Langtree PP and Panattoni

Six 56 Warrington

Addendum to Environmental Statement

Part 2 – Ecology Technical Paper 5

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Introduction

1.1. This addendum paper has been prepared by Tyler Grange LLP on behalf of Langtree PP and Panattoni for the Six 56 development.

1.2. The Paper will assess the impacts of the proposed development on ecological resources including protected sites, habitats and protected and priority species. The approach outlined in this Chapter has been informed by desk-based study, site survey work and published guidance. A review of relevant legislation, national and local planning policy, has been undertaken as part of the assessment of impacts.

1.3. This document now constitutes part of an addendum to the Environmental Statement originally submitted to Warrington Borough Council (WBC) in March 2019 to accompany the outline planning application for warehouse development and associated infrastructure at the Application Site referred to as Six 56 Warrington.

1.4. The outline application (all matters reserved except for means of access) comprises the construction of up to 287,909m² (3,099,025ft²) (gross internal) of employment floorspace (Use Class B8 and B1(a) offices) demolition of existing agricultural outbuildings and associated servicing and infrastructure including car parking and vehicle and pedestrian circulation, alteration of existing access road into site including works to the M6 J20 dumbbell roundabouts and realignment of the existing A50 junction, noise mitigation, earthworks to create development platforms and bunds, landscaping including buffers, creation of drainage features, electrical substation, pumping station, and ecological works.

1.5. Since the submission of the planning application, consultation responses have been received from key consultees and further discussions have taken place with the Council and their key consultees (namely WBC Highway Officers, Highways England (HE) and their consultants Atkins, WBC Environmental Protection Officers, Historic England and WBC Conservation Officer and Ramboll landscape designers acting on behalf of WBC).

1.6. Further clarification and information has been provided in line with requests by HE and WBC Highway's Officer relating to the design of the mitigation and the WMMTM traffic model.

1.7. Environmental Protection have concerns with exposure to high noise levels that will be experienced at existing properties on Cartridge Lane and sensitive receptors within the site comprising Bradley Hall Cottages and Bradley View to potentially unacceptably high noise

levels, even with mitigation in place, based on the worst case estimates of the proposals as illustrated on submitted masterplan and parameters plans.

1.8. Landscape Consultants Ramboll's acting on behalf of the Council have also recommended further supplementary information, including an assessment of potential effects on the visual amenity of properties in the vicinity, in order to provide greater transparency to the LVIA and its findings and to aid WBC in its determination of the application.

1.9. Consequently, the indicative masterplan and parameters plans have evolved to address comments raised by these key consultees and reduce the noise impacts on sensitive receptors within the site with realignment of estate roads. Further assessments have also been undertaken in respect of noise and vibration and landscape and visual impacts and cultural heritage. This addendum therefore includes additional and updated information to address the comments raised by key consultees. Part 2 of this addendum includes addendums to the following technical papers:

- Traffic and Transportation
- Water Quality and Drainage
- Landscape and Visual Impact
- Ecology and Nature Conservation
- Socio-Economic
- Noise and Vibration
- Cultural Heritage

1.10. This addendum to the Ecology and Nature Conservation technical paper provides an update to the ecological impact assessment where this is required as a result of the changes made to the scheme layout described above and also addresses LPA consultation responses.

1.11. This addendum should however be read in conjunction with the original ES submitted to WBC in April 2019 as the other technical papers (Ground Conditions and Contamination; Air Quality, Utilities, Energy, Waste and Agricultural Land and Soils) have not been amended or subject to change and as such are not included within this addendum, but still remain valid and still form part of the ES for the planning application. See Appendix 18 of the ES Part 1 Addendum which provides Consultants confirmation that there are no changes to the significance of impacts in the Ground Conditions and Contamination; Air Quality, Utilities, Energy, Waste and Agricultural Land and Soils Technical Papers arising from the updated project description presented in this ES Addendum.

In order to make the addendum more understandable and to avoid extensive cross referencing, changes have been integrated within the original text of this technical paper to form a single addendum to the ES. Wherever changes or additions have been made to the text of the original technical paper, the text has been underlined and anything that is no longer relevant or valid has been struck through but retained within the text. A log is also included within Appendix 5.9 of this technical paper addendum so that the text to be removed (i.e. the text struck through within the paper) is identified and a reason for its removal provided.

2 Documents Consulted

The following legislation, National and Local planning policy and data sources have been consulted to prepare this ES Paper.

Legislation

2.1 Specific habitats and species are afforded protection in the UK under the following legislation:

- The Conservation of Habitats and Species Regulations 2017 (as amended) ~~2018~~ (The Habitat Regulations);
- Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act (PBA) 1992; and
- Hedgerow Regulations 1997.

National Policy

2.2. Chapter 11 of the National Planning Policy Framework 2019 ~~2018~~ (The Framework), Conserving and Enhancing the Natural Environment, sets out the relevant adopted policy at the national level.

2.3. The Government Circular 06/2005 accompanies The Framework and sets out the application of the law in relation to planning and nature conservation.

Local Policy

2.4. The following policies contained in the Warrington Metropolitan Borough Council Local Plan Core Strategy (adopted July 2014) are considered to be of relevance:

- Policy QE3 – Green Infrastructure; and
- Policy QE5 – Biodiversity and Geodiversity.

2.5. A small area in the south of the site lies within Cheshire East Council (CEC). Therefore, a number of policies in the CEC Local Plan (adopted July 2017) are also considered to be of relevance:

- Policy SE3 Biodiversity and Geodiversity;
- Policy SE5 Trees, Hedgerows and Woodland; and
- Policy SE6 – Green Infrastructure.

2.6. The Cheshire Region Biodiversity Action Plan (BAP) lists a number of habitats and species which are subject to ongoing conservation action in the region. The potential impacts on these habitats and species should be considered when designing new developments.

3. Consultations

3.1. In preparation of this addendum technical paper and completion of supporting information, consultation has been undertaken with Greater Manchester Ecology Unit (GMEU), who advise Warrington Borough Council on ecology matters, and the Environment Agency (EA). This has included informal consultation to agree the scope of protected species surveys, formal ES scoping responses and attendance at a pre-application meeting with Warrington Borough Council and subsequent post-submission discussions with GMEU following receipt of consultee responses.

3.2. **Table 5.1** provides a summary of the consultation undertaken in preparation of this technical paper.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
Wintering Bird Surveys	14/02/2017	Greater Manchester Ecology Unit (GMEU) (Suzanne Waymont)	Telephone conversation followed by email correspondence	Requirement for wintering bird surveys.	Relay of anecdotal evidence that the local area supports numbers of lapwings and gulls over winter, and suggestion to contact Local Records Centre for more detailed information.
Bat Activity Surveys	07/06/2017	GMEU (Suzanne Waymont)	Email correspondence	Survey effort for bat activity	Agreement that our proposed scope of three bat activity surveys (one per season) is acceptable.
Water Vole / Otter Surveys	26/03/2018	Environment Agency (EA) (Dawn Hewitt)	ES Scoping Response	Request for inclusion of water and vole and otter surveys to inform the ecological assessment	Surveys undertaken during 2018, in accordance with published guidance.
Development offset along Bradley Brook	26/03/2018	EA (Dawn Hewitt)	ES Scoping Response	15m buffer zone along watercourse should be kept free from built development including lighting, road wats, footpath and formal landscaping.	Proposed masterplan retains minimum 15m buffer along watercourse, which is free from development as described and forms part of green infrastructure network.
Mitigation for loss of ponds	26/03/2018	EA (Dawn Hewitt)	ES Scoping Response	Loss of ponds should be mitigated for on a 2 for 1 basis	Confirmed GCN breeding ponds will be replaced on a 2 for 1 basis, other ponds will be replaced on a 1 for 1 basis. All will be designed and managed to provide a positive contribution to the biodiversity of the site.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
ES Scoping	March 2018	GMEU (Suzanne Waymont)	ES Scoping Response	Agreement with broad principle and surveys proposed as part of the ecological assessment. Ecological assessment should consider the impacts of air pollution on natural receptors including habitats and designated site.	All surveys proposed in scoping report have been undertaken and detailed within this Paper.
Pre-application Meeting	21/06/2018	Warrington Borough Council (WBC) and GMEU (Suzanne Waymont)	Pre-application Meeting	Request that detail of proposed mitigation measures is detailed as part of the ecological assessment.	Proposed mitigation for impacts to habitats and species is included in detail within the ES chapter, where possible at this outline stage.
Bat Roosts Great Crested Newts / Ponds Wintering/Breeding Birds Ecological Mitigation	19/06/2019	GMEU (Suzanne Waymont)	ES Consultation	Clarification required regarding bat survey results and proposed mitigation Clarification required regarding proposed number of replacement ponds. A request for 2 for 1 replacement of ponds. Proposals considered likely to result in a net loss biodiversity for breeding and wintering birds. Request that further details of proposed ecological mitigation are provided to demonstrate that adequate mitigation of impacts can be provided.	A formal response issued to GMEU (see **Appendix 5.8**, report ref: 10682/R02a).
Birds/Biodiversity Loss	28/10/2019	GMEU (Suzanne Waymont)	ES Consultation Response	GMEU are unconvinced that mitigation and compensation for all impacts can be provided on-site and advise that the scheme should be looking to provide biodiversity net gain in line with NPPF. GMEU advise that the Defra biodiversity metric is applied.	Off-site mitigation for ground nesting and overwintering birds is proposed on a site within WBC area, which will mitigate impacts to these species and contribute to overall biodiversity gains. Biodiversity Net Gain calculations to be dealt with separately.

Table 5.1: Summary of Consultations and Discussions

4. Methodology and Approach

Baseline Methodology

Study Area

4.1. The study area extends beyond the site boundary to include a 10km radius for international statutory site designations, a 2km radius for national statutory site designations; and a 1km radius for all protected and priority species records.

Scoping

4.2. Pre-application advice and consultation was undertaken with GMEU in 2017, see Section 3, which was used to inform the scope of detailed surveys and the relevant receptors for inclusion in this assessment.

4.3. A Scoping Report was produced and submitted to WBC in February 2018. Responses to the Scoping Report were received in April 2018. This response confirmed that all relevant ecological surveys and receptors had been identified.

Data Search

4.4. A desk-based study and initial site survey were used to identify important ecological features (sites, habitats and species) which may be affected by the development proposals, to determine the potential 'zone of influence'[1] (ZoI), and to inform the scope of further survey work required.

Extended Phase 1 Habitat Survey

4.5. An extended Phase 1 habitat survey was undertaken on 17th November 2016 by Paul Moody and Hayley Care and additional survey undertaken on 14th December 2018 by Joseph Dance, all experienced ecologists and members of the Chartered Institute of Ecology and Environmental Management (CIEEM), following published guidance (JNCC, 2010). This method of survey entails recording the main plant species and classifying / mapping broad habitat types present, as well as assessing the potential for legally protected or otherwise

[1] Defined as the areas over which ecological features may be subject to significant effects as a result of the proposed development and associated activities.

notable species to occur within and adjacent to the site. The weather conditions during the survey was cold (5°C), with blustery winds and heavy rain for a portion of the survey.

4.6. An update walkover survey was undertaken on 19th February 2020 by Laura Dennis, an experienced ecologist and graduate member of CIEEM, to confirm the distribution and condition of habitats on site, and potential for protected species, remains unchanged since the initial Phase I surveys, to inform the ES addendum.

4.7. Flora names provided in habitat descriptions use common names and follow those provided in New Flora of the British Isles 2nd Edition (Stace, 1997).

Detailed Surveys

4.8. The extended Phase I habitat survey conducted at the site identified the need for further survey data for protected and / or priority species. Findings of all detailed surveys (dates the surveys were undertaken in brackets) including meta data, methods and results are provided in Appendices as follows:

- Badger survey (April 2017) – full survey results presented in **Appendix 5.1**;
- Bat Activity Survey (May – October 2017) – full survey results presented in **Appendix 5.2**;
- Bat Preliminary Roost Assessment (PRA) of Buildings (late 2017) – full survey results presented in **Appendix 5.2**;
- Bat Roost Surveys of Buildings (June - August 2018) – full survey results presented in **Appendix 5.2**;
- Bat Preliminary Roost Assessment (PRA) of Trees, and follow-up aerial inspections, (June 2018 – preliminary ground inspections June 2018 followed by some aerial inspections September 2018 and February 2019)– full survey results presented in **Appendix 5.2**;
- Breeding Bird (including Barn Owl) Survey (April – June 2017) – full survey results presented in **Appendix 5.3**;
- Great Crested Newt (GCN) Survey (April - June 2017) – full survey results presented in **Appendix 5.5**;
- Otter and Water Vole Survey - – full survey results presented in **Appendix 5.6;** and

- Wintering Bird Survey (October 2017 – March 2018) – full survey results presented in **Appendix 5.4**.

4.9. The current location and distribution of badger setts was also confirmed during the update walkover survey in February 2020. Confirmation of findings is included within the text at Table 5.7.

Receptors

4.10. The results of the initial desk study, site surveys and data gathered during detailed surveys will be used to evaluate the importance of ecological resources within the ZoI in accordance the CIEEM Ecological Impact Assessment (EcIA) guidance[2].

4.11. The guidance provides a framework for the evaluation of features that considers the direct biodiversity importance of habitats and species, the indirect importance of features which help support the ecological integrity of key features, legal protection for both sites and species, and evaluation against national and local planning guidance and objectives. It uses a geographic frame of reference for identifying important ecological features according the to the scale in **Table 5.2**.

Designation	Receptors
International	An ecological feature (species, designated site or habitat) which is important at an international level. A population that would meet the published selection criteria as a qualifying feature for designation of a SAC. An internationally designated site or candidate site, i.e. an SPA, proposed SPA (pSPA), SAC, candidate SAC (cSAC), Ramsar site, or an area which would meet the published selection criteria for such designation. Other significant areas of Annex I priority habitats listed in the Habitats Directive, the loss of which would significantly change the overall range and area at the European scale in the long term.

[2] Chartered Institute of Ecology and Environmental Management. (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. 2nd ed. CIEEM, Winchester.

Designation	Receptors
National	Nationally significant populations of species identified in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the national scale. A population that would meet the published selection criteria as a qualifying feature of a SSSI. A nationally designated site, i.e. SSSI, NNR or discrete area which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the national scale in the long term. Such habitat should be a major component of areas that are at near-equivalence to SSSIs, meeting most of the published SSSI selection criteria.
Regional (north-west)	Regionally significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the regional scale. A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the regional level in the long term. Significant areas of semi-natural ancient woodland that do not meet the national value criteria (above) should be considered at this scale due to the irreplaceable nature of such habitat.

Designation	Receptors
County (Cheshire)	Significant populations of species identified in the NERC Act 2006 Section 41 as being of principal importance for the conservation of biodiversity in England, or otherwise formally deemed to be nationally rare and threatened (e.g. 'red-listed'), or priority species in the County BAP the loss of which would significantly change the species' overall conservation status (i.e. range, abundance, population trend) at the County scale. Sites formally recognised by local authorities, e.g. SBI, or considered to meet published ecological selection criteria for such designation. A significant area of a non-designated habitat type identified in the NERC Act 2006, Section 41 as being of principal importance for the conservation of biodiversity in England, the loss of which would significantly change the overall range and area of that habitat at the county scale in the long term. A significant area of key habitat identified in the County BAP.
Local (Warrington Metropolitan Borough)	Species listed on any of the above-mentioned priority lists, that appreciably enrich District/Borough biodiversity, but which are not in themselves of District/Borough importance or greater. Semi-natural habitats, listed on any of the above-mentioned priority lists, that appreciably enrich local biodiversity, but which are not in themselves of District/Borough importance or greater.
Site	Species populations of limited ecological importance due to their size, composition or lack of threat/rarity. The loss of such features would have no discernible impact on the species'/habitat's overall range and conservation status at any administrative scale in the long term, but would inevitably impact on habitats or populations of species within the context of the site.

Table 5.2: Importance of Ecological Features

4.12. Habitat features of ecological importance within the site are shown on **Plan 10682/P01b** included in **Appendix 5.7**.

Environmental Impacts

4.13. The assessment should consider impacts including direct loss of habitats, fragmentation and isolation of habitats, disturbance or killing / injury of species, changes to key ecological features, and changes to the local hydrology or water quality.

4.14. The following factors are considered when describing ecological impacts:

- Positive or negative – an impact can improve or reduce the quality of the environment, evaluated against nature conservation objectives and policy;
- Extent - this is the area over which an effect occurs;
- Magnitude - the size or amount of an effect, determined on a quantitative basis where possible;
- Duration - the time for which an effect is expected to last prior to recovery or replacement of the resource or feature;
- Timing and frequency - some effects are only likely if they happen to coincide with a critical life-stage or seasons. Others may occur if the frequency of an activity is sufficiently high;
- Reversibility - an irreversible (permanent) effect is defined as one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A reversible (temporary) effect is one from which spontaneous recovery is possible or for which effective mitigation is both possible and enforceable; and
- Cumulative effects - where consideration is given to any other developments within the ZoI, together with the proposed development, may result in significant effects.

The overall magnitude of impacts and the associated environmental impact are presented in **Table 5.3** below.

Magnitude	Environmental Impact
Substantial	An effect which will have a positive or negative impact on the integrity or conservation status of an ecological feature that is significant at a national level or above.
High	An effect which will have a positive or negative impact on the integrity or conservation status of an ecological feature that is significant at a regional level.
Moderate	An effect which will have a positive or negative impact on the integrity or conservation status of an ecological feature that is significant at a county level.
Minor	An effect which will have a positive or negative impact on the integrity or conservation status of an ecological feature that is significant at a local or site level.
Negligible	An effect which will have an insignificant impact on an ecological feature.

Magnitude	Environmental Impact
Neutral	No effect which will impact an ecological feature.

Table 5.3: Environmental Impacts

Significant Effects

4.15. The significance of an effect is the product of the magnitude of the impact and the importance or sensitivity of the ecological feature affected. The EcIA Guidance provides a complex framework for the consideration of impacts to ecological features and the reader is referred to the actual guidance for full details. However, in summary, greater levels of significance are generally ascribed to large impacts on features of higher ecological importance and lesser levels of significance are generally ascribed to small impacts on features of higher ecological importance, or larger impacts on features of lower ecological importance.

4.16. In accordance with professional guidance and terminology, a significant effect, in ecological terms, is defined as an effect (positive or negative) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative effects. Insignificant effects are those that would not result in such changes.

4.17. The importance of any features that would be significantly affected is then used to identify geographical scales at which the effect is significant. This value relates directly to the consequences, in terms of legislation, policy and/or development control at the appropriate level. So, a significant negative effect on a feature of importance at one level would be likely to trigger related planning policies and, if permitted, generate the need for development control mechanisms as described in those policies.

4.18. Significant effects on features of ecological importance should be mitigated (or compensated for) in accordance with the guidance derived from policies applied at the scale relevant to the feature or resource.

4.19. Effects are unlikely to be significant where features of local importance or sensitivity are subject to small scale or short-term effects. However, where there are a number of small scale effects that are not significant alone, it may be that, cumulatively, these may result in an overall significant effect.

4.20. The assessment of effects uses the terminology described above. However, to provide consistency with the terminology throughout the ES, potential and residual effects (positive or negative) are also described using the terms set out in **Table 5.3**.

Impact Prediction Confidence

4.21. It is also of value to attribute a level of confidence by which the predicted impact has been assessed. The criteria for these definitions are set out in **Table 5.4** below.

Confidence Level	Description
High	The predicted impact is either certain i.e. a direct impact, or believed to be very likely to occur, based on reliable information or previous experience.
Low	The predicted impact and its levels are best estimates, generally derived from first principles of relevant theory and experience of the assessor. More information may be needed to improve confidence levels.

Table 5.4: Confidence Levels

Assumptions / Limitations

4.22. Limitations with respect to specific protected species are provided in Appendices 5.1 to 5.6. No other assumptions/limitations were identified during the preparation of this assessment.

5. Baseline Information

Protected Sites

5.1. A desk-based study was undertaken in November 2016 and updated in January 2019. The data search has been undertaken for a 10km radius around the site for international statutory sites, a 2km radius for national statutory and non-statutory sites and a 1km radius for protected and priority[3] species records.

5.2. There are no statutory designated sites within the site boundary. However, four such sites are present within the study area, see **Table 5.5**.

Site Name	Designation	Distance / Direction from Site	Reason for Designation
Midland Meres and Mosses Phase I	Ramsar	7.2km East	A series of lowland open water and peatland sites supporting a number of rare species associated with wetlands including five nationally scarce plants and an assemblage of rare wetland invertebrates.
Rostherne Mere	Ramsar	7.4km East	One of the deepest and largest meres of the Shropshire-Cheshire Plain which supports overwintering cormorant *Phalacrocorax carbo carbo,* bittern *Botaurus stellaris,* and water rail *Rallus aquaticus,* occurring at nationally important levels.
Rixton Clay Pits	SAC	5.5km Northeast	Disused brickworks with many ponds which support great crested newt *Triturus cristatus.*
Manchester Mosses	SAC	6.3km North	Degraded raised bog habitat which is still capable of natural regeneration.

Table 5.5: Statutory Designated Sites Within the Study Area.

[3] UK priority species and habitats are those subject to conservation action and referred to as Species of Principal Importance (SoPIs) or Habitats of Principal Importance (HoPIs). They are listed at Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act states that local planning authorities must have regard for the conservation of both SoPIs and HoPIs.

5.3. There are no non-statutory designated sites within the site boundary. However, four such sites are present within the study area, see **Table 5.6**.

Site Name	Designation	Distance / Direction from Site	Reason for Designation
The Bongs and the Gorse	LWS	1.3km NE	Designated for its area of broad-leaved semi-natural woodland.
The Dingle and Ford's Rough	LWS	1.7km NW	Designated for its area of broad-leaved semi-natural woodland.
Grappenhall Heys	LWS	1.7km NNW	Designated for its area of broad-leaved semi-natural woodland.
Stretton Moss	LWS	2km SW	Designated for its moss land which is being colonised by scrub

Table 5.6: Non-statutory Designated Sites Within the Study Area.

5.4. SACs and Ramsar sites are of international importance for nature conservation and are legally protected in the UK by The Habitat Regulations. LWSs are of county importance. All protected sites are considered under Policy QE5 of the WMBC Local Plan and Policy SE3 of the CEC Local Plan.

Habitats

5.5. An 'extended' Phase I habitat survey undertaken in November 2016. An additional 'extended' Phase I habitat survey was undertaken in December 2018. The survey was undertaken to cover an additional parcel of land included in an updated site boundary plan. An update walkover survey to confirm the distribution and condition of habitats was completed in February 2020 in conjunction with the production of the ES Addendum. The phase I survey identified that the site supports the following habitats:

- Arable land;
- Buildings and hardstanding;
- Hedgerows;
- Improved grassland;
- Ponds;
- Scattered Trees and Scrub;

- Tall Ruderal;
- Watercourses;
- Woodland (semi-natural broad-leaved); and
- Woodland (broad-leaved plantation).

5.6. For ease of reference, habitat types have been described alphabetically, below. All the features described are shown on the Habitat Features Plan **10682/P01b**, included in **Appendix 5.7**.

Arable Land

5.7. The northern most fields (fields F1 to F3) are currently used for arable crop production (see Photograph 5.1). At the time of survey, the fields were drilled with a winter crop thought to be a winter silage crop. A small parcel of the same habitat type is also present to the north of Grappenhall Lane (B5356).

5.8. At the time of the update survey in February 2020 the easternmost field was ploughed while the other two fields had been left as stubble following the previous harvest.

5.9. Arable fields are monocultures and are of generally little ecological value and are of **negligible ecological importance**, although they can provide foraging habitat for wintering birds. This is evaluated separately under the protected species heading below.

Photograph 5.1: view of arable fields looking east.

Buildings and Hardstanding

5.10. A farm complex is present at the centre of the site, which comprises one dwelling (Bradley Hall Farmhouse) and agricultural buildings, with associated hard standing and small private gardens.

5.11. The building and hard standing have no inherent value and are of **negligible ecological importance**. However, they may have importance in relation to bats and barn owl and are considered separately in relation to these species below.

Grassland (improved pasture)

5.12. Most of the site consists of fields of improved pasture (see Photograph 5.2). A range of common grasses are present including, perennial-rye grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, red fescue *Festuca rubra*, cock's foot *Dactylis glomerata* and red fescue *Festuca rubra*. Common agricultural weeds were present, particularly around the sites margins, species present common nettle *Urtica dioica*, common cleavers *Gallium aparine*, curly-leaved dock *Rumex crispus*, cow parsley *Anthriscus sylvestris*, stitchwort *Stellaria sp* and creeping thistle *Cirsium arvense*.

5.13. The fields are used both for cattle and sheep grazing. The species composition of the swards is similar in fields grazed by cattle and sheep, however the sward within cattle grazed fields was longer with an increased dominance of perennial-rye grass. The sward in sheep grazed fields is shorter with a reduced dominance of perennial-rye grass and an increase in species such as red fescue.

5.14. A small strip of this habitat type is also present between Grappenhall Lane and the strip of broadleaved screen planting.

5.15. The improved pasture is generally species poor and is a common and widespread resource of little intrinsic ecological value. For this reason, it is considered to be of **negligible ecological importance** only.

Photograph 5.2: Improved pasture present within the site.

Hedgerows and Scattered Trees

5.16. The site and field units are predominantly bound by hedges, some with mature and semi-mature trees. The hedgerows are predominantly species poor hawthorn *Crataegus monogyna* hedgerows which are flail cut. Ground flora at the time of survey was limited to common agricultural weeds present within the fields margins; however, this is expected due to the time of year that the survey was conducted, and the ground flora could be notably more diverse during late spring and summer.

5.17. Hedgerows present in the north east of the site, as well as along Bradley Brook are considerably more species diverse and may be classed as being important if assessed against the Hedgerows Regulations 1997.

5.18. The hedgerows provide a network of habitat around the site and to and from the wider area. The majority of hedgerows are considered to be of **local ecological importance**.

Ponds

5.19. A total of 12 ponds are present within the site, see **Appendix 5.7**, these are predominantly field ponds with associated scrub, but two woodland ponds are also present within the site. Further information about the ponds, including descriptions, is given in **Appendix 5.5**.

5.20. Ponds present within the site are considered to be of **local ecological importance** as they provide habitat diversity and potentially habitat for amphibians, including great crested newt (GCN) *Triturus cristatus*. If during future surveys the ponds are found to contain important species (such as GCN) or important species assemblages, this value may need to be reassessed and increased.

Scattered Trees and Scrub

5.21. Two tree lines are present within the north west of the site these consisted of semi-mature to mature specimens of pedunculate oak, hawthorn, ash and horse chestnut *Aesculus hippocastanum*.

5.22. Several mature trees are present within the site; these are mostly associated with hedgerows or the Bradley Brook Corridor. Species present were predominantly pedunculate oak *Quercus robur* but other species including ash Fraxinus excelsior and alder *Alnus glutinosa* were also present.

5.23. Some small areas of scrub are present within the site, these are associated with ponds and other unmanaged areas of the site, such as meanders in Bradley Brook. Species present included hawthorn, alder and willow Salix sp.

5.24. The dense scrub and scattered trees cannot be reproduced in the short-medium term and are considered to be of **site ecological importance**.

Tall Ruderal

5.25. Small unmanaged areas within fields are dominated by ruderal species such as common nettle *Urtica dioica*, greater willow herb *Epilobium hirsutum*, cow parsley *Anthriscus sylvestris*, red campion *Silene dioica* and other species such as male fern *Dryopteris filix-mas* and read canary

grass *Phalaris arundinacea*. A thin strip of this habitat type comprising nettle is present between the strip of broadleaved plantation and the road in the far north of the site.

5.26. The areas of ruderal are small in area and consist of common and widespread species they are considered to be of **site ecological importance**.

