Woods Hardwick Planning Ltd.

Land off Bullens Green Lane, Colney Heath

ECOLOGICAL IMPACT ASSESSMENT

February 2021

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FPCR Environment and Design Ltd
Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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1.0 INTRODUCTION

1.1 This Ecological Impact Assessment (EcIA) has been prepared by FPCR Environment and Design Ltd on behalf of Woods Hardwick Planning in relation to a site at Colney Heath, Hertfordshire (Grid reference: TL 2105 2286). The Site, 5.2ha in extent is located to the west of Bullens Green Lane. The Site comprises a single arable field bound by native species dominated hedgerows with associated trees located along the eastern, southern boundaries and majority of the northern boundary, and a narrow woodland belt along the remaining western boundary. The landscape beyond the Site comprises the built edge of Colney Heath to the north and west of the Site, with Bullens Green Lane and Fellowes Lane to the immediate east and south, with arable fields beyond.

1.2 The EcIA has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment Guidelines[1]. In line with this guidance, the EcIA describes the assessment methodology; establishes the baseline conditions, currently existing at the Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent or reduce any impacts; the likely residual effects after these measures have been employed; and the compensation measures required to offset any residual effects.

1.3 This report has been prepared by an experienced ecologist at FPCR Environment & Design Ltd, who has over 10 years of professional and relevant ecological experience.

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

2.0 METHODOLOGY

Legislation, Planning Policy and Guidance

2.1 The policy and guidance framework for nature conservation is provided by various national, regional and local planning policies as outlined below, with further details, as necessary, within relevant subsequent sections.

Legislative Framework

2.2 In addition to the National, Regional and Local policies (discussed below), the following legislation and European Directives afford protection to wildlife and have been used to inform this assessment.

- The Conservation of Habitats & Species Regulations 2017 (as amended)[2];
- Wildlife and Countryside Act 1981 (as amended) (WCA)[3];
- Natural Environment and Rural Communities Act 2006 (NERC)[4].
- The Protection of Badgers Act 1992[5].
- The Hedgerow Regulations Act 1997[6].

National Policy Context

National Planning Policy Framework

2.3 The latest National Planning Policy Framework (NPPF)[7] sets out the Government's planning policies for England and how these are expected to be applied within the planning system. It provides a framework for local councils to produce local plans and determine planning applications in order to achieve more sustainable developments. Planning applications should aim to confirm to principles set out within this framework, which should be reflected at a local level in local development frameworks and other planning policy documents for that local area.

2.4 The ecological assessment has been guided by the requirements of the NPPF by ensuring that the determining authority is in receipt of adequate information to be able to make an informed assessment of the proposed scheme against National and Local planning policies regarding biodiversity.

2.5 Although the UK Biodiversity Action Plan (BAP) has now been superseded by the UK Post-2010 Biodiversity Framework[8] and Biodiversity 2020[9] the former UK Biodiversity Action Plan (BAP) lists of priority habitats and species continue to be regarded as conservation priorities under the Framework, and they have been used to compile the statutory lists of priority species and habitats as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (also referred to as Habitats and Species of Principal Importance). Whilst different planning

[2] HMSO. The Conservation of Habitats and Species Regulations 2017 (as amended) – No.1012.
[3] HMSO. The Wildlife and Countryside Act 1981 (as amended).
[4] HMSO. (2006), Natural Environment and Rural Communities Act.
[5] HMSO. The Protection of Badgers Act 1992 (as amended).
[6] HMSO. The Hedgerow Regulations Act 1997
[7] Ministry of Housing, Communities and Local Government (2019). National Planning Policy Framework. London
[8] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework. July 2012.
[9] DEFRA (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services.

authorities across the country are likely to take differing approaches with regard to delivery of biodiversity within their areas, Local BAPs remain a key element for securing the requirements of the NPPF at a local level, consequently this assessment has taken due consideration of the priority habitats and species within the Hertfordshire Biodiversity Action Plan.

Local Policy Context

St Albans District Council

2.6 The following 'saved' policies are of relevance to ecology matters and the proposed development:

Policy 106: Nature Conservation. This policy sets out to protect the ecological assists of the District, including SSSI's, Nature Reserves, other sites of wildlife, geological or geomorphological importance and any site supporting species protected by the Wildlife and County Act 1981, when considering planning applications. The policy states *'The Council will take account of ecological factors when considering planning applications and will refuse proposes which could adversely affect'* such sites, or if planning is granted which could affect such a site, permission would be subject to conditions aimed at the protecting the special features of the site.

St Albans City & District Council Local Plan Publication Draft 2018

2.7 The St Albans City and District Council Local Plan 2020-2036 Draft Publication 2018 makes reference to biodiversity under the following Policies.

2.8 Policy L29 – Green and Blue Infrastructure, Countryside, Landscape and Trees

Biodiversity

"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".

Protection of existing woodland, trees and landscape features

2.9 Woodland and trees to be retained on a development site shall not be endangered by construction works or underground services or proximity to development. Sufficient provision should be made for root protection. New development must not be sited where it is likely to lead to future requests for tree felling or surgery for reasons of safety, excessive shading, nuisance or structural damage.

2.10 There will be a presumption against the removal or destruction of any hedgerow that is considered important (according to the Hedgerow Regulations).

Welwyn Hatfield District Plan, adopted 2005

2.11 The following 'saved' policies are of relevance to landscape and visual matters and the proposed development:

2.12 Policy R11 – Biodiversity and Development.

(i) The retention and enhancement of the natural features of the site;

(ii) The promotion of natural areas and wildlife corridors where appropriate as part of the design;

(iii) The translocation of habitats where necessary, where it can be demonstrated that the habitat or species concerned cannot be successfully accommodated within the development;

(iv) The use of locally native species in planting in accordance with Policy D8 Landscaping;

(v) Helping meet priorities/targets set out in the Local Biodiversity Action Plan.

2.13 Policy R13 - Sites of Special Scientific Interest

Proposals for development in or likely to affect Sites of Special Scientific Interest will be subject to special scrutiny. Where such development including that on land adjoining or adjacent to the sites may have an adverse effect, directly or indirectly, on the SSSI it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard the national network of such sites. Where development is permitted the Council will consider the use of conditions and/or planning obligations to ensure the protection and enhancement of the site's nature conservation interest.

2.14 Policy R14 - Local Nature Reserves

Planning permission will not be granted for any development likely to have an adverse effect on local nature reserves unless it can be clearly demonstrated that there are reasons for the proposal which outweigh the need to safeguard the substantive nature conservation value of the site.

Where development is permitted which would damage the nature conservation value of the site such damage should be kept to a minimum. Where appropriate the Council will consider the use of conditions and/or planning obligations to provide appropriate compensatory measures.

2.15 Policy R15 - Wildlife Sites

Planning permission will not be granted for any development which would have an adverse effect on Wildlife Sites or Regionally Important Geological/Geomorphological Sites unless:

(i) It can be demonstrated that the reasons for development outweigh the need to safeguard the biodiversity of the site; and

(ii) Measures are taken to mitigate the effect of the development, to compensate for any residual adverse effects and to reinstate the nature conservation value of the site.

2.16 Policy R17 - Trees, Woodland and Hedgerows

The Council will seek the protection and retention of existing trees, hedgerows and woodland by the use of planning conditions, section 106 agreements, hedgerow retention notices and tree preservation orders where applicable. New development will be required to incorporate wherever appropriate new planting with locally native species and should be in accordance with Policy D8 Landscaping.

Welwyn Hatfield Borough Council – Draft Local Plan 2016

2.17 The Welwyn Hatfield Borough Council Draft Local Plan, going through the examination process at the current time, contains the following policy of relevance to ecology:

2.18 Policy SADM 16 – Ecology and Landscape

Ecological Assets

i. Proposals will be expected to maintain, protect and wherever possible enhance biodiversity, the structure and function of ecological networks and the ecological status of water bodies.

ii. Proposals that would result in loss of or harm to:

a) International sites, Sites of Special Scientific Interest, National Nature Reserves, Local Nature Reserves or other statutorily protect features or species, will be refused unless:

- *the mitigation hierarchy has been followed, to firstly avoid, reduce and remediate direct and indirect adverse impacts before considering compensation; and*
- *imperative reasons of overriding public interest can be demonstrated.*

b) Ancient Woodland, veteran trees, chalk river habitats or habitats or species of national principal importance, will be refused unless:

- *the mitigation hierarchy has been followed, to firstly avoid, reduce and remediate direct and indirect adverse impacts before considering compensation; and*
- *the need for, and benefits of, the development significantly outweigh the loss or harm.*

c) *Local Wildlife Sites, other habitats, species and ecological assets of local importance, including ecological networks, woodland, orchards, protected trees and hedgerows and allotments, will be refused unless:*

- *the mitigation hierarchy has been followed, to firstly avoid, reduce and remediate direct and indirect adverse impacts before considering compensation; and*
- *the need for, and benefits of, the development significantly outweigh the loss or harm.*

Other Relevant Strategies, Guidelines or Documents

Hertfordshire Biodiversity Action Plan (BAP)

2.19 The Hertfordshire BAP sets out a 50-year vision for the wildlife and natural habitats of Hertfordshire. The BAP five Species Action Plans and 8 Habitat Action Plans that guide work on protecting, restoring and re-creating a sustainable level of biodiversity in the county. Of some relevance to the Site is the Farmland Habitat Action Plan which seeks to protect and enhance through appropriate management, ancient and species rich hedgerows.

