

Tetrosyl, Walmersley Old Road, Bury, BL9 6RG

ECOLOGICAL SURVEY AND ASSESSMENT
(including a Licensed Bat Survey and Assessment and Mitigation Strategy)

July 2019

[ERAP (Consultant Ecologists) Ltd ref: 2018-202]

ERAP (Consultant Ecologists) Ltd
49a Manor Lane
Penwortham
Preston
Lancashire
PR1 0TA

Tel: 01772 750502

mail@erap.co.uk
www.erap.co.uk



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Document Control

Survey Type:	Surveyors ¹	Survey Date(s)
Phase 1 Habitat & Daylight bat survey and assessment	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM and Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	18 th July 2017 8 th November 2017 12 th July 2018
Dawn bat activity surveys	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM and assistants	16 th August 2017 30 th August 2017 14 th September 2017 12 th July 2018
Bat transect surveys	Amy Sharples assisted by Leah Hart or Danielle Rowlands	9 th August 2018 24 th August 2018
Breeding bird surveys	Chris Swindells	5 th July 2018 20 th July 2018
Otter and water vole surveys	Chris Swindells and assistant	5 th July 2018 9 th July 2018
Aquatic invertebrate survey	Peter Flint and S. Flint	6 th August 2018
Reporting	Personnel	Date
Author	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM Principal Ecologist	19 th December 2017
Signature(s)		
Checked by	Carol Flaxman B.Sc. (Hons) GradCIEEM	21 st December 2017
Revised and issued by	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM	21 st December 2017
Revised	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM	22 nd December 2017
Update 1	Victoria Burrows Updated to include results of surveys carried out in 2018 namely: Updated Phase 1 Habitat Survey; Updated badger survey; Water vole and otter survey; Breeding bird surveys; Aquatic flora and invertebrate survey; Bat re-entry survey; and Bat activity transect surveys. Updated to make reference to current wildlife legislation and planning policy guidance.	13 th December 2018
Update 2	Victoria Burrows Updated to refer to minor amendments to planning layout (Barratt Manchester Drawing 456/P/PL/02 Rev E (July 2019)) Updated to make reference to current wildlife legislation and planning policy guidance.	25 th July 2019
Checked by	Luke Atherton B.Sc. (Hons) M.Sc.	14 th December 2018
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¹ Licence reference numbers Bats Victoria Burrows, Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-10390-CLS-CLS Barn Owl Victoria Burrows Natural England Class Survey Licence Registration Number CL29/00061		

SUMMARY

Introduction and Scope

- i. This ecological survey and assessment presents the ecological, biodiversity and nature conservation status of land at the Tetrosyl site off Walmersley Old Road, Bury. The assessment was requested in connection with proposals to demolish the buildings, remediate and re-grade the site (including the mill lodge) and redevelop the site to housing.
- ii. The scope of ecological survey comprised a desktop study and data search, extended Phase 1 Habitat Survey, a licensed daylight bat survey and assessment, and dawn bat activity surveys carried out between July 2017 and November 2017. Additional surveys comprising an updated Phase 1 Habitat Survey, breeding bird surveys, otter and water vole surveys, aquatic invertebrate surveys, an updated dawn re-entry survey and bat activity transects were carried out in 2018. The scope of survey undertaken is appropriate to identify potential ecological constraints and any mitigation (including avoidance of specific habitats) required to inform the preparation of a detailed site layout.
- iii. The ecological survey has informed the preparation of comprehensive mitigation strategies for protected species, where necessary, and has enabled the specification of opportunities for biodiversity associated with the re-development proposals.
- iv. The approximately 10.5 hectare site is located approximately 3 kilometres to the north of Bury town centre and comprises a cluster of operational and derelict buildings surrounded by amenity grassland, unmanaged neutral grassland and tall-herb vegetation, established broadleaved woodland and a large mill lodge (open water). Land surrounding the site comprises existing residential development, the M66 motorway and agriculturally managed land.

Results of Survey and Assessment and Recommendations

- v. Provided the appropriate control measures are implemented in relation to the flow of water from the non-statutory designated sites to the north namely Baldingstone Site of Biological Importance (SBI) and Gindles Farm Clough Biological Heritage Site (BHS) it is reasonably concluded that the proposals will have no adverse direct or indirect effect on statutory or non-statutory designated sites for nature conservation, refer to **Section 4.2**.
- vi. Two Priority Habitats are present and comprise the lodge (Pond 1), which is suitable for the support of breeding common toad (Priority Species), and a 0.4 hectare area of Lowland Mixed Deciduous Woodland in the north-eastern area of the site. Priority Habitats are capable of being a material consideration in connection with a planning decision, this is recognised and addressed in this report to ensure the conservation function of these habitats is retained at the site, refer to **Section 5.2**.
- vii. Approximately 6 hectares (almost 60%) of the site is occupied by buildings and hard-standing. Of the remaining habitats, namely neutral grassland, self-seeded scrub, Bramble scrub and tall-herb vegetation, none are of significant interest in terms of their plant species composition or are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present.
- viii. Invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) are present, namely a stand of Japanese Knotweed, scattered Indian Balsam stands, Rhododendron shrubs and a small area of Montbretia. It is an offence under wildlife legislation to cause the spread of these species in the wild. Guidance on the control and management of these species is described (**Section 5.5**).
- ix. Badger activity is present at the site. The badger survey results and a mitigation strategy is presented in a separate addendum report (ERAP (Consultant Ecologists) Ltd, December 2018).

- x. A common pipistrelle bat day roost, supporting a maximum count of three bats (Roost 1) was recorded at the northern elevation of Building 3. Demolition will involve the loss of the roost which, in absence of mitigation, is a 'low' scale of impact in accordance with Figure 4 of *Bat Mitigation Guidelines* (Mitchell-Jones, 2004).
- xi. An appropriate Natural England licence will be required to legally proceed with the works and destroy the roost. It is concluded that the site meets the criteria and qualifies to be registered under the Natural England Bat Mitigation Class Licence (BMCL). The 'three tests' of *The Conservation of Habitats and Species Regulations 2017* will be met. **Appendix 2 (Section 9.0)** of this report presents both the results of the licensed bat survey and assessment and a mitigation strategy including the details of compensatory measures to demonstrate how the proposals may proceed in accordance with the BMCL, Natural England guidance and best practice including precautionary measures to be applied at the buildings / structures with high suitability for use by roosting bats.
- xii. Based on the ecological baseline, the proposals can be achieved with no adverse effect on other relevant protected species namely water vole, otter, Schedule 1 birds, great crested newt and reptile species.
- xiii. Best practice measures for the protection of fauna and environmental quality during the construction period will be detailed in a Construction Environmental Management Plan (CEMP) for Biodiversity to include:
 - Tree protection;
 - An Invasive Species Management Plan;
 - Compliance the relevant Pollution Prevention Guidelines (PPG);
 - The Badger Mitigation Strategy and works to be licensed by Natural England;
 - The Lodge Drainage and Fish Rescue Strategy to be applied;
 - A common toad mitigation strategy to be applied during the draining of the lodge and site preparation works;
 - The Bat Mitigation Strategy and works to be licensed by Natural England, refer to **Appendix 2**; and
 - The protection afforded to nesting birds and the mandatory actions to be applied during building demolition and vegetation clearance, refer to **Section 5.9**.
- xiv. The buildings and scrub habitats are suitable for use by nesting birds, including Priority Species such as dunnock. Guidance at **Section 5.9** in relation to the protection of nesting birds and the conservation of opportunities for nesting and foraging birds at the site in the long-term will be implemented.