Watercourses

5.27. Bradley Brook flows in a west – east direction along the southern boundary of the site, before entering in the south-eastern corner of the site. Bradley Brook is a small stream as it runs adjacent to and through the site (see Photograph 5.3).

5.28. The channel of Bradley Brook is approximately 1m wide and 0.5 m deep, with a water depth of approximately 10 – 20 cm. The brook was fast flowing at the time of survey and has a silt a pebble substrate. This section of the Brook is heavily shaded either by adjacent hedgerows or by trees.

5.29. Bradley Brook, provides habitat connectivity along the south of the site as well as habitat for a range of faunal groups, potentially including: aquatic invertebrates, feeding opportunities for birds (potentially including kingfisher) and may also provide a food resource for bats. As such it is considered to be of **local ecological importance**.

5.30. Three ditches (D1 – D3 on Plan 10682/P01b, see **Appendix 5.7**) are present within the site, these are field drains which were heavily shaded by trees or hedgerows, these channels were approximately 1m wide and 0.8m deep and held little water at the time of survey, with only small puddles being present (see Photograph 5.4).

5.31. The ditches present within the site are heavily shaded and were almost dry at the time of survey and do not provide the same level of habitat diversity or extent as Bradley Brook They do however contribute (together with their associated features such as hedgerows and trees) towards providing a network of habitats around the site. They are therefore considered to be of **site ecological importance**.

Photograph 5.3: Bradley Brook as it flows through the site.

Photograph 5.4: Ditch (D3) present to the north west of the site.

Woodland (semi-natural broad-leaved)

5.32. Two areas of semi-natural broad-leaved woodland are present within the site, Bradley Gorse and Wright's Covert.

5.33. The woodland consisted predominantly of semi-mature specimens included pedunculate oak *Quercus robur*, sycamore *Acer pseudoplatanus*, silver birch Betula pendula, willow *Salix sp*, alder *Alnus glutinosa*.

5.34. The understory was underdeveloped but species such as holly *Ilex aquifolium*, hawthorn, and dog rose *Rosa canina* were present. Large areas of the understory of Bradley Gorse are dominated by Rhododendron *Rhododendron ponticum* (see Photograph 5.5). This species is listed as an invasive species within schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and it is illegal to cause its spread in the wild.

Photograph 5.5: Bradley Gorse showing Rhododendron colonisation

5.35. Ground flora was limited at the time of survey and predominantly consisted of cleavers *Gallium aparine*, common nettle, bramble *Rubus fruticosus* and red campion.

5.36. The woodland is an important ecological resource which cannot be replaced in the short term; it provides structural diversity and habitat for a range of species including birds, invertebrates, amphibians including GCN and mammals including badger.

Woodland (broad-leaved plantation)

5.37. A thin strip of this habitat type is present on the corner of Grappenhall Lane and Cliff Lane between the roundabout and the adjacent arable field. At the time of the survey, ground flora was limited and comprised pockets of bramble, fescues Festuca sp., cleaver's, sphagnum moss, dog rose *Rosa canina*, broad-leaved dock, dove's-foot crane's bill *Geranium molle*, wood avens *Geum urbanum*, creeping thistle, ivy and hedge bindweed *Calystegia sepium*.

5.38. The tree species within this area comprised early-mature specimens of pedunculate oak, ash, silver birch, sycamore, hazel, horse chestnut, Prunus sp. and holly saplings. Scrubby species across the woodland also comprised hawthorn and elder.

5.39. Taking into account the above, the woodlands (semi-natural and plantation) on site are considered collectively to be of **local ecological importance**.

Photograph 5.6: Broadleaved plantation

Habitats on Adjacent Land

5.40. Habitats on adjacent land were not accessible, however based on what can be viewed from aerial photography and what could be seen from public rights of way a brief description is provided below:

5.41. The site is bounded to the north by the B5356 (considered to be of negligible ecological importance) beyond which lies further arable fields. To the east the site is bound by the M6 motorway. To the south of the site are areas of arable fields (considered to be of negligible ecological importance) and hedgerows. The west of the site is bounded by an industrial estate.

5.42. There are also nine ponds on adjacent land which lie within 250m of the site.

Protected and Priority Species

5.43. A summary of the findings of detailed surveys undertaken for protected and priority species is provided in **Table 5.7** below.

Protected/Priority Species	Description	Importance	Appendix
Badger	Two partially-used outlier setts dug into banks along watercourse which runs along southern boundary. One disused outlier sett present in Bradley Gorse. Fields and associated margins likely to provide foraging habitat. At the time of the update Phase I survey (February 2020) evidence of continued use by rabbits (hair, droppings) and no evidence of recent badger activity in or around the two partially-used outlier setts. The sett in Bradley Gorse remains disused.	Negligible	Appendix 5.1
Bats	Several day roosts of common bat species; common and soprano pipistrelle and ~~Brandt's~~ Myotis species bats (likely Brandt's) recorded in buildings B5, B6 (proposed for demolition) and B12. Potential roost features identified in mature trees. Woodland edges watercourses, hedges and ponds used as foraging and commuting habitat for a range of common pipistrelle, myotis species noctule and brown long-eared bat.	Local	Appendix 5.2
Birds	Assemblage of common birds including farmland species (most of which are priority species). Both wintering and breeding assemblages are of local ecological importance.	Local	Appendix 5.3
Brown Hare	Present - incidental observation of hares on both arable and improved pasture areas. Likely to use hedges, field margins and woodland edges for cover.	Local	NA
GCN (and other amphibians)	Small population present in one onsite pond. Surrounding terrestrial habitat likely to be used by GCN	Local	Appendix 5.5
Hedgehog	Likely to be present – using hedgerows, associated field margins and woodland areas	Local	NA
Otter	Not present - do not need to be considered further in this assessment	Negligible	Appendix 5.6
Water vole	Not present - do not need to be considered further in this assessment	Negligible	Appendix 5.6

Table 5.7 Protected and Priority Species Summary

Future Baseline

5.44. In accordance with Schedule 4 (3) of the EIA Regulations the likely evolution of the environment without implementation of the development is considered to be as follows:

5.45. The development site would continue to comprise a mixture of arable land and improved pasture use for grazing cattle and sheep. Woodland (Bradley Gorse and Wrights Covert) would remain unmanaged, together with ponds on site which would decline in value over time eventually succumbing to natural succession.

5.46. The site would continue to support a similar cohort of protected and notable species. However, the value of the site for GCN would be likely to decline over time due to the natural succession occurring in ponds leading to a decline in the quality of breeding sites.

5.47. This evolution of the baseline prediction is based on the availability of environmental information and scientific knowledge.

6. Alternatives Considered

6.1. While a series of alternatives have been considered as part of the evolution of the proposals, these have not been specifically influenced by the need to address any additional ecology and nature conservation inputs, therefore these are not discussed within this addendum technical paper. Section 4 of the ES Part 1 Report provides details of the alternatives considered.

6.2. However, Bradley Gorse woodland and the Ecological Mitigation Area in the south have always been safeguarded throughout the evolution of the masterplan. Although a development offset along the watercourse and the around Bradley Gorse was also always in place, this has been increased to a minimum of 15m through the design process to ensure that impacts to these receptors are avoided during construction and operational phases. This 15m buffer will be strengthened as a wildlife corridor with enhancement of the retained hedge linking the brook and retained habitats associated with the Farm / SAM.

7. Potential Environmental Effects

Construction Phase

7.1. The potential effects on habitats and species identified in the ecological assessment are described below.

7.2. The significance of the effect on each feature is assigned an importance (in accordance with CIEEM Guidelines for Ecological Assessment) and presented in **Table 5.9**.

Protected Sites

Statutory Sites

7.3. No significant impacts to statutory sites are expected as a result of the Proposed Development due to physical distance from the development site.

Non-statutory Sites

7.4. No significant impacts to non-statutory sites are expected as a result of the Proposed Development due to physical distance from the site.

Habitats

7.5. Permanent loss, or fragmentation, of habitats of ecological importance includes the following:

Broadleaved Woodland

7.6. Development proposals will not result in any direct habitat losses. However, there will be minor loss of habitat connections to other woodland / hedge features locally through the loss of an intact hedge which extends northwards from the northwest edge of the largest woodland block. Also due to the proximity of construction works to the woodland, dust could affect the adjacent mature trees in this habitat. In the absence of protection measures construction activities could result in a degradation of woodland habitat arising from incidental disturbance and dust from construction work.

Hedgerows

7.7. The Proposed Development will result in the loss of 4,400 m of intact species poor hedge. The impact of this will be the loss of shelter and food resources for a range of common

farmland species (see details on effects on species under their respective headings below). It will also result in the loss of habitat connections between other hedges and woodland features; both those retained within the development layout and those on adjacent land.

Ponds and Agricultural Ditches

7.8. A total of six ponds will be lost to development. No ditches associated with hedges or field boundaries will be lost. The six remaining ponds will experience a minor increase in their isolation due the loss of nearby ponds and severance of connecting habitats by the Proposed Development The loss of ponds will reduce habitat resources for aquatic fauna including invertebrates and amphibians as well as birds and bats. Effects on individual species (including GCN) are discussed separately under the Protected and Priority Species sub-heading below.

Scattered Trees and Scrub

7.9. Development will result in the loss of individual trees (63 No.) mainly within hedges (described above), and two groups of trees associated with the existing Grappenhall Lane - Cliff Lane junction. Mature trees associated with Bradley Hall farm / Scheduled Ancient Monument (SAM) and immediate environment are retained. Only very small areas of scrub will be lost, these are mainly associated with pond margins and field margins.

7.10. Loss of mature trees cannot be mitigated in the short-term and this will result in the loss of associated features such as cavities and decay that are of high value to some species, particularly birds, bats and invertebrates (effects on individual species are discussed separately under the Protected and Priority Species sub-heading below).

Tall Ruderal.

7.11. There are small areas of ruderal vegetation that will be lost, these are mainly associated with pond margins and field margins.

Watercourses

7.12. No habitat loss will result from the proposed development and there will be a buffer between the nearest development area (Zone D of the updated Parameters Plan at Appendix 5 of the ES Part 1 Report). However, there could be a risk of pollution during the construction phase arising from surface water sources if runoff is polluted by fuel or oils. Also due to the proximity of construction works dust could affect the watercourse habitat.

Other Habitats

7.13. Other habitats present (arable land, buildings, hardstanding, and improved grassland) are of negligible ecological importance, so no significant impacts are expected as a result of habitat loss. However, whilst they have no inherent ecological importance they provide a resource for a number of protected and priority species. The impacts on these species arising from loss of the above habitats is described under the Protected and Priority Species sub-heading below.

Invasive Non-native Species (INNS)

7.14. Spread of an INNS (*Rhododendron ponticum*) outside of the site, which is present in the woodland, which would breach WCA 1981 legislation.

7.15. Woodland habitats would be protected from incidental disturbance by fencing which will prevent the accidental spread of rhododendron during the construction phase of the development.

Protected and Priority Species

7.16. Loss of habitat with the potential to support protected and priority species as a result of the Proposed Development, and disturbance (e.g. noise and construction light) may impact protected / priority species identified within the development area. A description of the potential impacts is provided below.

Badger

7.17. None of the badger setts recorded in the survey are situated close to any proposed construction areas so it is unlikely that development works will result in damage / destruction of setts. However, once detailed plans are submitted this will need to be reviewed. Development will result in some loss of foraging resources for badgers, but this is not expected to be a significant adverse impact on the population as the scale of loss is minimal when considered within the context of other resources available to badgers that are retained within the site and available on adjacent farmland.

Bats

7.18. Development proposals will result in the loss of day roosts for common crevice dwelling bats as summarised in **Table 5.8** below. No maternity roosts were found during surveys, but non-maternity roosts were recorded in B5, B6 and B12.

Building No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**10**	**11**	**12**
No. of day roosts affected										
Common pipistrelle	0	0	0	0	1	3	0	0	0	1
Soprano Pipistrelle	0	0	0	0	1	1	0	0	0	3
Myotis Species	0	0	0	0	0	3	0	0	0	0
Unknown bat species	0	0	0	0	0	1	0	0	0	2

Table 5.8 - Summary of Roosts Found in Buildings

7.19. In the absence of mitigation, the above losses would constitute a minor negative effect significant at the local scale.

7.20. Aerial surveys of trees with bat roost potential identified one tree with high roost potential, T12 (see Appendix 5.7 - Plan 10682/P11b). However, by the time of the update Phase 1 survey (February 2020) this tree was found windfallen from the roots (likely a result of recent storms). ~~and t~~Two further trees with moderate roost potential (T3 and T13) will be lost to development. To date no evidence of occupation of roost features has been recorded during the two survey visits which have been undertaken in September 2018 and February 2019. Loss of roost locations (should presence within trees be confirmed in future) would be likely to be a minor negative effect significant at the local scale.

7.21. The development has been designed to retain key habitat resources for bats, namely; woodland and their associated edges and watercourses and their associated trees and margins. However, development of the site will result in the loss of some foraging and commuting resources used by local populations of common and soprano pipistrelle, myotis species (unid), noctule and brown long-eared bat, all of which are widespread species in Cheshire. The resources that will be lost consist of ponds, hedges and associated field margins.

Birds

7.22. Development proposals will result in the loss of 20 ha of arable, 59 ha of improved grassland, 4,400 m of intact hedge and six ponds which form a mosaic of habitat supporting a locally important breeding assemblage of farmland bird species. The number of territories or colonies

is given in parenthesis: dunnock (4), house martin (1), linnet (1), skylark (3), swallow (1), yellowhammer (2).

7.23. The loss of the above habitat is also significant with respect to the wintering bird assemblage. Priority species recorded using habitats within the site include: lapwing, and starling (circa 200 and 300-400 respectively, recorded during the same survey visit on 13th December 2017). Other priority species recorded during surveys in smaller flocks using the site include fieldfare, redwing, song thrush, house sparrow, linnet, grey partridge, skylark, yellowhammer and reed bunting. However, some of these species, such as reed bunting, linnet, starling, fieldfare and yellowhammer will also make use of retained habitats within the site, particularly trees along the brook delineating the southern boundary.

7.24. The loss of the farmland mosaic is not mitigatable within the proposed development layout and this will result in the permanent loss of breeding resources for some species, particularly skylark and for wintering species which solely make use of open habitats such as lapwing, gulls and curlew. When considered in relation to similar available habitat on farmland in the locality, such loss is not likely to be significant beyond the local context.

7.25. Habitat loss for other farmland birds such as yellowhammer, starling, reed bunting, linnet, house sparrow, swallow and house martin can be mitigated by the provision of alternative habitats and enhancement of existing habitats that are retained within the development layout. Further details are provided in the Mitigation section.

7.26. In addition to habitat loss, construction works pose an individual risk to nesting birds if habitat clearance (including buildings) occurs during the breeding season (March – August inclusive).

Brown Hare

7.27. Development will result in the loss of 20 ha of arable and 59 ha of improved grassland used by brown hares for foraging. Given the amount of similar habitat available on adjacent land, the loss would not be likely to be significant on the local population. However, development will reduce dispersal opportunities and access to other habitats locally.

Great Crested Newt (and other amphibians)

7.28. Development will result in the loss of one breeding pond (Pond 3) supporting a small population of GCN assessed as being of local ecological importance and the loss of surrounding terrestrial habitat consisting of 1.17 ha of immediate habitat within 50m of a breeding pond and 16.3 ha of intermediate habitat within 250m.

7.29. Loss of six ponds within the development layout would also reduce habitat resources for other amphibian species found to be using ponds within the site for breeding.

Hedgehog

7.30. The majority of high-quality habitat within woodland and adjacent edges and along the brook delineating the southern boundary are retained within the proposed development layout. Losses will be confined to areas of lower habitat quality along hedges which border intensively farmed fields, both improved grass and arable. Provision of high-quality habitat for hedgehog consisting of scrub, ruderal vegetation and rough grassland within the Proposed Ecological Mitigation Area are will maintain the balance of habitat resources available for this species within the site. However, development will reduce dispersal opportunities and access to other habitats locally.

7.31. Potential impacts during the construction phase, in the absence of mitigation, are summarised in **Table 5.9**.

Feature / Nature of Impact	Receptor Importance	Environmental Impact	Significance of Effect	Confidence Level
Protected Sites				
Statutory Sites – direct / indirect impacts	International	Negligible	Negligible	High
Non-statutory Sites – direct / indirect impacts	County	Negligible	Negligible	High
Habitats				
Broadleaved Woodland – permanent loss, fragmentation or degradation	Local	Minor Negative	Minor Adverse	High
Hedgerow - permanent loss, fragmentation or degradation	Local	Minor Negative	Minor Adverse	High
Ponds - permanent loss or degradation	Local	Minor Negative	Minor Adverse	High
Scattered Trees and Scrub - permanent loss, or degradation	Site	Minor Negative	Minor Adverse	High
Tall Ruderal - permanent loss or degradation	Site	Negligible	Negligible	High
Watercourses – degradation	Local	Minor Negative	Minor Adverse	High
Arable and Improved Grassland – permanent loss	Negligible	Negligible	Negligible	High
Buildings and Hardstanding – permanent loss	Negligible	Neutral	Neutral	High
Invasive Non-native Species (INNS)				
Spread of Rhododendron	Negligible	Minor Negative	Minor Adverse	High
Species				

Badger - disturbance, killing / injury	Negligible	Negligible (but legislative requirement)	Neutral	High
Bats – loss / fragmentation of habitat, loss of several day roosts of common bat species sites risk of disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High
Birds - loss / fragmentation of habitat, disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High
Brown Hare – loss / fragmentation of habitat, disturbance	Local	Minor Negative	Minor Adverse	High
GCN (and other amphibians) - loss / fragmentation of habitat, disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High
Hedgehog - loss / fragmentation of habitat.	Local	Minor Negative	Minor Adverse	High

Table 5.9: Significance of Impact - Construction

Operational Phase

Statutory Sites

7.32. No significant impacts to statutory sites are expected as a result of the Proposed Development due to physical distance from the development site, and non-residential development type.

Non-statutory Sites

7.33. No significant impacts to non-statutory sites are expected as a result of the Proposed Development due to physical distance from the site, and non-residential development type.

Habitats

7.34. During operation of the Proposed Development, impacts on existing retained habitat and newly created ones could consist of:

- Degradation of retained habitats (woodland, trees, hedgerows, ponds and a watercourse) due to changes in management;
- Pollution from the development, especially in relation to watercourses; and
- Disturbance of habitats from increased human activity either within habitats (if publicly accessible) or; indirect disturbance arising from movement of vehicles or personnel close to habitats.

Protected and Priority Species

7.35. Displacement as a result of disturbance due to increased human activity, traffic, noise, and lighting, of species including:

Badger

7.36. There is a risk of killing / injury from road accidents and disruption of foraging activity by human disturbance and night-time lighting.

Bats

7.37. Roosts could be disturbed if present within or near to areas used as part of the development, such as the retained farm building within the SAM area. This could arise due to human

disturbance or as a result of lighting of outside areas. Foraging habitat for bats could be adversely affected if dark corridors are not maintained along key foraging habitats.

Birds (including barn owl) –

7.38. During operation of the development potential impacts to breeding birds could include:

- Disturbance for species such as house sparrow and hirundines which use the built environment for nesting; and
- In the absence of appropriate management, degradation of retained habitats could reduce the quality and availability of resources for both breeding and wintering species.

Brown hare

7.39. Habitat loss arising from loss of open pasture and arable land, would not be likely to be significant for hares when considered within the context of other similar habitat available on land within the immediate locality of the site.

There is a risk of killing / injury from road accidents and disruption of foraging activity by human disturbance and night-time lighting.

GCN and other amphibians, if present;

There could be a risk of killing/ injury of GCN and other amphibians, if present on the site, as a result of becoming trapped in unsuitable drainage features on new roads or crushed by traffic, if crossing roadways / hardstanding, particularly during spring migration to breeding ponds

Hedgehog

7.40. There is a risk of killing / injury from road accidents and disruption of foraging activity by human disturbance and night-time lighting.

7.41. Potential impacts during the operation phase, in the absence of mitigation, are summarised in **Table 5.10**.

Nature of Impact	Receptor Importance	Environmental Impact	Significance of Effect	Confidence Level
Protected Sites				
Statutory Sites – direct / indirect impacts	International	Negligible	Negligible	High
Non-statutory Sites – direct or indirect impacts	County	Negligible	Negligible	High
Habitats				
Broadleaved Woodland –habitat degradation	Local	Minor Negative	Minor Adverse	High
Hedgerow - habitat degradation	Local	Minor Negative	Minor Adverse	High
Ponds - habitat degradation	Local	Minor Negative	Minor Adverse	High
Scattered Trees and Scrub - habitat degradation	Site	Minor Negative	Minor Adverse	High
Watercourses – habitat degradation	Local	Minor Negative	Minor Adverse	High
Improved Grassland – habitat degradation	Negligible	Negligible	Negligible	High
Species				
Badger – none expected	Negligible	Negligible (but legislative requirement)	Neutral	High
Bats – disturbance / displacement from retained habitats and roost locations on site.	Local	Minor Negative	Minor Adverse	High

Birds – disturbance / displacement from retained habitats	Local	Minor Negative	Minor Adverse	High
Brown Hare – disturbance / displacement from retained habitats	Local	Minor Negative	Minor Adverse	High
GCN (and other amphibians) – displacement / displacement from retained habitats, direct killing/injury	Local	Minor Negative	Minor Adverse	High
Hedgehog – disturbance / displacement from retained habitats, habitat fragmentation	Local	Minor Negative	Minor Adverse	High

Table 5.10: Significance of Impact – Operation

8. Proposed Mitigation

Construction Phase

Protected Sites

Statutory and Non- Statutory Sites

8.1. No significant impacts to statutory sites are expected as a result of the Proposed Development due to physical distance from the development site, and non-residential development type. Therefore, no mitigation is required.

Habitats

8.2. The main components for mitigating the loss of habitats arising from the development are:

- Provision of an area specifically set aside for ecological mitigation in the southwest corner of the site (see Ecological Mitigation Area on the updated Illustrative Masterplan, see Appendix 4 of ES Part One Report) which has habitat connections to key habitat features which are retained within the overall site layout: namely:
- A buffer to the brook delineating the southern boundary of the site which will form an important wildlife corridor; and
- The retention of Bradley Gorse an area of mature woodland and an adjacent strip of mature trees (Wrights Covert).

8.3. Details of what the Ecological Mitigation Area will comprise are provided under various habitat and species sub-headings below. The creation of these habitats and opportunities for protected species should be undertaken ahead of commencement of the first phase of development as this area is required for GCN translocation. Further details, including species composition, can be conditioned and provided as part of a subsequent reserved matters application. Details for the ongoing management of this area are discussed under the Operation section.

Broadleaved Woodland

8.4. Habitat severance arising from loss of the hedge connection (previously described in Section 7 will be mitigated through strengthening the wildlife corridor along the brook (delineating

the southern boundary of the site) and enhancement of the retained hedge linking the brook and retained habitats associated with the Farm / SAM.

Hedgerows

8.5. Loss of 4,400 m of hedge will be mitigated through:

- Enhancement of retained hedge extending north towards the Farm / SAM from the brook along the southern boundary (to the west of Plot 3);
- The formation of a 15 m wide (at narrowest point) corridor containing a mixture of rough grassland and scrub habitat along the southern boundary brook, thereby strengthening this existing wildlife corridor;
- Inclusion of new native tree planting blocks between the northernmost development areas (Development zone B on the updated Parameters Plan in Appendix 5 of ES Part 1 Report);
- Inclusion of additional native tree planting will be included along the boundary of the Ecological Mitigation Area to screen the area from the motorway slip road to the southeast; and
- Planting of a hedge to link the proposed boundary planting (described above) to the hedge and associated drain present on the northwest boundary of the mitigation area.

Ponds

8.6. Pond loss will be mitigated through the inclusion of ~~six~~ seven new ponds created specifically for wildlife (notably GCN) within the Ecological Mitigation Area located in the southeast corner of the development. These ponds will be positioned relatively close to each other so that close habitat links can be created between them and the two existing ponds retained within this area.

8.7. To increase the provision of new wetland habitat towards a 2:1 replacement of all ponds (a total of 12 new pond features), a minimum of five of the proposed attenuation basins will be designed so that they will permanently hold water. Where possible, ponds selected for this treatment will be those most closely linked to the proposed Green Infrastructure and Bradley Brook watercourse corridor and will be landscaped to maximise benefits for biodiversity.

8.8. Also, the Ecological Mitigation Area will connect to Bradley Gorse which contains another three of the ponds retained within the development thereby providing additional terrestrial habitat linkages.

Scattered Trees and Scrub

8.9. New tree planting will mitigate some of the effects of individual tree loss however, this cannot replace the loss of those features associated with mature trees such as cavities and decay. Loss of scrub will be mitigated through the inclusion of a scrub component within the Ecological Mitigation Area.

Tall Ruderal

8.10. Loss of ruderal vegetation will be mitigated through the inclusion of a ruderal component within the Ecological Mitigation Area.

Watercourses

8.11. Sustainable Urban Drainage (SUDs) form part of the Proposed Development layout (see updated Illustrative Masterplan, in Appendix 4 of the ES Part One Report) which will be designed to take surface water from the Proposed Development which will attenuate flows into any watercourses and provide a buffer against pollution, should this occur.

8.12. Pollution control measures in accordance with relevant pollution prevention guidance will be implemented throughout the construction phase, in this case: Guidance on Pollution Prevention:

- Works and Maintenance in or Near Water: EGPP 5;
- PPG 6 Working at Construction and Demolition Sites; and
- GP22 Dealing with Spills

Invasive Non-native Species (INNS)

8.13. Woodland habitats would be protected from incidental disturbance by fencing which will prevent the accidental spread of rhododendron during the construction phase of the development.

Protected and Priority Species

Badger

8.14. The enhancement of habitat along the southern boundary brook and within the proposed Ecological Mitigation Area should provide additional secluded habitat which may provide suitable habitat for badger setts and additional foraging resources for badger.

Bats

8.15. The following mitigation is proposed for the loss of roosts detailed in **Table 5.8** which would consist of providing replacement roost locations in the form of bat boxes (suitable for the species identified), or other crevice type roosting opportunities on the remaining buildings that are retained within the proposed development layout. ~~The number of roost locations provided would be double the number lost to development. Works would be timed to occur when bats are likely to be absent from buildings i.e. during the autumn, winter or early spring.~~

8.16. The principles of proposed mitigation will include roost replacement at a ratio of 2:1 using bat boxes, timing of construction work to minimise impacts (i.e during the autumn, winter or early spring when bats are likely to be absent from buildings) and retention and enhancement of foraging and commuting habitat combined with a sensitively designed lighting scheme. This should be achieved by consideration of the specification and placement of luminaires to ensure that light spill onto retained habitat features (such as woodland edge and tree lines) is avoided as far as possible. Where light spill on these features is unavoidable, it should not exceed 1 Lux. As this is an outline application, some of the finer details of the scheme remain unknown at this stage so the mitigation strategy can only comprise principles at this stage.

8.17. B12 is be retained but will cease its residential use on commencement of development. Proposals for a change of use of this building will be subject of a later planning application following grant of any outline application on the Site. It is likely that impacts to roosting bats in B12 will be only temporary during construction works. Detailed proposals for the change of use of B12 are not yet known. However, the principles of mitigation will include the timing of works (as above, to coincide with periods when bats are more likely to be absent) and the provision of bat boxes on retained buildings or adjacent trees to offer suitable replacement roosting features, both during temporary construction impacts, and long-term.

8.18. The above approach is consistent with the recommendations of the Bat Mitigation Guidelines (Mitchell-Jones 2004).

8.19. No further aerial surveys are recommended at this stage and no roost locations have been confirmed to date. A re-survey of the ~~three~~ two trees identified with roost potential should be undertaken at the detailed planning stage. Should loss of tree roosts be identified then there are ample opportunities to provide replacement roosting opportunities (in the form of bat boxes) on retained mature trees within the proposed development layout.