2.20 The BAP also identifies a number of Key Biodiversity Areas (KBA), which reflect higher concentrations and/or distinctive types of habitat resource, and where conservation action would be valuable in restoring, creating or enhancing biodiversity.

Herefordshire Ecological Network Mapping

2.21 The 2013 Hertfordshire ecological networks mapping project identifies the strategic priorities and which/where habitats need to be maintained, restored and created, in addition to identifying areas suitable for appropriate development. The map component of the dataset is colour-coded with three overarching categories;

2.22 The 2013 Hertfordshire ecological networks mapping project identifies the strategic priorities and which/where habitats need to be maintained, restored and created, in addition to identifying areas suitable for appropriate development. The map component of the dataset is colour-coded with three overarching categories;

- Green - identifying areas containing habitats listed within S41 of the NERC Act and should be avoided by development and protected by the development management system;
- Purple – containing habitats not currently qualifying under S41 of the NERC Act but with high potential to do so. Whilst not receiving the same level of statutory and policy-based protection as the green areas, they should nonetheless be avoided by development and protected by the development management system where reasonable to do so.
- Orange/yellow/cream - These patches contain no mapped existing habitats of any significance. Therefore, in the context of the ecological network's dataset, these areas are suitable for appropriate development.

2.23 The Site is categorised as Orange, with the tree belt and plantation woodland along and adjacent to the western boundary categorised as Purple.

Birds of Conservation Concern

2.24 Leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of 244 bird species regularly found in Britain and, using standardised criteria, have assessed and assigned all bird species onto lists of conservation concern[10].

2.25 Birds are placed into one of three lists - Red, Amber or Green and although these listings offer no further legal protection, they are meant to guide conservation action for the individual species. The listings reflect an individual species' global and European conservation status as well as that within the UK and additionally measure the importance of the UK population in international terms.

Scope of Assessment

Assessment Approach

2.26 The EcIA has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment (EcIA) Guidelines, published in 2018. Baseline information and potential impacts have been quantified as far as practical to inform the assessment, supported by professional judgement and experience as appropriate. Where uncertainties exist, a precautionary approach has been adopted and a 'worse case' scenario approach assumed for the purposes of assessing impacts and recommending mitigation.

2.27 The significance of ecological impacts in relation to a proposal can be considered in relation to the importance of affected ecological features and the predicted magnitude of impact upon them.

2.28 The main source of information for this assessment are:

- Biological records (obtained from the relevant Local Biological Records centre and local interest groups);
- Online sources of Ecological Data;
- Review of legislation and land-use policies;
- Field surveys.

Zone of Influence

2.29 The CIEEM guidelines require the identification of a 'zone of influence' (ZoI) within which the ecological features that may be affected by the proposed scheme can be identified. This will identify the potential impact of the development not just to the Site but beyond the boundaries of proposed scheme.

2.30 The ZoI is determined by the source / type of impact, a potential pathway for that impact and the location and sensitivity of the important ecological feature beyond the boundary. For the majority of impacts identified as part of the proposed scheme, the ZoI is generally considered as the application site and immediately surrounding areas.

2.31 However, the ZoI can also vary considerably depending upon the species potentially affected by the proposed scheme. For example, some species may be confined to a specific location whilst

[10] Eaton et al (2015), Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108, 708-746. https://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf

others, such as bats and birds are more mobile and can occupy much larger home ranges. The presence of dispersal barriers can also have an effect on the ZoI such as roads or rivers which may either reduce the potential of animals crossing it or could cause a potential means of killing on injury. As such, this could isolate areas of potentially suitable habitat within the propose scheme due to fragmentation. In each case this is considered in association with the nature and scale of the proposed scheme and informed by best practice guidance and professional judgement.

2.32 Specific study areas were identified for the desk study and field surveys to inform the valuation of ecological features and the selection of 'key' ecological features material to the assessment.

Desk Study

2.33 In order to compile existing baseline information, relevant ecological information was requested and received from the Hertfordshire Environmental Record Centre (HERC) in June 2020, including records of protected or notable species and sites of designated for nature conservation interest.

2.34 Online sources of ecological data were also sought from the Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk).

2.35 Further inspection, using colour 1:25,000 OS base maps (www.ordancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

2.36 The search area varied depending upon the likely significance and ZoI of the data requested, as follows:

- A minimum of a 5km radius around the Site was searched for sites with an international statutory designation: Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites;
- A minimum of a 2km radius around the Site for sites of national / regional or local importance with a statutory designation: Site of Special Scientific Importance (SSSI) or National Nature Reserve (NNR);
- Up to a 1km radius around the Site for sites of local importance with statutory designation of Local Nature Reserve (LNR), or non-statutory designation of Site of Importance for Nature Conservation (SINC) or the equivalent Local Wildlife Site (LWS); and
- 1km search area for records of notable / protected species, including Species of Principal Importance under S41 of the Natural Environment and Rural Communities Act (NERC) 2006 and local biodiversity action plan species.

2.37 Further consideration of potential zones of influence in relation to statutory designated sites of International and National importance was made using Natural England's SSSI Impact Risk Zone Tool[11] which outlines the likely zone of influence from impacts for a range of development types.

[11] https://data.gov.uk/dataset/5ae2af0c-1363-4d40-9d1a-e5a1381449f8/sssi-impact-risk-zones

Field Survey - Habitats

2.38 Where available all surveys were undertaken following methodologies published in guidelines accepted by statutory and non-statutory agencies, including Natural England and CIEEM.

Extended Phase 1 Habitat Survey

2.39 An Extended Phase 1 Habitat Survey was undertaken which involved classification of the broad habitat types present using the system published by the UK Joint Nature Conservation Committee[12], but were considered appropriate, with additional information collected beyond that required to determine the Phase 1 Habitat type, with the scale of recording of habitat parcels adjusted to provide more detail for smaller sites. The survey comprised a walkover of the site, mapping the principal habitat types present and identifying a representative species list for each habitat. The Extended Phase 1 Habitat Survey of the Site was undertaken on 17th June 2020 by A. Lacey (Associate Ecologist - BSBI Field Identification Skills Certificate Level 4).

2.40 Any habitats suitable for, or features with the potential to support, protected or notable species were also assessed and recorded with the surveys.

Hedgerows

2.41 Hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)[13]. This method of assessment includes recording canopy species composition, associated ground flora and climbers, structure of the hedgerow including height, width and gaps, associated features including number and species of mature trees, banks, ditches and grass verges.

2.42 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:

- Grade 1 – High to very high value;
- Grade 2 – Moderately high to high value;
- Grade 3 – Moderate value;
- Grade 4 – Low value.

2.43 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.

2.44 The hedgerows were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997[14] to determine whether they qualified as 'Important Hedgerows' under the Regulations.

[12] JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7
[13] Clements, D.K. & Tofts, R.J. (1992) Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.
[14] DEFRA (1997) The Hedgerow Regulations 1997: A Guide to the Law and Good Practice, London, HMSO

Field Survey - Species

Badger

2.45 The standard methodology as recommended by Harris, Creswell and Jefferies [15] was followed to search for evidence which would indicate the presence of badgers on the site, signs sought included the identification of:

- Setts: including earth mounds, evidence of bedding and runways between setts
- Latrines: often located close to setts, at territory boundaries or adjacent to favoured feeding areas
- Prints and paths or trackways
- Hairs caught on rough wood or fencing
- Other evidence: including snuffle holes, feeding and playing areas and scratching posts

Bats

2.46 Trees present within or immediately adjacent to the Site were examined from ground level, with the aid of binoculars, for features that could provide suitable roosting opportunities including cracks, cavities, woodpecker/rot holes, fissures or missing limbs, and for evidence of use by roosting bats such as staining or the presence of bat droppings. Dense ivy cover was also noted when present as this can obscure the aforementioned features.

2.47 Trees were classified into general bat roost potential groups based on the presence of these features. The Table presented within Appendix A. broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in Bat Surveys for Professional Ecologists: Good Practice Guidelines[16] .

Great Crested Newts

2.48 Any ponds within the Site or in close proximity to its boundaries were assessed for their potential to support great crested newt Triturus cristatus using the Habitat Suitability Index (HSI) scoring methodology[17]. This is a quantitate means of evaluating habitat quality for GCN measured over ten suitability indices. The HSI provides a numerical index between 0 and 1 where scores closer to 0 indicate poor habitat with a lower probability of great crested newt occurrence, and scores closer to 1 represent optimal habitat with a higher probability of occurrence.

Table 1: Pond Suitability to support GCN according to HSI Score

HSI score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

[15] Harris, Creswell and Jefferies (1989), Surveying Badger, Mammal Society
[16] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust
[17] Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index.

Survey Limitations

2.49 The extended Phase I survey and hedgerow survey was undertaken within the optimal period for botanical surveys, during the growing season, as such no constraints exist in relation to the survey.

2.50 The ground-based inspection of the trees was undertaken outside of the peak survey period listed by the current BCT guidance of December to March, however all suitable features could be observed and it was considered that an accurate assessment of its potential could be made.

Assessment Methodology

2.51 The impact assessment for ecology has been carried out using guidance from CIEEM (2018). The impact assessment process involves:

- Identifying and characterising impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts;
- Assessing the significance of any residual effects after mitigation; and
- Identifying appropriate compensation & enhancement measures to offset significant residual effects.