Net Gain for Biodiversity

- xv. In addition to the mitigation and compensatory measures to be provided as part of the scheme, the redevelopment will secure a net gain for biodiversity by:
 - Creation of an open channel with a varied geomorphology (following the removal of a culvert);
 - Extensive planting of wildflower grassland;
 - Planting of extensive areas of native woodland and scrub to complement and supplement the wildlife corridor function along the eastern area of the site;
 - Planting of new hedgerows to demarcate the residential development and the open space;

- Provision of additional opportunities for nesting birds and roosting bats, including Priority Species, within the retained habitats, new habitats and the built environment; and
- Securing the management of the retained and created habitats by the preparation and implementation of a Landscape and Habitat Management Plan.

Conclusion

- xvi. The development proposals can be achieved with no adverse effect on designated sites for nature conservation and ecologically valuable or sensitive habitats. The site layout plan achieves the long-term protection of the woodland and the conservation of Priority Habitat. Mitigation for protected species (namely roosting bats, badger and nesting birds) and conservation and enhancement of opportunities for other wildlife is entirely feasible.
- xvii. The proposals will secure an opportunity to implement beneficial measures such as habitat management and habitat creation that will safeguard habitats for wildlife such as invertebrates, birds and bats, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.
- xviii. It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy.

1.0 INTRODUCTION

1.1 Background and Rationale

- 1.1.1 ERAP (Consultant Ecologists) Ltd was initially commissioned by Barratt Manchester to carry out an updated ecological survey and assessment of the Tetrosyl site off Walmersley Old Road, Walmersley, Bury (hereafter referred to as the 'site') in July 2017. The Ordnance Survey (OS) grid reference at the centre of the site is SD 80955 13826.
- 1.1.2 Previous ecological surveys comprising a Phase 1 Habitat Survey and licensed bat survey were carried out in 2010 and 2011, refer to **Sections 2.1** and **3.1**, to inform an outline planning application to redevelop the site to housing. The proposals were granted outline planning consent by Bury Council on 30th January 2012, subject to a series of conditions (Bury Council reference: 53762). A second bat survey was carried out in 2015 to inform a reserved matters application; this document is also referred to for background information (BSG Ecology, September 2015).
- 1.1.3 The updated ecological survey and assessment carried out in 2017 was requested in connection with the submission of a new, full planning application for the redevelopment of the site to housing.
- 1.1.4 In June 2018, ERAP (Consultant Ecologists) Ltd was commissioned to carry out an updated survey to ensure a comprehensive suite of ecological survey information was available to support the planning submission. The scope of ecological survey works presented in this report and a separate Confidential Addendum (ERAP (Consultant Ecologists) Ltd, December 2018) has been discussed and agreed with David Dutton at the Greater Manchester Ecology Unit (GMEU).

1.2 Scope of Works

- 1.2.1 The scope of ecological works undertaken in 2017 and 2018 comprised:
 - a. A desktop study and data search for known ecological information at the site and the local area;
 - b. An Extended Phase 1 Habitat Survey and assessment;
 - c. Assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
 - d. Survey and assessment of all habitats for relevant statutorily protected species and other wildlife including great crested newt (*Triturus cristatus*), water vole (*Arvicola amphibius*), otter (*Lutra lutra*), bird species, invertebrates and reptiles;
 - e. A licensed bat survey and assessment of the buildings and trees, refer to **Appendix 2**;
 - f. Transect surveys for bat activity;
 - g. Breeding bird surveys;
 - h. Surveys of the lodge for aquatic invertebrates and plants;
 - i. Identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
 - j. The identification of any further surveys or precautionary actions that may be required prior to the commencement of any demolition / site preparation and redevelopment activities.
- 1.2.2 A separate Badger (*Meles meles*) Survey and Assessment report has been prepared for the site. The results are presented in a separate confidential addendum for restricted distribution (ERAP (Consultant Ecologists) Ltd, December 2018).

2.0 METHOD OF SURVEY

2.1 Desktop Study

2.1.1 The following sources of information and ecological records were consulted:

- a. MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
- b. Greater Manchester Local Records Centre (GMLRC);
- c. Lancashire Environment Record Network (LERN); and
- d. Greater Manchester Biodiversity Action Plan (BAP).

2.1.2 Ecological reports previously prepared for the site were also consulted, namely:

- a. Bevis Green Site, Walmersley. *Bat Survey Report* (Baker Shepherd Gillespie, October 2010);
- b. Bevis Green Site, Walmersley, Bury. *Ecology Survey Report* (Baker Shepherd Gillespie, February 2011); and
- c. Bevis Green Works, Mill Road, Bury. *Method Statement: Mitigation and Compensatory Measures for Bats* (BSG Ecology, September 2015).

2.1.3 Relevant consultation responses made in relation to the previously approved outline planning permission for the site (Bury Council reference: 53762) namely:

- a. Letter from David Dutton (Bury Council Wildlife Officer) dated 19th April 2011;
- b. Letter from Natural England dated 26th April 2011; and
- c. A subsequent follow-up letter prepared by Natural England dated 30th June 2011.

2.2 Vegetation and Habitats

2.2.1 An updated Extended Phase 1 Habitat Survey of the site was carried out by Victoria Burrows on 18th July 2017. The weather conditions were warm (22°C), sunny and calm (Beaufort Scale 0).

2.2.2 The survey was updated by Victoria Burrows and Amy Sharples on 8th November 2017. The weather was dry but overcast, with light air (Beaufort Scale 1) and 8°C at 9am.

2.2.3 A walkover survey was carried out on 12th July 2018 to valid the Phase 1 Habitat Survey results. The weather conditions were dry, 18°C with a light breeze (Beaufort Scale 2).

2.2.4 A habitat and vegetation map was produced for the site and the immediate surrounding area at a scale of 1:2000 (refer to **Figure 8.2**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.