8.20. The above mitigation will need to be subject to a detailed strategy and once planning consent is granted, an application made for a European Protected Species Licence from Natural England to implement the measures proposed.

8.21. Additionally, to comply with Local and National planning policy, the Proposed Development will need to comply with the three derogation tests under the Conservation of Habitats and Species Regulations 2018. Namely:

- *Regulation 53. (2)(e) "preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;"*
- *Regulation 53(9)(a) "that there is no satisfactory alternative"; and*
- *Regulation 53(9)(b) "that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range".*

8.22. It is considered that with the implementation of mitigation proposed above that the favourable conservation status of bats would be maintained within the development proposed. The other tests requiring a development need of overriding public interest and lack of satisfactory alternatives to development lie outside of the scope of this ES chapter to assess as they are planning arguments.

8.23. The development has been designed to retain key habitat resources for bats namely; woodland and their associated edges and watercourses and their associated tree and margins.

8.24. Loss of foraging and commuting habitat (ponds and hedges) will be mitigated through the enhancement of linear habitat along the southern boundary brook to increase the value of this habitat as a foraging and commuting corridor and through provision of a mixture of wetland habitat (ponds and associated margins), scrub and hedges within the Ecological Mitigation Area located in the southeastern corner of the site.

8.25. The position of key habitat features described above for foraging / commuting bats would be protected from incidental disturbance from construction lighting, where necessary.

Birds

8.26. The provision of a high-quality mosaic of rough grassland, scrub, wetland and ponds within the Ecological Mitigation Area will partly replace habitat resources for some priority species such as yellowhammer, reed bunting, linnet as well as additional resources for other non-priority bird species recorded breeding within the site. In winter these resources will also be used by thrushes including field fare and redwing.

8.27. Provision of new tree planting will provide replacement habitat resources for common woodland bird species.

8.28. Loss of breeding resources around the farm buildings used by colonial species namely; house sparrow, house martin and swallow can be mitigated through the provision of nest boxes on new buildings, provided these are appropriately sited and protected from disturbance.

8.29. Loss of farmland habitat which is suitable for breeding skylark and overwintering birds such as lapwing and starling cannot be mitigated entirely within the scheme boundary. Following consultation with GMEU it is proposed that compensation for habitat losses to these species should be provided via an off-site mitigation scheme. This will be implemented principally for the benefit of the above-mentioned species and will provide long-term habitat management of land of a comparable size to the arable habitat impacted as a result of the proposed development (which has most existing suitability for ground-nesting birds). It is anticipated that this will be implemented for a period of 20 years and should be located within the local area (within WBC area). The exact details of the proposal will be agreed with WBC (and their statutory consultee GMEU) and can be secured via a Section 106 agreement.

8.30. Clearance of any habitats (including buildings) would be timed to avoid the bird nesting season or preceded by a preclearance survey to check for nesting birds by a suitably qualified ecologist. Where necessary, where nesting birds would be disturbed, an exclusion zone around the nest and immediate environs would be set up and maintained until nestlings have fledged and moved away from the site.

Brown Hare

8.31. No specific mitigation is proposed. Habitat creation proposed in the Ecological Mitigation Area will provide dense cover in which hares could lay up whilst not foraging on adjacent open farmland.

Great Crested Newt

8.32. Mitigation for the loss of breeding habitat and surrounding terrestrial habitat as well as avoiding killing / injury of GCN will need to consist of the following elements:

- Provision of replacement breeding habitat – seven ~~six~~ new ponds are to be created within the Ecological Mitigation Area;
- Provision of replacement terrestrial habitat – the above ponds will be surrounded by 9 ha of high-quality terrestrial habitat, most of which will be immediate (i.e. within 50m of a breeding pond;
- Translocation of the GCN population from pond 3 into the proposed Ecological Mitigation Area.

8.33. Additional attenuation features (including several which will be designed to be permanently wet) will also contribute to the provision of terrestrial and aquatic habitat for GCN and other amphibians across the wider site.

8.34. Detailed planting schemes for new and enhanced habitats will be provided at the reserved matters stage, but indicative General Arrangement drawing and Planting Palette tables have been prepared by the landscape architect (Layer). These drawings demonstrate proposals for new and replacement habitats which include the use of native species to create hedgerows, scrub, scattered trees, wildflower meadow and aquatic/marginal planting of ponds.

8.35. The mitigation proposed above is consistent with recommendations of the Great Crested Newt Mitigation Guidelines (English Nature 2001) will need to be subject to a detailed strategy and once planning consent is granted, an application made for a European Protected Species Licence from Natural England to implement the measures proposed.

8.36. Additionally, to comply with Local and National planning policy the Proposed Development will need to comply with the three derogation tests under the Conservation of Habitats and Species Regulations 2018. Namely:

- *Regulation 53. (2)(e) "preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;"*

- *Regulation 53(9)(a) "that there is no satisfactory alternative"; and*

- *Regulation 53(9)(b) "that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range".*

8.37. It is considered that with the implementation of mitigation proposed above that the favourable conservation status of GCN could be maintained within the development proposed. The other tests requiring a development need of overriding public interest and lack of satisfactory alternatives to development lie outside of the scope of this ES chapter to assess as they are planning arguments.

8.38. The mitigation proposed to mitigate habitat loss for GCN would also ensure that there is no net loss of habitat for other amphibian species found within the site.

Construction Environmental Management Plan (CEMP) and Mitigation Strategies for Protected Species

8.39. Details for protection of retained habitats, avoiding the risk of pollution and avoiding impact to badgers, foraging resources for bats and breeding birds would be provided within a CEMP which could be secured via a planning condition. See Framework CEMP in Appendix 9 of the ES Part One Report.

8.40. Specific ecological mitigation strategies would be produced to provide detailed mitigation measures to be implemented in respect of bats and GCN. These too can be secured via planning conditions.

Operational Phase

Habitats

8.41. Degradation of habitats both as a result of human activity (changes in management, disturbance, pollution etc.) would be avoided through the adoption of an Ecological Management Plan (EcMP) to cover both retained and new habitats incorporated into the development layout. The EcMP should be implemented for a minimum of 10 years. This could be secured via a planning condition.

8.42. The EcMP will broadly include:

- Periodic grass cutting (twice yearly) within the Ecological Mitigation Area to ensure a species-rich sward is maintained;
- Periodic scrub cuts (on a biennial basis) to ensure that the Ecological Mitigation Area maintains grassland habitats;
- Maintenance of hedgerows; cutting in winter on a rotational basis to allow fruits to set and avoid impacts to nesting birds;
- Annual maintenance of gully pots to ensure they remain free of debris and remain amphibian friendly;
- Annual monitoring of invasive species and eradication as necessary; and
- Prescriptions for maintenance of communal ornamental planting to ensure it is conducted in a manner that is sensitive to wildlife.

8.43. Use of SUDs will prevent any pollution (for example form surface water drainage reaching watercourses).

8.44. Following relevant Environment Agency Guidelines on pollution protection as previously stated for construction impacts should ensure that pollution is stopped before it even reaches SUDs.

Protected and Priority Species

8.45. Displacement as a result of disturbance due to increased human activity, traffic, noise, and lighting, of species including:

Badger

Speed limits would be imposed around site together with suitably located warning signs to reduce the risk of road kill. Access would be restricted to ecologically important areas along brook, woodland and Ecological Mitigation Area to avoid human disturbance of badger setts and adjacent foraging habitat.

Bats

8.46. Where roosts are present, they would be protected from incidental disturbance by restricting access to roost features. The lighting design would ensure that any roost locations are not lit at night by street or security lighting.

8.47. Similarly, lighting would also be designed to avoid illumination of areas likely to provide feeding foraging / commuting routes for bats.

Birds (including barn owl)

8.48. Within the built environment building managers would be made aware of the locations of nest boxes and any other nest sites in buildings of priority species such as house sparrow and hirundine species and measures would be employed to ensure they are not disturbed during the bird breeding season. These would be set out within the EcMP for the site.

8.49. Speed limits would be imposed around site together with suitably located warning signs. This would reduce the risk of birds being struck by traffic moving through the site.

8.50. Implementation of the EcMP (see Habitats sub-heading above) will ensure that habitats for priority and other bird species are maintained.

8.51. Management of habitats would also be timed to avoid the bird nesting season.

Brown hare

8.52. Speed limits to be imposed around site together with suitably located warning signs would reduce the risk of hares being struck by traffic moving through the site. The lighting design of the proposed development would ensure that hedges providing cover for hares and other wildlife are not lit at night by street or security lighting.

GCN and other Amphibians

8.53. Offset gully pots which allow for the passage of amphibians along the bottom of kerbs (without dropping into drains) would be used throughout the site in order to allow free passage of amphibians across the site.

Hedgehog

8.54. Speed limits to be imposed around site together with suitably located warning signs would be used reduce the risk of hares being struck by traffic moving through the site. The lighting

design of the proposed development would ensure that hedges providing cover for hedgehog and other wildlife are not lit at night by street or security lighting.

9. Potential Residual Effects

Potential Residual Effects – Construction Phase

9.1. **Table 5.11** summaries the anticipated residual impacts on each of the ecological features identified in the impact assessment. Taking into account mitigation proposals set out in the Mitigation Section, the residual effect of the Proposed Development will consist of the permanent loss of improved pasture of arable land. Whilst this is intrinsically of negligible ecological importance, it provides habitat for an assemblage of farmland bird species; both breeding and wintering.

9.2. Losses for most species can be mitigated through the inclusion of high-quality grassland and scrub habitat within a dedicated Ecological Mitigation Area but some species (for example skylark and lapwing) will not use this habitat and therefore this will result in a permanent loss of resources for these species. This will be a minor adverse impact (significant at the local scale).

9.3. A similar situation exists for brown hare and for hedgehog. Development will reduce dispersal opportunities locally, but the impact from the loss of habitat area is likely to be negligible.

9.4. The overall impact of the Proposed Development in terms of ecological issues during the construction phase is highlighted in the **Table 5.11** overleaf:

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Protected Sites						
Statutory Sites – direct / indirect impacts	International	Negligible	Negligible	High	None Required	Negligible
Non-statutory Sites – direct / indirect impacts	County	Negligible	Negligible	High	None Required	Negligible
Habitats						
Broadleaved Woodland – permanent loss, fragmentation or degradation	Local	Minor Negative	Minor Adverse	High	Strengthening the wildlife corridor along the brook (delineating the southern boundary of the site) and enhancement of the retained hedge linking the brook and retained habitats associated with the Farm / SAM.	Negligible

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Hedgerow - permanent loss, fragmentation or degradation	Local	Minor Negative	Minor Adverse	High	• Enhancement of retained hedge extending north towards the Farm / SAM from the brook along the southern boundary (to the west of development Zone D on the Parameters Plan included in Appendix 5 of ES Part 1 Report); • The formation of a 15 m wide corridor containing a mixture of rough grassland and scrub habitat along the southern boundary brook, thereby strengthening this existing wildlife corridor; • Inclusion of new native tree planting blocks between the northernmost plots (cells 5 and 6 within development zone B on the Parameters Plan included in Appendix 5 of ES Part 1 Report); Inclusion of additional native tree planting will be included along the boundary of the Ecological Mitigation Area to screen the area from the motorway slip road to the southeast; and • Planting of a hedge to link the proposed boundary planting (described above) to the hedge and associated drain present on the northwest boundary of the mitigation area.	Negligible

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Ponds - permanent loss or degradation	Local	Minor Negative	Minor Adverse	High	Inclusion of six new ponds within the Ecological Mitigation Area located in the southeast corner of the development. These ponds will be positioned relatively close to each other so that close habitat links can be created between them and the two existing ponds retained within this area. Also, the Ecological Mitigation Area will connect to Bradley Gorse which contains another three of the ponds retained within the development thereby providing additional terrestrial habitat linkages.	Negligible
Scattered Trees and Scrub - permanent loss, or degradation	Site	Minor Negative	Minor Adverse	High	New tree planting will mitigate some of the effects of individual tree loss however, this cannot replace the loss of those features associated with mature trees such as cavities and decay. Loss of scrub will be mitigated through the inclusion of a scrub component within the Ecological Mitigation Area.	Negligible
Tall Ruderal - permanent loss or degradation	Site	Negligible	Negligible	High	Inclusion of a ruderal component within the Ecological Mitigation Area.	Negligible
Watercourses – degradation	Local	Minor Negative	Minor Adverse	High	Pollution control measures will be implemented	Negligible
Arable and Improved Grassland – permanent loss	Negligible	Negligible	Negligible	High	None Required	Negligible

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Buildings and Hard standing – permanent loss	Negligible	Neutral	Neutral	High	None Required	Negligible
Invasive Non-native Species (INNS)						
Spread of Rhododendron	Negligible	Neutral	Neutral	High	Woodland habitats would be protected from incidental disturbance by fencing which will prevent the accidental spread of rhododendron during the construction phase of the development.	Neutral
Species						
Badger - disturbance, killing / injury	Negligible	Neutral (but legislative requirement)	Neutral (but legislative requirement)	High	The enhancement of habitat along the southern boundary brook and within the proposed Ecological Mitigation Area should provide additional secluded habitat.	Neutral

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Bats – loss / fragmentation of habitat, loss of several day roosts of common bat species sites risk of disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High	Bat box scheme. Enhancement of linear habitat along the southern boundary brook to increase the value of this habitat as a foraging and commuting corridor and through provision of a mixture of wetland habitat (ponds and associated margins), scrub and hedges within the Ecological Mitigation Area located in the southeastern corner of the site. Habitat features described above for foraging / commuting bats would be protected from incidental disturbance from construction lighting where necessary.	Negligible

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Birds - loss / fragmentation of habitat, disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High	The provision of a high-quality mosaic of rough grassland, scrub, wetland and ponds within the Ecological Mitigation Area and provision of new tree planting. Implementation of off-site habitat for ground-nesting / overwintering birds including lapwing and skylark arranged via a S106 agreement with a third-party landowner. ~~However, this cannot replace open farmland habitat of importance to skylark and lapwing~~. Provision of nest boxes on new buildings Clearance of any habitats (including buildings) would be timed to avoid the bird nesting season.	~~Minor Adverse~~ Negligible
Brown Hare – loss / fragmentation of habitat, disturbance	Local	Minor Negative	Minor Adverse	High	No specific mitigation is proposed. Habitat creation proposed in the Ecological Mitigation Area will provide dense cover in which hares could lay up whilst not foraging on adjacent open farmland.	Minor Adverse

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
GCN (and other amphibians) - loss / fragmentation of habitat, disturbance, killing / injury	Local	Minor Negative	Minor Adverse	High	Mitigation for the loss of breeding habitat and surrounding terrestrial habitat as well as avoiding killing / injury of GCN will need to consist of the following elements: • Provision of replacement breeding habitat - 6 7 new ponds are to be created within the Ecological Mitigation Area; • Provision of replacement terrestrial habitat – the above ponds will be surrounded by x has of high-quality terrestrial habitat most of which will be immediate (i.e; within 50m of a breeding pond; • Translocation of the GCN population from pond 3 into the proposed Ecological Mitigation Area.	Minor Beneficial
Hedgehog - loss / fragmentation of habitat.	Local	Minor Negative	Minor Adverse	High	No specific mitigation is proposed. Habitat creation proposed in the Ecological Mitigation Area will provide dense cover in which hedgehogs could lay up and forage	Minor Adverse

Table 5.11: Residual Significance of Effect - Construction Phase

Potential Residual Effects – Operational Phase

9.5. The overall impact of the Proposed Development in terms of ecological issues during the operational phase is highlighted in the **Table 5.12** overleaf but can be summarized as:

- Potential reduction in habitat quality through lack of management – this will be mitigated by adoption of an EcMP which will ensure habitats are managed for nature conservation throughout the lifetime of the proposed development;
- Potential for water pollution which will be mitigated through the inclusion of SUDs within the development design and the adoption of pollution control measures; and
- Adoption of lighting designs, traffic control, public access controls and drainage designs to avoid / reduce risks to wildlife on site.

9.6. Provided the mitigation measures are successfully implemented the overall impact of the Proposed Development during operation on ecology would be negligible.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Protected Sites						
Statutory Sites – direct / indirect impacts	International	Negligible	Negligible	High	None Required	Negligible
Non-statutory Sites – direct or indirect impacts	County	Negligible	Negligible	High	None Required	Negligible
Habitats						
Broadleaved Woodland – habitat degradation	Local	Minor Negative	Minor Adverse	High	Adoption of an Ecological Management Plan (EcMP) to cover both retained and new habitats incorporated into the development layout. This could be secured via a planning condition.	Negligible
Hedgerow - habitat degradation	Local	Minor Negative	Minor Adverse	High	Adoption of an Ecological Management Plan EcMP	Negligible
Ponds - habitat degradation	Local	Minor Negative	Minor Adverse	High	Adoption of an Ecological Management Plan EcMP	Negligible
Scattered Trees and Scrub - habitat degradation	Site	Minor Negative	Minor Adverse	High	Adoption of EcMP	Negligible
Watercourses – habitat degradation	Local	Minor Negative	Minor Adverse	High	Adoption of (EcMP). Use of SUDs will prevent any pollution (for example form surface water drainage reaching watercourses. Following relevant Environmental Agency Guidelines on pollution protection as previously stated for construction impacts should ensure that pollution is stopped before it even reached SUDs.	Negligible

Improved Grassland – habitat degradation	Negligible	Negligible	Negligible	High	None Required	Negligible
Species						
Badger – none expected	Negligible	Neutral (but legislative requirement)	Neutral	High	Speed limits around site together with warning signs. Access would be restricted access to ecologically important areas	Neutral
Bats – disturbance / displacement from retained habitats and roost locations on site.	Local	Minor Negative	Minor Adverse	High	Where roosts are present, they would be protected from incidental disturbance by restricting access to roost features. Lighting design would ensure that any roost locations are not light at night by street or security lighting. Lighting would also be designed to avoid illumination of areas likely to provide feeding foraging / commuting routes for bats.	Negligible
Birds – disturbance / displacement from retained habitats	Local	Minor Negative	Minor Adverse	High	Speed limits would be imposed around site together with suitably located warning signs. This would reduce the risk of birds being struck by traffic moving through the site. Implementation of the EcMP will ensure that habitats for priority and other bird species are maintained.	Negligible
Brown Hare – disturbance / displacement from retained habitats	Local	Minor Negative	Minor Adverse	High	Speed limits with suitably located warning signs would reduce the risk of hares being struck by traffic moving through the site. The lighting design of the proposed development would ensure that hedges providing cover for hares and other wildlife are not lit at night by street or security lighting.	Negligible

GCN (and other amphibians) – displacement / displacement from retained habitats, direct killing/injury	Local	Minor Negative	Minor Adverse	High	Offset gully pots which allow for the passage of amphibians along the bottom of kerbs. would be used throughout the development to allow free passage of amphibians across the site.	Negligible
Hedgehog – disturbance / displacement from retained habitats, habitat fragmentation	Local	Minor Negative	Minor Adverse	High	Speed limits to be imposed around site together with suitably located warning signs would reduce the risk of hedgehogs being struck by traffic moving through the site. The lighting design of the proposed development would ensure that hedges providing cover for hedgehog and other wildlife are not lit at night by street or security lighting.	Negligible

Table 5.12 Residual Significance of Effect - Operation Phase

10. Additive Impacts (Cumulative Impacts and their Effects)

10.1. For the purposes of this ES we define the additive cumulative effects as:

> ***'Those that result from additive impacts (cumulative) caused by other existing and/or approved projects together with the project itself***

10.2. The developments that are likely to have a cumulative impact when considered with the Proposed Development have been scoped with the Local Authority and Key Consultees during the preparation of this ES (a full list is included within Section 9 of the ES Part One Report). The following **Table 5.13** includes the agreed list of cumulative developments that have been assessed in respect of ecology. These are also shown geographically on the plan included at **Appendix 11** of the ES Part One Report.

No.	Cumulative Development	Details	Status	Justification for Inclusion / Exclusion in Cumulative Assessment
1	Land bounded by Pewterspear Green Road, Ashford Drive, Stretton, Warrington LPA Ref: 2016/28807 Applicant - HCA	Outline Planning Application for 180 dwellings.	Planning permission granted by WMBC 28-09-2017 (3 years to implement planning permission)	**Exclude** Cumulative effects are unlikely due to physical distance and separation by other existing development. Small scale of development means that habitat losses are unlikely to be significant for populations of species identified as ecological features of the site.
2	Land bounded by Green Lane &, Dipping Brook Avenue, Appleton, Warrington, WA4 5NN LPA Ref: 2017/29930 Applicant - HCA	Outline Planning Application for 370 dwellings	Planning permission granted by WMBC 22-01-2018 (3 years to implement planning permission)	**Exclude** Cumulative effects are unlikely due to physical distance and separation by other existing development. Small scale of development means that habitat losses are unlikely to be significant for populations of species identified as ecological features of the site.
3	Land South of Astor Drive, East of Lichfield Avenue &, South of Witherwin Avenue, Grappenhall Heys, Warrington, WA4 3LG LPA Ref: 2017/29929 Applicant - HCA	Outline Planning Application for 400 dwellings	Planning permission granted by WMBC 22-01-2018 (3 years to implement planning permission)	**Exclude** Cumulative effects are unlikely due to physical distance and separation by other existing development

4	Land North of Barleycastle Lane, Appleton, Warrington Liberty Properties Development Ltd & Eddie Stobart LPA Ref: 2017/31757	Full Planning application (Major) - Demolition of all existing on-site buildings and structures and construction of a National Distribution Centre building (Use Class B8) with ancillary office accommodation (Class B1(a)), vehicle maintenance unit, vehicle washing area, internal roads, gatehouse, parking areas, perimeter fencing, waste management area, sustainable urban drainage system, landscaping, highways improvements and other associated works. (Gross internal floor space of 56,197m², together with 1,858m² of ancillary office).	Refused Planning Permission by WMBC 14-11-2018. Decision subsequently appealed (Appeal ref: APP/M0655/W/19/3222603) and considered at Public Inquiry. Decision pending following closure of inquiry. New planning application submitted (LPA Ref: 2019/34739) and granted permission at planning committee by WBC in July 2019. Referred to the Secretary of State. On the 21st May 2020, the SoS confirmed that that the new application (Ref: 2019/34739) should be called in. The SoS states that as the appeal scheme and the new application scheme are effectively identitical, they should be joined. As an inquiry has already been held into the appeal scheme, he does not consider that a further inquiry is necessary. The SoS has therefore invited representations on any material change in circumstances, fact or policy, that may have arisen since the inquiry. A decision on both these schemes is therefore pending.	**Include** Proximity to proposed development and size would result in additional habitat loss and dispersal opportunities for wildlife identified as ecological features of the site (particularly birds).
5	Land to the east of Stretton Road, north of Pepper Street, Stretton Road, Appleton Thorn, Warrington LPA Ref: 2017/31848	Full Planning Application for 71 dwellings		**Exclude** Small development in existing developed area which would be unlikely to result in habitat losses that would be significant for wildlife identified as ecological features of the site.
6	Blue Machinery Ltd, Barleycastle Trading Estate, Lyncastle Road, Warrington, WA4 4SY LPA Ref: 2016/28994	Full Planning Application for new industrial warehouse building for storage (replacing smaller storage building), single storey extension to existing building for further storage and two storey extension for additional office space, associated parking provision and landscaping. (1,699m2 new build, 180m2 and 265m2 extensions)		**Exclude** Small development in existing developed area which would be unlikely to result in habitat losses that would be significant for wildlife identified as ecological features of the site.

7	Land off Lyncastle Way, Barleycastle Lane, Appleton, Warrington, WA4 4SN LPA Ref: 2015/25255 Morley Estates	Full Planning Application for industrial / warehouse development (Sui Generis) to facilitate a plant hire business with elements of vehicle / plant repair, servicing, maintenance and plant storage / distribution / parking and associated offices / welfare facilities, vehicular access via existing service road, acoustic bunding and fencing and other means of enclosure, soft landscaping, 36 car park spaces, fuel pumps (and associated underground tanks), vehicle / plant wash bay and sub-station (Resubmission of 2014/24618) (4,545sqm industrial warehouse building)		**Exclude** Small development in existing developed area which would be unlikely to result in habitat losses that would be significant for wildlife identified as ecological features of the site.
8	Former Stretton Airfield, Warrington, WA4 4RG LPA Ref: 2014/2332 Hensmill Property	Proposed construction of subterranean car storage facility (B8 Use Class) with ancillary office development and associated demolition and landscaping accessed from Crowley Lane.		**Exclude** Development is separated from site by motorway (as significant physical dispersal barrier. Site is small and unlikely to result in habitat losses that would be significant for wildlife identified as ecological features of the site.

9*	Warrington Garden Suburb (as identified in the Council's Preferred Development Option Consultation Document (July 2017) and Submission Version of the Local Plan (March 2019))	The Warrington Garden Suburb was is identified as a Preferred Development Option in the July 2017 Consultation Document, which provides the potential development of around 7,000 new homes to be delivered over the full 20 years of the Plan, therefore we have assessed relevant phases with the Cumulative Assessment. Using the Development Trajectory (Table 20 Garden City Suburb Employment Land Trajectory of the Preferred Development Option Consultation Document) we have based the cumulative assessment ONLY on the quantum of development within the Garden Suburb expected to come forward in parallel with the delivery timeframe for the Six 56 Application Proposals. It should be noted that since the original ES was prepared and submitted the Council have published their Proposed Submission Version Local Plan (March 2019), which states that the Garden Suburb will deliver around 7,400 homes, with around only 5,100 of these homes to be delivered within the Plan Period, up to 2037. Policy MD2 of the Submission Version Local Plan does not identify a phasing or development trajectory, therefore this assessment remains based on the information contained in the Preferred Development Option Consultation Document (July 2017). On this basis, the cumulative assessment of 700 homes over the plan period of 20 years undertaken as part of the original ES provides an overly robust assessment. *Due to the limited information available in respect of the Garden Suburb, the Six 56 Warrington Cumulative Assessment will be a non-spatial assessment.		**Exclude** Proximity to proposed development and size would result in additional habitat loss and dispersal opportunities for wildlife identified as ecological features of the site (particularly birds). However, there is not sufficient information available in terms of spatial delivery for cumulative assessments to be undertaken. As such it is not possible to undertake a cumulative assessment in respect of ecology.

	Warrington Garden Suburb Phase	**Uses and Quantum identified in Preferred Development Option (July 2017)**	**Uses and Quantum to be identified in Six 56 Cumulative Assessment**	
	Phase 1 0-5 years Assumed 2020-2025	406 residential units (non- Green Belt sites) 22ha employment (employment areas include Six 56 Warrington and Land around Barley Castle Lane)	Six 56 Proposals will be under construction, with part delivered within Phase 1 of the Garden Suburb. The following form part of the Garden Suburb Phase 1 and will be included within the Cumulative Assessment: • HCA sites (950 dwgs)* • 71 dwgs associated with land to east of Stretton Road* • Land North of Barley Castle Lane (Liberty Properties and Stobart) (LPA Ref: 2017/31757) - 15.7ha* *Note that these sites are already included as part of the Cumulative Assessment and already referenced as sites 1, 2, 3 and 4.	