2.52 The starting point for the assessment of impacts is to determine the importance of ecological features and as such, which should be subject to detailed assessment. Ecological features can be important for a variety of reasons, for examples, the quality of designated sites or habitats, habitat / species rarity, or their rate of decline (CIEEM, 2018).

Determining Importance

2.53 CIEEM have identified various characteristics that can be used to identify ecological features or features likely to be important in terms of biodiversity. These include:

- Animal or plant species that are rare or uncommon, either internationally, nationally or more locally;
- Ecosystems and their component parts, which provide the habitats required by the above species, populations and / or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity, connectivity and or / synergistic associations (e.g. networks of hedgerows and areas of species-rich pasture that may provide important feeding habitat for rare species);
- Notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical valued natural / semi-natural vegetation types – these will include examples of natural species-poor communities;
- Species on the edge on their range, particularly where their distribution is changing as a result of global trends and climate change;
- Species-rich assemblages of plants and animals; and
- Typical faunal assemblages that are characteristic of homogenous habitats.

2.54 Once an ecological feature has been identified as being important, guidelines promote the use of characterising this feature with the relevant geographic frame of reference. This allows the scale of significance of effects to be presented in a meaningful way and provides a focus of maintaining a feature at an appropriate scale. The known or potential value of an ecological feature within this assessment will be considered within the following geographical context:

- International;
- National;
- Regional;
- County (Hertfordshire); &
- Local (St. Albans District/Welwyn Hatfield Borough).

2.55 If an ecological feature is not considered to be important, the proposed scheme is not anticipated to have an effect that would be of relevance to the decision maker and these features are not considered further within the assessment. Exceptions to this would be if the species, population or habitat in question was identified as having a high social or economic value or if they are afforded legal protection (e.g. badgers). While the assessment does include protected species that receive statutory protection and are of material consideration at the local level, the presence of such a species does not necessarily infer value in relation to the proposed scheme but only to the level of protection it receives.

2.56 As such the value of the proposed scheme for protected species is considered by the specific ecological feature, taking into account the level of activity, the level of protection it receives and the overall value of habitat to that species within the Site.

2.57 Features with a value of Local or above were considered to represent an 'Important Ecological Feature' (IEF). Those features not meeting the criteria for IEF's were classified as having either lower than local level (immediate zone of influence) or negligible ecological importance.

2.58 Evaluation of habitats which did not reach this scale of significance were otherwise recognised as being of negligible significance or as providing habitat diversity at a site level but not considered to appreciably enrich the habitat resource at a local level.

Determining Impacts and Effects

2.59 The CIEEM guidelines, define an impact as an influence on an ecological feature. The effect is the outcome of the influence on the ecological feature. As part of the EcIA it is important to assess whether or not an impact is defined as an effect (negative or positive) on the integrity of a defined site or ecosystem and / or the conservation status of a habitat or species within a given geographical area (CIEEM, 2018).

2.60 Impacts should be identified and understood to be able to determine their likely effect (consequence) of that impact in relation to the ecological feature.

2.61 As part of the process of determining whether there is likely to be an effect on the status of an ecological feature, the following questions are considered:

- Will any site / ecosystem process be removed or changed?
- What will be the effect on the nature, extent, structure and function of component habitats?

- What will be the effect on the average population size and viability of the component species?

2.62 A description of parameters that are considered when assessing the degree and type of change are detailed in Table 2 below.

Table 2: Parameters used to Describe Effects

Parameter for describing impacts on ecological structure and function	Definition of the parameter
Positive or Negative	Whether the impact has a positive or negative effect
Extent	The area of which the effect occurs
Magnitude	The size or amount of an effect
Duration	The time for which the effect is predicted to last prior to recovery or replacement of the resource or feature
Reversibility	Whether the effect is permanent (i.e. irreversible) or temporary (i.e. reversible)
Timing and Frequency	How often the effect occurs (e.g. repeated noise from piling work) and when it occurs (e.g. vegetation clearance undertaken outside of the bird breeding season.

2.63 With reference to the duration of an ecological impact, in addition to other uses, for the purposes of the assessment Table 3 defines the timeframes used within the chapter:

Table 3: Definition of Timeframes

Term	Definition within this assessment
Short term	1-5 years
Medium term	6-15 years
Long term	16-60 years

2.64 In addition to considering the effect on the ecological feature an assessment of significance of the residual effect (for the type / nature of change), is provided in Table 4, below.

Table 4: Classification of the Significance of the Effects

Impact Classification	Explanation
Significant Negative Effect	Likely to create a significant negative effect, including loss, or long-term or irreversible damage on the status of the ecological feature.
Not Significant Negative Effect	Likely to create a negative effect without causing long-term or irreversible damage to the status of ecological feature.
Neutral	Effects are either absent or such that no overall net change to the ecological feature.
Not Significant Positive Effect	Likely to create a beneficial effect on an ecological feature, or providing a new lower value ecological feature without improving its conservation status.

Impact Classification	Explanation
Significant Positive Effect	The activity is likely to create a significant beneficial effect, including long-term enhancement and favourable conditions for an existing ecological feature.

2.65 Once an effect is considered to be significant then the scale of effect is assessed on a geographical scale (i.e. international, national, regional, district etc.). For example, the effect may not be significant at a district scale, but significant at a more local scale. It is important to note that effects on features will need to be considered at more than one geographical scale.

Mitigation, Compensation and Enhancement

2.66 For the purpose of the EcIA, impacts on ecological features are generally assessed without mitigation in place. Although in some situations it is impossible to separate the mitigation as this is embedded into the scheme, in these situations it will be acknowledged and just the residual effects considered.

2.67 In line with current CIEEM guidelines, a sequential process, known as the 'mitigation hierarchy' should be adopted on negative ecological impacts and effects. This involves:

- Avoid negative ecological effects;
- Reduce negative effects that cannot be avoided (mitigate); and
- Compensate for any remaining significant ecological effects.

3.0 BASELINE CONDITIONS AND EVALUATION

3.1 This section presents a description and evaluation of baseline conditions for the EcIA, based upon consultation and the results of the Extended Phase 1 Habitat survey.

Statutory and Non-statutory Designated Sites

3.2 The locations of the statutory and non-statutory designated sites are mapped within Figure 1.

Statutory Sites

3.3 No statutory designated sites of international nature conservation importance were identified for within 5km of the Site.

3.4 One statutory designated site of national / regional nature conservation importance was identified within 2km of the Site. Water End Swallow Holes SSSI is located 2km south-east. The SSSI is notified for its geological importance which comprise 'the only major sinkholes in chalk which are a permanent feature of the landscape'. Willow carr/swamp habitats associated with the sinkhole group are also noted to be of biological importance.

3.5 It is considered that the statutory designated site is of importance at a **National/Regional** level.

3.6 One statutory designated site of local nature conservation importance was identified within 1km of the Site. Colney Heath LNR is located 500m west of the Site, beyond the urban area of Roestock. The LNR is 23.2ha and incorporates a section of the River Colne. The site supports a mosaic of neutral, acid and marshy grasslands, heathland, scrub and riverine habitats which collectively support a diverse flora, including several species scarce or locally distributed in the county.

3.7 The potential ecological value of the site is based on its designation as a non-statutory designated site. See paragraph 4.9.

Non-Statutory Designated Sites

3.8 Eight non-statutory designated, Local Wildlife Sites were identified within the 1km search area. The details of all non-designated sites are provided in Table 5 below and mapped on Figure 1.

3.9 It is considered that all non-statutory sites recorded within the zone of influence are of importance at a **County** level.

Table 5: Non-statutory Designated Sites identified within 1km search area.

Name / Designation	Features of Interest	Distance from Site
Tollgate Wood LWS	Old secondary woodland with a semi-natural canopy and varied structure.	280m south-east
Colney Heath Farm Meadows LWS	A mosaic of old unimproved neutral to acid grasslands along the River Colne, which forms part of a larger complex of heathland/wetland sites in the area	440m west
Sleapshyde Gravel Pit LWS	Former gravel pit restored to amenity/wildlife Park. Supports mosaic of habitats including open water, wet neutral grassland, tall herb, scrub and plantation. Of ornithological interest.	570m north-west
North Mymms Park LWS	Parkland of semi-improved neutral grassland with planted trees.	580m south
Colney Heath Common LWS / LNR	Acid heathland bordering the River Colne.	500m west
Frederick's Wood LWS	Mature plantation on old heathland/acid grassland	600m west
Scrubby Grassland by Frederick's Wood LWS	Area of unimproved acid grassland with scattered scrub.	960m south-west
Hazel Grove LWS	Ancient semi-natural woodland.	970m north-east

Protected / Notable Species

3.10 Records of protected and priority faunal species derived from the desk study are provided in Table 6 below.

3.11 The locations of the pertinent species records are shown on Figure 2.

Table 6: Existing Protected / Notable Species Records within 1km search area.