2.2.5 Plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.

- 2.2.6 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.
- 2.2.7 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).
- 2.2.8 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 Refer to the separate 'Badger Survey and Assessment' report (ERAP (Consultant Ecologists) Ltd, December 2018).

Bat Species

Roosting Bats

- 2.3.2 The survey methods applied during the licensed daylight bat surveys of the buildings and trees and re-entry surveys are presented at **Appendix 2**.

Habitat Assessment for Commuting / Foraging Bats

- 2.3.3 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016). Reference has been made using the following categories and descriptions / examples, presented below.

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting bats.	Negligible habitat features on site likely to be used by foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.	Habitat that is linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Transect Surveys for Bat Activity

- 2.3.4 Two transect surveys have been conducted at the site in early and late August 2018. One transect route was walked on each survey occasion. Surveys at these times of year were considered appropriate to detect the maximum number of bats at the site as juvenile bats (typically born in June) will also be flying by this time.
- 2.3.5 The transect route, as shown on **Figure 8.3**, was plotted to examine all habitat types at the site, taking into account surveyor access and safety.
- 2.3.6 The walked transect surveys were conducted from sunset until 2 hours after sunset. All bat activity was recorded throughout the transect surveys by Anabat Express units. Surveyors noted areas of frequent or high levels of bat activity during the walked transects¹.
- 2.3.7 Five point counts were conducted at the transect route (labelled 1.1 to 1.5). During the point counts, all bat activity was recorded over 10 minute intervals. A measure of bat activity at each location was taken via counting the number of bat passes by each species detected. In order to ensure consistency of recording, a bat 'pass' has been defined as any bat activity detected within each ten second interval of the ten minute spot count.
- 2.3.8 The maximum number of bat passes per species which could therefore be recorded during one point count location is 60². Heterodyne detectors and recording detectors (Anabat Express units) were used to detect bats and identify to species (where possible, see 'Analysis of Anabat Data', below). The dates, times, weather conditions and personnel of each transect survey are presented below.

Table 2.2: Transect Survey Dates, Weather Conditions and Surveyors

Date	9 th August 2018	24 th August 2018
Sunset	20:57	20:19
Start and end time	20:50 to 22:55	20:19 to 22:26
Duration	2 hours and 5 minutes	2 hours and 7 minutes
Weather	Calm (Beaufort Scale 0), dry, 12°C	Light air (Beaufort Scale 1), dry with drizzle intervals, 11°C
Transect Number	Surveyor and Detector^a	Surveyor and Detector^a
1	Amy Sharples & Leah Hart Batbox III & AE	Amy Sharples & Danielle Rowlands Batbox III & AE
^a AE = Anabat Express Unit		

- 2.3.9 The transect survey data have been used to determine species distribution across the transect, and levels of bat activity across different habitats over the transect.

Analysis of Transect Anabat Data

- 2.3.10 Anabat files have been initially analysed using species-specific filters for common and soprano pipistrelle (*Pipistrellus pipistrellus* and *P. pygmaeus*), noctule (*Nyctalus noctula*), *Myotis* species and brown long-eared bat (*Plecotus auritus*). The files have subsequently been individually checked by a suitably experienced ecologist to ensure the accuracy of the analysis and to locate and determine any calls of rarer or unusual species, such as Nathusius' pipistrelle (*P. nathusii*).

¹ It is recognised that this is a subjective measure, and comparative to the other areas surveyed as part of the transect

² 10 minutes x 60 = 600 seconds.

600 seconds ÷ 10 second intervals = 60.

60 is the maximum number of bat passes which can be recorded at any spot count location during that spot count repetition.

- 2.3.11 The analysis has been informed by ERAP (Consultant Ecologists) Ltd's knowledge of the area, the results of the desktop study and the known distribution of bat species within the UK, as well as the limitations of identifying bats to species from their recorded echolocation calls.
- 2.3.12 Noctule, Leisler's (*Nyctalus leisleri*) and serotine (*Eptesicus serotinus*) all emit similar echolocation calls, however only noctule are of known occurrence in the Bury area. All calls resembling noctule, Leisler's and serotine have been individually checked for characteristic features of Leisler's and serotine bats, and (unless characteristic call features of either species is present) a presumption has been given that the call is of a noctule bat.
- 2.3.13 *Myotis* species known to be present in the local area comprise whiskered and Brandt's bats (*Myotis mystacinus* and *M. brandtii*), Daubenton's bat (*Myotis daubentonii*) and Natterer's bat (*Myotis nattereri*). Calls have been checked for characteristic features of each species, however due to the number of calls which cannot be attributed to any one species, it is not been possible to use the *Myotis* calls to measure relative levels of activity of individual species. It has been considered more accurate to give the abundance of *Myotis* activity as a whole across the site, and name any individual species which may be identified by a characteristic call separately.
- 2.3.14 Two species of long-eared bat are native to the UK, namely the brown long-eared (*Plecotus auritus*) and grey long-eared bat (*Plecotus austriacus*). Both species have similar echolocation calls, however the grey long-eared bat is '*primarily confined to the extreme south of the British Isles, from Sussex to Devon, including Somerset, the Isle of Wight and the Channel Islands. Recently, a grey long-eared bat roost was found in Pembrokeshire, indicating that the species may be also present in south-west Wales*' (Bat Conservation Trust, 2012); the site is sufficiently distant from the known range of the grey long-eared bat that all calls resembling long-eared bats have been considered to be those of the brown long-eared bat.

Bird Species

Scoping Surveys and Assessment

- 2.3.15 Bird species observed and heard during the site visits were recorded.
- 2.3.16 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.
- 2.3.17 All buildings were searched for pellets, faecal splashes and feathers which may indicate use by roosting or nesting barn owl on the 8th November 2017 in accordance with *The Barn Owl Conservation Handbook* (Barn Owl Trust, 2012) and *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting* (Shawyer, 2011).
- 2.3.18 Observations of the buildings were also carried out for other relevant Schedule 1 listed birds namely black redstart and peregrine during both the daylight surveys and the dawn surveys for bat activity.

Breeding Bird Surveys

Survey Area

- 2.3.19 The survey area comprised the site and the immediate surrounding land.

Surveyors and Equipment

- 2.3.20 Breeding bird surveys were carried out by Chris Swindells, an experienced ornithologist. Bird species were identified by their call and binoculars (Nikon 10x50) were used to identify bird species, where necessary.