	Phase 2 6-10 years Assumed 2026-2030	2610 residential units (includes 496 non-Green Belt sites and 2,114 Green Belt sites) 30.3 ha employment (employment areas include Six 56 Warrington and Land around Barley Castle Lane)	Six 56 Proposals will be completed during 2027/2028. The following form part of the Garden Suburb Phase 2 and will be included within the Cumulative Assessment: Garden City Suburb Phase 1 and 2 employment land equates to 52.3ha, beyond the 30 ha referenced in the Phase 1 and Phase 2 employment trajectory set out in the PDO. Six 56 Warrington developable area and planning application for Land North or Barley Castle Lane (LPA Ref: 2017/31757) already equates to 77.52 ha and is already included as part of the Cumulative Assessment. Garden Suburb Phase 1 and 2 residential units equates to a total of 3016 units. The Cumulative Assessment already includes 1,021 residential units. Therefore this Cumulative Assessments should include an **additional 1995 residential units** (i.e. the residual number of units identified in Preferred Development Option that not already included within Six 56 Cumulative Assessment)	
	Phase 3 11-15 years Assumed 2031-2035	2,144 ha residential units 45.9 ha employment	The Six 56 Proposals will be fully operational Given this Phase of the Garden City Suburb will be beyond the delivery of Six 56 Proposals this phase will not to be included within the Six 56 Cumulative Assessment	
	Phase 4 16-20 years Assumed 2036-2040	2,144 residential units 18.6ha employment	The Six 56 Proposals will be fully operational Given this Phase of the Garden City Suburb will be beyond the delivery of Six 56 Proposals this phase will not to be included within the Six 56 Cumulative Assessment	

Table 5.13: Cumulative Development

10.3. Both Construction and Operational phases will be considered and the short, medium and long- term impacts assessed.

Short Term

10.4. In the short-term the cumulative effect of the combined developments will result in the loss of farmland habitats currently used by a cohort of farmland birds, most of which are priority bird species. Those requiring open habitats for breeding such as lapwing and skylark will be most affected. The cumulative effects arising from both developments could lead to losses of habitat that are significant for farmland birds at a local ~~county~~ scale and therefore minor ~~moderate~~ adverse.

10.5. Mitigation proposals in respect of other habitats and species both on and off site should ensure negligible impacts for other habitats and species in terms of habitat loss therefore significant cumulative effects in this respect are unlikely. However, the presence of another adjacent development will further reduce dispersal opportunities for some species (such as brown hare, hedgehog and badger) and lead to a minor adverse impact overall.

Medium Term

10.6. Over the medium term the effects of habitat loss for farmland birds described above would reduce populations locally, which would also be significant on a local ~~county~~ scale equating to a minor ~~moderate~~ adverse impact.

10.7. The presence of another adjacent development will continue to affect dispersal opportunities for some species (such as brown hare, hedgehog and badger) and lead to a minor adverse impact overall.

Long Term

10.8. Over the long term the effects of habitat loss for farmland birds described above would reduce populations locally, which would also be significant on a local ~~county~~ scale equating to a minor ~~moderate~~ adverse impact.

The presence of another adjacent development will continue to affect dispersal opportunities for some species (such as brown hare, hedgehog and badger) and lead to a minor adverse impact overall.

11. Conclusion

11.1. Ecological surveys and reviews of ecological information conducted for the site have concluded that development will not affect any statutory or non-statutory nature conservation designations.

11.2. The development proposals have sought to retain existing key habitats; namely watercourses and woodland areas of local ecological importance.

11.3. Development will mainly result in losses of arable land, improved pasture buildings and hardstanding of negligible ecological importance. There will be some small-scale loss of ponds of local ecological importance and scrub of site ecological importance which will be mitigated through the provision of an ecological area of approximately 10 ha containing rough grassland, scrub and ponds.

11.4. The ecological area together with the retained habitats will provide suitable mitigation for habitat loss for; bats, most bird species (both breeding and wintering) and GCN. Mitigation for the loss of bat roosts in buildings has also been provided together with measures avoiding killing / injury of bats and GCN. Collectively the measures reduce to negligible the potential negative effects of the proposed development on the above habitats and species.

11.5. Negative impacts of development which cannot be fully mitigated consist of the loss of breeding and wintering habitat for farmland bird species which require open ground such as skylark and lapwing. ~~This will be a minor adverse significant at the local scale.~~ To compensate for these impacts, it is proposed that a contribution is made towards management of off-site habitat for these species secured via a S106 agreement. Cumulatively with the other development considered in Section 10 this equates to a minor adverse impact significant at up to the county scale.

Reference List

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

Mitchell-Jones, A., 2004. *Bat Mitigation Guidelines.* Peterborough: English Nature.

Appendices

Appendix 5.1 – Badger Survey Methodology and Results

Appendix 5.2 – Bat Survey Methodology and Results

Appendix 5.3 - Breeding Bird and Barn Owl Survey Methodology and Results

Appendix 5.4 – Wintering Bird Survey Methodology and Results

Appendix 5.5 - Great Crested Newt Survey Methodology and Results

Appendix 5.6 - Water Vole and Otter Survey Methodology and Results

Appendix 5.7 – Plans

Appendix 5.8 – Response to Ecology Consultation Comments (10682/R02a)

Appendix 5.9 – Deleted Text from Original ES Technical Paper

Appendices

Appendix 5.1 – Badger Survey Methodology and Results *Removed as Result are Confidential

Appendix 5.2 – Bat Survey Methodology and Results

Appendix 5.2: Bat Survey Methodology and Results

Legislation and Conservation Status

A5.2.1 As European protected species, all UK bats receive legal protection in England under the Conservation of Habitats and Species Regulations 2018 and the Wildlife and Countryside Act 1981 (as amended).

A5.2.2 Several species of bats (barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteinii*, brown long-eared *Plecotus auritus*, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe *R. hipposideros*, noctule *Nyctalus noctula* and soprano *pipistrelle Pipistrellus pygmaeus*) are listed as species of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. These are the species found in England which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

Methodology

Scope of Surveys

A5.2.3 All surveys followed standard methodologies set out in the Bat Mitigation Guidelines (Mitchell-Jones 2004), the Bat Workers Manual (Mitchell-Jones *et al*. 2004) and Bat Surveys for Professional Ecologists - Good Practice Guidelines 3rd edition (Collins 2016) and comprised:

- Ground level tree assessment – to assess the mature trees on site for potential roosting features for bats;
- Aerial inspection of trees with potential roosting features – to inspect features in detail;
- Preliminary roost assessment of buildings within the site – to assess the buildings on-site for potential to support roosting bats;
- Nocturnal emergence/re-entry surveys of buildings within the site assessed as providing potential to support roosting bats – to assess the presence/likely absence of roosting bats within the buildings.
- Activity surveys – Three dusk transect surveys – to assess bat activity across the site; and
- Automated activity surveys – deployment of two static bat detectors (Anabat Express), on three occasions, left to record for five nights.

Preliminary Roost Assessment of Buildings

A5.2.4 A preliminary roost assessment (PRA) of buildings within the site boundary was undertaken on 20th March 2018. The potential of all buildings within the site to support roosting bats was assessed to inform the need for further surveys and/or mitigation using the criteria shown in **Table A5.2.1** overleaf. The survey was undertaken by Steven Coyne who is registered to use a

Class 2 Bat Licence in all counties of England (Ref: 2015-14981-CLS-CLS). **Plan 10682/P07** outlines the location of each building subject to survey.

A5.2.5 The survey comprised an external and internal inspection of all buildings. The external inspection involved a thorough examination of the buildings to record potential roosting features, possible access points for bats into the building and evidence of bat presence (i.e. droppings, urine stains). The internal inspection comprised a thorough examination of all accessible loft spaces/potential roosting features with torchlight.

Table A5.2.1. Bat roost assessment categories – adapted from the Bat Conservation Trust Guidelines (Collins 2016).

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure 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). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more 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 – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
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.

Preliminary Roost Assessment of Trees

A5.2.6 A PRA of trees was undertaken on 13th June 2018 by Laura Dennis and Joseph Dance, both experienced field ecologists and members of CIEEM. An update walkover of the site was undertaken in February 2020 by Laura Dennis and any significant changes are noted below, where appropriate.

A5.2.7 The trees were subject to a ground-based survey in accordance with standard guidance (Collins 2016), see **Table A5.2.1** above. Potential roost features (PRFs) such as cracks or crevices, lifted bark, split limbs, and woodpecker holes were recorded to inform the need for further surveys. The inspection was aided using binoculars and a high-powered torch.

A5.2.8 The scope of the initial PRA was based on draft tree loss as a result of the development proposals. Areas of the site where tree retention was proposed (such as Bradley Gorse, and

around the Scheduled Ancient Monument (SAM) were not studied in detail at this stage). The draft tree loss information was reviewed for any discrepancies against the fixed tree loss plan once finalised, and any additional trees scheduled for removal were also subject to a ground level assessment on 5th February 2019.

A5.2.9 Any evidence of nesting birds, particularly barn owl *Tyto alba*, was also recorded (see **Appendix 5.3**).

Tree Climbing Inspection

A5.2.10 Trees with PRFs suitable for bats, which are scheduled for removal based on the Arboricultural Impact Assessment report (Landscape Science Consultancy) were subject to a follow-up climbing inspections survey on the 12th September 2018 based on draft tree loss plans. These surveys were completed on behalf of Tyler Grange by Bagshaw Ecology, and were undertaken by a pair of trained arborists, including one NE-licensed bat worker. A further climbing inspection of those trees deemed to have moderate – high roost potential (apart from tree T9) was conducted by Tyler Grange on the 5th February 2019. T9 was not re-surveyed as this tree is now retained within the proposed development layout based on the up-to-date fixed tree loss plans.

A5.2.11 Any additional trees scheduled for removal and with PRFs identified during the re-visit ground-based PRA survey on 5th February 2019, were also climbed during the same visit.

A5.2.12 All features identified during the ground-based PRA were subject to visual inspection at close range using an endoscope camera to identify any direct evidence of roosting bats and to confirm the level of suitability for roosting of each PRF in accordance with criteria described in Collins (2016).

Nocturnal Emergence/Re-entry Surveys

A5.2.13 All buildings assessed as providing low – high potential to support roosting bats were subject to nocturnal emergence/re-entry surveys. In line with the current BCT guidelines, buildings assessed as providing 'Low' potential to support roosting bats were subject to a single nocturnal emergence/re-entry survey; 'Moderate' potential buildings were subject to two nocturnal emergence/re-entry surveys; 'High' potential buildings, or those where roosting bats were confirmed during the PRA, were subject to three nocturnal emergence/re-entry surveys. Where bats were confirmed roosting in buildings assessed as 'Low' or 'Moderate' bat roost potential during the emergence/re-entry surveys, up to a total of three nocturnal surveys were completed on these buildings.

A5.2.14 The surveys followed standard methodologies and were undertaken during the optimal season in 2018 (see **Table A5.2.2** for dates and details of surveyors) by a sufficient number of surveyors to ensure all possible sightlines were covered. The locations of surveyors throughout the emergence/re-entry surveys are highlighted in **Plan 10682/P10**.

A5.2.15 Surveyors were equipped with BatBox Duet (BD), Anabat Express (AE), Peersonic (PS), Anabat Walkabout (AW) or EM3 devices to enable echolocation detection of all frequencies. Surveyors used these devices, with visual observation to identify any bats emerging from or re-entering the buildings. A high definition digital infrared camcorder with infrared illuminators paired with

an Anabat Express device was used during several visits to record visual and ultrasonic bat activity.

A5.2.16 In line with the current BCT guidelines, dusk surveys began 30 minutes before sunset and continued for a minimum of 1.5 hours after sunset. Dawn surveys began 1.5 hours before sunrise and continued for a minimum of 15 minutes after sunrise or until all bats had re-entered the roost.

Table A5.2.2. Details of dusk emergence/dawn re-entry surveys of buildings within site.

Survey	Date	Sunrise/ Sunset	Weather conditions	Surveyors+ and detector*
Building B1				
Visit 1 Dusk	11.07.18	21:36	21-19°C, BFS 2, 6 Oktas, No rain	LD, SK, MV (AE/BD)
Building B5				
Visit 1 Dusk	11.07.18	21:36	21-19°C, BFS 2, 6 Oktas, No rain	EB2, JD, KM (AE/BD)
Visit 2 Dawn	31.08.18	06:17	8-6°C, BFS 1, 5 Oktas, No rain	JD, KM, LD (AE/BD)
Visit 3 Dusk	17.09.18	19:06	19-18°C, BFS 2-3, 5 Oktas, No rain	SC (PS), MV, GP (AE/BD), Infrared Camera (AE)
Building B6				
Visit 1 Dusk	02.07.18	21:41	22-20°C, BFS 2, 1 Oktas, No rain	SK, MV, EB2, JD, LD, GP (AE/BD), SC (AE/PS)
Visit 2 Dusk	25.07.18	21:36	19-18°C, BFS 2-3, 2 Oktas, No rain	SC (AE/PS), EB2, JD, GP, KM, MV, OC (AE/BD)
Visit 3 Dawn	10.08.18	05:42	12-11°C, BFS 1-2, 7 Oktas, No rain	MV, KM, EB, SK (AE/BD) JC (AW), EB (EM3) Infrared Camera (AE)
Building B10				
Visit 1 Dusk	27.06.18	21:42	22-19°C, BFS 1, 1 Oktas, No rain	SC (AE/PS), SK (AE/BD)

Survey	Date	Sunrise/ Sunset	Weather conditions	Surveyors+ and detector*
Building B11				
Visit 1 Dusk	03.07.18	21:40	22-19°C, BFS 1, 1 Oktas, No rain	GP, MV (AE/BD)
Building B12				
Visit 1 Dusk	03.07.18	21:40	22-19°C, BFS 1, 1 Oktas, No rain	EB2, JD, JM (AE/BD), SC (AE/PS)
Visit 2 Dawn	03.08.18	05:29	17°C, BFS 0, 7 Oktas, No rain	EB2, KM, MV, SK (AE/BD), Infrared Camera (AE)
+ EB – Elizabeth Barratt, EB2 – Elliott Burns, GP – Georgina Palmer, JC – Jeff Clarke, JM – John Moorcroft, JD – Joseph Dance, KM – Kyle Mellish, LD – Laura Dennis, MV – Madara Vilde, OC – Orla Conlan, SC – Steven Coyne, SK – Sophie Kirk * AE – Anabat Express, AW – Anabat Walkabout, BD – Batbox Duet, PS – Peersonic				

Activity Transect Surveys

A5.2.17 A total of three dusk activity surveys were undertaken during the optimal season in 2017 (for full details see **Table A5.2.3**). Surveyors used a combination of visual observation and echolocation detection techniques, using BatBox Duets and Anabat Express devices, to identify bat activity within the site. In line with BCT guidelines, the surveys began at sunset and ended two hours after sunset as a minimum.

A5.2.18 Two transect routes were walked per survey (one surveyor per transect), which covered all site boundaries and potential features of interest on site such as hedgerows, scrub, tree lines and water-bodies. The transect was walked at a constant speed along a planned route recording visual and sound observations such as number of bats, flight directions and activity (e.g. commuting / foraging). The route followed is shown on **Plan 10682/P06**.

Table A5.2.3. Weather conditions and timings of the bat activity surveys.

Survey	Date	Sunset Time	Weather Conditions	Temp (˚C)		Start time	End time
				Start	End		
Visit 1	23.05.2017	21:16	BFS 1, 2 Oktas, Dry	17	15	21:05	23:15
Visit 2	09.08.2017	20:50	BFS 2, 7-5 Oktas, Slight rain 21:50-22:00	16	16	20:50	23:50
Visit 3	03.10.2017	18:43	BFS 3, 8 Oktas, Dry	11	11	18:43	20:43

Automated Activity Surveys

A5.2.19 To supplement the manned activity survey data, automated surveys of the site were also conducted in 2017. Two Anabat Express static detectors were placed on the site for each transect month (i.e. May, August, October) in two separate locations for a minimum of five consecutive nights (see **Plan 10682/P06** for location of static detector deployments). Echolocation calls were later analysed to identify calls characteristic of different bat species or group of species present. Where poor weather resulted in sub-optimal data for a given night, this night was excluded from the data analysis so that the first five 'optimal' nights were used but not necessarily in consecutive order.

A5.2.20 The Anabat Express detectors were set to begin recording half an hour before sunset and to continue until half an hour after sunrise. The dates and weather conditions for the automated survey are shown in **Table A5.2.4**.

Table A5.2.4. Sunrise/Sunset times and weather conditions for the 2017 automated bat surveys – sourced from www.sunrise-and-sunset.com **and** www.wunderground.com **(Weather Station:).**

Survey	Date	Sunset Time	Sunrise Time	Weather Conditions		
				Air Temperature at sunset (°C)	Precipitation (mm)	Wind at sunset (Beaufort Scale)
Visit 1	23.05.2017	21:16	04:57	14.1	0	0
	24.05.2017	21:17	04:56	15.7	0	0
	25.05.2017	21:19	04:55	19.7	0	1
	26.05.2017	21:20	04:53	18.4	0	1
	27.05.2017	21:21	04:52	15.2	0	1
Visit 2	10.08.2017	20:48	05:43	11.1	0	0
	11.08.2017	20:46	05:45	16.0	0.5mm at sunset	0
	12.08.2017	20:44	05:46	12.2	0.3mm earlier in the day	0
	13.08.2017	20:42	05:48	15.4	0	0
	14.08.2017	20:40	05:50	15.4	3mm in day (0.5mm after sunset)	1
Visit 3	18.10.2017	18:07	07:44	11.6	0	1
	19.10.2017	18:04	07:46	12.9	12.7mm in day (0.3mm after sunset)	1
	20.10.2017	18:02	07:48	10.2	5.1mm (2.8mm after sunset)	1
	23.10.2017	17:56	07:54	15	1mm (0mm after sun set)	0
	24.10.2017	17:54	07:56	15.1	3.6mm (2.1mm after sunset)	0

Survey Limitations

A5.2.21 An exhaustive internal inspection of building 6 was not possible for health and safety reasons as the upper floors of the building are in poor physical condition. Additionally, an internal survey of building 12 was not possible due to access constraints. However, as both buildings were subject to follow up nocturnal surveys this is not considered to be a significant limitation.

A5.2.22 Bat surveys are subject to numerous variables. The echolocation calls of species such as brown long-eared bats are of low amplitude and may not always be picked up on bat detectors. Survey results represent a sample of bat activity during the surveys. It is possible that bats may use the site at other times.

A5.2.23 Bat calls cannot always be identified to species level, either due to distant contacts or the similarity between some types of bats. Where this occurs, it is recorded as 'unidentified bat species' (Unid) or will show which bat species it is likely to be (e.g. *Pipistrelle* sp. / *Myotis* sp.).

A5.2.24 The weather was optimal during all activity surveys and a high level of confidence is placed on the results.

Results

Preliminary Roost Assessment of Buildings

A5.2.25 **Table A5.2.5** below outlines the buildings within the site, along with a description, photograph and bat roost potential assessment. For the location of the buildings referenced in **Table A5.2.5,** refer to **Drawing 10682/P07**.

Table A5.2.5 Preliminary Roost Assessment of Buildings Survey Results

Photograph	Description
	Building 1: Bungalow. Brick built with cross pitched concrete overlapping tile roof. Soffit boxes present and in good condition A small number of potential gaps were present where overlapping tiles were damaged. Roosting is only likely under the damaged overlap which may not provide access to the main under tile crevice area. Internal access was not permitted. Roosting potential is considered **low**.

Photograph	Description
	Building 2: Free standing garage Rendered walls and a pitched corrugated board roof. No potential access points were recorded. Roosting potential is considered **negligible**.
	Building 3: Agricultural barn Brick built with metal and wooden frame and a pitched corrugated board roof. The barn was open at both ends and no separate enclosed roof space was present. The timber beams lacked suitable joints to allow crevice roosting and no other potential roosting locations were recorded. Roosting potential is considered **negligible**.
	Building 4: Agricultural barn A wooden frame and wooden clad building with metal corrugated roof. The barn was open at both ends and no separate enclosed roof space was present. The timber beams lacked suitable joints to allow crevice roosting and no other potential roosting locations were recorded. Roosting potential is considered **negligible**.

Photograph	Description
	Building 5: A timber and metal framed barn with a multi ridge pitched roof. Roof covering varied between corrugated metal sheets and slates. The underside of the roof was also lined with wooden boards that would create a crevice habitat between the boards and the slates. Gaps in the underside of the boards and gaps above between the slates would allow bats access into this crevice space. However, as the space below the roof is open, conditions would be less stable and therefore less suitable compared to a fully enclosed building Roosting potential is considered **low**.

Photograph	Description
	Building 6: Agricultural barn and milking parlour. A complex C-shaped building with one and two storey sections. Construction is mainly brick with some wooden panelling. The roof structure varies between unlined slate and some corrugated metal. No enclosed roof spaces were present but an upper floor was present over most of the building. The building was not in a good condition and potential access points were present widespread across all areas which included open windows, open archways, missing and displaced roof tiles, gaps in brickwork. No bats were recorded during the visit. However, two small collections of dropping were recorded with a total of around 30-40 droppings. These were recorded on the ground on the upper floor towards the south of the building. The dropping did not contain any fresh droppings and were considered from a single or small number of bats. These droppings were approximately 8mm in length and 2mm wide, contained 3 sections with a slight corkscrew appearance. These droppings are likely to be from either brown long-eared or a myotis species such as Natterer's or whiskered/Brandt's bat. Likely roosting location was within the roof beam junctions. This building is considered **high potential/confirmed historical use**.

Photograph	Description
	Building 7: Agricultural barn A metal and wood frame barn with corrugated metal and fibre boards roof Brick built with metal and wooden frame and a pitched corrugated board roof and walls. The barn was open at both sides and no separate enclosed roof space was present. The timber beams lacked suitable joints to allow crevice roosting and no other potential roosting locations were recorded. Roosting potential is considered **negligible**.
	Building 8: Green house No suitable access points or suitable roosting locations. Roosting potential is considered **negligible**.
	Building 9: Small poultry sheds No suitable access points or suitable roosting locations. Roosting potential is considered **negligible**.

Photograph	Description
	Building 10: Garage building A single storey garage made from brick and wood with a sloped corrugated metal roof which was also lined with wood. Half of the building was open sided which would allow access into that section. Gaps in brickwork, gaps between the roof and walls and gaps in the soffit would allow access into the fully enclosed areas. Roosting potential is considered **low**.
	Building 11: Outbuilding A single storey rendered brick building with a single ridge pitched slate roof. No enclosed roof space was present, but the roof was lined with bitumen liner. Gaps were also present where small section of the roof have collapsed, under soffit boards and along the gable end tile edge. Roosting potential is considered **low**.
	Building 12: Farmhouse A three-storey farmhouse, brick built and rendered with a single ridge pitched slate roof. Several single storey sections were also present and of a similar construction. Internal access was not granted so the interior of the building was not inspected. Potential access points into the fabric of the building included gaps at the gable end tile edge, gaps where tiles were displaced or damaged, gaps in the soffit and between the soffit and the wall, gaps under ridge tiles. Roosting potential is considered **moderate**.

Tree PRA and Climbing Inspections

A5.2.26 Several trees surveyed have PRFs for bats, which are detailed in **Table A5.2.6**. All trees which will be impacted by the development layout but not referred to in this table were assessed as having negligible potential to support roosting bats. For the location of trees referenced in **Table A5.2.6**, refer to **Plan 10682/P11b**.

A5.2.27 All trees with PRFs were subject to a follow-up climbing inspection on 12th September 2018 based on draft tree loss plans (Landscape Science Consultancy), except for three trees (T4 – T6) which are ivy-covered and have no obvious PRFs but are not suitable for a climbing inspection due to dense vegetation cover which limits visibility, and so are categorised as having very low roost suitability.

A5.2.28 Trees of moderate or high suitability, as identified during the first climbing inspection, were subject to a second climbing inspection on 5th February 2019.

A5.2.29 Update ground-based PRAs undertaken on the 5th February 2019 based on the fixed tree loss plans did not identify any additional trees with roost potential.

A5.2.30 The results of the climbing inspection and roost suitability categorisation are also detailed in **Table A5.2.6**.

A5.2.31 No physical evidence of roosting bats was recorded in any of the trees climbed, but PRFs in five trees (T3, T8, T9, T11, and T13) were confirmed to have roost suitability (low, moderate or high) in accordance with stand guidelines (Collins, 2016). Features in four other trees were ruled out following closer inspection during the climbing survey and so were categorised as having negligible roost suitability. T12, which was assessed as having high roost suitability during 2018/2019 surveys, was subsequently found to have fallen (likely as a result of recent storms) during an update walkover of the site in February 2020, so now has no bat roost potential.

Table A5.2.6. Tree PRA and Climbing Inspection Results (Conducted on the 12th September 2019 and repeated for moderate and high potential trees on the 5th February 2019).

TG Tree Reference (see Plan 10682/P11b)	Grid Reference	Species	Potential Roost Features (PRFs)	Aerial Inspection Notes	Bat Roost Suitability
T1	SJ 65159 84558	oak	At north side of pond, with south-facing vertical split in main stem	Basal cavity, does not extend upwards. High clutter environment. None evidence of roosting bats.	**Negligible**
T2	SJ 65155 84551	oak	At south side of pond, south facing	Superficial wound. No evidence of roosting bats	**Negligible**

TG Tree Reference (see Plan 10682/P11b)	Grid Reference	Species	Potential Roost Features (PRFs)	Aerial Inspection Notes	Bat Roost Suitability
			knot hole on primary branch		
T3	SJ 65174 84548	oak	12th September 2018 At east side of pond, split limb on south aspect of main stem (at fork, 4-5m above ground).	12th September 2018 Cavity extends 20cm up. Substrate dry, becoming increasingly damp towards domed apex. Also extends 1m down, with bird nesting material at base. Callous rolls at edge of cavity entrance.	12th September 2018 **Moderate**
			5th February 2019 As above	5th February 2019 As above All PRF re-inspected with endoscope. No evidence of occupation recorded	5th February 2019 **Moderate**
T4	SJ 65669 84702	oak	Ivy-covered, no other obvious features	n/a	**Low**
T5	SJ 65671 84676	oak	Ivy-covered, no other obvious features	n/a	**Low**
T6	SJ 65680 84679	oak	Ivy-covered, no other obvious features	n/a	**Low**

TG Tree Reference (see Plan 10682/P11b)	Grid Reference	Species	Potential Roost Features (PRFs)	Aerial Inspection Notes	Bat Roost Suitability
T7	SJ 65782 84648	birch	1. South-facing crack in main stem; 2. West-facing crack in main stem; 3. Broken branch on south aspect.	Polyporous squamosus on stem and extensive brown rot throughout. Cracks on stem, although all superficial. Broken branch at 2m to south and knothole at 2m to north, both superficial.	**Negligible**
T8*	SJ 65793 84463	oak	Tear out wound 6m above ground level on south-east aspect of main stem.	Cavity extends approximately 15cm inwards. Recent bird nesting material in cavity.	**Low**
T9 **	SJ 65786 84454	oak	1. North-facing cavity on upper side of primary branch approximately 5km above ground level; 2. Cavity on north-west aspect approximately 6m above ground level; 3. Branch wound on primary branch on south aspect at approximately 8m above ground level.	1. Cavity extends 20cm along branch in multi-chambered apex - substrate dry and smooth; 2. Cavity extends 1m up, although full of detritus; 3. Branch wound superficial.	**High**
T10*	SJ 65790 84477	oak	Wound where branch has previously been removed on southwest aspect,	Wound blind - *Laetiporus sulphureus* growing out of wound and	**Negligible**

TG Tree Reference (see Plan 10682/P11b)	Grid Reference	Species	Potential Roost Features (PRFs)	Aerial Inspection Notes	Bat Roost Suitability
			approximately 2m above ground level.	blocking entrance to cavity.	
T11*	SJ 65721 84479	birch	Immature specimen with hollow stem.	Cavity extends 1.5m up stem. Substrate rough and dry, although relatively exposed.	**Low**
T12	SJ 65384 84457	oak	12th September 2018 On north-west bank of pond. 1. North-south hazard beam wound on primary branch; 2. East-facing crack in stem.	12th September 2018 1. Hazard beam - cavity at top of split extends 40cm. Substrate smooth and dry, culminating in narrow apex; 2. Superficial wound.	12th September 2018 **High**
			5th February 2019 As above	5th February 2019 As above All re-inspected with endoscope. No evidence of occupation recorded	5th February 2019 **High**
			Update Feb 2020 – found to be windfallen during an update walkover of the site (presumably the result of recent storms) – **No bat roost potential.**		
T13	SJ 65368 84426	oak	12th September 2018	12th September 2018	12th September 2018

TG Tree Reference (see Plan 10682/P11b)	Grid Reference	Species	Potential Roost Features (PRFs)	Aerial Inspection Notes	Bat Roost Suitability
			On south bank of pond. North-facing split in main stem.	Superficial stem split.	Negligible
			5th February 2019 Split in main stem NE facing.	5th February 2019 Several cavities some exposed, some providing shelter. Some wet pockets and some dry pockets which potentially could be used by bats. All inspected with endoscope. No evidence of occupation recorded	5th February 2019 **Moderate**
** Trees T8, T10 and T11 will now be retained within the proposed development layout.* *** Tree T9 was not resurveyed on the 5th February 2019 as it will now be retained within the proposed development layout.*					

A5.2.32 In summary, a total of five trees which will be impacted as a result of the proposed development layout have potential to support roosting bats (T3, T4, T5, T6 and T13), but no roosts were recorded.

