelle	0.000	4.486	0.316	0.663	100	15

Appendix H

Riparian Mammals

1.0 Legislation

Water Vole

1.1 Water vole *Arvicola amphibius* have full legal protection under the Wildlife & Countryside Act 1981 (as amended) and Countryside Rights of Way Act 2000. These regulations make it an offence to:

- Intentionally kill, injure or take water voles
- Possess or control live or dead water voles or derivatives
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection
- Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose
- Sell water voles or offer or expose for sale or transport for sale.
- Publish or cause to be published any advertisement which conveys the buying or selling of water voles

1.2 Water vole are also a species of principal importance under the Natural Environment and Rural Communities (NERC) Act 2006, and local authorities and other public bodies therefore have a legal duty to take their conservation into account.

Otter

1.3 The European otter *Lutra lutra* and its respective habitats are fully protected under Schedule 5 (Section 9) of the Wildlife and Countryside Act 1981 (as amended) and under Conservation of Habitats & Species Regulations 2017. These regulations make it an offence to:

- Intentionally or recklessly capture, kill, disturb or injure otters
- Intentionally or recklessly damage or destroy a breeding or resting place of an otter
- Obstruct access to their resting or sheltering places
- Possess, sell, control or transport live or dead otters, or parts of otters

1.4 In addition, the otter is listed as a species of principal importance under the NERC Act 2006 and a globally threatened species on the IUCN Red Data List. Special Areas of Conservation (SACs) can be designated on the basis on the presence of otters.

2.0 Methods

2.1 The section of the River Colne which runs adjacent to the Site boundary was surveyed for water vole and otter on 29 April 2022 and 08 July 2022 by Bethany Wilson ACIEEM and Matthew Dale.

2.2 Water vole field signs include droppings and latrines, feeding stations, footprints, runways, lawns, burrows and nests. The optimal period for water vole survey is late April to early October, with peaks of activity typically in May and August. In-line with guidance in the Water Vole

Mitigation Handbook (2016), two survey visits for water vole were undertaken to account for variability in habitat suitability.

2.3 Otter field signs include spraints (conspicuous black faeces with or without a mucus coating), footprints, feeding remains (fish or amphibian carcasses/bones) and slides (frequently used routes used to get into waterways). Occasionally 'couches' (resting places including 'natal couches' made in reeds to rest/raise cubs) or holts (dens in bank or pollarded trees/tree stumps) are found, although some of these features can be less diagnostic when identifying current presence of otter.

Limitations

2.4 Access was not granted to the western bank of the river or along the watercourse itself. Therefore, both banks were viewed by walking along the eastern bank of the river. However, the use of binoculars meant a relatively clear view of both banks could be obtained and therefore it is unlikely that water vole and otter field signs would have been missed along the banks of the river.

3.0 Results

3.1 Where it runs along the Site boundary the River Colne is c. 3.0m wide and less than 0.5m deep, with a shallow (<45°) bank. The watercourse is slow flowing and highly shaded with trees and vegetation lining much of the banksides. A wooded bank with abundant alder *Alnus glutinosa* runs along both sides of the watercourse, with the eastern bank opening up to the on-site grassland and residential gardens along the western bank. Vegetation is varied in composition along the length of the watercourse, with some aquatic vegetation present.

3.2 No field signs of water vole or otter were identified during the surveys despite the river providing some suitable sheltering and foraging opportunities for both species.

3.3 During the July survey the water course was noted to have predominantly dried following an extended period of low rainfall. Only the occasional pool of shallow water (c. 10cm deep) was present. This reduces the suitability of the water course for both species.

Appendix I

Reptiles

1.0 Legislation

1.1 All native British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded protection against killing and injury under parts of sub-section 9(1) of the Act. In addition, all native British reptile species are adopted as Species of Principal Importance for the Conservation of Biodiversity in England in respect of Section 41 of the Natural Environment and Rural Communities Act 2006.