Survey Dates and Weather Conditions

2.3.21 The surveys were carried out on the following dates:

Table 2.3: Details of the Survey Dates, Weather Conditions and Survey Times

Survey Number	Date	Time Period	Weather Conditions
1	5 th July 2018	06:00 to 09:00	Sunny. Light air (Beaufort Scale 1), 26°C (maximum)
2	20 th July 2018	06:00 to 09:00	Sunny. Light air (Beaufort Scale 1), 20°C (maximum)

2.3.22 It is accepted that the surveys were not carried out in full accordance with the timings specified in *Bird Monitoring Methods* (Gilbert, et al., 1998), however, the surveys in July 2018 were carried out at time of year when the some species are still nesting and other birds are present with young; in combination with observations at the site during all other surveys it is considered that this survey approach has enabled an understanding of the use of the site by nesting birds and has informed the proposals, particularly in consideration of Priority Species and Schedule 1 listed birds.

Survey Approach

2.3.23 The survey methodology employed was broadly based on that of territory mapping as used for the British Trust for Ornithology (BTO) Breeding Bird Survey (BBS) and Common Bird Census (CBC). Transects were walked through the site and survey area survey stations / vantage points were used. Bird surveys were not undertaken in unfavourable conditions such as heavy rain or strong wind, which may negatively affect the results.

2.3.24 Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate.

2.3.25 For the purposes of this assessment birds were counted as 'breeders' within the site (or close by) if they were recorded in territorial song, observed as a family, carrying food / nest material, in an actual nest and / or repeatedly giving alarm calls thought to have a strong territorial significance. Other birds have been categorised as 'non-breeders' if they were observed flying over the site only, were not engaged in any behaviours indicative of breeding and / or the habitat is not considered to suitable for breeding habitat for that species.

Great Crested Newt

Desktop Search for Ponds

2.3.26 In accordance with current Natural England guidance (Natural England, 2015) all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding great crested newts.

2.3.27 There are 10 ponds within 500 metres radius from the site boundary, as detailed in **Table 2.1**.

Table 2.4: Ponds within 500 metres of the Site

Pond Reference	OS Grid Reference	Distance from Site Boundary	Location (refer to Figure 8.1)
1	SD 81030 13923	Within site	Large (1.1 hectare) on-line lodge
2	SD 81177 13858	108 metres	Large on-line lodge to the east of the site, separated from the site by a stone wall
3	SD 80967 13457	166 metres	Located to the south of the site, on the opposite side of existing built land
4	SD 81106 13509	199 metres	Located to the south of the site, on the opposite side of existing built land

Pond Reference	OS Grid Reference	Distance from Site Boundary	Location (refer to Figure 8.1)
5	SD 81249 13463	348 metres	Located to the south-east of the site, on the opposite side of existing built land
6	SD 81210 13420	335 metres	Located to the south-east of the site, on the opposite side of existing built land
7	SD 81249 14463	303 metres	Located within Baldingstone SBI to the north of the site and on the opposite side of the M66
8	SD 81258 14495	320 metres	Located within Baldingstone SBI to the north of the site and on the opposite side of the M66
9	SD 81338 14515	404 metres	Located within Baldingstone SBI to the north of the site and on the opposite side of the M66
10	SD 81389 14578	479 metres	Located within Baldingstone SBI to the north of the site and on the opposite side of the M66

Assessment of Requirement for Further Survey

2.3.28 The requirement for further survey at each pond was assessed using the following criteria:

- Results of the desktop study and data search;
- Presence of dispersal barriers to great crested newt movements between ponds and the site, as detected during the walkover survey;
- Distance of the ponds from the site;
- Potential influence of the proposed development of the site on any populations of great crested newt (if present at ponds), using the Natural England rapid risk assessment tool, as needed; and
- Presence of other ponds which may form metapopulations and/or alter the influence of the site on ponds at greater distances.

2.3.29 In accordance with ODPM Circular 06/2005 “*developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and affected by the development*” (Office of the Deputy Prime Minister, August 2005). The ponds are considered in relation to this guidance below.

2.3.30 Ponds 7 to 10 are located over 300 metres from the site and on the opposite side of the M66 motorway embankment. There is no direct habitat connectivity between the pond cluster 7 to 10 and the site. Examination of the OS map indicates that Ponds 7, 9 and 10 are hydrologically connected and that there is hydrological connectivity between Ponds 7, 9 and 10 to Pond 1 within the site. However, all ponds, including Pond 1, are reported to support coarse fish (pers. comm. with site personnel). In consideration of the combination of the distance between the site and Ponds 7 to 10, the presence of the M66 motorway embankment as a dispersal barrier and the sub-optimal conditions at these ponds for use by great crested newt no further survey and assessment was considered necessary at Ponds 7 to 10 to inform the application.

2.3.31 The cluster of ponds at Ponds 3 to 4 and also Pond 2 are on-line ponds and likely to support coarse fish. Ponds 5 and 6 are located over 300 metres from the site and are separated from the site by existing built development and a stone wall at the eastern boundary between Pond 2 and the site. It is reasonably concluded that Ponds 2 to 6 are separated from the site by dispersal barriers, unsuitable for use by breeding great crested newt and / or are isolated from the site.

2.3.32 In consideration of the combination of the distance between Ponds 2 to 10 and the site boundary, the intervening habitats including physical barriers to dispersal such as the M66 motorway and existing building development, the absence of any positive great crested newt records within at least 500 metres from the site, the presence of fish in a number of the on-line ponds in the radius and the conditions at the site it is concluded that the presence of great crested newt is reasonably

discounted. No further survey for great crested newt at Ponds 2 to 10 is necessary to support this planning application.

Habitat Suitability Index Assessment

- 2.3.33 Pond 1 (within the site) was assessed using the Habitat Suitability Index (HSI) (Oldham, et al., 2000). The pond was examined with reference to the ten HSI scoring criteria, which are: **SI₁**: Geographical location; **SI₂**: Pond area; **SI₃**: Pond drying; **SI₄**: Water quality (as indicated by the diversity of aquatic plants and invertebrates); **SI₅**: Shade; **SI₆**: Waterfowl; **SI₇**: Fish; **SI₈**: Abundance of other ponds within a one kilometre radius; **SI₉**: Quality of terrestrial habitat; and **SI₁₀**: Macrophyte cover (i.e. aquatic and emergent plants). The survey was conducted in accordance with *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom* (ARG UK, 2010).
- 2.3.34 The assessment followed guidance in relation to interpreting HSI scores, following the categorical scale shown below.

Table 2.5: Pond Habitat Suitability Index Categories

HSI Score	Pond Suitability for Great Crested Newt
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Assessment of Terrestrial Habitat

- 2.3.35 An assessment of the terrestrial habitat within the site for great crested newts was conducted, as informed by the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and the *Great Crested Newt Conservation Handbook* (Langton, 2001).
- 2.3.36 Habitats present within the site were assessed for their value to support foraging, sheltering and hibernating great crested newt and other amphibians such as common toad (*Bufo bufo*), a Priority Species. Favourable habitats can comprise rough grassland, scrubland, woodland and sites with underground crevices or cracks, such as mammal holes, voids in tree stumps or banks, and refugia such as rock piles or dead wood.