Species	Conservation Status	Location/Notes
Brown-long eared bat *Plecotus auritus*	HabRegs, W&C, S41 NERC	2005 field observation record 225m north.
Common pipistrelle bat *Pipistrellus pipistrellus*	HabRegs, W&C	Three roost records dated 2011, 1990 and 2013 located 130m north, 230m west and 950m north-east.
Soprano pipistrelle bat *Pipistrellus pygmaeus*	HabRegs, W&C, S41 NERC	2006 field observation record 140m north.
a Pipistrelle bat *Pipistrellus* sp.	HabRegs, W&C	Three roost records spanning the period 2005 to 2012, 190m – 280m west.
Bullhead *Cottus gobio*	S41 NERC	Three records dated 2013-2015, 630m west.
Grass snake *Natrix natrix*	S41 NERC	Records from two locations, spanning the period 1985 – 2004, located 800m west.
Great crested newt *Triturus cristatus*	HabRegs, W&C, S41 NERC	Records dated 2011 and 1998 from monads TL2206 TL 2004 located minimum distance of 700m east and 850m south-west.
Badger *Meles meles*	PBA	Records of badger at 900m north.
Hedgehog *Erinaceus europaeus*	S41 NERC	Four records spanning period 2014-18 located between 250m – 730m north-west and 550m south-east.
Notable Invertebrates – Small heath *Coenonympha pamphilus*, wall *Lasiommata megera*, white-letter hairstreak *Satyrium w-album* & white ermine *Spilosoma lubricipeda.*	S41 NERC	Records spanning the period 1986 to 2016 from Colney Heath LWS / LNR & Frederick's Wood LWS 440-600m west. In addition, single 2011 record of white-letter hairstreak 165m north-east.
Notable Plants – cornflower *Centaurea cyanus* & shepherd's needle *Scandix pecten-veneris*	S41 NERC	Records from Colney Heath located 440m west, dated 1999 and 1996.

Conservation Status – HabRegs – The Conservation of Habitats and Species Regulations 2017, W&C – Wildlife & Countryside Act 1981 (as amended), PBA – Protection of Badgers Act 1992, S41 NERC – Listed as Species of Principal Importance on S41 of the Natural Environment & Rural Communities (NERC) Act 2006.

3.12 In addition to the above HERC provided a range of protected / notable bird species records (such as those listed Schedule 1 of the Wildlife & Countryside Act, S.41 of the NERC Act and Red and the Amber Birds of Conservation Concern lists. The majority of records are from two locations, Sleapshyde Gravel Pit LWS located 570m north and North Mymms Park LWS 580m south. A small number of records were also provided from within the built environment of Colney Heath approximately 180m north of the Site. Species recorded include a range of farmland and wood/scrub edge birds, and raptors characteristic of the habitats occurring locally. These species are identified on Figure 2.

Field Survey

Habitats

3.13 Habitat descriptions of the Site are provided below; the locations of the habitats described can be found on Figure 3 – Phase I Habitat Plan. Site photographs taken during the survey are presented throughout the text.

Arable

3.14 At the time of the survey, the field forming the Site had been recently sown with a maize crop. Established vegetation was restricted to generally narrow margins of poor semi-improved grassland associated with the boundary features. These margins are dominated by broad-leaved grass species such as false oat-grass *Arrhenatherum elatius*, perennial rye-grass *Lolium perenne*, common couch *Elytrigia repens* and soft-brome *Bromus hordeaceus*, with frequent to locally dominant tall, largely ruderal herbs which included common nettle *Urtica dioica*, great willowherb *Epilobium hirsutum,* American willowherb *E. ciliatum*, garlic mustard *Alliaria petiolata* and cow parsley *Anthriscus sylvestris*.

3.15 The arable farmland forming the Site, absent of any conservation headlands and with margins of poor semi-improved grassland, is considered to be of negligible intrinsic nature conservation value. Consequently, this habitat is not considered an important ecological feature in the context of the assessment and is not subject to detailed assessment.

Photograph 1. Site / Arable habitat viewed southwards

Tree / Woodland Belt

3.16 An approx. 8 - 10m wide belt of semi-mature to mature trees extends along the southern extent of the western boundary, between the Site and Roestock Park. The feature was likely to have previously been a hedgerow which has become outgrown and has been reinforced with supplementary planting of trees along the Park edge. The belt comprises scattered mature sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior* and pedunculate oak *Quercus robur* with groups of aspen *Populus tremula.* Hawthorn Crataegus monogyna, an elm Ulmus sp. and hazel *Corylus avellana* form the most abundant species to a dense shrub-layer with holly Ilex aquifolium, dogwood *Cornus sanguinea,* holm oak *Q. ilex* and field-rose *Rosa arvensis* also present. Common ivy *Hedera helix* dominated the ground-layer with a small number of other 'woodland' species such as false brome *Brachypodium sylvaticum*, germander speedwell *Veronica chamaedrys* and wood avens *Geum urbanum*, present.

3.17 A further belt of mature broad-leaved plantation woodland borders the northern extent of the western boundary. This woodland is largely absent of any shrub layer with grassland forming the ground-layer. A small number of the canopy trees, including a number of mature pedunculate oak, stand on or close to the boundary and overhang the Site.

3.18 The two woodland belts are not considered to represent a Habitat of Principal Importance (HPI) under the NERC Act 2006, however they do play a role in providing ecological connectivity around the margins of the Site and are considered to be of importance at a **Local** scale.

Hedgerows

3.19 A total of eight individual hedgerows were identified within the Site, and form sections of the northern boundary (H1 – H4) with the adjacent residential properties and the eastern (H4 & H5) and southern boundaries (H7-H8) with Bullen's Green Lane and Fellowes Lane respectively.

3.20 All of the substantive lengths of native hedgerow, H3, H4, H6 and H7, were species-rich (supporting at least six native species on average per 30m sample section). Hawthorn, field maple *Acer campestre*, hazel and blackthorn *Prunus spinosa* form the predominate canopy species within the hedgerows, with species such as holly, elder *Sambucus nigra*, wild plum *P. domestica*, ash, an elm and pedunculate oak as occasional associates. Species occurring more rarely (i.e., of low coverage in individual hedgerows) included field-rose, crab apple *Malus sylvestris* and dogwood.

Photograph 2. Tall, outgrown hedgerow (H6) along Bullen's Green Lane, viewed southwards.

3.21 A summary of the details (canopy compositions, profile, % gaps etc.) of the individual hedgerows within the site is provided in Table 7.

Table 7: Hedgerow Survey Results

Ref	Canopy and Tree Sp.	Height / Width (m)	Approx. Length (m)	*Av. Species Per 30m Sample Section	Comments / Associated Features	HEGS Grade	Import. HR
1	***Cm**, **Cs**, Cxl, Sv*	4+ / 2-3	20	-	Dwelling boundary, non-native dominated	-	N/A
2	***Fe**, Pd, **Ps**, Rf, **Sc***	4+ / 3-4	22	3	Dwelling boundary, >1 standard/50m, <10% gaps.	-	Exempt
3	***Ac**, Ah, **Ca**, **Cb**, **Cm**, **Fe**, **Ia**, **Qr**, Rf, Sn*	4+ / 3+	52	6	>1 Standard/50m, <10% Gaps, Ditch (Dry) >50% of Hedgerow, 1 End Connection Score.	2+	Exempt
4	***Ac**, Ah, **Bp**, **Ca**, **Cb**, **Cm**, **Cs**, Cxl, **Fe**, **Fs**, **Ia**, Pd, **Ps**, **Qr**, **Ra**, **Sn**, Sv,*	2-4 / 2-3	167	9	>1 Standard/50m, No Gaps, Ditch (Dry) >50% of Hedgerow, Adjacent to PRoW.	2	Exempt
5	***Ac**, **Ca, Ps***	2-4 / 3+	26	3	No Gaps, Hedgebank >50% of Hedgerow.	3	No

Ref	Canopy and Tree Sp.	Height / Width (m)	Approx. Length (m)	*Av. Species Per 30m Sample Section	Comments / Associated Features	HEGS Grade	Import. HR
6	***Ac**, **Ca**, **Cm**, **Fe**, **Ia**, **Qr**, **Ms,** Pd, **Ps**, **Ra**, Rf, **Sn**, **Ul***	4+ / 3+	192	8	>1 Standard/50m, <10% Gaps, Ditch (Dry) >50% of Hedgerow, Bank <50% of Hedgerow, Parallel Hege within 15m.	-1	Yes
7	***Ac**, **Ca**, **Cm**, **Cs**, **Ia**, Pd**, Ps**, **Pt, Qr**, Sa, **Rc**, Rf, **Ul***	4+ / 3-4	91	7	<10% Gaps, Ditch (Dry) >50% of Hedgerow, Bank >50% of Hedgerow, Parallel Hege within 15m.	1	Yes
8	***Ca, Cs, Ps***	3+ / 4+	20	3	Dwelling boundary, No Gaps, 1 End Connection	-	Exempt

Species Key: *Ac Acer campestre* – field maple, *Ah Aesculus hippocastanum* - horse-chestnut, *Ap Acer pseudoplatanus* – sycamore, *Ca Corylus avellana* – hazel, *Cb Carpinus betulus* – hornbeam, *Cm Crataegus monogyna* - hawthorn, *Cs Cornus sanguinea* – dogwood, *Cxl Cupressus × leylandii* – Leyland cypress, *Fe Fraxinus excelsior* - ash, *Ia Ilex aquifolium* - holly, *Pd Prunus domestica* – wild plum, *Ps Prunus spinose* - blackthorn, *Pt Populus tremula* – aspen, *Qr Quercus robur* - pedunculate oak, *Ra Rosa arvensis* – field-rose, *Rc Rosa canina* - dog-rose, *Rf Rubus fruticosus* agg. - bramble, *Sa Symphoricarpos albus* – snowberry, *Sc Salix caprea* – goat willow, *Sn Sambucus nigra* – elder *Sv Syringa* vulgaris – lilac, *Ul Ulmus* sp. – an Elm.