2.0 Methods

2.1 A total of 158 reptile refugia, comprising rectangles of roofing felt measuring 1.0 x 0.5m, were installed in suitable habitat present at the Site on 22 April 2022 by Matthew Dale (see Reptile Survey Plan CSA/3925/112).

2.2 Following an initial 2-week 'bedding-in' period for refugia, surveys were carried out on seven occasions during favourable weather conditions (e.g. intermittent or hazy sunshine, not too windy, sunny spells following wet or cloudy weather) between 06 May and 09 June 2022. Each survey visit comprised a slow walk of the Site to visually and physically check refugia for the presence of reptiles. On each occasion a visual search was also carried out within areas of suitable habitat whilst walking between refugia locations.

2.3 The primary aim of the reptile survey was to establish the presence or likely absence of widespread reptile species within the survey area, rather than to estimate abundance or population size. To this end, seven survey checks, an effort generally considered 'reasonable effort' in establishing the presence or likely absence of reptiles at a Site, were carried out.

Limitations

2.4 Field F2 in the south-west of the Site is horse grazed for the majority of the year. Given the presence of horses and the associated risk of trampling of reptile refugia, it was determined that this field was not suitable for inclusion within the survey. No limitations to the survey methods were identified.

3.0 Results

3.1 A single adult grass snake *Natrix natrix* (syn. *N. helvetica*) was found on 09 June 2022 along the northern boundary of F1, adjacent to the off-site residential gardens. In addition to this, five toads *Bufo bufo* comprising three adults and two juveniles were identified under mats on 19 May 2022.

3.2 Full results, including weather data, are provided in Table 1 below.

Table 1. Reptile Survey Results

Job Name & No.	3935 Colney Heath						Beaufort Scale: 0. Calm. Vertical smoke. 1. Light air. Smoke drifts. 2. Light breeze. Leaves rustle. 3. Gentle breeze. Small twigs constantly move. 4. Moderate breeze. Small branches begin to move. 5. Fresh breeze. Small trees in leaf begin to sway.																
Set-up Surveyor / Project Manager	Matthew Dale/Alexandra Cole						Precipitation: (Type) No Rain / Light / Moderate / Heavy (Duration) Intermittent / Continuous															
Set-Up Date	22/04/2022		Total Number of Refugia	158																		
			Weather				Slow worm *Anguis fragilis*					Common lizard *Zootoca vivipara*					Grass snake *Natrix natrix*					
Date	Time	Surveyor	Temp (°C)	Cloud Cover (Oktas; n/8)	Wind (Beaufort Scale)	Rain (type & duration)	Adult Male (>230mm)	Adult Female (>230mm)	Unidentified adult	Sub-Adult	Newborn	Male	Female	Unidentified adult	Sub-Adult	Newborn	Male	Female	Unidentified adult	Sub-Adult	Newborn	Other Notes
Survey 1																						
06/05/2022	17:45	MD	17	7	1	No rain																No reptiles
Survey 2																						
13/05/2022	09:00	MD	13	8	4	No rain																No reptiles
Survey 3																						
19/05/2022	08:55	AC	15	7	1	No rain																No reptiles. Adult toad: TL 20756 05514 Adult toad: TL 20831 05404 Adult toad: TL 21085 05480 Juvenile toad: TL 21095 05483 Juvenile toad: TL 21103 05492
Survey 4																						
23/05/2022	07:30	MD	13	5	0	No rain																No reptiles
Survey 5																						
24/05/2022	09:40	MD	16	7	1	No rain																No reptiles
Survey 6																						
01/06/2022	08:50	MD	12	7	0	No rain																No reptiles
Survey 7																						
09/06/2022	08:50	MD	16	1	1	No rain													1			Grid reference:TL 20947 05565
							Total Adult			Total Juvenile		Total Adult			Total Juvenile		Total Adult			Total Juvenile		
							0			0		0			0		1			0		

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