Reptile Species

- 2.3.37 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined in **Table 2.3**, below.

Table 2.6: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

Water Vole and Otter

Survey Area

2.3.38 The survey for evidence and field signs of water vole and otter covered the following search area:

- a. All banks and margins of the lodge, including the inlet; and
- b. The banks of the open section of the outfall at the southern end of the site.

Surveyors, Survey Date and Conditions

2.3.39 The survey was carried out by Chris Swindells and an assistant on the 5th and 9th July 2018. The weather conditions are detailed below.

Table 2.7: Water Vole and Otter Survey Dates and Conditions

Survey	Survey Date	Conditions
1	5 th July 2018	Sunny. Light air (Beaufort Scale 1), 26°C (maximum)
2	9 th July 2018	Sunny with scattered cloud. Light air (Beaufort Scale 1) and 22°C

2.3.40 The survey of the lodge was carried out from a canoe.

Water Vole

2.3.41 The survey methodology detailed in *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)* Eds. Fiona Mathews and Paul Chanin (Dean, et al., 2016), was applied and the lodge and outlet banks were searched for burrows, latrines, feeding remains, runs, feeding lawns, nests and footprints.

Otter

2.3.42 The survey area was also searched for dung (spraints), tracks (footprints), feeding remains, otter slides (into water), holts (underground dens) and couches (above ground sites where otters rest during the day).

2.3.43 An assessment of the suitability of each habitat feature was undertaken to assess their suitability for use by otter (*Lutra lutra*) in accordance with the habitat requirements and preferences detailed in *Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series 10* (Chanin, 2003) and searches were made for signs of otter in accordance with *Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No 10* (Chanin, 2003) and current Natural England guidance (Natural England, 2014).

Aquatic Invertebrates

2.3.44 Aquatic invertebrate surveys were conducted by Peter Flint FRES and Sharon Flint B.Sc., two highly experienced entomologists with extensive knowledge of invertebrate survey methods and the local area.

2.3.45 A site visit was undertaken on 6th August 2018. The weather on this date was dry and cloudy with sunny intervals, 16 °C, with a gentle breeze (Beaufort Scale 3). The time of year was suitable for undertaking aquatic invertebrate surveys.

2.3.46 Surveys were carried out in accordance with the methods described in *Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation* (Drake, et al., 2007).

2.3.47 Where the margins of the lodge were accessible a long-handled, standard mesh, pond net was used to sample the substrate and any aquatic vegetation, together with any marginal vegetation. Where stones and items of woody debris were present hand searching was carried out.

- 2.3.48 Each sampling station was approached quietly and observed for several minutes to ascertain if any surface active insects; such as whirligig beetles (*Gyrinidae* sp.) or pondskater bugs (*Gerridae* sp.) were visible before the water was disturbed by sampling.
- 2.3.49 The contents of the net were examined in a tray of water on the bank. Most specimens were collected into 70% alcohol to be returned to the laboratory for identification. Some, soft bodied, animals were collected into water to be returned to the laboratory alive as preservation in the field renders them unidentifiable.
- 2.3.50 As one of the objectives of the survey was to ascertain whether or not swan mussel (*Anodonta cygnea*) were present in the lodge a hand operated drag-line dredge sampler was deployed from the bank. As with the pond net samples the contents of the dredge sampler were examined in a tray of water on the bank.
- 2.3.51 The inflow stream was sampled by the standard 'kick netting' technique; supplemented by hand searching of stones and woody debris.

Other Wildlife

- 2.3.52 The site was assessed for its suitability for use by notable species (i.e. Priority Species) associated with semi-rural landscapes such as brown hare (*Lepus europaeus*).

2.4 Survey Limitations

- 2.4.1 No access restrictions or other survey limitations were experienced in the completion of the scope of works outlined above.
- 2.4.2 Survey limitations experienced during the bat surveys are described in **Appendix 2**.

2.5 Evaluation Methodology

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*. Where suitable, the ecological value of the habitats present have been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, February 2019) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.
- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *NERC Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Greater Manchester Biodiversity Action Plans has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study

Land Allocations

- 3.1.1 Approximately 1.7 hectares in the north-eastern corner of the site is allocated as Green Belt in the Bury Unitary Development Plan (UDP) (Bury Council , August 1997). This allocation restricts certain actions, such as development, to ensure the strategic purpose of Green Belt is fulfilled.
- 3.1.2 Immediately outside the north-eastern site boundary and parallel with the M66 motorway is land allocated under Policy EN6/4. Policy EN6/4 Wildlife Links and Corridors states:

“The Council will seek to consolidate and, where appropriate, strengthen wildlife links and corridors, and will not permit development which would adversely affect identified areas. In particular, the Council will seek to ensure that new development within or adjacent to identified links or corridors contributes to their effectiveness through the design, landscaping and siting of development proposals and mitigation works, where appropriate”.

Designated Sites for Nature Conservation

- 3.1.3 The site has no statutory or non-statutory designation for nature conservation.
- 3.1.4 The site lies within the Site of Special Scientific Interest (SSSI) Impact Risk Zone (IRZ) for the West Pennine Moors SSSI. The West Pennine Moors SSSI at Ramsbottom is 3.6 kilometres to the north-west of the site boundary. The large (7,615.49 ha) SSSI is designated for the presence of an extensive mosaic of upland and upland-fringe habitats. It is of special interest for the following nationally important features that occur within and are supported by the wider habitat mosaic:
- blanket bogs;
 - wet and dry heathlands;
 - acid and lime-rich flushes;
 - rush pastures and mire grasslands;
 - acid grasslands;
 - neutral hay meadows and pastures;
 - wet and dry broadleaved woodlands and scrub;
 - diverse assemblages of upland moorland, in-bye and woodland breeding birds;
 - breeding black-headed gull (*Chroicocephalus ridibundus*), Mediterranean gull (*Larus melanocephalus*) and grey heron (*Ardea cinerea*); and
 - populations of Starry lady's-mantle (*Alchemilla acutiloba*), Large-toothed Lady's-mantle (*A. subcrenata*) and Floating Water-plantain (*Luronium natans*).
- 3.1.5 The proposal to redevelop the site to housing, within an existing built up area, is not identified as a criterion that would trigger the need for the local planning authority (LPA) to consult with Natural England in relation to a planning application and the statutory designated sites (Ordnance Survey, 2018).
- 3.1.6 Two non-statutory Sites of Biological Importance (SBI) and one Biological Heritage Site (BHS) lie within 1 kilometre of the site boundary and comprise:

Table 3.1: Non-statutory Designated Sites for Nature Conservation within a One Kilometre Radius of the Site

Site Name	OS Grid Reference	Minimum Distance and Direction from Site	Reasons for Designation
Gorses Quarry SBI Grade B	SD811131	470 metres to the south	A geological site with the presence of pools that support great crested newt and common toad.
Baldingstone SBI Grade B	SD812145	250 metres to the north-west	A wooded clough supporting ancient woodland and fishing ponds supporting common toad.
Gindles Farm BHS	SD814145	250 metres to the north-west	A wooded clough supporting ancient woodland, acid grassland, scrub and fishing ponds supporting common toad.
Note: Gindles Farm BHS and Baldingstone SBI Grade B adjoin each other			

Priority Habitat

- 3.1.7 An approximately 0.4 hectare of land in the north-eastern area of the site, on the east and north-west side of the lodge, is identified as Deciduous Woodland Priority Habitat on MAGIC.

Protected and Notable Species

- 3.1.8 The Greater Manchester Local Records Centre (GMLRC) holds no records of protected species for the site.
- 3.1.9 Reported records of protected and notable species for a one kilometre radius of the site are summarised below.

Table 3.2: Records of Protected Species Within a One Kilometre Radius of the Site

Taxon Group	Species Name and Designation ¹	Notes (all measurements are approximate and are taken from the site boundary)
Amphibians	Great crested newt (<i>Triturus cristatus</i>) EPS, WCAs5, S41 and GMBAP	2 records from a pond 625 metres south of the site
	Common toad (<i>Bufo bufo</i>) WCAs5 (sale only) and S41	16 records at least 50 metres from the site
Bat species	Common pipistrelle (<i>Pipistrellus pipistrellus</i>) EPS, WCAs5 and GMBAP	2 records of roosts at least 410 metres from the site and 6 records of signs of bats at least 215 metres from the site
	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) EPS, WCAs5, S41 and GMBAP	1 record of a roost 520 metres from the site and 1 record of signs of bats 610 metres from the site
	Pipistrelle species (<i>Pipistrellus</i> sp.) EPS, WCAs5 and GMBAP	7 records of roosts at least 240 metres from the site and 3 records of signs of bats at least 100 metres from the site
	Noctule (<i>Nyctalus noctula</i>) EPS, WCAs5, S41 and GMBAP	2 records of signs of bats at least 500 metres from the site
	Bat species EPS, WCAs5 and GMBAP	2 records of signs of bats at least 250 metres from the site
Birds	S41 Single records of bullfinch (<i>Pyrrhula pyrrhula</i>), song thrush (<i>Turdus philomelos</i>) and yellowhammer (<i>Emberiza citrinella</i>) at least 200 metres from the site. WCAs1 One record of Kingfisher (<i>Alcedo atthis</i>) 230 metres south of the site.	
¹ Key to designation codes EPS = European Protected Species under the <i>Conservation of Habitats and Species Regulations 2017</i> WCAs1 = Listed on Schedule 1 of the <i>Wildlife and Countryside Act 1981</i> (as amended) WCAs5 = Listed on Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended) S41 = Priority Species listed under Section 41 of the <i>NERC Act (2006)</i> GMBAP = Greater Manchester Biodiversity Action Plan		

Previous Ecological Surveys

Phase 1 Habitat Survey and Bat Surveys 2010

- 3.1.10 Ecological surveys carried out to support the previously approved planning application for the site in 2010 ((Baker Shepherd Gillespie, February 2011) and (Baker Shepherd Gillespie, October 2010)) reported the following sightings / records of protected and notable species:
- a. A common pipistrelle day roost (one bat) recorded entering an access point between the window lintel and blockwork at the western elevation of Building 5a on 25th May 2010 (Roost A);
 - b. A common pipistrelle day roost (four bats) recorded entering at a crack in the stonework above the stone window lintel on the third floor level of the south elevation of Building 7 on 25th May 2010 (Roost B);
 - c. A common pipistrelle day roost ("at least 6 bats") recorded entering a roost above the window lintel on the east elevation of Building 7 of 28th July 2010 (Roost C); and
 - d. Use of Buildings 5a and 7 by nesting swift (*Apus apus*).

Updated Bat Surveys 2015

- 3.1.11 To inform a reserved matters application submission, BSG carried out updated bat activity surveys in July and August 2015 (BSG Ecology, September 2015). The results are summarised as:
- a. No evidence of use of the previously recorded bat roosts (Roosts A to C) was recorded;
 - b. A possible but unconfirmed common pipistrelle roost (1 bat) was reported at the ridge of Buildings 5a/5b (Roost D); and
 - c. A possible but unconfirmed common pipistrelle roost (1 bat) was reported at the roof of Building 6 (Roost E).
- 3.1.12 The previously recorded roost locations are annotated on **Figure 9.1** at **Appendix 2**.
- 3.1.13 In addition, the consultation response prepared by Bury Council for the planning application in 2011 referred to a previous planning application and survey of the lodge (Pond 1) carried out in 2003 that did not detect great crested newt but confirmed the presence of common toad, a Priority Species.
- 3.1.14 The records of protected and notable species within the site and the wider area has been taken into account throughout this report.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately 10.5 hectare (ha) site is located immediately south of the M66 and approximately 3 kilometres to the north of Bury town centre.
- 3.2.2 The site comprises an operational factory with associated buildings and hard-standing. In the north-eastern area of the site is a large (1.1 ha) lodge of open water with mature Oak (*Quercus*) woodland along the eastern and northern margins.
- 3.2.3 The site is bounded by Walmersley Old Road and existing residential development to the west and north, parkland to the south, a track and agricultural land to the east and a scrub covered embankment leading up to the M66 motorway to the north-east.

3.2.4 A Phase 1 Habitat Survey map appended at **Figure 8.2**. Photographs are appended at **Table 8.12**.

Buildings, Hard-standing and Grassed Verges

3.2.5 All buildings are described at **Appendix 2**.

3.2.6 Associated with the buildings are grass verges with short mown grassland, refer to **Photos 1** and **2**. The verges support constant and abundant Perennial Rye-grass (*Lolium perenne*) with constant, frequent and locally abundant Dandelion (*Taraxacum officinale* agg.), Cock's-foot (*Dactylis glomerata*), Red Fescue (*Festuca rubra*) and Common Bent (*Agrostis capillaris*).