Activity Transect Surveys

A5.2.33 The following species were detected during the 2017 activity surveys:

- Common pipistrelle (Ppi);
- Soprano pipistrelle (Ppy);
- Brown long-eared bat (Pa);
- Noctule (Nn);
- Myotis sp. (My)

A5.2.34 The results of each activity survey are outlined in **Tables A5.2.7 to A5.2.9** below. The location of all bat activity recorded during the manned transect surveys is illustrated in **Drawing 10682/P08**.

Table A5.2.7. Activity Transect Survey Visit 1 Results.

Species	*Ppi*	*Ppy*	*Pa*	*Nn*	Grand Total
Number of Passes	63	8	5	4	**80**
%	79	10	6	5	

Table A5.2.8. Activity Transect Survey Visit 2 Results.

Species	*Ppi*	*Ppy*	*Myo*	*Nn*	Grand Total
Number of Passes	66	37	4	40	**147**
%	45	25	3	27	

Table A5.2.9: Activity Survey Visit 3 Results.

Species	*Ppi*	*Ppy*	*Myo*	*Nn*	Grand Total
Number of Passes	33	48	6	68	**155**
%	21	31	4	44	

Automated Activity Surveys

A5.2.35 The following species were detected during the automated surveys:

- Common pipistrelle;
- Soprano pipistrelle;
- Brown long eared bat;
- Noctule; and
- Myotis sp;

A5.2.36 The results the Automated Activity surveys for each Anabat location are outlined in **Tables A5.2.10 to A5.2.15** below. The tables use the following abbreviations:

- Common pipistrelle – Ppi;
- Soprano pipistrelle – Ppy;
- Pipistrelle species social call - Pip.soc
- Brown long-eared bat – Pa
- Myotis sp. – My; and
- Noctule – Nn;
- Nyctalus species – Ny
- Serotine – Ny.ep

A5.2.37 The date, sunset and sunrise times and weather conditions for the static surveys undertaken are shown in **Table A5.2.4** above. The location of each deployment is illustrated in **Drawing 10682/P06**.

Table A5.2.10 Automated activity survey data – Visit 1, Location 1N

Date	*Ppi*	*Ppy*	*My*	Grand Total	% Total
23.05.17	25	13	6	**44**	**24**
24.05.17	29	18	1	**48**	**27**
25.05.17	23	17	0	**40**	**22**
26.05.17	7	6	0	**13**	**7**
27.05.17	21	15	0	**36**	**20**
Grand Total	**105**	**69**	**7**	**181**	
%	**58**	**38**	**4**		

Table A5.2.11. Automated activity survey data – Visit 1, Location 1S

Date	*Ppi*	*Ppy*	*Pa*	*My*	*Nn*	*Ny*	*Ny.Ep*	Grand Total	% Total
23.05.17	84	72	34	12	7	2	0	**211**	**8**
24.05.17	630	21	47	25	14	3	0	**740**	**29**
25.05.17	74	75	51	24	0	0	0	**224**	**9**
26.05.17	90	56	28	75	6	1	0	**256**	**10**
27.05.17	940	59	42	26	9	7	1	**1084**	**44**
Grand Total	**1818**	**283**	**202**	**162**	**36**	**13**	**1**	**2515**	
%	**72**	**11**	**8**	**6**	**1**	**<1**	**<1**		

Table A5.2.12. Automated activity survey data – Visit 2, Location 2N.

Date	*Ppi*	*Ppy*	*Pip*	*My*	*Nn*	*Ny*	Grand Total	% Total
10.08.17	61	4	0	6	5	1	**77**	**11**
11.08.17	80	53	9	1	11	3	**157**	**23**
12.08.17	30	4	0	3	3	11	**51**	**8**
13.08.17	280	39	4	9	18	11	**361**	**54**
14.08.17	6	9	0	4	7	2	**28**	**4**
Grand Total	**457**	**109**	**13**	**23**	**44**	**28**	**674**	
%	**68**	**16**	**2**	**3**	**7**	**4**		

Table A5.2.13. Automated activity survey data – Visit 2, Location 2S.

Date	*Ppi*	*Ppy*	*Pip Soc*	*My*	*Nn*	*Ny*	*Ny.Ep*	*Pa*	Grand Total	% Total
09.08.17	146	3	0	6	22	10	1	3	**191**	**10**
10.08.17	237	101	1	18	53	17	0	4	**431**	**22**
11.08.17	45	3	1	2	61	45	0	10	**167**	**8**
13.08.17	606	96	0	13	109	165	0	3	**992**	**50**
14.08.17	42	5	0	3	35	110	0	10	**205**	**10**
Grand Total	**1076**	**208**	**2**	**42**	**280**	**347**	**1**	**30**	**1986**	
%	**54**	**10**	**<1**	**2**	**14**	**17**	**<1**	**2**		

Table A5.2.14. Automated activity survey data – Visit 3, Location 3N.

Date	*Ppi*	*Ppy*	*Pa*	*My*	*Nn*	Grand Total	% Total
18.10.17	19	18	1	0	3	**41**	**14**
19.10.17	6	3	0	0	0	**9**	**3**
20.10.17	4	25	0	0	0	**29**	**10**

23.10.17	88	73	0	1	1	**163**	**55**
24.10.17	18	31	0	0	7	**56**	**18**
Grand Total	**135**	**150**	**1**	**1**	**11**	**298**	
%	**45**	**50**	**<1**	**<1**	**4**		

Table A5.2.15. Automated activity survey data – Visit 3, Location 3S.

Date	*Ppi*	*Ppy*	*Pip*	*Pip Soc*	*Pa*	*My*	*Nn*	Grand Total
18.10.17	10	53	0	1	1	17	7	**89**
19.10.17	115	29	5	3	1	150	3	**306**
20.10.17	0	14	1	1	0	1	2	**19**
23.10.17	134	38	11	3	0	5	82	**273**
24.10.17	12	66	8	8	0	4	9	**107**
Grand Total	**271**	**200**	**25**	**16**	**2**	**177**	**103**	**794**
%	**34**	**25**	**3**	**2**	**<1**	**22**	**13**	

Nocturnal Emergence/Re-entry Surveys

A5.2.38 The following provides a summary of the results during each survey for all buildings, see **Plan 10682/P10** for building and surveyor locations. **Table A5.2.16** below summarises the roosts recorded within the site.

Table A5.2.16 Summary of roosts within the site

Building	Species	Number of bats
B5	Common pipistrelle, soprano pipistrelle	Up to four common pipistrelle bats and one soprano pipistrelle.
B6	Common pipistrelle, *Myotis sp.*	Up to four common pipistrelle bats, up to four myotis bats and up to one unidentified bat species.
B12	Common pipistrelle, soprano pipistrelle	One common pipistrelle, three soprano pipistrelle and two unidentified bats.

Building B1 – Dusk Emergence 11.07.2018

A5.2.39 **No bats were observed emerging from the building during the survey.** Incidental activity recorded around the building by the surveyors comprised abundant common pipistrelle activity around the adjacent gardens, with only small numbers of soprano pipistrelles and unidentified bat calls.

Building B5 – Dusk Emergence 11.07.2018

A5.2.40 **Several possible emergences were identified from this building, suspected by the fact that no bats were seen to enter the open-sided barn prior to the suspected emergences out of the barn. It was suspected that two common pipistrelle bats emerged from the barn at 22.00 and 21.56, with a third common pipistrelle and soprano pipistrelle at 22.03. The exact emergence point could not be determined.** Incidental activity recorded around the building by the surveyors comprised abundant foraging within the barn of common pipistrelle, soprano pipistrelle and *Myotis sp.* bats within the barn and noctule in the surrounding fields.

Building B5 – Dawn Re-entry 31.08.2018

A5.2.41 **No bats were observed re-entering the building during this dawn survey.** Incidental activity recorded around the building by the surveyors comprised low levels of *Myotis sp.* bat and common pipistrelle bat activity.

Building B5 – Dusk Emergence 17.09.2018

A5.2.42 **Four common pipistrelle bats were suspected to emerge from the barn at 19.47, 19.57, 19.46 and 19.52 from both the open north and south elevations. Although emergence was not confirmed, it was deduced by the fact that no bats were seen to enter the building prior to these emergences.** Incidental activity recorded around the building by the surveyors comprised regular common pipistrelle and soprano pipistrelle activity through the barn, along with *Myotis sp.* within and noctule in the surrounding fields.

Building B6 – Dusk Emergence 02.07.2018

A5.2.43 **Up to 4 myotis bat species were suspected to emerge from the archway in the centre of the building at 22.25, 22.26, 22.35, 22.40 and 22.45, heading both east and west away from the building. Additionally, common pipistrelle and an unidentified bat were observed emerging from under roof tiles and through an open door on the north aspect of the southernmost structure, at 22.33 (unidentified), 22.42 (common pipistrelle) and 22.57 (common pipistrelle). Exact emergence points were difficult to examine due to the relative darkness of the archway and large number of bats re-entering and exiting to forage and socialise.** As noted, a large amount of social activity from common pipistrelle, myotis and soprano pipistrelle bats was recorded in and around the archway, with repeated foraging activity noted in the adjacent cow byre to the east.

Building B6 – Dusk Emergence 25.07.2018

A5.2.44 **Overall, 52 emergence events were observed to emerge from archway of the building during visit 2, with 50 subsequent re-entries to participate in swarming and foraging in and around the archway, i.e. a small number of bats moving repeatedly in and out of the roost area, no more than two bats were outside the building at one time. Emergences and re-entries were**

recorded from 21.56 to 22.49, and comprised of common pipistrelle and myotis bat species, with some unidentified calls and some emergences and re-entries absent of echolocation. The survey indicated the likely presence of at least one small myotis bat roost within the archway and attached buildings, and one small common pipistrelle roost in the same location, most of which flew west upon emerging. Three bats were seen to emerge from the northern roof of the southernmost structure, comprising a common pipistrelle at 21.56, a myotis bat species at 22.01 and another common pipistrelle at 22.08; all of which headed west upon emergence. Finally, four bats were seen to emerge from the milk shed and upper door of the milk shed in the south-east corner of the building, heading north upon emergence. These bats comprised of one myotis and an unidentified non-echolocating bat at 22.07, another myotis at 22.15 and a common pipistrelle at 22.21. Incidental recordings during the survey comprised of common pipistrelle, soprano pipistrelle, myotis and occasional noctule bats, with high amounts of socialising activity within the archway and foraging within the cattle byre to the east.

Building B6 – Dawn Re-entry 10.08.2018

A5.2.45 **A single common pipistrelle bat was seen to re-enter B6 through a window to the north of archway on the east face of the building at 04.34, after approaching from the north-east. Additionally, a single myotis bat species was seen to re-enter through the archway and into the south barn at 05.12 having flown in from the north-east. A myotis bat species likely to be the same bat was then observed 5 seconds later moving from the south barn into the north barn through the arch.** Activity around the building observed during the survey was generally low, with common pipistrelle, soprano pipistrelle, myotis and noctule all recorded in small numbers, with little foraging or socialising within range of the detectors.

Building B10 – Dusk Emergence 27.06.2018

A5.2.46 **No bats were observed emerging from the building during the survey.** Incidental activity recorded around the building by the surveyors comprised foraging and commuting activity over and around building in all directions, with the species present being predominantly common pipistrelle and soprano pipistrelle. Noctule and an unidentified *Myotis sp.* bat were also recorded occasionally.

Building B11 – Dusk Emergence 03.07.2018

A5.2.47 **No bats were observed emerging from the building during the survey.** Incidental activity recorded around the building by the surveyors comprised regular activity around the surveyor to the northwest of the building comprising common pipistrelle, soprano pipistrelle, noctule and an unidentified *Myotis sp.* bat.

Building B12 – Dusk Emergence 03.07.2018

A5.2.48 **Two possible emergences of soprano pipistrelle bats were identified at 22.15 and 22.19. The locations were around the southwest corner of the building and the centre of the southern side of the house. Another confirmed soprano pipistrelle emergence was recorded at 22.17 from the gable end centre of eastern elevation.** Incidental activity recorded around the building by the surveyors comprised predominantly soprano pipistrelle bats around all elevations of the building. Other species recorded included common pipistrelle, noctule, *Myotis sp.* bat and a possible brown long-eared bat.

Building 12 – Dawn Re-entry 03.08.2018

A5.2.49 **Two likely re-entries were recorded under the northern gable fascia board, under the northeast gable fascia board at 04.35 and 04.57. Neither of these bats were recorded echolocating so it was not possible to confirm species. Two more confirmed re-entries of a single common pipistrelle bat at 04.15 underneath the soffit at the southern gable end and a soprano pipistrelle bat at 05.06 in the gable soffit under a tile edge at the southern end of the house.** activity recorded around the building by the surveyors comprised mainly soprano pipistrelle activity (social calls and feeding calls, predominantly around moat) with common pipistrelle, noctule and *Myotis sp.* bats also present in lower numbers.

A5.2.50 It should also be noted that several of the adjacent cottages outside of the redline boundary (referenced C01, C02 and C05 in **Drawing 10682/P07**) were also surveyed but will not be impacted by development proposals.

A5.2.51 During these surveys, roosts were recorded in association with C05 (plus incidental observations of bat emerging/re-entering from C04 and C06) comprising common pipistrelle and a *Myotis sp.* roosts. No roosts were recorded in association with C01 and C02.

References

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

Mitchell-Jones, A., 2004. *Bat Mitigation Guidelines.* Peterborough: English Nature.

Mitchell-Jones, A. J. & McLeish, A., 2004. *Bat Workers' Manual, 3rd edition.* Peterborough: Joint Nature Conservation Committee (JNCC).

Appendix 5.3 - Breeding Bird and Barn Owl Survey Methodology and Results

Appendix 5.3: Breeding Bird and Barn Owl Survey Methodology and Results

Legislation and Conservation Status

A5.3.1. All birds are protected whilst actively nesting under the provisions of the Wildlife and Countryside Act (WCA) 1981 (as amended).

A5.3.2. In addition, barn owl *Tyto alba* is protected under WCA Schedule 1, Part 1, Section 1 (5) which offers additional protection against disturbance whilst nesting. Listed under schedule 1 it is an offence to intentionally or recklessly:

- Disturb any wild bird included in schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
- Disturb dependant young of such a bird.

A5.3.3. Reference is made to birds listed as Species of Priority Importance (SoPI) under Section 42 of the NERC Act 2006 and to Birds of Conservation Concern (BOCC). All breeding and wintering bird species in the UK, Channel Islands and the Isle of Man have been assigned to one of three groups by the British Trust for Ornithology – either 'red', 'amber' or 'green', based on their conservation status. Each group is defined as follows:

- BTO red list species are those that are Globally Threatened according to International Union for Conservation of Nature (IUCN) criteria; those whose population or range has declined rapidly (≥ 50%) in recent years; and those that have declined historically and not shown a substantial recent recovery;
- BTO amber list species are those with an unfavourable conservation status in Europe, those whose population or range has declined moderately (25%-49%) in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations; and
- The remaining species are placed on the BTO green list, indicating that they are of low conservation priority, although population sizes should be monitored.

Previous Records

A5.3.4. Notable bird records received from rECOrd are presented in **Table A5.3.1.**

Table A5.3.1. Records of protected or priority bird species within the study area.

Common Name	Scientific Name	Number of records from last 20 years	Conservation Status
Gadwall	*Anas strepera*	1	LBAP, BoCC Amber
Short-eared Owl	*Asio flammeus*	1	BoCC Amber

Common Name	Scientific Name	Number of records from last 20 years	Conservation Status
Snipe	*Gallinago gallinago*	2	BoCC Amber
Kestrel	*Falco tinnunculus*	5	BoCC Amber
Mallard	*Anas platyrhynchos*	1	BoCC Amber
Swift	*Apus apus*	1	BoCC Amber
Common Gull	*Larus canus*	1	BoCC Amber
Black-headed Gull	*Chroicocephalus ridibundus*	1	BoCC Amber
Mistle Thrush	*Turdus viscivorus*	1	BoCC Red
Willow Warbler	*Phylloscopus trochilus*	2	BoCC Amber
Pochard	*Aythya ferina*	2	BoCC Red
Tufted Duck	*Aythya fuligula*	1	BoCC Amber
Shoveler	*Anas clypeata*	1	BoCC Amber
Pink-footed Goose	*Anser brachyrhynchus*	1	BoCC Amber
Reed Bunting	*Emberiza schoeniclus*	1	BoCC Amber
Song Thrush	*Turdus philomelos*	1	LBAP, BoCC Amber, S41, UKBAP
Starling	*Sturnus vulgaris*	1	LBAP, BoCC Red
Skylark	*Alauda arvensis*	4	LBAP, BoCC Red, S41
Grey Partridge	*Perdix perdix*	1	LBAP, BoCC Red, S41
Yellowhammer	*Emberiza citrinella*	1	LBAP, BoCC Red, S41
House Sparrow	*Passer domesticus*	1	LBAP, BoCC Red, S41
Lapwing	*Vanellus vanellus*	3	LBAP, BoCC Red, S41
Barn Owl	*Tyto alba*	1	LBAP, S41, WCA 1

Common Name	Scientific Name	Number of records from last 20 years	Conservation Status
Scaup	*Aythya marila*	2	LBAP, BoCC Red, S41, WCA 1
Abbreviations: BoCC – RSPB/BTO Birds of Conservation Concern (red, amber); LBAP – Local Biodiversity Action Plan; S41 - Section 41 (S41) of the 2006 Natural Environment and Rural Communities (NERC) Act; WCA 1 – Wildlife and Countryside Act (1981) Schedule 1: Species protected against disturbance at or near an 'active' nest.			

A5.3.5. Mid-Cheshire Barn Owl Conservation Group was also contacted for records of confirmed breeding of roosting barn owl within 5km of the site boundary during the past 10 years. A total of 31 records of confirmed breeding were returned, the closest being just over 2km from the site in 2018. A further 13 records of barn owl roosts were returned.

A5.3.6. An incidental record of barn owl calling was heard on one occasion within the vicinity of the site during the great crested newt survey in spring 2017.

Survey Methodology

Breeding Bird Survey

A5.3.7. The site was surveyed for breeding birds by experienced ornithologists on three occasions using a territory mapping methodology, based on Bibby *et al*. (2000) and Gilbert *et al*. (1998). Surveys were carried out monthly, during the breeding season (April to June, inclusive); the survey date, time and weather conditions of each survey visit are presented in **Table A5.3.2**.

Table A5.3.2. Date, time and weather of survey visits.

Date	Time	Weather	Surveyors
19.04.2017	07.05 – 09.50	6°C, 90% cloud, BFS 1-3, no rain	Laura Dennis John Moorcroft
24.05.2017	06.40 – 09.30	15°C, 100% cloud, BFS 2, no rain	Laura Dennis John Moorcroft
14.06.2018	06.50 – 10.00	14°C, 25% cloud, BFS 1, no rain	Hayley Care John Moorcroft

A5.3.8. The survey visits were conducted between sunrise and midday, as this is considered to be the optimal period for recording bird breeding activity. The identity and activity of all birds were recorded on maps of a suitable scale.

A5.3.9. The start point of surveys was varied during each visit, to ensure adequate coverage during the peak periods of bird activity. The transect route was also walked in reverse on each visit.

A5.3.10. On each survey, bird activity likely to indicate breeding was recorded on a map. The species of bird was noted using the standard BTO two letter codes. Behaviour considered likely to indicate breeding (or attempted breeding) included; singing, display flights, mating and courtship displays, nesting, carrying of nesting material and birds showing fidelity to a particular patch of ground or vegetation. An aggregation of two or more sightings of a species was taken to indicate that breeding was likely. 'Confirmed' breeders were those species directly observed with active nests or carrying nest material/food into suitable nesting habitat; 'probable' breeders were those species displaying indicative breeding behaviour (i.e. fidelity to a particular area) but with no active nests confirmed. 'Possible' breeders were identified as species which did not display breeding behaviour, but repeated surveys highlighted their continued presence across the site in proximity to suitable nest sites.

A5.3.11. Over-flying birds such as corvids, woodpigeon *Columba palumbus* and black-headed gulls *Chroicocephalus ridibundus* were not recorded. Similarly, blue tits *Cyanistes caeruleus* and great tits *Parus major* were recorded but have not been subject to territory mapping analysis due to the large numbers recorded and likely overlap of territories.

A5.3.12. The results of each visit were then transcribed onto a summary map in order to identify species showing fidelity to areas of habitat over several site visits. An aggregation of two or more sightings of a species was taken to indicate that breeding was likely. Also, if specific breeding behaviour (such as the gathering of nest material or copulations) was observed, this was also determined to be a sign of (likely) breeding.

A5.3.13. The conservation status of the birds recorded was ascertained through consultation of national, regional and local bird reports.

Barn Owl Survey

Building Inspections

A5.3.14. The potential for some of the buildings within the farmyard complex to support roosting or breeding barn owl was identified during the bat preliminary roost assessment inspections on 20th March 2018. This includes both modern and traditional barns with features such as open access points leading to cavities, upper floors or other suitable roost locations.

A5.3.15. A follow-up building inspection of buildings within the farm complex was undertaken in accordance with published guidance (Shawyer 2011). Where access and safety allowed all buildings were subject to an internal and external inspection to determine the current status of barn owl at the site, and the presence of any potential or active roost or nest sites.

A5.3.16. The inspection was undertaken between 19:00 and 21:00 on 11th July 2018 during the optimal time for completing nest verification surveys in order to minimise disturbance to nesting barn owls which may be present. A 'bottom-up' approach was adopted to minimise disturbance (Barn Owl Trust 2012). This involved searching the buildings with the lowest barn owl potential first, leaving the buildings with the most potential until last, so that should a barn owl be flushed then it would be close to dusk and a time where it would be active of its own accord (or be

able to easily find somewhere to hide). Weather conditions were optimal, being dry and warm at 21°C with a light breeze.

A5.3.17. The building inspection was undertaken by Laura Dennis (Graduate member of CIEEM and Natural England Barn Owl Survey Class Licence holder), assisted by Sophie Kirk (Associate member of CIEEM).

A5.3.18. Buildings were inspected externally with the aid of a high-powered torch, ladder and binoculars, looking for features that barn owls may use to access potential roost and/or nest sites or signs of use of the features themselves. Where accessibility allowed, the buildings were inspected internally, including upper floors and hay lofts.

A5.3.19. The following signs were looked for:

- Pellets;
- White wash;
- Nesting remains;
- Eggs / unsuccessful eggs / egg shells;
- Feathers;
- Down; and
- Prey caches.

A5.3.20. Care was taken to minimise disturbance, keeping noise levels low. When entering a building a second surveyor kept watch externally in the event an owl was flushed.

Ground-based Tree Inspections

A5.3.21. Trees within and up to 30m outside the red line boundary (where access was available) were assessed for their potential to support roosting/nesting barn owl on the 13th June 2018. A ground-based assessment was made using binoculars and a torch to identify suitable features (cavities with an opening at least 75mm x 75mm and an unobstructed approach).

Survey Limitations

A5.3.22. No constraints to the breeding bird survey method were experienced throughout the survey. All areas of the site were sufficiently accessible and no unusual disturbance was observed.

A5.3.23. During the barn owl survey the interior and upper floors of some of the farm buildings were not accessible for health and safety reasons associated with their poor structural condition, or due to the presence of livestock. However, it is considered that the information gathered during the inspections enable sufficient confidence in the results, and further confirmation of the results was provided during evening bat emergence surveys.

Survey Results and Summary

Breeding Bird Survey

A5.3.24. Based on the surveys undertaken, it is likely that the site supports 13 breeding bird territories of seven Red/Amber List species, listed in **Table A5.3.3** and the approximate centre of each territory is shown on **Plan 10682/P03. Table A5.3.3** also provides information on the conservation status of each species.

Table A5.3.3. Red/Amber List breeding bird territories in site.

Species	Latin name	Site status	Likely number of territories	Conservation Status
Dunnock	*Prunella modularis*	Probable breeder	4	BoCC Amber, SoPI
House martin	*Delichon urbicum*	Confirmed breeder	1 – see text below	BoCC Amber
House sparrow	*Passer domesticus*	Probable breeder	1 – see text below	BoCC Red
Linnet	*Linaria cannabina*	Confirmed breeder	1	BoCC Red, SoPI
Skylark	*Alauda arvensis*	Probable breeder	3	BoCC Red, SoPI
Swallow	*Hirundo rustica*	Confirmed breeder	1 – see text below	BoCC Amber
Yellowhammer	*Emberiza citronella*	Confirmed breeder	2	BoCC Red, SoPI

A5.3.25. More observations of the species included in **Table A3.3** were identified during the surveys but the birds did not display sufficient affinity to an area to conclude probable or confirmed breeding.

A5.3.26. It should be noted that house martin, swallow and house sparrow are colonial nesters and as such do not have easily-defined territories. Consequently, these species have been labelled as having one 'territory', which contains several pairs of breeding birds. The 'territories' of all species were focussed around the farm complex in the centre of the site (see **Plan 10682/P03**), where several nests of each species were recorded.

A5.3.27. Individual lapwing *vanellus vanellus* were recorded flying through the site and present off-site but no evidence of this species indicative of breeding or attempted breeding was recorded within the site.

A5.3.28. A single little ringed plover *Charadrius dubius* (Schedule 1 Bird – Wildlife and Countryside Act 1981 [as amended]) was recorded around the margins of Pond 6 within the site on the second

survey visit but no habitat with the potential to support this species in terms of nesting is present within the site.

A5.3.29. Several mallard *Anas platyrhynchos* pairs were recorded present in association with the ponds across the site but no evidence of breeding (i.e. nearby young) was recorded within the site, although the woodland and scrubby areas provide potential nesting habitat.

A5.3.30. Several starling *Sturnus vulgaris* were recorded foraging within the fields across the site but no behaviour indicative of breeding or breeding attempts was recorded despite the presence of suitable nesting habitat (e.g. farm complex).

A5.3.31. An individual tree sparrow *Passer montanus* was recorded flying within the site during the second survey visit but no behaviour indicative of breeding or breeding attempts was recorded.

A5.3.32. **Table A5.3.4** below outlines the 'Green List' species confirmed (or probably/possibly) breeding within the site, along with their status. **Drawing 10682/P09** highlights the areas within the site which supported these species and would be retained in the proposals.

Table A5.3.4. Confirmed/Probable breeding Green List species.