Bold text denotes those species listed as Woody Species on Schedule 3 of the Hedgerow Regulations.

* Average Species Per 30m Sample Section includes only Schedule 3 listed Woody Species.

3.22 Two hedgerows, H6 and H7, forming the Site's eastern and southern boundaries were identified as being 'important' in accordance with the Wildlife and Landscape criteria of the Hedgerow Regulations 1997. Hedgerows H2, H3 and H4 were exempt from the Act due to their function as boundaries to dwellings.

3.23 HEGS identified two hedgerows, H6 and H7, as being of high to very high conservation value (Grade 1), due to their good structural attributes (relatively high number of trees and optimal canopy structures) and diverse canopies. The remaining substantive hedgerows, H3 and H4, were found to be of moderately high to high conservation value, scoring relatively lower in comparison to the aforementioned hedgerows due to their relatively lower structural attributes.

3.24 With the exception of hedgerow H1, supporting Leyland cypress *Cupressocyparis leylandii*, all of the hedgerows supported at least 80% native canopy species and therefore meet the criteria as a Habitat of Principal Importance under the NERC Act 2006.

3.25 Hedgerows are a common and widespread habitat type both nationally and locally, however hedgerows being 'Important in accordance with the Hedgerow Regulations and Grade 1 under HEGS are likely to be of more limited occurrence, hedgerows H6 and H7 are therefore considered to be of importance at a **County** scale. Hedgerows H3 and H4 being species-rich and Grade 2 are considered to of importance at a **Local** scale. The remaining three hedgerows, H1, H2 and H5 being species-poor and of short length are considered to represent poor examples of the habitat type. Subsequently these hedgerows are considered to be of importance **Below Local** scale.

Mature Trees

3.26 Mature to early mature trees form a frequent component of the hedgerows. Pedunculate oak and ash form the most common species with small numbers of horse chestnut, field maple and sycamore. No trees were considered to be of veteran status, however prominent species by virtue of their greater size, included a group of five 'interlocking' pedunculate oak along Bullens Green Lane and single oak standards along the northern boundary (H4) and the southern boundary (H7) hedgerows.

3.27 Mature trees are a common feature of the local landscape and considering the relatively limited number present within the Site and absence of any aged or veteran specimens, the resource is considered to be of importance at **Below Local** scale.

Species

Badger

3.28 No evidence of badger was observed on Site or on land immediately adjacent to the Site where accessible/visible during the Phase I survey and no badger records were identified on or in close proximity to the Site by the desk study.

3.29 The value of the habitats within the Site for badgers is therefore not considered to be an important ecological feature in the context of this assessment

Bats

3.30 The desk study provided records of three bat species from the 1km search area. These included common pipistrelle, soprano pipistrelle and brown long-eared bat. Soprano pipistrelle and brown long-eared bat are listed as Species of Principal Importance under the NERC Act (2006). Despite this listing, these species are common and widespread.

Roosts

3.31 The ground level assessment of the mature trees found the majority to be in good condition and absent of features suitable for use by roosting bats. One ash (TN1) located within the woodland belt along the Site's western boundary was classified as having low potential for roosting bats. Potential roost features on this tree were limited to a small (10cm Ø) downward facing branch-socket cavity located on the western aspect at 5m from ground-level.

Habitat Assessment

3.32 The arable habitat forming the core of the Site was considered to offer very few opportunities for foraging and commuting bats. However, the boundary habitats, including the hedgerows along Roestock Park, Bullens Green Lane and Fellows Lane which are unlit, provide suitable commuting and foraging habitat to local bat populations.

Importance

3.33 Taking into account the urban edge location of the Site and its arable nature and restriction of foraging and commuting value to boundary habitats, it is considered unlikely that the Site will be of particular importance for bats. However, the boundary features are likely to provide foraging and

commuting habitat to an assemblage of more common and widespread bat species, such as common pipistrelle, soprano pipistrelle and potentially brown long-eared bat, which the desk study highlighted as being previously recorded from the local area. The importance of the Site for bats is therefore considered to be no greater than at a **Local** scale

Birds

3.34 The boundary hedgerows and woodland belts provide suitable nesting and year-round foraging and shelter habitat for more generalist urban edge species, including declining but common and widespread species such as song thrush *Turdus philomelos* and dunnock *Prunella modularis*, both listed as Species of Principal Importance under the NERC Act and on the BoCC Red and Amber list respectively. The hedgerows also provide potential nesting habitat for small numbers of declining but common and widespread farmland species such as yellowhammer *Emberiza citrinella* and linnet *Linaria cannabina,* listed as Species of Principal Importance under the NERC Act and on the BoCC Red list.

3.35 Based on the crop planted at the time of the assessment, maize, the Site represents sub-optimal nesting habitat for small numbers of skylark *Alauda arvensis* due to the crop becoming tall and dense by late spring and limiting the number of broods.

3.36 The stubble of maze is also of limited foraging value to wintering farmland birds such as skylark, yellowhammer, linnet and reed bunting supporting only occasional and/or small numbers. The boundary hedgerows, dominated by berry producing species such as hawthorn and blackthorn are likely to provide winter forage for birds, including redwing *Turdus iliacus* and fieldfare *T. pilaris.*

3.37 It is recognised that annual crop rotation will heavily influence the suitability of the arable habitat for breeding and wintering birds. Nevertheless, the restricted size of the Site limits its value. For example, based on evidence by Donald and Vickers[18], a cereal crop on a Site of this size would be expected on average to support one skylark breeding territory.

3.38 Based on its relatively small size and limited habitat diversity which in turn limited the species diversity and numbers of farmland birds, and widespread availability of similar farmland habitats within the local area, the Site is considered to be of importance at no greater than **Local** scale for breeding and wintering birds.

Great Crested Newts

3.39 No waterbodies were present within the Site; however, a single ornamental garden pond was noted to the immediate north of the Site (TN2). Examination of the 1:25000 OS identified no further waterbodies within 250m and sharing habitat connectivity to the Site.

3.40 The small garden pond was approximately 15m² with near vertical lined sides and was stocked with koi carp, as shown in Photograph 3. HSI assessment of the pond found it to be of poor habitat suitability (HSI score 0.24) for great crested newts.

[18] Donald, P. F. and Vickery, J. A. (2000) The importance of cereal fields to breeding and wintering Skylark Alauda arvensis in the UK. Pp. 140–150 in N. J. Aebischer, A. D. Evans, P. V. Grice and J. A. Vickery, eds, Proceedings of the 1999 BOU Spring Conference: ecology and conservation of lowland farmland birds. Tring, UK: British Ornithologists' Union.

Photograph 3. Garden Pond (TN2) located to the immediate north of the Site.

3.41 Based on the absence of any pond suitable to support great crested newts within 250m and sharing habitat connectivity to the Site, it is concluded that great crested newts are absent from the Site and will not be subject to detailed assessment.

Reptiles

3.42 Consultees returned no records of reptiles from within 1km of the site.

3.43 Habitats within the site were considered to be generally unsuitable for use by reptile species, being comprised mostly of intensively-managed arable land with narrow field margins.

3.44 Therefore, the presence of reptiles is considered unlikely and reptiles are not considered to be an important ecological feature and will not be subject to detailed assessment.

Invertebrates

3.45 The majority of the Site comprising intensively farmed arable land is of little interest for invertebrates. The eastern and southern boundary hedgerows, H6 and H7, in addition to the woodland belt along western boundary support elm at varying levels of coverage (locally abundant to frequent) and may provide suitable habitat for white-letter hairstreak *Satyrium w-album* butterfly.

3.46 The white-letter hairstreak is listed as a species of principal importance under S41 of the NERC Act 2006, although is noted to be fairly widespread and common within Herefordshire and Middlesex[19].

3.47 The Site is considered to be of importance **Below Local** scale for Invertebrates.

Summary of Ecological Features

3.48 A summary of the ecological features that have been determined as requiring detailed assessment is provided in Table 8.

Table 8: Summary of Important Ecological Features and their Relative Geographical Importance

Ecological Feature	Geographical / Ecological Frame of Reference
Water End Swallow Holes SSSI	National/Regional
Local Wildlife Sites (including Colney Heath Common LWS / LNR)	County
Tree / Woodland Belts	Local
Hedgerows H6 & H7	County
Hedgerows H3 & H4	Local
Bats (assemblage)	Local
Breeding & Wintering Birds	Local

4.0 DESCRIPTION OF THE PROPOSED SCHEME

4.1 Proposals are for a residential development of up to 100 dwellings, including 45% affordable and 10% self-build, together with all ancillary works. Vehicular access will be via Bullens Green Lane. The planning approval sought is outline with all matters reserved except access. The proposals as shown on the Illustrative Site Layout Plan (Dwg. No. 17981 1002) and the Landscape Strategy Layout Plan (Figure 1, Rev B) have informed the following impact assessment.

4.2 Consideration was given to siting the vehicular access at alternative locations as to limit hedgerow loss. These included at the northern extent of Bullens Green Lane and eastern extent of Fellowes Lane, where existing gaps in the hedgerow are present. The former location was found unsuitable due it being unable to accommodate the required instability splay northwards within the Site boundary and due to the existing parking on the Lane in this location which present issues in regards to tracking. The latter location was considered unfavourable, as to observe a suitable offset from the existing junction, the widening of the road and associated visibility splays would have resulted in clearance of hedgerow habitat along a proportion of both Fellowes and Bullens Green Lane.