3.2.7 Scattered borders of ornamental planting are present.

3.2.8 The verge along the western boundary and site entrance off Walmersley Old Road supports a row of mature Poplar (*Populus* sp.) trees with planted standard Cherry (*Prunus* sp.), Silver Birch (*Betula pendula*) and Sycamore (*Acer pseudoplatanus*).

3.2.9 The grass verges are characteristic of the OV23 *Lolium perenne* – *Dactylis glomerata* community that is typically associated with frequently mown grassland such as those at institutional playing fields and grassed verges. A plant species list is appended at **Table 8.1**.

Scrub and Tall-herb Vegetation Around the Site Margins

3.2.10 Around the margins of the site, particularly around the western and northern site boundaries and local areas to the south of the car park areas are unmanaged belts of scattered planted and self-seeded young trees and shrubs. Species comprise of frequent Grey Poplar (*Populus x canescens*), Silver Birch, Goat Willow (*Salix caprea*), Hazel (*Corylus avellana*), Norway Maple (*Acer platanoides*), Grey Willow (*Salix cinerea*), Cherry Laurel (*Prunus laurocerasus*), Dogwood (*Cornus sanguinea*) and occasional scattered Ash (*Fraxinus excelsior*) saplings.

3.2.11 The understorey supports locally dominant and abundant Bramble (*Rubus fruticosus* agg.) with frequent and locally abundant Yorkshire-fog (*Holcus lanatus*), Cock's-foot, Red Fescue (*Festuca rubra*) and locally frequent False Oat-grass (*Arrhenatherum elatius*), Common Nettle (*Urtica dioica*) and Ribwort Plantain (*Plantago lanceolata*). Where the scrub cover is less dense, Bramble scrub or stands of tall herb vegetation comprising of Great Willowherb (*Epilobium hirsutum*) or Rosebay Willowherb (*Chamerion angustifolium*) have established, refer to **Photos 3** and **4**.

3.2.12 In the north-western corner of the site the shallow soils and compacted ground over a storage area have been colonised by a sparse cover of ruderal pioneer herbs such as Creeping Bent (*Agrostis stolonifera*), Strawberry (*Fragaria vesca*), Hairy Sedge (*Carex hirta*), Great Willowherb, Colt's-foot (*Tussilago farfara*), Herb Robert (*Geranium robertianum*), Common Ragwort (*Senecio jacobaea*), Dove's-foot Crane's-bill (*Geranium molle*) and Butterfly Bush (*Buddleia* sp.) saplings. A small stand of approximately 10 Southern Marsh-orchid (*Dactylorhiza praetermissa*) spikes were also found immediately north of Building 1. Indian Balsam plants are scattered around this area, as annotated on **Figure 8.2**.

3.2.13 The establishing scrub does not currently conform to any NVC community. A plant species list is appended at **Table 8.2**.

Established Woodland

North-eastern Area of Site

3.2.14 As detailed on **Figure 8.2**, along both sides of the lodge and on steeply sloping ground to the south of Building 10 is established broadleaf woodland. Semi-mature to mature Pedunculate Oak (*Quercus robur*) dominates the canopy of the woodland in the north east of the site with locally frequent Goat Willow, Grey Willow and Sycamore.

- 3.2.15 The shrub layer is open but constant species comprise frequent Hawthorn (*Crataegus monogyna*), Holly (*Ilex aquifolium*) and Rhododendron (*Rhododendron ponticum*) with very locally frequent Guelder Rose (*Viburnum opulus*) and Beech (*Fagus sylvatica*).
- 3.2.16 The herb layer is sparse but supports constant Bramble and locally frequent Creeping Soft-grass (*Holcus mollis*). Stands of Bracken (*Pteridium aquilinum*) are abundant at the woodland margins. Woodland herbs are restricted to Broad Buckler-fern (*Dryopteris dilatata*), Male-fern (*D. filix-mas*), Hart's Tongue (*Phyllitis scolopendrium*) and Wood Avens (*Geum urbanum*) with a single plant of Common Polypody (*Polypodium vulgare*). The 2011 ecological survey (Baker Shepherd Gillespie, February 2011) reported the presence of Bluebell (*Hyacinthoides non-scripta*); no evidence of this species was found at the time of year the surveys were carried out. Tufted Hair-grass (*Deschampsia cespitosa*) is locally frequent and Wavy Hair-grass (*Deschampsia flexuosa*) is very locally frequent.
- 3.2.17 Both standing and fallen dead wood is present but there is no evidence that the woodland has received any management in recent years.
- 3.2.18 The woodlands has affinities with the W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* NVC community. A plant species list is appended at **Table 8.3**.

Woodland to the South of Building 10

- 3.2.19 The steeply sloping ground to the south of Building 10 is colonised by semi-mature trees comprising Poplar species, Ash, Goat Willow, Sycamore, Pedunculate Oak and Lombardy Poplar (*Populus nigra 'Italica'*).
- 3.2.20 The understorey supports abundant Common Nettle and Bramble with locally abundant Dogwood, Tufted Hair-grass, Cock's-foot, Ivy (*Hedera helix*) and Great Willowherb. Woodland herbs are limited to Male-fern, Wood Avens and Hart's Tongue.
- 3.2.21 The woodland is similar in species composition to the woodland in the north-eastern area of the site but modifications as a result of planting of non-native species and it's relatively small area (0.1 hectare) suggest this wooded fragment does not meet the criteria to be Priority Habitat.

Field of Improved Grassland

- 3.2.22 Immediately north of the Tetrosyl working area is a small (c. 1.6 hectare) field of short mown improved grassland, refer to **Photo 5**. Ribwort Plantain dominates the sward with frequent Perennial Rye-grass, Creeping Buttercup (*Ranunculus repens*) and locally abundant Yorkshire-fog, Smooth Meadow-grass (*Poa pratensis*), Rough Meadow-grass (*Poa trivialis*) and White Clover (*Trifolium repens*).
- 3.2.23 The grassland is species-poor and characteristic of the MG7 *Lolium perenne* ley community of the NVC. A plant species list is appended at **Table 8.4**.

Lodge (Pond 1)

- 3.2.24 The lodge extends an area of approximately 1.1 hectares, refer to **Table 8.5**. The lodge is fed from a water course that enters the site from a culvert beneath the M66 to the north. At the western boundary of the lodge, near Building 4 is a weir and overflow which takes water from lodge into a culvert beneath Building 5a.
- 3.2.25 The banks along the southern boundary of the lodge are formed by large stone and concrete boulders colonised by self-seeded Goat Willow and Alder (*Alnus glutinosa*) scrub. At the western and eastern boundaries are stone retaining walls that separate the water from the established woodland and areas of built development.

- 3.2.26 The lodge supports limited vegetation with the exception of local stands of Brooklime (*Veronica beccabunga*) and Yellow Water-lily (*Nuphar lutea*) associated with the shallow water near the weir.