Species	Latin Name	Status
Blackbird	*Turdus merula*	Confirmed breeder
Blackcap	*Sylvia atricapilla*	Probable breeder
Blue Tit	*Cyanistes caeruleus*	Confirmed breeder
Buzzard	*Buteo buteo*	Possible breeder
Chaffinch	*Fringilla coelebs*	Probable breeder
Chiffchaff	*Phylloscopus collybita*	Probable breeder
Goldfinch	*Cardeulis cardeulis*	Confirmed breeder
Great Tit	*Parus major*	Confirmed breeder
Great spotted woodpecker	*Dendrocopos major*	Probable breeder
Greenfinch	*Chloris chloris*	Probable breeder
Long-tailed Tit	*Aegithalos caudatus*	Probable breeder
Magpie	*Pica pica*	Probable breeder
Moorhen	*Gallinula chloropus*	Confirmed breeder
Pied wagtail	*Motacilla alba*	Confirmed breeder
Robin	*Erithacus rubecula*	Confirmed breeder
Whitethroat	*Sylvia communis*	Possible breeder
Wood pigeon	*Columba palumbus*	Probable breeder
Wren	*Troglodytes troglodytes*	Confirmed breeder

Barn Owl Survey

Building Inspections

A5.3.33. No physical evidence of barn owl (including pellets, white wash, nest remains etc) was recorded in any of the buildings surveyed (B1 to B12, see drawing **10682/P07** Bat PRA results).

A5.3.34. However, several buildings possess features with potential for use by barn owl for nesting or roosting, see **Table A5.3.5**.

Table A5.3.5. Summary of buildings inspected and assessment of barn owl potential.

Building	Photograph	Assessment
B1: Bungalow		Not surveyed – no suitable features for barn owl
B2: Domestic garage		Not surveyed – no suitable features for barn owl
B3: Modern agricultural barn		Potential Roost Site – open joists and timbers
B4: Modern agricultural barn		Potential Roost Site - open joists and timbers
B5: Dutch barn (used for hay bale and machinery storage)		Potential Roost Site – open sided, but with high bale stacks, open joists.
B6: Traditional stone barn		Potential Nest Site – multiple access points to enclosed upper floors / haylofts.
B7: Modern agricultural barn (cattle shed)		Potential Roost Site – open sided, but with open joists
Building 8: Greenhouse		Not surveyed – no suitable features for barn owl
Building 9: Small poultry sheds		Not surveyed – no suitable features for barn owl

Building 10: Domestic garage		Limited roost potential via access through broken window/open door
Building 11: Single-storey domestic outbuilding		Limited roost potential via access through broken window/collapsed roof
Building 12: Farmhouse		Not surveyed – no suitable features for barn owl

A5.3.35. In addition, bat surveys of several of the farm buildings were undertaken on nine occasions between June and September 2018. During these visits surveyors were stationed at various locations around the farmyard to observe the buildings at dusk or dawn. No barn owls were recorded entering or exiting any of the buildings during any of these surveys, neither were they seen or heard in the vicinity of the farmyard.

Ground-based Tree Inspections

A5.3.36. No trees within the survey area exhibited any features that would be suitable for roosting or nesting barn owl.

References

Barn Owl Trust (2012) *Barn Owl Conservation Handbook*. Pelagic Publishing, Exeter.

Bibby, C. J., Burgess, N. D., Hill, D. A., Mustoe, S. & Lambton, S. 2000. *Common Bird Census Techniques* 2nd Edition. Academic Press, London.

Gilbert, G., Gibbons, D. & Evans, J., 1998. *Bird Monitoring Methods - a manual of techniques for key UK species.* RSPB, Bedfordshire.

Shawyer, C.R. (2011) *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.

Appendix 5.4 – Wintering Bird Survey Methodology and Results

Appendix 5.4: Wintering Bird Survey Methodology and Results

Legislation and conservation status

A5.4.1. Several bird species which are commonly found in farmland habitats are listed as Species of Principal Importance (SoPI) under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and are regarded as conservation priorities in England.

A5.4.2. Similarly, the 'Farmland Seed-eating Birds' Local Biodiversity Action Plan (LBAP)[1] for Cheshire includes a number of farmland bird species which are subject to conservation action locally.

A5.4.3. This appendix also refers to the Birds of Conservation Concern 4 (Eaton *et al.* 2015), which assigns all UK bird species (breeding, passage and wintering) to Red, Amber or Green Lists according to an assessment of their status and level of conservation concern.

Survey Methodology

A5.4.4. The aim of the survey was to record the use of the site by farmland birds during the winter months to identify and assess its likely importance for these species in the context of the wider area.

A5.4.5. Most of the site comprises cattle and sheep-grazed pasture, with a chain of three arable fields to the north planted with a winter crop during the survey period.

A5.4.6. A total of six, monthly survey visits were completed at the site, between October 2017 and March 2018. The date, time and weather conditions during each visit are presented in **Table A5.4.1**.

Table A5.4.1. Date, time and weather of survey visits.

Date	Time	Weather Conditions	Surveyor
18.10.2017	07.45 – 10.45	7°C, 15% cloud, BFS 1, no rain	Hayley Care & John Moorcroft
29.11.2017	08.00 – 10.40	4°C, 20% cloud, BFS 2, no rain	Hayley Care & John Moorcroft
13.12.2017	08.20– 10.45	4°C, 100% cloud, BFS 1, no rain	John Moorcroft & Jeff Clarke
30.01.2018	08.15 – 11.10	3°C, 30% cloud, BFS 1, no rain	Laura Dennis & Jeff Clarke
21.02.2018	08.25 – 10.45	5°C, 90% cloud, BFS 1, no rain	Paul Webb & John Moorcroft

[1]Available online at: https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/Farmland%20seed%20eating%20birds.pdf. Accessed 10/01/2019.

28.03.2018	07.10 – 09.30	5°C, 100% cloud, BFS 2, heavy rain 07.50 – 08.20	Laura Dennis & John Moorcroft

A5.4.7. Surveys were undertaken by experienced ornithologists and comprised a walked transect survey across the site, as informed by standard methodologies (Bibby *et al*. 2000, Gilbert *et al*. 1998).

A5.4.8. All birds seen or heard within the study area were recorded. For ease of reporting, all records of 'Green List' species have been omitted from this report, but details can be made available upon request.

Survey Limitations

A5.4.9. The weather was optimal during the surveys and a high level of confidence is placed on the results. The heavy rain shower on the last survey visit is not expected to have altered the assessments and conclusions made in this report.

Survey Results and Summary

A5.4.10. **Table A5.4.2** outlines the Red and Amber List species (Eaton *et al.* 2015) recorded in the survey area during all survey visits. For ease of reporting, all green list species have been omitted from this table, but data can be made available upon request.

Table A5.4.2. Red/Amber List and Schedule 1 Species recorded during surveys.

Species	Survey Visit	Conservation Status	SoPI
Skylark *Alauda arvensis*	1, 3, 4, 5, 6	Red List	Yes
Yellowhammer *Emberiza citrinella*	1, 4, 5, 6	Red List	Yes
Dunnock *Prunella modularis*	1, 2, 3, 4, 5, 6	Amber List	Yes
Lesser black-backed gull *Larus fuscus*	1, 3, 4, 5	Amber List	No
Snipe *Gallinago gallinago*	1, 3, 4	Amber List	No
Song thrush *Turdus philomelos*	1, 3, 4, 5, 6	Red List	Yes
Meadow pipit *Anthus pratensis*	1, 2, 3, 4	Amber List	No
Starling *Sturnus vulgaris*	1, 2, 3, 4, 5	Red List	Yes
Curlew *Numenius arquata*	1	Red List	Yes
House sparrow *Passer domesticus*	1, 2, 3, 4, 5, 6	Red List	Yes
Linnet *Linaria cannabina*	1, 4, 6	Red List	Yes
Fieldfare *Turdus pilaris*	2, 3	Red List	No
Redwing *Turdus iliacus*	2, 3, 4	Red List	No
Lapwing *Vanellus vanellus*	2, 3, 4, 5	Red List	Yes
Reed bunting *Emberiza schoeniclus*	2, 3	Amber List	Yes
Common sandpiper *Actitis hypoleucos*	2	Amber List	No
Black-headed gull *Chroicocephalus ridibundus*	2, 5, 6	Amber List	No
Mistle thrush *Turdus viscivorus*	3	Red List	No
Teal *Anas crecca*	3, 4, 5, 6	Amber List	No
Grey partridge *Perdix perdix*	4	Red List	Yes
Kestrel *Falco tinnunculus*	4	Amber List	No

Species	Survey Visit	Conservation Status	SoPI
Mallard *Anas platyrhynchos*	4, 5, 6	Amber List	No
*Species of Principal Importance			

A5.4.11. Large numbers of starling were recorded within the site on the 3rd survey visit (December), with a peak count of a flock of approximately 300-400 birds. On the same visit, a peak count of c. 200 lapwing was recorded.

A5.4.12. All other records of these and the other bird species identified in **Table A4.2** refer to small flocks of birds (never more than 50 birds) or individuals. The waterfowl recorded on site (teal, mallard) were confined to the ponds within the site, most notably Pond 6.

References

Bibby, C., Burgess, N., Hill, D. & Mustoe, S., 2000. *Bird Census Techniques, 2nd edition.* Academic Press, London.

Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R. 2015. Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds,* Volume 108, pp. 708-746.

Gilbert, G., Gibbons, D. & Evans, J., 1998. *Bird Monitoring Methods - a manual of techniques for key UK species.* RSPB, Bedfordshire.

Appendix 5.5 - Great Crested Newt Survey Methodology and Results

Appendix 5.5: Great Crested Newt Survey Methodology and Results

Legislation and Conservation Status

A5.5.1. As a European protected species (EPS), great crested newts (GCN) *Triturus cristatus* receive legal protection in England under the Conservation of Habitats and Species Regulations 2018 and the Wildlife and Countryside Act 1981 (as amended). In addition, planning policy set out in the National Planning Policy Framework 2018 requires planning authorities to consider GCN when determining planning applications and to ensure that development proposals do not lead to an adverse effect on the conservation of GCN.

A5.5.2. GCN are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2018, as an EPS. Regulation 43(1) makes it an offence to:

- Deliberately capture, or injure an EPS;
- Deliberately disturb an EPS;
- Deliberately take or destroy the eggs of an EPS; or
- Damage or destroy a breeding site or resting place of an EPS.

A5.5.3. Although GCN still maintain a widespread distribution in England, they are in decline, notably through loss of breeding ponds. A greater decline has been noted across the European range of the GCN, and now the UK holds a large proportion of the world population of the species. GCN is listed on the UK and Greater Manchester Biodiversity Action Plan[1] (LBAP) and is a Species of Principal Importance (SoPI)[2].

Previous Records

A5.5.4. No previous records of GCN occurring within 1km of the site during the last 20 years were provided by rECOrd.

Survey Methodology

Methods

A5.5.5. A total of 14 ponds were surveyed for GCN during the optimal season in 2017; 12 of these ponds were located within the site and two off-site ponds located within 250m of the site boundary. For the location of all ponds, see **Plan 10682/P04**.

A5.5.6. The GCN survey of the ponds was carried out by pairs of experienced ecologists during the months of April, May and June 2018. Surveys were carried out in accordance with published

[1] www.gmbp.org.uk/site/images/stories/introduction%20gm%20bap%2009.pdf, accessed 12/10/18

[2] UK priority species and habitats are those subject to conservation action and referred to as Species of Principal Importance (SoPIs) or Habitats of Principal Importance (HoPIs). They are listed at Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act states that local planning authorities must have regard for the conservation of both SoPIs and HoPIs.

guidance (English Nature 2001), with at least one surveyor each visit holding a Natural England [NE] GCN licence. Survey dates and conditions are shown in **Table A5.5.1** below.

Table A5.5.1. Survey dates and weather conditions.

Visit	Ponds Surveyed	Date	Weather Conditions Cloud cover / precipitation / wind	Air Temp During Torching / overnight minimum	Licensed Surveyor	Notes
V1	1 – 11 + 19	18 – 19.04.17	85% c/c, no rain, BFS 2	9°C / 5.2°C	Georgina Palmer	
V2	1 – 12 + 19	02 – 03.05.17	15% c/c, no rain, BFS 3	13°C / 5.1°C	Georgina Palmer	
V3	1 – 12 + 19	09 – 10.05.17	5% c/c, no rain, BFS 1	12°C / 1.1°C	Laura Dennis	Cold overnight temperature
V4	13	11 – 12.05.17	80% c/c, no rain, BFS 2	14°C / 9.1°C	Laura Dennis	
V5	All	16 – 17.05.17	95% c/c, no rain, BFS 0	16°C / 12.2°C	Georgina Palmer	
V6	3, 12, 13 + 19	18 – 19.05.17	90% c/c, no rain, BFS 2	12°C / 8.5°C	Georgina Palmer	
V7	3, 13 + 19	23 – 24.05.17	5% c/c, no rain, BFS 1	13°C / 11.3°C	Georgina Palmer	
V8	13	30 – 31.05.17	20% c/c, no rain, BFS 1	12°C / 5.2°C	Steven Coyne	
V9	13	08 – 09.05.17	5% c/c, no rain, BFS 1	13°C / 11°C	Georgina Palmer	

A5.5.7. The guidance recommends that four survey visits should be undertaken during the spring months between March and June and that at least two of the visits should be undertaken between mid-April and mid-May. Ponds found to contain GCN during the first four visits receive two additional visits i.e. are visited a total of six times, in order assess the Population Size Class, with three visits occurring in the optimal period between mid-April and mid-May.

A5.5.8. In accordance with English Nature's Great Crested Newt Mitigation Guidelines, populations of GCN were then attributed to one of three population class sizes:

- 1- 10 individuals – 'Small' Population
- 11 – 100 individuals – 'Medium' Population
- 101 + individuals – 'Large' Population

A5.5.9. The following methods were employed on each visit in order to detect the presence of GCN:

- Egg searching: all suitable submerged vegetation was searched for GCN eggs, which are characteristically wrapped individually in the submerged leaves of aquatic vegetation; although their presence cannot be used to estimate population size it can indicate the presence of breeding adults;
- Bottle trapping: involving setting of bottle traps (where water body conditions allow). This involves the use of funnel traps (made from 2 litre clear plastic bottles) that were secured in the water around the pond margin in the evening before dark, and left set overnight to be checked the following morning; and
- Torch survey: the accessible margins of the water body were slowly walked once, searching the margins by torchlight (a minimum of one million candlepower) for GCN. This torch searching was undertaken a minimum of one hour after dark. All GCN observed in the water were counted and where possible identified as males, females and juveniles.

Habitat Suitability Index (HSI)

A5.5.10. In addition to the survey methods outlined above, a Habitat Suitability Index (HSI) was calculated for each water body in accordance with the methodology outlined by NE (Oldham *et a*l. 2000). The HSI assigns a score to the pond based upon various factors including, size of pond, aquatic vegetation, shading, geographic location, proximity to other ponds, and potential presence of fish. A score is given to each waterbody between 0 and 1, with scores closer to 0 having lower probability of GCN occurrence. The HSI cannot be used as confirmation of GCN presence or absence but is used as a guide to assess the habitat in terms of its potential to support GCN. It also provides useful information that can inform pond management and enhancement programmes.

A5.5.11. The Natural England (NE) HSI classifications are provided below:

- < 0.5 Poor;
- 0.5 – 0.59 Below average;
- 0.6 – 0.69 Average;
- 0.7 – 0.79 Good; and
- 0.8 Excellent.

A5.5.12. An HSI score was calculated for each pond and the results of these calculations are outlined in **Table A5.5.2.**

Survey limitations

A5.5.13. A review of OS maps identified an additional seven off-site ponds located within 250m of the site boundary. Three of these ponds are located to the south of the M56 carriageway and were scoped out of the survey due to the presence of a physical barrier. The landowners of the other five ponds were approached via post, telephone and/or in person to request access for surveys. Of these five:

- One pond was found to not exist during ground truthing, and is just the continuation of a running stream (north of Cartridge Lane);

- One pond was dry during the GCN survey season and was scoped out of the survey for this reason (northeast of Cliff Lane); and
- Access to the remaining two ponds was refused by the landowner (one to the north of Barleycastle Lane, and one adjacent to Bradley View). Due to the location of these ponds (one 125m south of the site boundary, and one adjoining pond 5) this is not considered to reduce the confidence in the overall assessment of the site for GCN.

A5.5.14. The GCN Mitigation Guidelines specify that surveys should not be conducted when overnight temperatures drop below 5°C as this can affect GCN movement and hence results. On the 9/10th May overnight temperatures dropped to ~1°C but due to the repeated results obtained throughout the remainder of the surveys, this anomaly is not considered to have significantly impacted the assessments or conclusions made in this report.

A5.5.15. For the 2nd, 3rd and 4th survey visits on Pond 11, bottle trapping and torching could not be employed as the water level was too low to effectively employ these survey methods.

Survey Results

HSI of ponds

A5.5.16. Detailed pond descriptions and HSI calculations for the ponds surveyed, and how the scores were derived can be found at the end of this appendix; **Table A5.2** shows the summary HSI results for each pond.

Table A5.5.2. Summary of HSI scores.

Pond Number	HSI Score	Pond suitability for GCN
1	0.67	Average
2	0.56	Below Average
3	0.66	Average
4	0.64	Average
5	0.67	Average
6	0.43	Poor
7	0.60	Average
8	0.60	Average
9	0.57	Below Average
10	0.44	Poor
11	0.34	Poor
12	0.37	Poor
13	0.71	Good

Pond Number	HSI Score	Pond suitability for GCN
19	0.32	Poor

Presence/Absence survey results

A5.5.17. GCN and/or their eggs were recorded in Ponds 3 and 13. **Table A5.3** below shows the results of these ponds. GCN were not recorded in any other pond subject to survey so these ponds have been omitted from **Table A5.5.3**.

Table A5.5.3. Summary of GCN Results.

Pond Number	Survey Visit						Max Count
	V1	V2	V3	V4	V5	V6	
3	1* gravid female (bottle trap) + eggs	0*	0*	2* males, 1 female (bottle trap)	0*	1 female (torch)	**3**
13	3* males, 1 female (bottle trap) + eggs	1* female (torch), 1 male (bottle trap)	0*	0	0	0	**4**
* Surveys undertaken in the optimal mid-April to mid-May period.							

A5.5.18. The maximum count labelled in **Table A5.5.3** refers to the maximum number of GCN recorded via a single survey method.

A5.5.19. In accordance with published guidance (English Nature, 2001) ponds 3 and 13 were assessed as supporting 'small' populations of GCN.

A5.5.20. While no GCN were recorded in the other ponds, other amphibians were recorded in 11 of the 14 ponds during the surveys; see **Table A5.5.4** for a summary of the survey results.

A5.5.21. An assemblage of invertebrates was also present in many of the ponds, including great diving beetle *Dytiscus marginalis* and water boatman *Corixa punctata* in particular.

Table A5.5.4. Maximum count of other amphibian species.

Pond Number	Amphibian Species	Maximum Count	Notes
1	Smooth Newt Frog Toad	16 0 (tadpoles) 1	
2	Smooth Newt	1	Stickleback present
3	Smooth Newt Frog	7 1	
4	Smooth Newt Toad	11 1	Fish present
5	Smooth Newt Frog Toad	9 1 1	
6	Frog	Tadpoles	Waterfowl (mallard, Canada goose) regularly present.
7	None		
8	Toad	1	
9	None		Stickleback present
10	Smooth Newt Frog	4 1 (+tadpoles)	
11	None		
12	Frog	Tadpoles	Duckweed *Lemna spp.* present
13	Smooth Newt Frog	8 3	
19	Frog	1	

HSI Survey Results

Pond Number	Pond 1		Pond 2		Pond 3	
Grid Reference	SJ 65162 84546		SJ 65466 84633		SJ 65597 84669	
Description	Moderately-sized pond on edge of agricultural fields (arable/pasture) – connected to Ponds 2, 3 and 4 via hedgerow. Partially shaded by tree cover; no evidence of fish presence during torching.		Small pond on edge of agricultural fields (arable/pasture) – connected to Ponds 1, 3 and 4 via hedgerow. Partially shaded by tree cover; stickleback present during torching.		Small pond on edge of agricultural fields (arable/pasture) – connected to Ponds 1, 2 and 4 via hedgerow. Partially shaded by tree cover; no evidence of fish presence during torching.	
Distance to Site	onsite		onsite		onsite	
Photograph						
SI_1- Location	A	1	A	1	A	1
SI_2- Pond area	440m^2	0.9	100m^2	0.2	250m^2	0.5
SI_3 - Pond drying	Never	0.9	Never	0.9	Never	0.9
SI_4 - Water quality	Poor	0.33	Poor	0.33	Poor	0.33
SI_5 - Shade	c.25%	1	c.10%	1	c.10%	1
SI_6 - Fowl	Minor	0.67	Absent	1	Minor	0.67
SI_7 - Fish	Absent	1	Minor	0.33	Absent	1
SI_8 – Ponds in 1km	16	1	16	1	16	1

SI_9 – Terrestrial habitat	Poor	0.33	Poor	0.33	Poor	0.33
SI_{10} - Macrophytes	0%	0.3	c.25%	0.5	c. 25%	0.5
HSI Score	**Average**	**0.67**	**Below Average**	**0.56**	**Average**	**0.66**
Pond Number	**Pond 4**		**Pond 5**		**Pond 6**	
Grid Reference	SJ 65679 84692		SJ 65822 84845		SJ 65389 84442	
Description	Moderately-sized pond on edge of agricultural fields (arable/pasture) – connected to Ponds 1, 2 and 3 via hedgerow and Ponds 5 and 12 by hedgerow. Partially shaded by tree cover; stickleback present during torching.		Small pond set on edge of arable field – connected to Ponds 4 and 12 via hedgerow – another pond present (inaccessible to survey) on opposite side of track. Heavy duckweed *Lemna. Spp.* cover and partially shaded by trees; fish and waterfowl apparently absent.		Large pond set in centre of pasture – not directly connected to any other ponds. Partially shaded by tree cover; waterfowl including Canada goose *Branta canadensis*, teal *Anas crecca* and mallard *Anas platyrhynchos* regularly present, no fish observed during survey but possible due to large size. Water level retreated significantly through season.	
Distance to Site	onsite		onsite		onsite	
Photograph						
SI_1- Location	A	1	A	1	A	1
SI_2- Pond area	600m^2	1	100m^2	0.2	1800m^2	0.8
SI_3 - Pond drying	Never	0.9	Sometimes	0.5	Never	0.9
SI_4 - Water quality	Poor	0.33	Poor	0.33	Poor	0.33
SI_5 - Shade	c.70%	0.7	c.40%	1	c.20%	1
SI_6 - Fowl	Minor	0.67	Absent	1	Major	0.01

SI_7 - Fish	Minor	0.67	Absent	1	Possible	0.67
SI_8 – Ponds in 1km	16	1	16	1	16	1
SI_9 – Terrestrial habitat	Poor	0.33	Moderate	0.67	0.33	Poor
SI_{10} - Macrophytes	10%	0.4	50%	0.8	c.10%	0.4
HSI Score	**Average**	**0.64**	**Average**	**0.67**	**Poor**	**0.43**

Pond Number	**Pond 7**		**Pond 8**		**Pond 9**	
Grid Reference	SJ 66194 84352		SJ 66190 84320		SJ 65597 84669	
Description	Moderately-sized pond set within and on edge of woodland; likely to form same body of water as Pond 8 in periods of flood. Totally shaded by tree cover; presence of fish possible but none observed during surveys.		Moderately-sized woodland pond; likely to form same body of water as Pond 7 in periods of flood. Totally shaded by tree cover; presence of fish possible but none observed during surveys.		Moderately-sized woodland pond, also set on edge of pasture. Completely shaded by tree cover; fish impact only minor and no fish recorded during surveys but presence possible.	
Distance to Site	onsite		onsite		onsite	
Photograph						
SI_1- Location	A	1	A	1	A	1
SI_2- Pond area	640m^2	1	400m^2	0.8	350m^2	0.7

SI_3 - Pond drying	Rarely	1	Never	0.9	Never	0.9
SI_4 - Water quality	Poor	0.33	Poor	0.33	Poor	0.33
SI_5 - Shade	100%	0.2	100%	0.2	100%	0.2
SI_6 - Fowl	Minor	0.67	Minor	0.67	Minor	0.67
SI_7 - Fish	Possible	0.67	Possible	0.67	Possible	0.67
SI_8 – Ponds in 1km	16	1	16	1	16	1
SI_9 – Terrestrial habitat	Moderate	0.67	Moderate	0.67	Moderate	0.67
SI_{10} - Macrophytes	0%	0.3	0%	0.3	0%	0.3
HSI Score	**Average**	**0.60**	**Average**	**0.60**	**Below Average**	**0.57**

Pond Number	**Pond 10**	**Pond 11**	**Pond 12**
Grid Reference	SJ 66018 84054	SJ 65966 83944	SJ 65680 84517
Description	Small pond set in centre of pasture and not directly connected to any other ponds, unshaded by trees. Waterfowl and fish likely absent and likely to dry out most years	Small pond set towards edge of pasture and not directly connected to any other ponds, unshaded by trees. Waterfowl and fish likely absent and likely to dry out every year. During the survey period, the pond had dried sufficiently to prevent bottle trapping.	Large moat-style pond which surrounds farm complex and sits adjacent to pasture. Heavy duckweed cover and completely shaded by overhanging trees; minor impact of waterfowl and fish possible but none observed during surveys (expected given extent of duckweed cover).
Distance to Site	onsite	onsite	onsite
Photograph		Photograph unavailable	

						
SI_1- Location	A	1	A	1	A	1
SI_2- Pond area	c.200m^2	0.4	100m^2	0.2	Omitted from calculation - >2000m^2[3]	
SI_3 - Pond drying	Sometimes	0.5	Annually	0.1	Never	0.9
SI_4 - Water quality	Bad	0.01	Bad	0.01	Bad	0.01
SI_5 - Shade	0%	1	0%	1	100%	0.2
SI_6 - Fowl	Absent	1	Absent	1	Minor	0.67
SI_7 - Fish	Absent	1	Absent	1	Possible	0.67
SI_8 – Ponds in 1km	16	1	16	1	16	1
SI_9 – Terrestrial habitat	Poor	0.33	Poor	0.33	Poor	0.33
SI_{10} - Macrophytes	10%	0.4	0%	0.33	10%	0.4
HSI Score	**Poor**	**0.44**	**Poor**	**0.34**	**0.37**	**Poor**

Pond Number	**Pond 13**	**Pond 19**
Grid Reference	SJ 65346 84048	SJ 65479 84856

[3] HSI guidance specifies that for ponds larger than 2000m^2, the 'pond area' index should be omitted from the calculation as there are no data available for such sized ponds.

Description	Small pond set on edge of grassland not directly connected to any other pond, partially shaded by bankside trees. Minor waterfowl impact and fish absent through torching.		Very small ornamental pond set amongst trees and scrub between two roads. Completely shaded by tree cover; fish and waterfowl considered likely absent.	
Distance to Site	100m south		20m north	
Photograph			Photograph unavailable	
SI_1- Location	A	1	A	1
SI_2- Pond area	300m^2	0.6	50m^2	0.1
SI_3 - Pond drying	Never	0.9	Sometimes	0.5
SI_4 - Water quality	Poor	0.33	Bad	0.01
SI_5 - Shade	25%	1	100%	0.2
SI_6 - Fowl	Minor	0.67	Absent	1
SI_7 - Fish	Absent	1	Absent	1
SI_8 – Ponds in 1km	16	1	>20	1
SI_9 – Terrestrial habitat	Moderate	0.67	Poor	0.33
SI_{10} - Macrophytes	10%	0.4	0%	0.3
HSI Score	**0.71**	**Good**	**0.32**	**Poor**

References

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

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

Appendix 5.6 - Water Vole and Otter Survey Methodology and Results

Appendix 5.6: Water Vole and Otter Survey Methodology and Results

Legislation and Conservation Status

A5.6.1. Water voles *Arvicola amphibius* are fully protected in England under the Wildlife and Countryside Act (WCA) 1981 (as amended), which makes it an offence to:

- Deliberate capture, injuring or killing;
- Damage, destruction or obstruction of breeding or resting places; and
- Disturbance of water voles while in a breeding or resting place.