[19] Butterfly Conservation Hertfordshire and Middlesex Branch White-letter Hairstreak. [online] Available at: https://www.hertsmiddx-butterflies.org.uk/species/White-letterHairstreak.php [Accessed 20 Jul. 2020].

4.3 The landscape proposals for the Site's include areas of green space within the Site's northern and southern extent, the former accommodating the attenuation requirements, and green corridors buffering the boundary hedgerows. The specifics of the landscape proposals will be provided at the detailed design stage. However, as to maximise the biodiversity value of the Site the following principles would be adopted;

- Areas of informal green space within the northern extent would be sown with a wildflower grassland mix appropriate to the local area, and subject to appropriate management to maintain its species-diversity;
- Any structural planting (trees and shrubs) within the areas of green space would use native species of local provenance, as is a requirement Policies R11 & D7 of the adopted local plan;
- Existing gaps in the western and southern boundary hedgerows would be replanted (with the exception of that required for pedestrian access) with native species of local provenance;

4.4 Created and retained habitats within the green space would be subject to a Landscape & Ecological Management Plan (LEMP) secured by way of planning condition, to ensure that their future value is maintained.

5.0 IMPACT ASSESSMENT OF IMPORTANT ECOLOGICAL FEATURES

Statutory Designated Sites

Potential Construction Phase Impacts

Water End Swallow Holes SSSI

5.1 Based on the nature of the proposals and their distance from the Site, Water End Swallow Holes SSSI would **Not be subject to any Significant Effects** resulting from the construction phase.

5.2 This conclusion is supported by the online Impact Risk Zone Tool which at the distance the Site is from the SSSI does not identify residential development as having the potential to adversely impact the SSSI.

Colney Heath Common LNR/LWS

5.3 Colney Heath LNR/LWS is located approximately 500m west of the Site and is separated from the Site by the existing built environment of Rostock. Based on its distance from the Site and nature of the intervening land-use, the LNR/LWS would **Not be subject to any Significant Effects** resulting from the construction phase.

Potential Operational Phase Impacts

Water End Swallow Holes SSSI

5.4 Based on the nature of the proposals and their distance from the site, Water End Swallow Holes SSSI would **Not be subject to any Significant Effects** resulting from the construction phase.

5.5 This conclusion is supported by the online Impact Risk Zone Tool which at the distance the Site is from the SSSI does not identify residential development as having the potential to adversely impact the SSSI.

Colney Heath Common LNR/LWS

5.6 The Common shares some connectivity to the Site through the local footpath network, with the shortest-walking distance between the Site and entrance of the LNR/LWS being approximately 630m via Roestock Lane, and therefore may be subject to a degree of increased visitation from additional residents from the proposed development.

5.7 Review of the desk study information and the Strategic Plan[20] for the Common highlights that the supports good quality semi-improved grassland, acid grassland and heathland. Significant increases in visitor pressure can result in long-term damage to such habitats through trampling of vegetation, compaction of soils and nutrification from uncollected dog faeces.

5.8 The LNR/LWS is a relatively large designation and appears to be well-used by the local community with a well-defined network of largely unsurfaced footpaths present. Review of the Strategic Plan prepared to inform future management of the Common for the period of 2019 – 2024, does not highlight any current effects or concerns relating to visitor pressure.

5.9 Taking into account, the distance of the LNR/LWS from the Site, the presence of alternative public footpath routes which would be available for residents for recreation, including those extending to the north and east of the Site and within the development itself. It is considered unlikely that the levels of visitation from residents from the development would be such as to result in any adverse effects to the designated site. Especially when considering the well-defined provision of footpaths and extensive nature of the designated site.

5.10 Subsequently the LNR/LWS would **Not be subject to any Significant Effects** resulting from the construction phase.

Non-Statutory Designated Sites

Potential Construction Impacts

5.11 The desk study identified a further seven non-statutory designated LWSs at distance between 280m and 970m from the Site. No pollution pathways have been identified from the Site to any the LWSs.

5.12 Based on their distances from the Site and absence of any pollution pathways, the LWS's would **Not be subject to any Significant Effects** resulting from the construction phase.

Potential Operational Phase Impacts

5.13 Based on a combination of their distance from the Site, the nature of these features of value, and that a number of the LWSs, including Tollgate Wood, Colney Heath Farm Meadow and Frederick's Wood LWS are located on private land with no apparent formal access, the LWS's would **Not be subject to any Significant Effects** resulting from the construction phase

[20] Colney Heath Parish Council (2019) Strategic Plan for Colney Heath Common January 2019

Tree / Woodland Belts

Potential Construction Phase Impacts

5.14 Proposals will not result in the loss of any of the woodland belts. The arboricultural report outlines that one tree, T26, and tree group, G9, comprising mature aspen would require removal due to their physiological and structural condition and increased risk of failure. The removal of these trees would not affect the integrity of the woodland belt or its function as a habitat corridor to local wildlife. It should also be noted that the arboricultural report recommends the removal of these trees irrespective of the development.

5.15 There is potential for indirect impacts on the retained plantation woodland through accidental physical damage to both above and below ground parts.

5.16 The construction phase also has the potential to increase the amount of airborne dust, particularly in periods of dry weather. In the absence of mitigation, dust deposition could result in damage to vegetation and potentially affect associated fauna. Where impacts are severe, some species may disperse from affected areas in the short-term.

Potential Operational Phase Impacts

5.17 No potential operational phase impacts to the broad-leaved woodland belts have been identified.

Mitigation

5.18 The arboricultural report outlines measures to provide protection to the above and below ground elements of retained hedgerows and trees that are present on Site. This is based on BS 5837:2012, 'Trees in relation to design, demolition and construction'. It utilises the use of protective fencing of root protection areas to restrict damage features during construction. These and further measures will be included in a Construction Environmental Management Plan (CEMP). These measures will ensure that no significant long-term impacts occur to trees or hedgerows during the construction phase.

5.19 A CEMP providing detailed information on dust control measures will be implemented during works.

Significance of Residual Effects

5.20 The successful implementation and monitoring of the CEMP throughout the construction phase will ensure the residual effects due to accidental damage and dust deposition will be **Neutral**.

Hedgerows

Potential Construction Impacts

5.21 Under the proposals approximately 70m of hedgerow (26m of hedgerow H5 and a 43m section of hedgerow H6) would require removal to facilitate the vehicular access point on Bullens Green Lane and the required visibility splays. A short section of hedgerow H7, no greater than 2-3m, would also require removal to create the new footpath link from the development along Fellows Lane. Hedgerows H6 and H7 were identified as being Important in accordance with the wildlife and landscape criteria of the Hedgerow Regulation Act and Grade I under HEGS. Prior to the implementation of mitigation these losses would result in a net loss of a habitat of principal

importance and hedgerow habitat identified as being of high nature conservation value. As the proposals only result in partial loss of H6 (22% of the total hedgerow) and H7 (3%) this loss would be unlikely to affect the integrity of the retained sections of these hedgerows such that they would no longer be Important under the Hedgerow Regulations or grading under HEGS.

Potential Operational Phase Impacts

5.22 All of the retained (and created) hedgerow resource will be buffered from the proposals. Subsequently no potential operational phase impacts have been identified.

Mitigation/Compensation

5.23 The hedgerow loss totalling 73m will be compensated for through the planting of native species-rich hedgerow set-back along the required visibility splay along Bullens Green Lane and along the currently open sections of the boundaries along the northern extent of the Lane and the eastern extent of Fellowes Lane. This hedgerow planting totalling approximately 163m would comprise native species, characteristic of the National Character Area (Northern Thames Basin) and planted to be species-rich, with no fewer than five species per 30m section. Along Bullens Green Lane the new hedgerow would incorporate the associated features, including a small hedgerow bank and shallow ditch, characteristic of the section of hedgerow being affected.

Significance of Residual Effects

5.24 The scheme would result in a minor increase (15%) of native hedgerow habitat and a habitat of Principal Importance over the current Site baseline. Some residual effects would remain through the loss of hedgerow habitat qualifying as Important under the Hedgerow Regulations. However, considering the relatively small amount affected and the likely occurrence of such similar hedgerows within the County, the effects of the hedgerow loss are considered to be **Not Significant Negative Effect** at no greater than a **Local** scale.

Bats

Potential Impacts

Roosts

5.25 One mature ash tree (TN1) located within the narrow woodland belt along the western boundary was identified as having low potential for roosting bats. The tree will be retained within the proposals and as the potential roost feature is sited on the western aspect (facing away from the Site) would remain unaffected.

Foraging/Commuting Habitat

5.26 The majority of the boundary habitat of value as commuting / foraging habitat to bats will be retained within proposals, however as is outlined within para. 6.21 the creation of the access into the Site will result in the temporary loss of hedgerow habitat along Bullens Green Lane with a subsequent reduction in the available foraging resource and a commuting route for the common and widespread bat species identified within the local area and potentially using the on-Site habitat.

5.27 Impacts on foraging and commuting bats are possible as a result of increased levels of artificial light, particularly along retained habitats, during both the construction and operational phases.

Mitigation/Compensation/Enhancement

Roosts

5.28 The current low availability of roosting habitat within the Site would be enhanced through the provision of artificial bat roost features. Based on the size of the scheme, a total of nine of the box types (or similar) recommended below, placed on suitably located mature trees, and would provide suitability for different species, roosting both singularly and in groups at different times of year.