A5.6.2. Otters *Lutra lutra* are subject to protection under UK law through WCA 1981 (as amended) and European law through the Habitats Directive, which is transposed into law in England and Wales by The Conservation of Habitats and Species Regulations 2018.

A5.6.3. Taken together this legislation makes the following acts offences:

- Intentional/deliberate killing, injuring or taking;
- Damage or destruction of breeding or resting places;
- Intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; and
- Intentional or reckless disturbance of otters while they are using a place of shelter or protection.

A5.6.4. Water vole and otter are also both included on Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC). Their inclusion on Section 41 makes them a Species of Principal Importance for conservation (SoPI).

Previous Records

A5.6.5. No previous records of water vole or otter occurring within 1km of the site during the last 20 years were provided by rECOrd.

Survey Methodology

Methods

A5.6.6. The extent of water vole survey effort is illustrated on **Drawing 10682/P05**. The surveys followed best-practice guidelines outlined in The Water Vole Mitigation Handbook (Dean *et al*. 2016).

A5.6.7. The survey area encompassed all of the watercourses within, or adjacent to, the red line boundary of the proposed works. As all of the ditches within the site are culverted and pass beneath roads (significantly reducing the likelihood of water vole traversing the culverts into the site), it was not deemed necessary to survey any length of watercourse off-site.

A5.6.8. A search of these areas was undertaken for any evidence of water vole presence such as burrows, droppings, prints and feeding remains.

A5.6.9. Similarly, the otter survey covered all watercourses within, or adjacent to, the red line boundary. A search of these areas was undertaken for any evidence of otters such as, spraints, prints, runs/pathways, slides and holts.

A5.6.10. The surveys were led by Georgina Palmer and Steven Coyne, Consultant Ecologists at Tyler Grange LLP. Both have over four years of experience surveying for water voles and are competent in both designing and undertaking water vole surveys. The dates of the surveys are provided in Table A5.6.1.

Table A5.6.1. Date, weather of survey visits.

Date	Weather	Surveyors
20.06.2018	15-18°C, 50% cloud cover, BFS 2, no rain	Steven Coyne and Elliott Burns
19.09.2018	15-18°C, 100% cloud cover, BFS 2-3, no rain	Georgina Palmer and Madara Vilde

Limitations

A5.6.11. Several lengths of watercourse and bank were inaccessible to survey due to dense bramble cover and/or steep banks. In these situations, the surveyors made an assessment of the likelihood of water vole and otter presence based on the general habitat suitability and proximity of other records. This is not expected to have altered the assessments or conclusions made in this report. The areas of water course which could not be surveyed are highlighted in **Drawing 10682/P05.**

Survey Results

A5.6.12. The results of the two surveys conducted in 2018 are presented in **Table A5.6.2**. In summary, no conclusive evidence of current water vole activity was recorded in the watercourses subject to survey. Whilst several burrows were encountered in WC2a, which were large enough to be attributable to water vole, no other evidence of this species was recorded. All small mammal evidence noted near to these burrows was attributed to rat *Rattus norvegicus*, so it is considered that these burrows belonged to rat. As such, water vole is considered to be absent from site.

A5.6.13. Likewise, no evidence of otter was recorded along any of the watercourse surveyed, and this species is also considered to be absent from the site.

A5.6.14. All of the ditches surveyed were considered to be largely unsuitable for water vole and otter based on the lack of foraging resources and appropriate bankside cover.

Table A5.6.2. Water course descriptions and survey results.

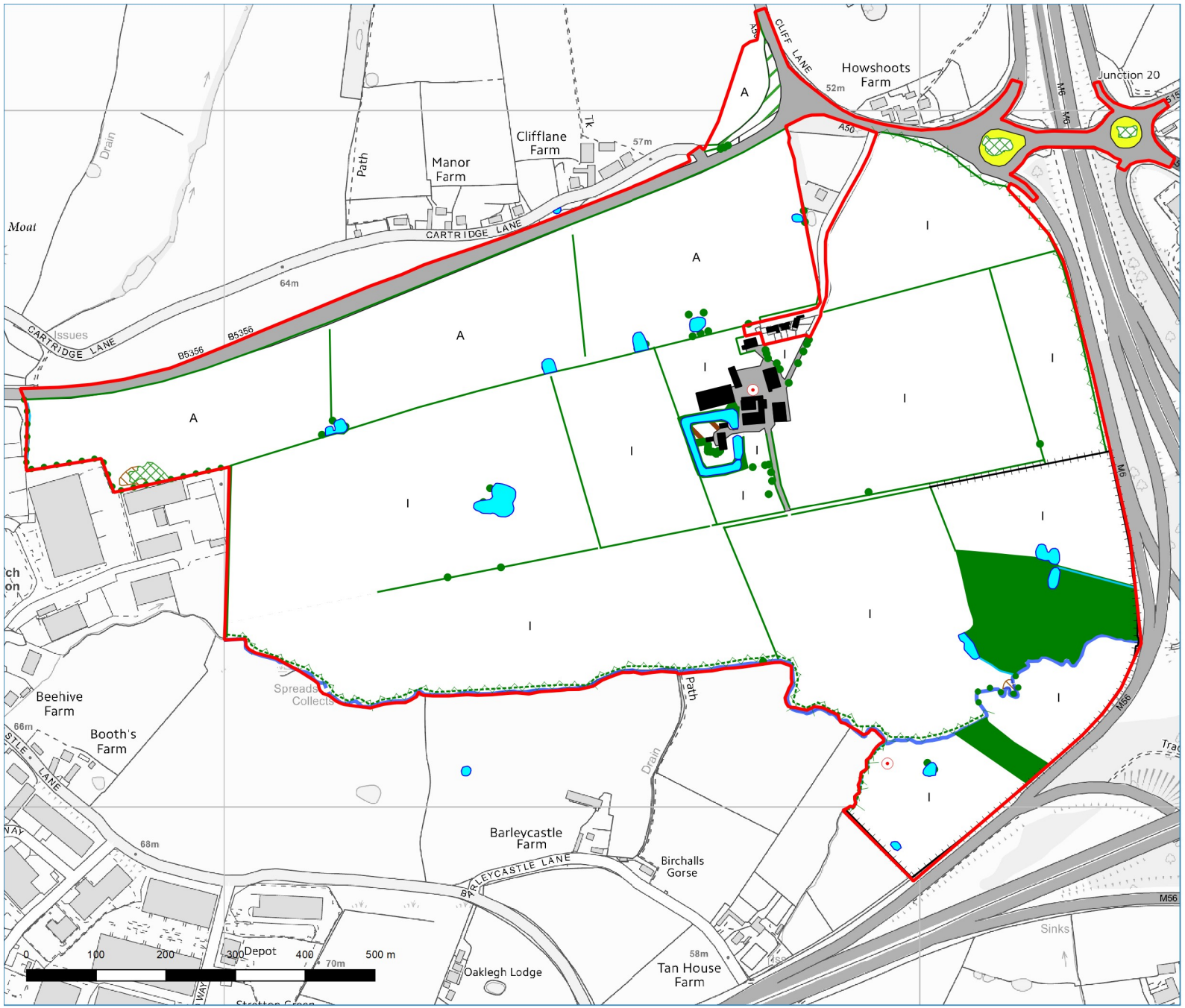
Reference	Photograph	Description	Results
WC1		Dry ditch with shallow banks. Unsuitable for water vole and otter.	Visit 1 June 2018 No evidence Visit 2 September 2018 No evidence
WC2a		Shallow ditch with little water; variable banks from shallow to steep. Sluggish flow. Bankside vegetation comprises tree cover and dense patches of Himalayan balsam *Impatiens glandulifera*. Very little channel cover and lack of suitable foraging resources for water vole; generally unsuitable for this species.	Visit 1 June & Visit 2 September 2018 Rat-sized burrows present towards eastern end and rat prints and droppings present in east as well. No evidence of water vole.
WC2b		Same ditch as WC2b, separated by culvert. Banks shallow and covered in dense patches of Himalayan balsam and occasional scrub/tree cover in the west; transitions to partial woodland cover towards east. Very little channel cover and lack of suitable foraging resources for water vole; generally unsuitable for this species.	Visit 1 June & Visit 2 September 2018 Rat droppings present in east. No evidence of water vole.

Reference	Photograph	Description	Results
WC2c		Channel indiscernible – choked with vegetation and very little water present. Banks very shallow. Largely unsuitable for water vole.	No evidence
WC2d		Dry ditch with shallow banks, choked with vegetation. Unsuitable for water vole and otter.	Visit 1 June 2018 No evidence Visit 2 September 2018 No evidence
WC3		Dry ditch with shallow banks. Unsuitable for water vole and otter.	Visit 1 June 2018 No evidence Visit 2 September 2018 No evidence
WC4		Dry ditch with shallow banks. Unsuitable for water vole and otter.	Visit 1 June 2018 No evidence Visit 2 September 2018 No evidence

References

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Matthews and Paul Chanin. The Mammal Society, London.

Appendix 5.7 – Plans



- Site Boundary

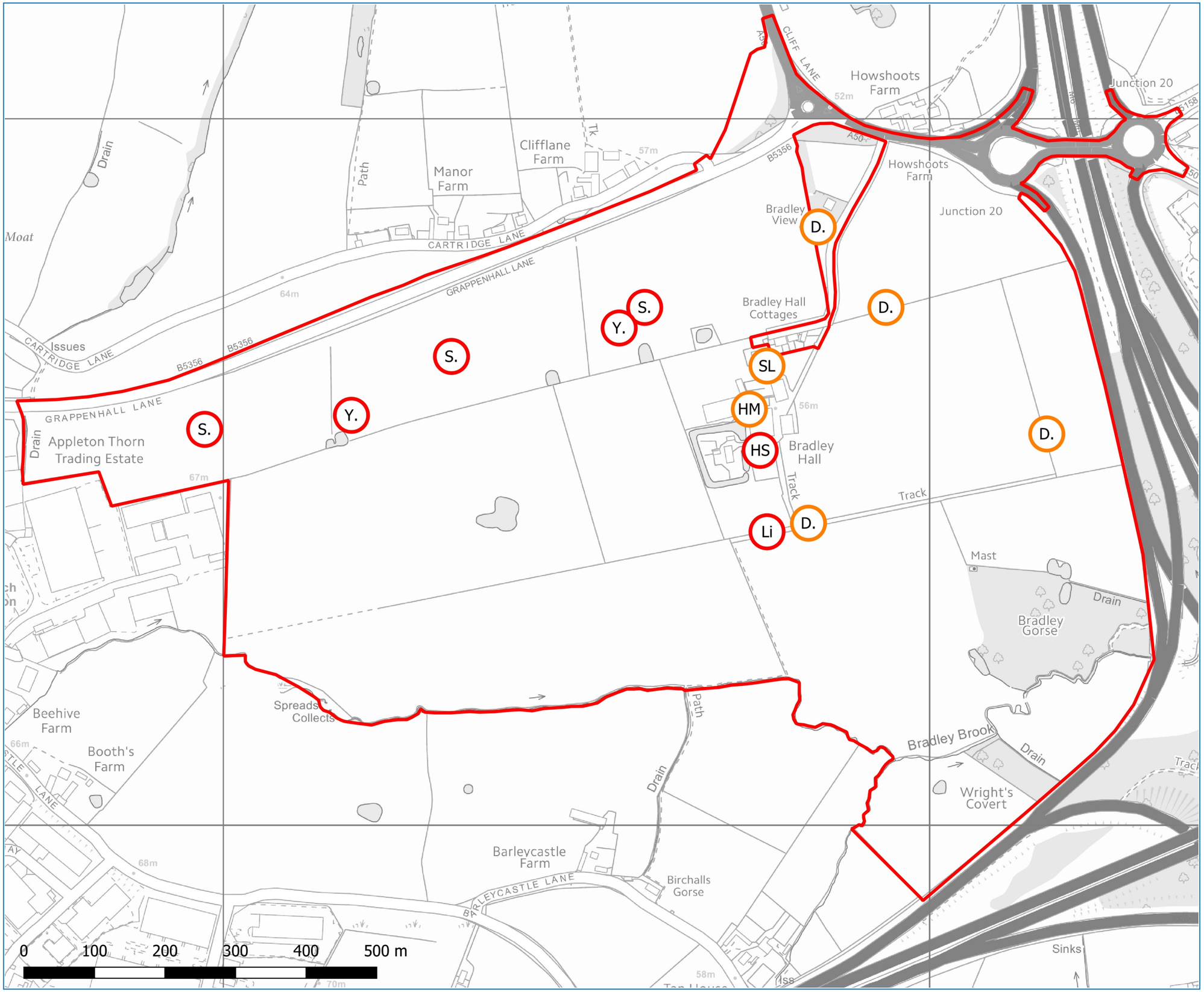
Habitat Features

- A Amenity Grassland
- A Arable
- Buildings
- Broadleaved Plantation
- Fence
- Dense Scrub
- Ditch
- Flowing Water
- Hardstanding
- Hedgerow Species-poor Intact
- Hedgerow Species-rich Intact
- Hedgerow Species-rich Defunct
- I Improved Grassland
- Introduced Shrubs
- Ponds
- Scattered Tree
- Semi-natural Broad-leaved Woodland
- Tall Ruderals
- Target Note
- Tree Line

N

Project	Six56 Warrington
Drawing Title	**Habitat Features**
Scale	As Shown (Approximate)
Drawing No.	10682/P01b
Date	February 2019
Checked	JD/LJD

Tyler Grange
3 Jordan Street, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk



Project	Six56 Warrington
Drawing Title	Breeding Bird Territories
Scale	As Shown (Approximate)
Drawing No.	10682/P03
Date	January 2019
Checked	JD/LJD

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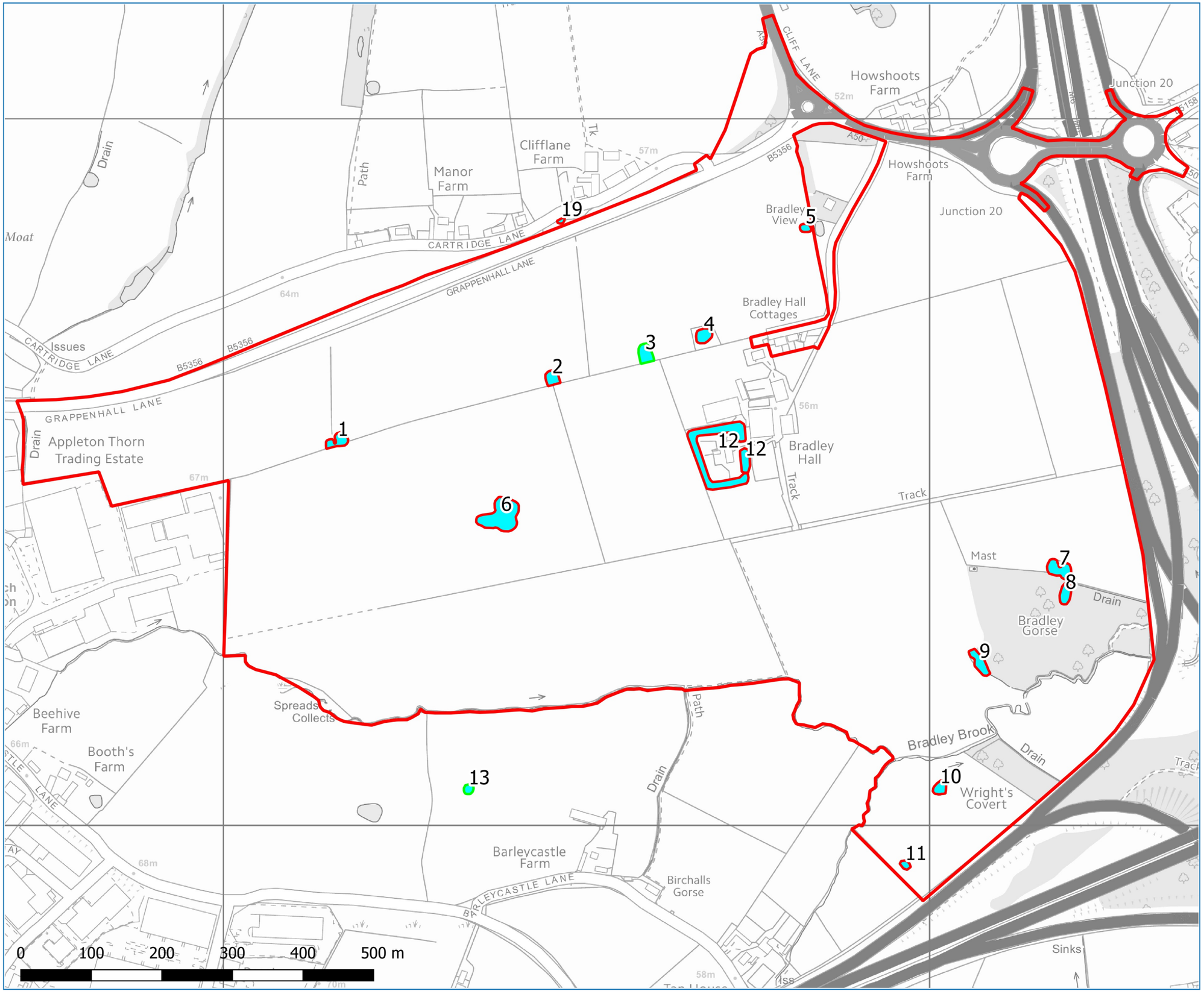

Tyler Grange LLP

Project	Six56 Warrington
Drawing Title	Great Crested Newt Ponds and Survey Results
Scale	As Shown (Approximate)
Drawing No.	10682/P04
Date	January 2019
Checked	JD/LJD

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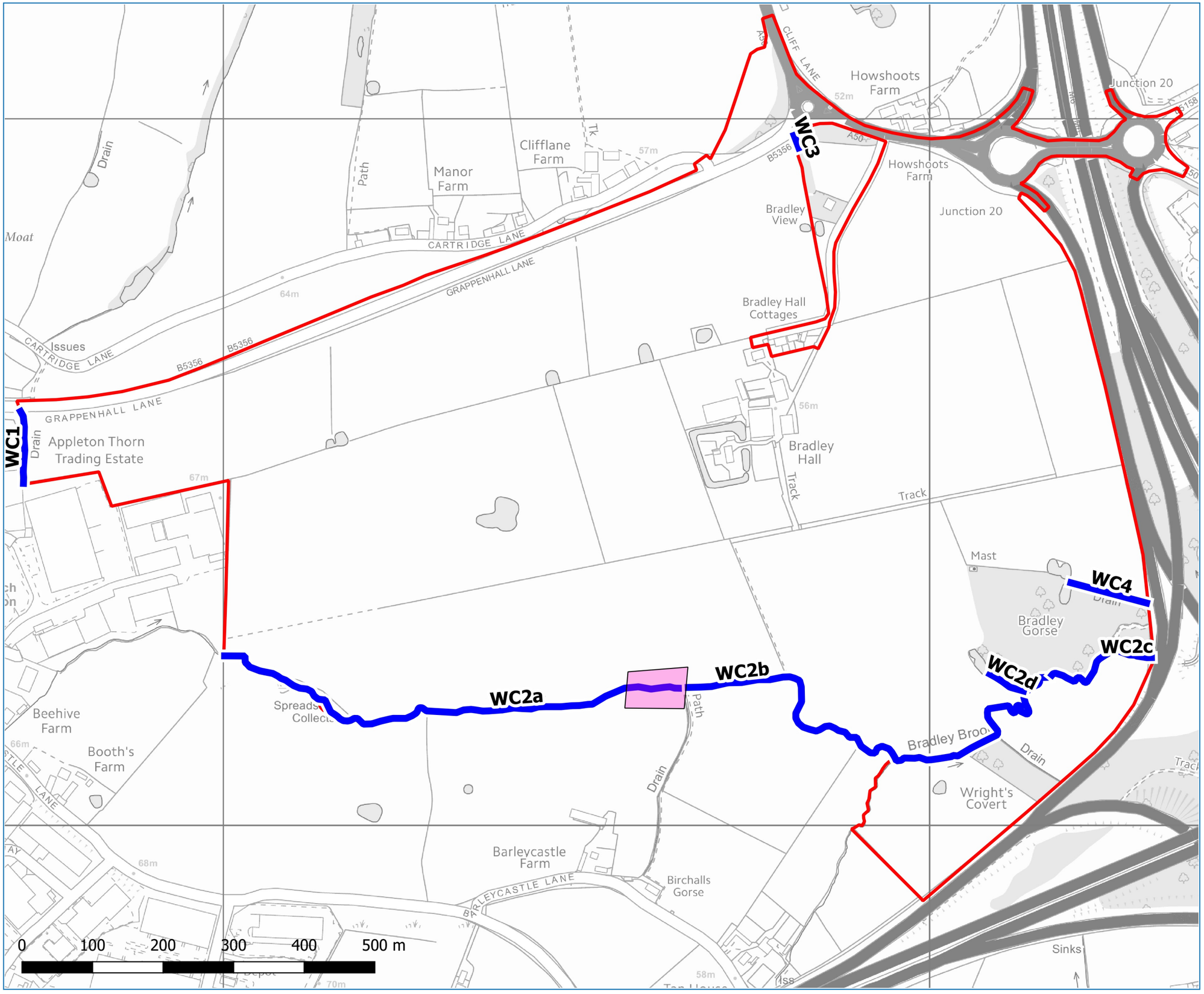

Project: Six56 Warrington

Drawing Title: Water Vole and Otter Survey Results

Scale: As Shown (Approximate)

Drawing No.: 10682/P05

Date: January 2019

Checked: JD/LJD

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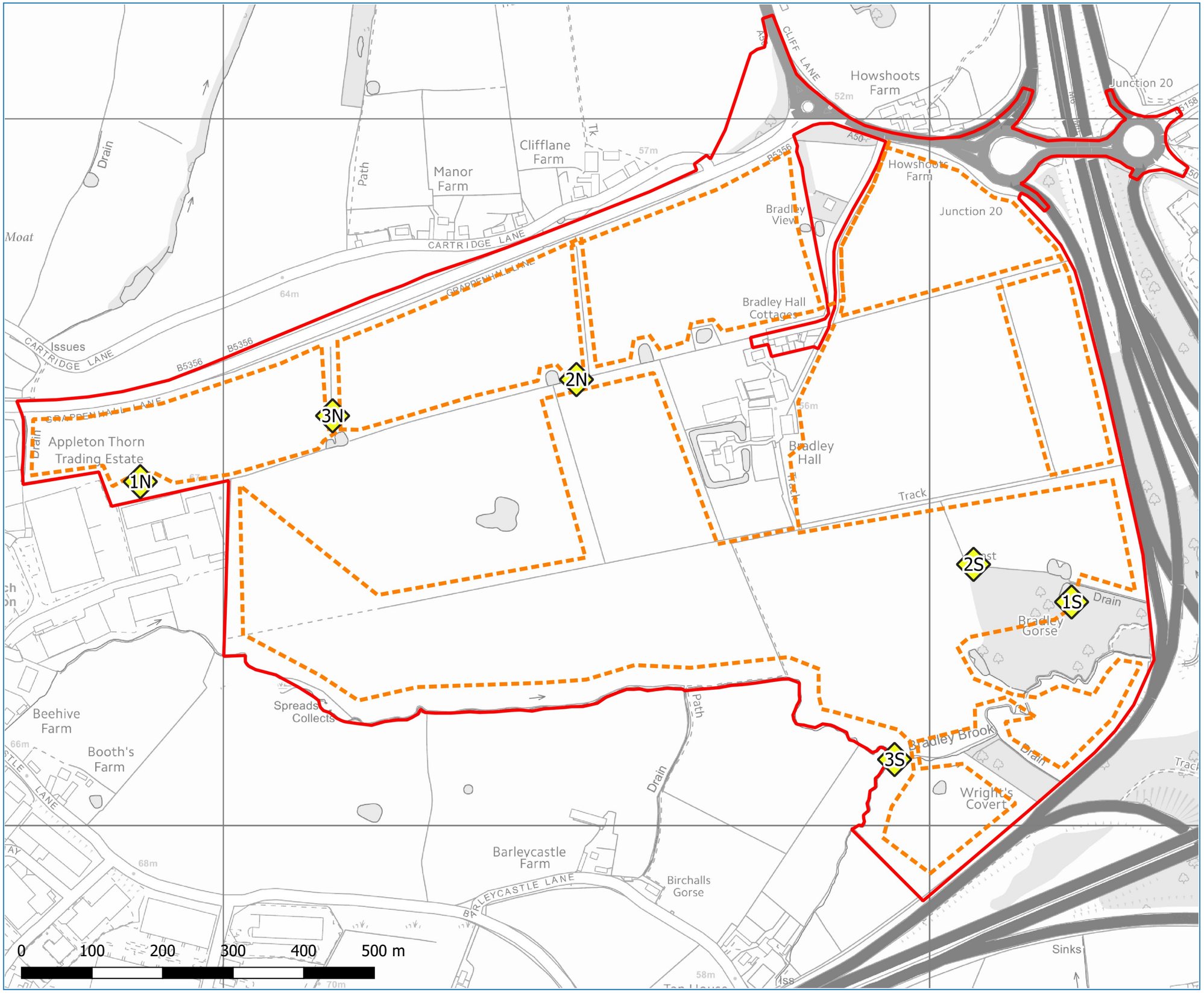

Tyler Grange LLP

Project	Six56 Warrington
Drawing Title	Bat Transect Route and Static Detector Locations
Scale	As Shown (Approximate)
Drawing No.	10682/P06
Date	January 2019
Checked	JD/LJD

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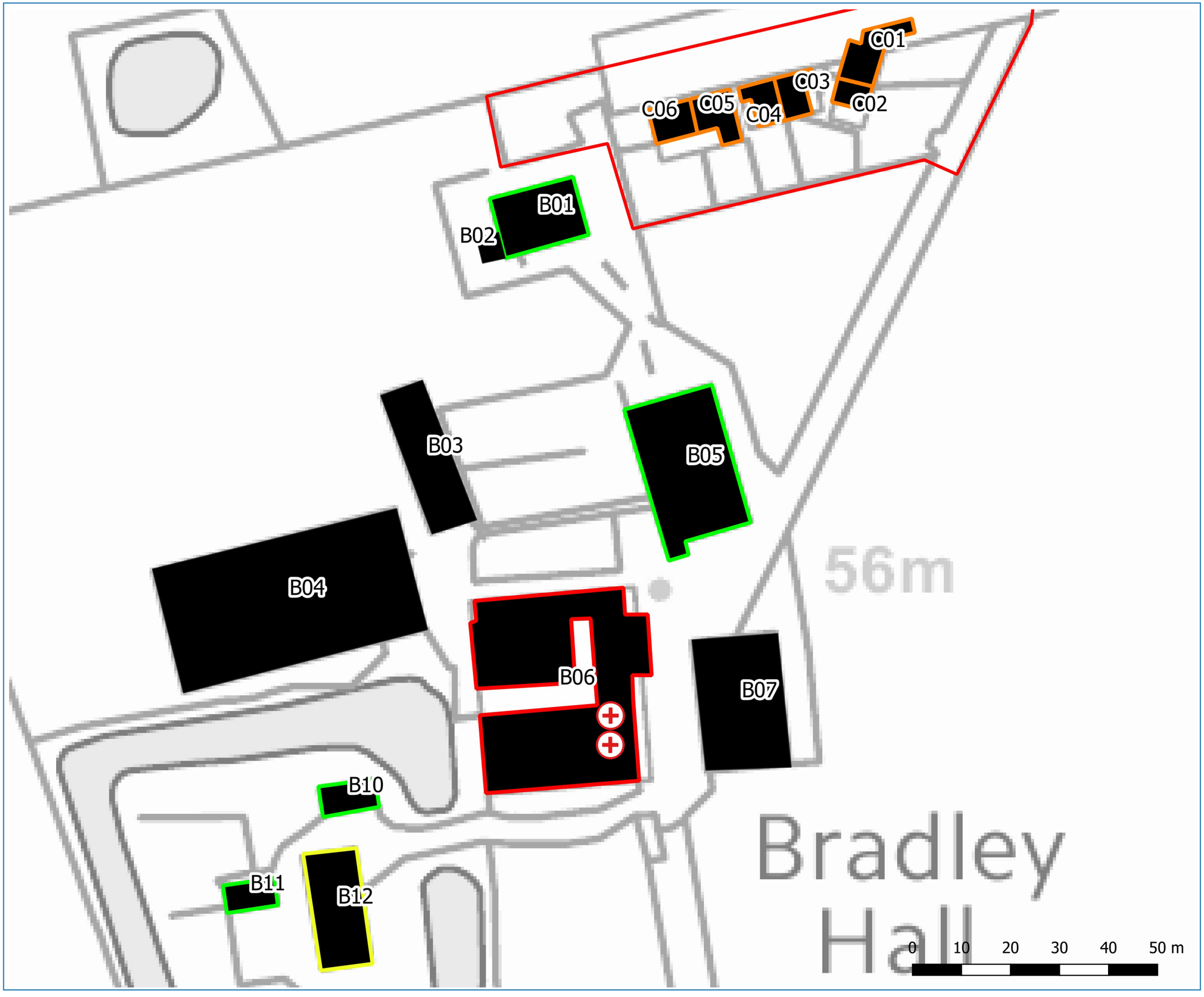

Site Boundary

Droppings

Buildings

- High Bat Roost Potential
- Low Bat Roost Potential
- Moderate Bat Roost Potential
- Negligible Bat Roost Potential
- Confirmed Roost (Droppings)

N

Project	Six56 Warrington
Drawing Title	Preliminary Roost Assessment Results
Scale	As Shown (Approximate)
Drawing No.	10682/P07
Date	January 2019
Checked	JD/LJD

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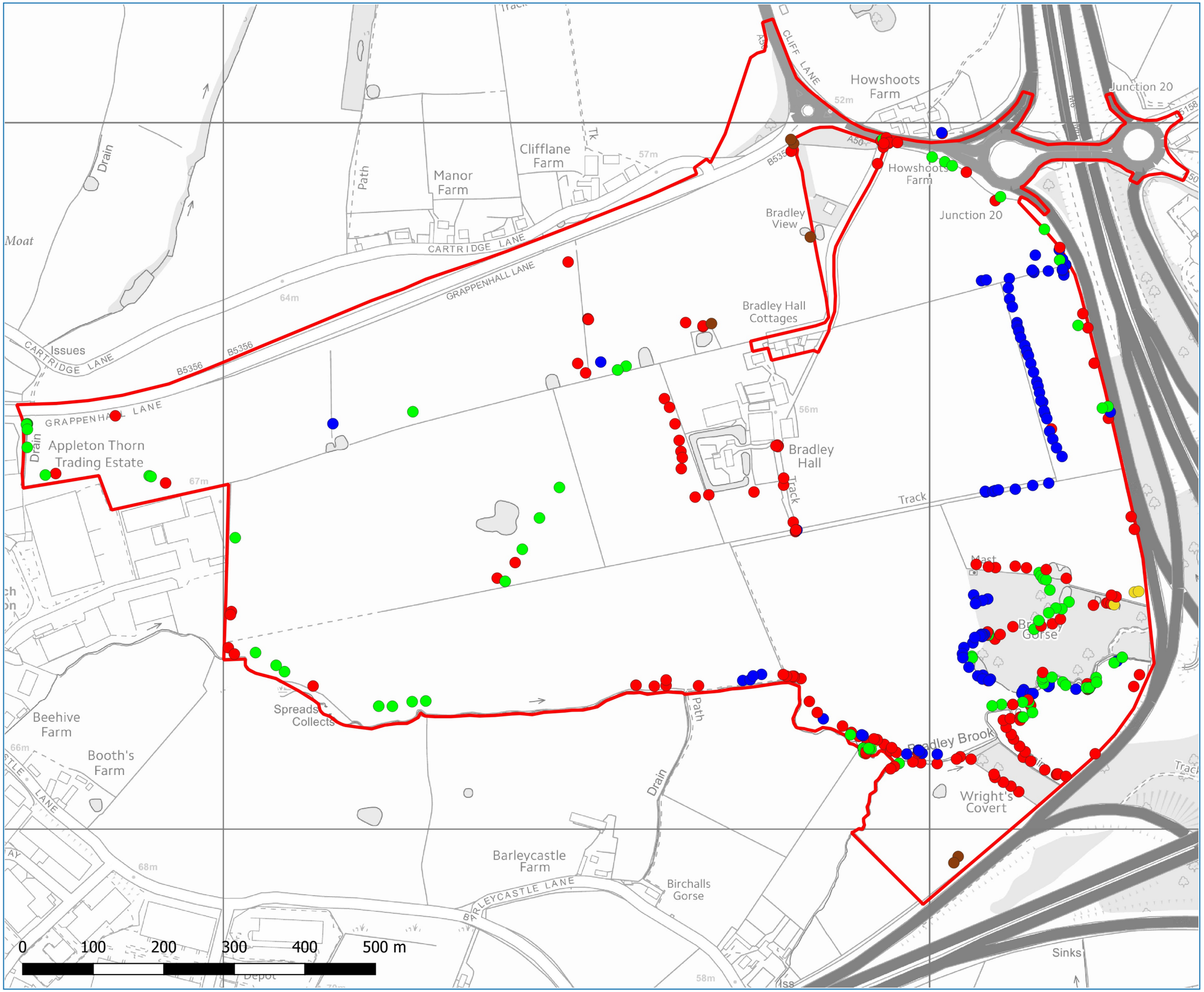

Tyler Grange LLP

Project	Six56 Warrington
Drawing Title	Bat Transect Results
Scale	As Shown (Approximate)
Drawing No.	10682/P08
Date	January 2019
Checked	JD/LJD

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Green-list species were also identified as probable/confirmed breeders in areas of the site that would be retained for biodiversity, including the brook which runs along the southern boundary of the site, area of broad-leaved woodland and open grassland to the south. The species recorded were:

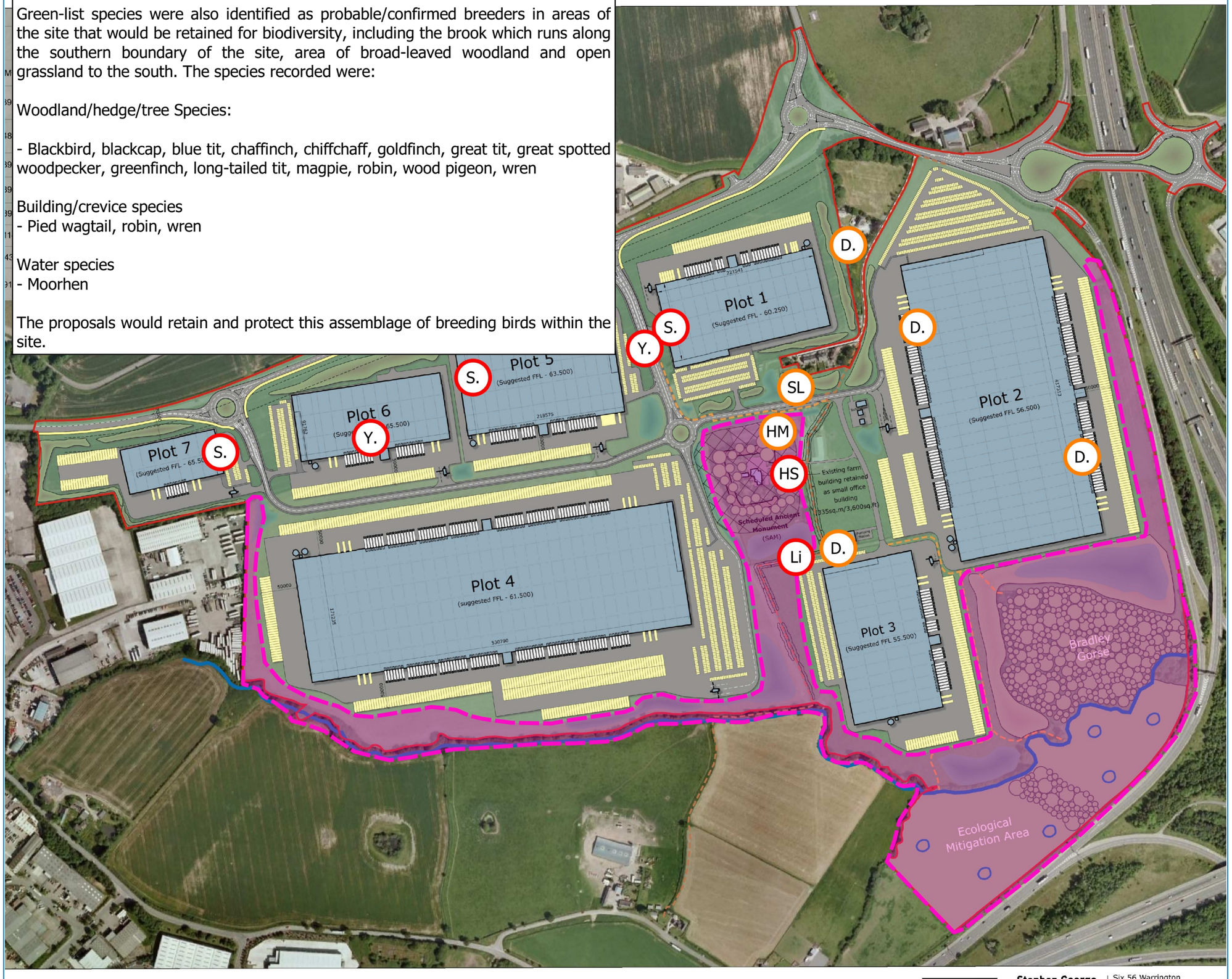
Woodland/hedge/tree Species:

- Blackbird, blackcap, blue tit, chaffinch, chiffchaff, goldfinch, great tit, great spotted woodpecker, greenfinch, long-tailed tit, magpie, robin, wood pigeon, wren

Building/crevice species
- Pied wagtail, robin, wren

Water species
- Moorhen

The proposals would retain and protect this assemblage of breeding birds within the site.



Bird Territories

- Red List (BoCC) Species
- Amber List (BoCC) Species
- Bird Mitigation Area

N 0

Langtree | Stephen George + Partners LLP | Six 56 Warrington Illustrative Masterplan

Project	Six56 Warrington
Drawing Title	Bird Mitigation Strategy
Scale	As Shown (Approximate)
Drawing No.	10682/P09
Date	January 2019
Checked	JD/LJD

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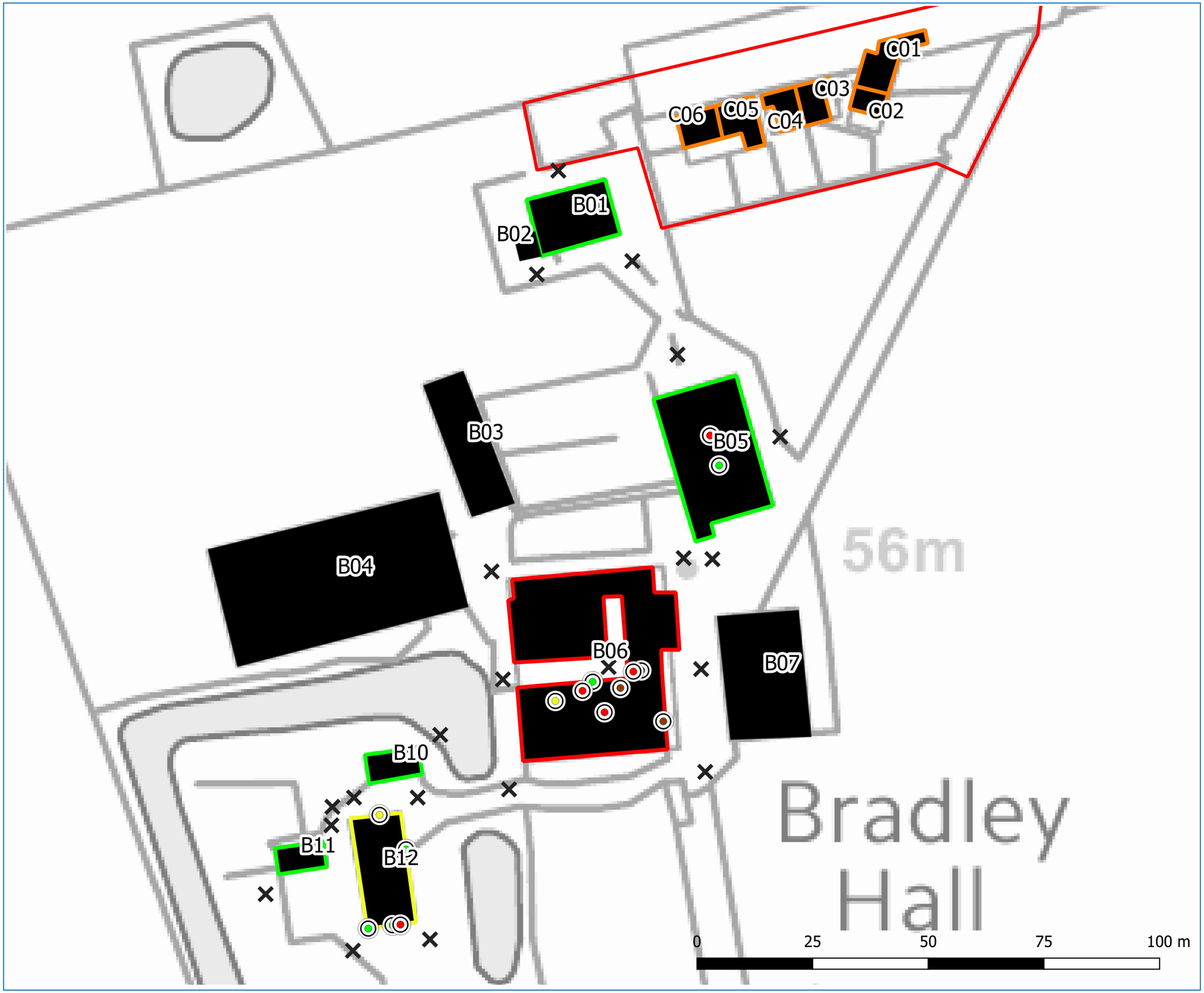

Site Boundary

Bat Roost Emergence/Re-entry Points

- Common Pipistrelle Roost Emergence/Re-entry point
- Myotis sp. Roost Emergence/Re-entry point
- Soprano Pipistrelle Roost Emergence/Re-entry point
- Unknown species Roost Emergence/Re-entry point

Surveyor Locations

Buildings

- High Bat Roost Potential
- Low Bat Roost Potential
- Moderate Bat Roost Potential
- Negligible Bat Roost Potential
- Confirmed Roost (Droppings)

N

Project	Six56 Warrington
Drawing Title	Roost and Surveyor Location Plan
Scale	As Shown (Approximate)
Drawing No.	10682/P10
Date	January 2019
Checked	JD/LJD

Tyler Grange

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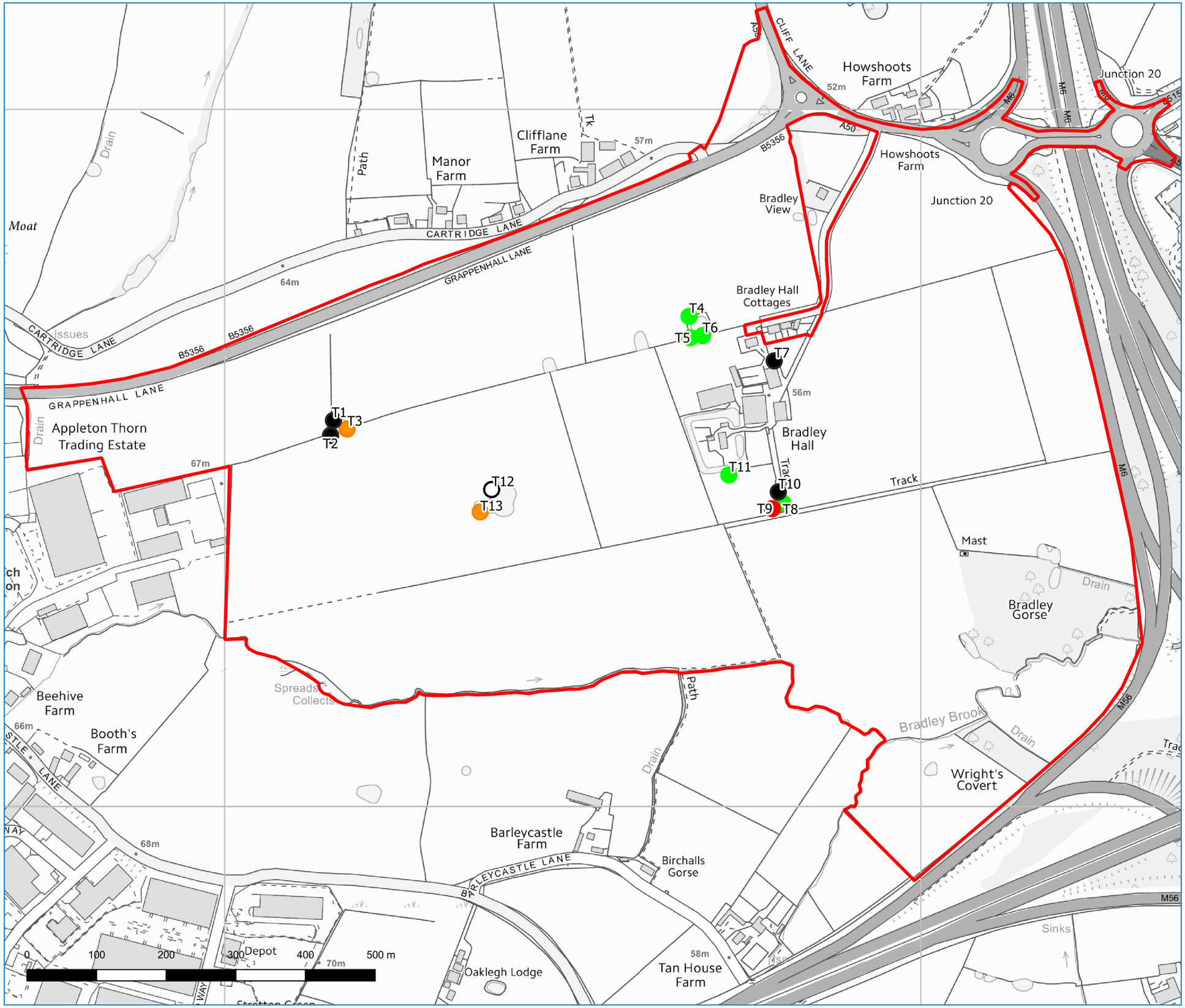

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Project	Six56 Warrington
Drawing Title	**Bat Tree Assessment Results**
Scale	As Shown (Approximate)
Drawing No.	10682/P11b
Date	March 2020
Checked	JD/LJD

Tyler Grange
3 Jordan Street, Manchester, M15 4PY
T: 0161 236 8367 E: info@tylergrange.co.uk W: www.tylergrange.co.uk

Arable fields across site provide nesting habitat for ground-nesting species such as Lapwing and Skylark

Site Boundary

Buildings with Bat and Barn Owl Potential

Habitats of Local Importance

- Ponds
- Hedgerow species poor intact
- Hedgerow species rich (intact)
- Hedgerow species rich defunct
- Semi-natural broad-leaved woodland
- Flowing water

0 100 200 300 400 500 m

N

Project	Six56 Warrington
Drawing Title	Key Ecological Receptor Plan
Scale	As Shown (Approximate)
Drawing No.	10682/P12
Date	February 2019
Checked	JD/LJD

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Appendix 5.8 – Response to Ecology Consultation Comments (10682/R02a)

Six 56 Warrington – Planning Ref. 2019/34799

10682_R02a_Response to Ecology Consultation Comments

1.0 Introduction

1.1. This note has been prepared by Tyler Grange LLP on behalf of Langtree PP and First Panattoni in response to comments received from Greater Manchester Ecology Unit (GMEU) on outline planning application 2019/34799 dated 19th June 2019.

2.0 Bat Roosts

2.1. Six (of a total of ten) buildings within the site boundary have potential to support roosting bats. Bat surveys were undertaken by Tyler Grange in 2018 in accordance with standard guidelines.

2.2. The omission of buildings B10, B11, and B12 from Table 5.8 of the Ecology and Nature Conservation Environmental Statement Chapter was an error. Of these three buildings, non-maternity roosts of common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and an unidentified bat (no echolocation recorded) were recorded in B12. Non-maternity roosts were also recorded in buildings B5 and B6. No bat roosts were recorded in any other buildings.

2.3. Under current proposals, B12 will be retained but converted into office space. It is considered likely that the bat roosts in B12 will be impacted but this may only be temporary impacts during construction works. Detailed proposals for the conversion of B12 are not yet known, but it is likely that roosting opportunities for bats can be retained/re-incorporated in the building in the long-term.

2.4. Non-maternity bat roosts were also recorded in buildings B5 and B6 which are proposed for demolition. Additional clarity with respect to the survey result for B6 on 25th July 2018 was requested by GMEU which is provided as follows:

- Fifty-two emergence events were recorded in proximity of the eastern archway by a small number of bats (moving repeatedly in and out of the roost area), rather than the sequential emergence of 52 separate bats. i.e. no more than two bats were outside the building at once, before re-entering and then re-emerging. Emergences from other parts of the building during this survey comprised a total of four myotis species bats and two common pipistrelles;
- Two additional nocturnal surveys conducted on B6 during the maternity period (dusk on 2nd July 2019, and dawn on 10th August 2019) recorded similarly small numbers of common pipistrelle and myotis species bats emerging from or re-entering the building (across all roost locations); and,
- Therefore, it is concluded that B6 supports small numbers of day roosting common pipistrelle and myotis species bats, no more than six myotis and four common pipistrelles. Small numbers of unidentified bats are likely to also be one of these species.

2.5. The principles of proposed mitigation include roost replacement at a ratio of 2:1 using bat boxes, timing of construction work to minimise impacts and retention and enhancement of foraging and commuting habitat combined with a sensitively designed lighting scheme. As this is an outline application, some of the finer details of the scheme remain unknown at this stage so the mitigation strategy can only comprise principles at this stage.

2.6. Detailed mitigation strategies for impacts to roosting bats in B5 and B6 and B12 will be provided at the reserved matters planning stage.

3.0 Great Crested Newts and Ponds

3.1. A total of six existing ponds will be lost, either due to the development layout or to allow creation of attenuation basins, one of which tested positive for great crested newts (GCN) (a small population was recorded during surveys undertaken by Tyler Grange in 2017 using traditional survey methods).

3.2. The ecological mitigation area can accommodate seven replacements ponds, based on the principle of 2:1 replacement of GCN breeding ponds, and 1:1 replacement of other ponds. As only one breeding pond is to be lost and the quality of the other ponds to be lost was so poor, the replacement and long-term management of seven new ponds is considered suitable to replace and enhance aquatic breeding habitat for GCN. It is also considered that this will provide a suitable balance between the availability of aquatic and terrestrial habitat for GCN in the mitigation area.

3.3. To raise the provision of new wetland habitat towards a 2:1 replacement of all ponds, a number of the proposed attenuation basins will be designed so that they will permanently hold water. Where possible, ponds selected for this treatment will be those most closely linked to the proposed Green Infrastructure and Bradley Brook watercourse corridor and will be landscaped to maximise benefits for wildlife.

3.4. Other attenuation features included across the scheme which are likely to be dry most of the time will be appropriately landscaped to provide a contribution towards additional terrestrial habitat for GCN and other wildlife using the site.

3.5. Habitat within the ecological mitigation area will include rough grassland for foraging with hedgerows and scattered scrub for cover and hibernation. It is likely that the existing grassland habitat can mostly be enhanced through an appropriate management regime of periodic cutting, rather than habitat creation. New hedgerow and scattered scrub (throughout the site) will include native species such and those which provide flowers or fruit resources through the year to also provide benefit for other wildlife.

3.6. It is not appropriate to provide detailed planting schemes at the outline stage of the application, but indicative planting palette drawings will be provided separately by the project landscape architect (Layer).

4.0 Breeding and Wintering Birds

4.1. Four records of skylark *Alauda arvensis* were returned by the Local Records Centre, occurring to the south and west of the site between 2008 and 2014 (during March, April and May). Three records of lapwing *Vanellus vanellus* were returned, also occurring to the south and west of the site between 2008 and 2014 (during the months of May, Nov and Dec). One record of

starling *Sturnus vulgaris* was returned, occurring to the south of the site in May 2008. No previous records for any of these species occurred within site itself.

4.2. During breeding bird surveys, undertaken by Tyler Grange in 2017, three skylark territories were recorded in the northern arable fields. Lapwing were only recorded flying over the site.

4.3. Wintering bird surveys were undertaken by Tyler Grange between October 2017 and March 2018. During the December 2017 survey visit, lapwing and starling occurred in connection with recent muck-spreading which had taken place on fields within the site which attracted larger flocks of birds for opportunistic foraging than usually recorded. During all other wintering bird survey visits lapwing and starling occurred only in smaller flocks, and so the overall results do not suggest the reliance of these species on the site throughout winter.

4.4. Loss of farmland habitat which is suitable for breeding skylark and overwintering birds such as lapwing and starling cannot be mitigated entirely within the scheme boundary. However, this loss is compensated by the provision of alternative habitats including rough grassland, hedgerows, scrub and ponds. These habitats offer suitable breeding and over-wintering habitat for farmland birds such as yellowhammer *Emberiza citrinella*, reed bunting *Emberiza schoeniclus*, dunnock *Prunella modularis* and song thrush *Turdus philmelos* which were all recorded using the site during surveys and are priority species both locally and nationally.

Appendix 5.9 – Deleted Text from Original ES Technical Paper

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ES Addendum – Text Deleted from Original ES Technical Paper - Ecology Technical Paper 5

Section Number / Paragraph Number / Table number / Figure Number in Original Paper	Text Deleted from Original ES	Reason
2.1	The Conservation of Habitats and Species Regulations 2017 (as amended) ~~2018~~ (The Habitat Regulations);	Update to CHSR reference in line with CIEEM guidance following the UKs exit from the European Union on 31st January 2020.
2.2	Chapter 11 of the National Planning Policy Framework 2019 ~~2018~~	Update to NPPF reference following adoption of amended policy in 2019.
8.15	~~The number of roost locations provided would be double the number lost to development. Works would be timed to occur when bats are likely to be absent from buildings i.e. during the autumn, winter or early spring.~~	Removal replaced by inclusion of additional text to provide further clarity in line with formal response provided to GMEU (Appendix 5.8)
8.19	A re-survey of the ~~three~~ two trees identified with roost potential should be undertaken at the detailed planning stage.	Updated to account for natural loss of T12 as a result of storm damage
8.32	seven ~~six~~ new ponds are to be created within the Ecological Mitigation Area	Amended to be correct with updated proposals
Table 5.11 (Birds)	~~However, this cannot replace open farmland habitat of importance to skylark and lapwing.~~	Replace with text outlining the proposed off-site bird mitigation.

Table 5.11 (GCN)	~~6~~ 7 new ponds are to be created within the Ecological Mitigation Area.	Amended to be correct with updated proposals
10.4 / 10.6 / 10.8	The cumulative effects arising from both developments could lead to losses of habitat that are significant for farmland birds at a local ~~county~~ scale and therefore minor ~~moderate~~ adverse.	Downgrade of cumulative impact to account for off-site bird mitigation proposals.