- Schwegler 2FN/1FD
- Schweglar 2F-DFP
- Schweglar 1FF

5.29 Boxes should be installed in groups of 2 or 3 at least 4m from the ground. Ideally bat boxes should be sited on south-eastern or south-western aspects.

Foraging/commuting Habitat

5.30 As outlined within para. 6.23 compensatory hedgerow planting will be undertaken along the Sites, eastern and southern boundaries. A residual gap, approximately 12-15m will result from the vehicular access point into the Site. As to guide commuting bats at a safe hight across this, tall vegetation would be planted on either side to create a 'hop-over'.

5.31 The landscape proposals for the open space within the Site's northern extent, including areas of wildflower grassland in association with the SuDS features and structural planting of native shrubs and trees will provide foraging habitat to local bat populations.

5.32 The development design has sought to minimise any potential lighting impacts on the boundary habitats from the proposed residential dwellings, through their buffering by private drives and provision of grassland strips with associated structural planting or siting of residential gardens backing onto the habitat.

5.33 Measures to limit the impact of artificial light on bats during the construction phase would be outlined within the CEMP and would include the appropriate siting of any required flood lighting as to avoid light spill on features of foraging and commuting value.

5.34 As to avoid lighting impacts on the commuting and foraging habitats a sensitive lightening strategy would be implemented in accordance with best practice guidelines[21] and would adhere to the following principles:

- The strategic use of structural landscaping and planting to avoid light spill on sensitive habitats, including retained hedgerows, to help to retain a dark corridor;
- The avoidance of direct lighting of existing trees or proposed areas of habitat creation/landscape planting;

[21] Bat Conservation Trust & Institution of Lighting Professionals (2018) Guidence Note 08/18 – Bats and artificial lighting in the UK, Bats and the Built Environment Series.

- Unnecessary light spill will be controlled through a combination of LED directional lighting, low lighting columns, hooded/shielded luminaires or strategic planting;
- Light free of UV emissions to prevent potential adverse effects on flying insects and bat populations.
- Lighting designed to automatically switch off or be dimmable where possible.

Significance of Residual effects

5.35 The removal of sections of hedgerow along Bullens Green Lane will result in the loss of suitable bat foraging and commuting habitat for the common and widespread bat species recorded locally. The magnitude of these effects is reduced by the retention of other foraging and commuting habitat, along the western boundary, which links into the wider landscape. Prior to the maturation of the proposed green infrastructure, it is considered that the loss of this habitat, particularly the hedgerows will result in a **Not Significant Negative Effect** at a **Local scale** on the common and widespread bat species likely utilising the Site. Once the Landscape strategy has matured a **Not Significant Beneficial Effect** at a **Local** Scale would result through a betterment of foraging/commuting over the existing baseline.

Birds

Potential Impacts

5.36 The conversion of the Site from an arable environment to an urban one would result in the loss of habitat and displacement of those species requiring open farmland habitats. Based on the relatively small size of the Site and limited habitat diversity, this loss would be expected to impact on a small number of declining, common and widespread species such as linnet, yellowhammer and skylark, which may utilise the Site for breeding and winter forage.

5.37 During the construction phase there is also a potential impact arising from vegetation and Site clearance through the damage or destruction of active nests.

Mitigation/Compensation Measures

5.38 The landscape proposals including the creation of flower-rich grassland and structural planting of native shrubs and trees, in addition to the minor increase of hedgerow habitat will provide additional foraging, shelter and nesting habitat for more generalist bird species, this may include a small number of declining, common and widespread including declining but common and widespread species such as song thrush and dunnock.

5.39 Additional enhancements for generalist birds would be integrated into the development proposals and include the erection of a mixture of nest box types such as hole-fronted boxes for blue tit and great tit and open fronted boxes for robin.

5.40 Vegetation clearance should take place between September and February inclusive, so that breeding birds would not be affected. If this is not possible, the area will be checked prior to removal by an experienced ecologist. If active nests are found, areas will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance.

Significance of Residual effects

5.41 A negative effect is anticipated on farmland birds using the Site. However, given the relatively small size of the Site and limited numbers of farmland birds it will support, and the widespread availability of similar farmland habitats within the local area, this effect is considered **Not Significant Negative** at a **Local** scale.

5.42 The loss of the Site's habitat is expected to have a negligible impact on the local breeding status of the other bird species with habitat compensation measures providing a medium term **Not Significant Beneficial** effect at a **Local** scale.

Key

- Site Boundary
- 1km Buffer
- 2km Buffer
- Local Wildlife Site (LWS)
- Local Nature Reserve (LNR)
- Site of Special Scientific Interest (SSSI)
- Ancient Semi-Natural Woodland (ASNW)

1 - Tollgate Wood LWS
2 - North Mymms Park LWS
3 - Colney Heath Farm Meadows LWS
4 - Colney Heath Common LWS, LNR
5 - Frederick's Wood LWS
6 - Scrubby Grassland by Fredericl's Wood LWS
7 - Sleapshyde Gravel Pit LWS
8 - Hazel Grove LWS, ASNW
9 - Water End Swallow Holes SSSI
10 - Cobs Ash / Cangsley Grove ASNW
11 - Bush Wood ASNW
12 - Millwards Park ASNW

0 500 1000 m

FPCR Environment and Design Ltd, Lockington Hall, Lockington, Derby, DE74 2RH ■ t:01509 672 772 ■ f:01509 674 565 ■ e: mail@fpcr.co.uk ■ w: www.fpcr.co.uk
masterplanning ■ environmental assessment ■ landscape design ■ urban design ■ ecology ■ architecture ■ arboriculture

client
Woods Hardwick Planning Ltd

project
Land off Bullens Green Lane,
Colney Heath

drawing title
SITE LOCATION AND CONSULTATION RESULTS PLAN - DESIGNATED SITES

scale 1:18000 | drawn LG / AL | issue 27/8/2020

drawing / figure number **Figure 1** | rev **9569-E-01**

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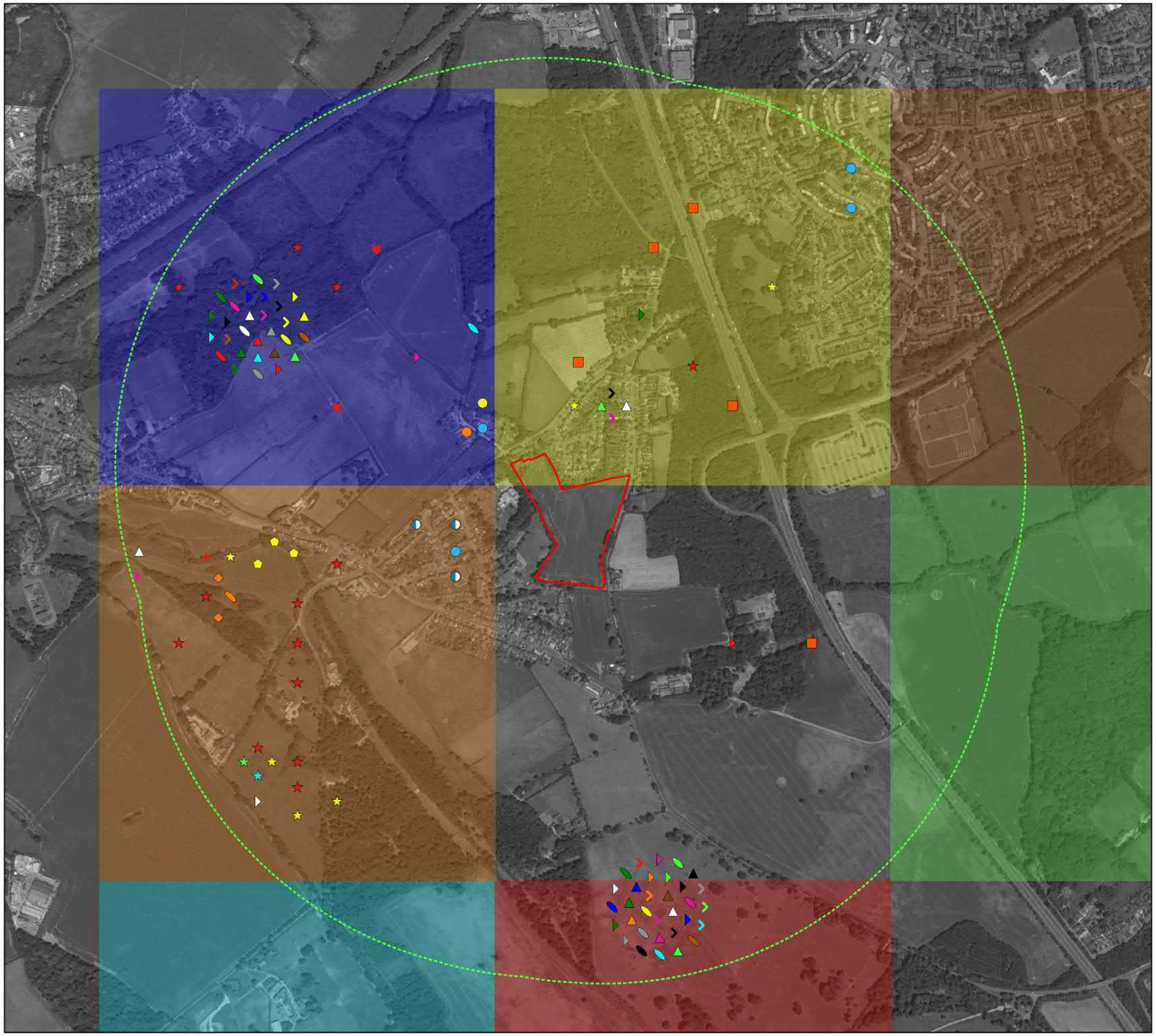

Key

- Site Boundary
- 1km Buffer

Bats
- Brown Long-eared
- Common Pipistrelle
- Pipistrelle sp.
- Soprano Pipistrelle

Birds
- Barn Owl
- Brambling
- Bullfinch
- Common Redpoll
- Cuckoo
- Curlew
- Dunnock
- Fieldfare
- Firecrest
- Goshawk
- Grasshopper Warbler
- Green Sandpiper
- Grey Partridge
- Grey Plover
- Grey Wagtail
- Hobby
- House Martin
- House Sparrow
- Kestrel
- Kingfisher
- Lapwing
- Lesser Redpoll
- Lesser Spotted Woodpecker
- Linnet
- Marsh Tit
- Meadow Pipit
- Mistle Thrush
- Osprey
- Oystercatcher
- Peregrine
- Red Kite
- Redstart
- Redwing
- Reed Bunting
- Skylark
- Snipe
- Song Thrush
- Spotted Flycatcher
- Starling
- Swift
- Tree Pipit
- Tree Sparrow
- Willow Warbler
- Woodcock
- Yellow Wagtail
- Yellowhammer

Fish
- Bullhead

Herpetofauna
- Grass Snake

Mammals
- Hedgehog

Notable Invertebrates
- Cinnabar
- Small Heath
- Wall
- White-letter Hairstreak

Notable plants
- Cornflower
- Shepherd's-needle

Species Records of 1km Accuracy
- Species within TL2006: Cinnabar; 33 notable bird species
- Species within TL2106: House sparrow; Red kite; Shaded broad-bar; Small heath; Starling
- Species within TL2206: Great crested newt
- Species within TL2005: Blood-vein; Cinnabar; Cornflower; Small heath; White ermine
- Species within TL2205: Swift
- Species wihtin TL2004: Great crested newt; 48 notable bird species
- Species within TL2104: 44 notable bird species

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client: Woods Hardwick Planning Ltd

project: Land off Bullens Green Lane, Colney Heath

drawing title: SITE LOCATION AND CONSULTATION RESULTS PLAN - DESIGNATED SITES

scale: 1:10000 | drawn: LG / AL | date: 27/8/2020

drawing / figure number: **Figure 2** | rev: **9569-E-02**

FPCR Environment and Design Ltd, Lockington Hall, Lockington, Derby, DE74 2RH ■ t:01509 672 772 ■ f:01509 674 565 ■ e: mail@fpcr.co.uk ■ w: www.fpcr.co.uk

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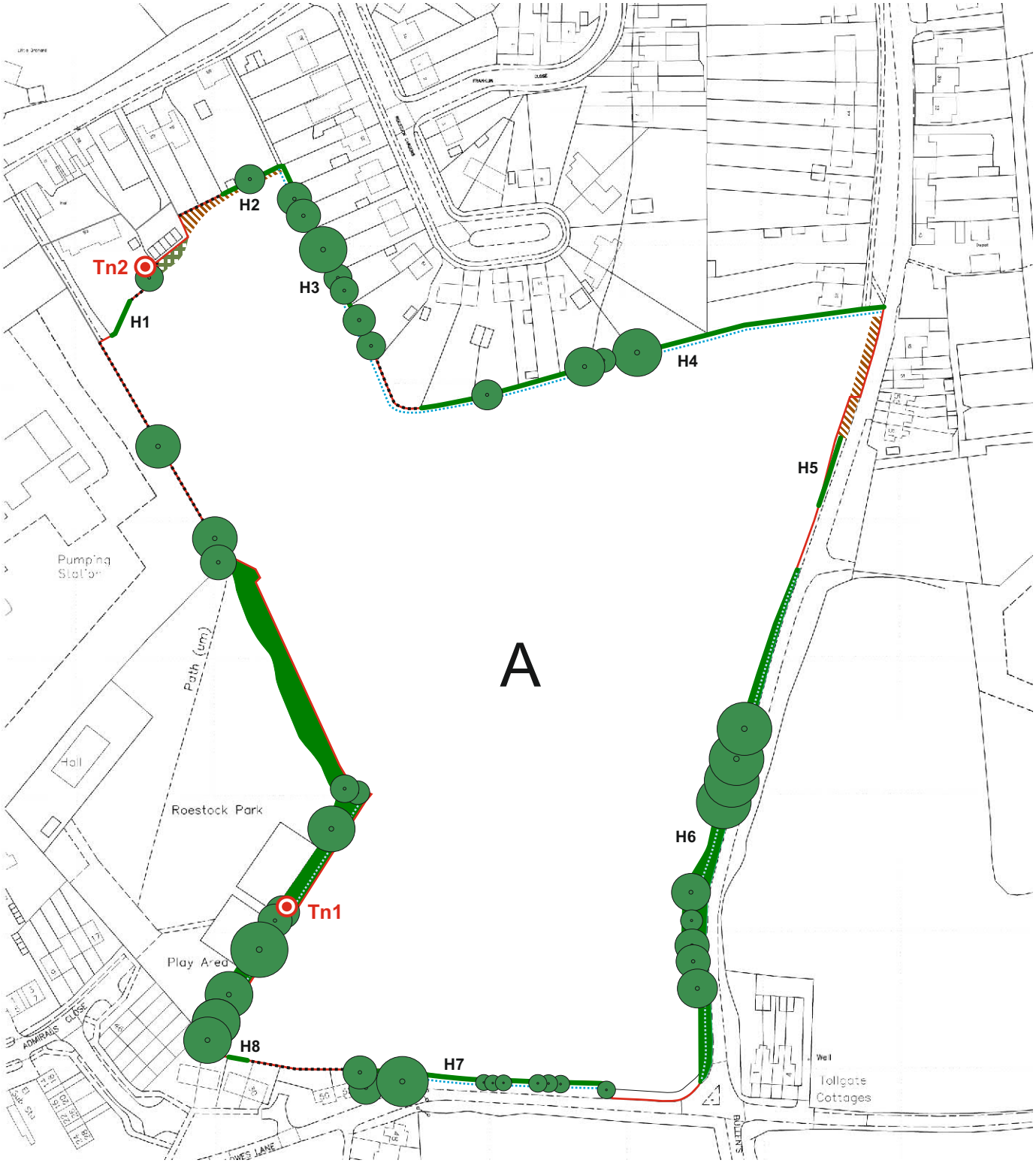

- Site Boundary
- A — Arable
- Hedgerow
- Mature Tree
- Tall Ruderal
- Dense Scrub
- Dry Ditch
- Target Note

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Woods Hardwick Planning Ltd.

Land off Bullens Green Lane
Colney Heath

PHASE I HABITAT PLAN

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Figure 3.0 9501-E-03

APPENDIX A – CLASSIFICATION AND SURVEY REQUIREMENTS FOR BATS IN TREES

Classification and Survey Requirements for Bats in Trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
Confirmed Roost	Evidence of roosting bats in the form of live bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be undertaken. This will require a combination of aerial assessment by roped access bat workers and nocturnal survey during appropriate period (May to August). Replacement roost sites commensurate with status of roost to be provided. Works to be undertaken under supervision using a good practice method statement.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	A combination of aerial assessment by roped access bat workers and nocturnal survey during appropriate period (May to August). Following additional assessments, tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	A combination of aerial assessment by roped access bat workers and /or nocturnal survey during appropriate period (May to August). Following additional assessments, tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but some good practice removal operations may be required
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2010 (as amended) affords protection to breeding sites or resting places at all times. For an area to be classified as a breeding site or resting place, the Regulations require there to be a reasonably high probability that the species will return to the sites and / or place.

Confirmation of a breeding site or resting place in trees can be established through the completion of aerial inspection and / or nocturnal surveys (as appropriate). In situations where nocturnal surveys are completed and a breeding site or resting site is not confirmed, the survey effort is considered to be sufficient to reasonably discount the presence of roosting bats (for a period of time as defined in Natural England's current Standing Advice). However, further precautionary works may be recommended if the trees is affected by works.

Where features of a tree are identified as providing potential to be used as a breeding site or resting place, evidence of current or previous use of the feature should be identified during an aerial inspection to necessitate the completion of further detailed nocturnal survey work prior to the granting of planning permission. In situations where no evidence of use is identified it is reasonable to conclude that a feature is not being used as a breeding site or resting place as defined by the Regulations but further precautionary measures maybe recommended if a tree is affected by development to ensure occupation has not occurred following completion of the survey. If the presence of a breeding site or resting place cannot be discounted from ground level or aerial inspections, nocturnal survey work to confirm the presence of a breeding site or resting place should be completed.

Where features suitable to be used as a roost site (as above) were identified, evidence that bats had used the site as a roost was sought. This evidence can comprise live or dead bats, droppings, urine staining, and grease /scratch marks on wood.

APPENDIX B – HSI ASSESSMENT

HSI Assessment

Pond No.	SI - 1	SI – 2	SI - 3	SI - 4	SI - 5	SI - 6	SI - 7	SI - 8	SI - 9	SI - 10	HSI Score	Pond Suitability	Predicted Presence
	Geographical location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes			
1	1	0.05	0.9	0.67	0.2	1	0.01	0.1	0.33	0.3	0.24	Poor	0.03