Land South of Mill Road

- 3.2.27 The site boundary includes a small (0.2 hectares) parcel of land outside of the Tetrosyl site border and south of Mill Road.
- 3.2.28 The area supports neutral grassland composed of Red Fescue, Cock's-foot and Ribwort Plantain bordered by dense Bramble scrub and Great Willowherb tall-herb vegetation and semi-mature Goat Willow, Crack Willow (*Salix fragilis*) and Ash trees.

Invasive Plant Species

- 3.2.29 As annotated on **Figure 8.2**, four invasive non-native species (INNS) were recorded at the site namely:
- a. An established stand of Japanese Knotweed at the southern site boundary;
 - b. A couple of plants of Montbretia (*Crocasmia x crocosmiiflora*) at the margin of the compacted ground storage area in the north-western area of the site;
 - c. Scattered plants of Indian Balsam around the margins of the compacted ground storage area in the north-western area of the site and at the weir where water from the lodge enters a culvert beneath Building 4; and
 - d. Rhododendron shrubs within the oak woodland (not annotated on Figure 8.2).
- 3.2.30 All these INNS are listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), and it is an offence to spread or cause their spread in the wild. This is considered further at **Section 4.3**.

3.3 Animal Life

Badger

- 3.3.1 Please refer to the separate 'Badger Survey and Assessment' addendum (ERAP (Consultant Ecologists) Ltd, December 2018).

Bat Species

Roosting Bats

- 3.3.2 The report of licensed bat surveys carried out in 2017 and 2018 is appended at **Appendix 2**.
- 3.3.3 In summary:
- a. Buildings 3, 5, 6 and 7 are assessed to have a high suitability for use by roosting bats;
 - b. Buildings 9 and 11c are assessed to have a moderate suitability for use by roosting bats;
 - c. Buildings 4, 13 and 14 are assessed to have a low suitability for use by roosting bats;
 - d. Buildings 1, 2, 8, 10, 11a, 11b and 11d, 12, 15, 16 are assessed to have negligible suitability for use by roosting bats;
 - e. A common pipistrelle bat day roost (maximum three bats) was recorded in the stone wall at the northern elevation of Building 3 on all survey dates (Roost 1);
 - f. No bat exit or entry activity was recorded at the culvert entrances;

- g. No evidence of use of the common pipistrelle day roosts (Roosts A to C) previously recorded at Buildings 5 and 7 in 2010 was recorded;
- h. No evidence of use of the common pipistrelle day roosts (Roosts D and E) previously recorded at Buildings 5a/5b and 6 in 2015 was recorded;
- i. The presence of a maternity roost is reasonably discounted owing to the results of the 2010, 2015 and 2017 bat activity surveys and the absence of suitable conditions;
- j. Use of the buildings, particularly crevices in the stone buildings (Buildings 3, 5, 6 and 7) and the underarch of the stone culverts is possible and precautionary measures prior to demolition are necessary; and
- k. Only two bat species were recorded at the site by the surveyors and the Anabat detector recordings and comprise common pipistrelle which was recorded on all surveys and two brief passes of a *Myotis* species over the lodge on 30th August 2017 and a brief pass at surveyor position 6 on 16th August 2017.

Habitat Assessment for Commuting / Foraging Bats

- 3.3.4 The lodge and wooded belts are of moderate suitability for use by foraging bats. The areas of hard-standing and developed areas are of low suitability for the attraction of an abundance and / or diversity of foraging bats as these areas are unlikely to provide an abundance or diversity of invertebrate prey. This is demonstrated by the results of the bat transect surveys, as described below.

Bat Activity Surveys: Transects

- 3.3.5 **Tables 3.3** and **3.4** show the bat species recorded at each spot count location and between the spot counts during the transect surveys; raw data are appended at **Tables 8.5** and **8.6**. Only one species was recorded (common pipistrelle) throughout all surveys. **Figure 8.3**, appended, illustrates the route of the transect, the spot count locations and all recorded bat activity.

Table 3.3: Summary of Survey Results: Repetition 1: 9th August 2018

	Common Pipistrelle Pass Counts at Each Spot Count Location					Total
	1	2	3	4	5	
Transect circuit 1	0	0	1	18	2	21
Transect circuit 2	4	0	0	27	-	31
Transect circuit 3	-	1	5	3	-	9
Maximum number of passes during any transect circuit	4	1	5	27	2	N/A
¹ Sunset time was 20:57. The survey started at 20:50 and ended at 22:55. All detected echolocation calls were of common pipistrelle. The first detected call was at 21:17, 20 minutes after sunset, and the latest call was detected at 22:55. 64 passes were detected during the transect survey, 61 of which (i.e. 95%) were detected during the spot counts.						

Table 3.4: Summary of Survey Results: Repetition 2: 24th August 2018

	Common Pipistrelle Pass Counts at Each Spot Count Location					Total
	1	2	3	4	5	
Transect circuit 1	0	0	0	0	0	0
Transect circuit 2	0	1	0	1	-	2
Transect circuit 3	0	0	0	0	-	0
Total number of passes over whole survey	0	1	0	1	0	N/A
¹ Sunset time was 20:19. The survey started at 20:19 and ended at 22:26. The first detected call was at 21:22, 1 hour and 2 minutes after sunset, and the latest call was detected at 21:53. Three passes were detected during the transect survey, 2 of which (i.e. 67%) were detected during the spot counts.						

- 3.3.6 Low levels of common pipistrelle activity were detected during the surveys. The greatest level of bat activity was detected at Spot Count Location 4, refer to **Figure 8.3**; this is comparable with observations made during the dawn re-entry surveys.
- 3.3.7 Use of the site by a diversity of bat species and a high level of bat activity has not been regularly detected, it is considered that the site is used by the recorded species (namely common pipistrelle) for foraging as part of a wider network of habitats.

Bird Species

Barn Owl

- 3.3.8 No evidence of barn owl was found during the daylight survey of the buildings. One barn owl was observed flying over the lodge during the bat transect survey on the 9th August 2018, the owl flew into the site from the east, over the lodge, towards the M66.

Other Schedule 1 Bird Species

- 3.3.9 No evidence of use of the site by other relevant schedule 1 birds namely black redstart or peregrine was recorded.

Bird Species Detected During Breeding Bird Surveys 2017 and 2018

- 3.3.10 Birds detected during the site visits in 2017 are listed below.

Table 3.5: Bird Species Detected at the Site in 2017

Scientific Name	Common Name	Location / Habitat	Nesting Recorded / Likely on Site?	BOCC Status ¹
<i>Anas platyrhynchos</i>	Mallard	Three birds on the lodge	Yes	Amber
<i>Cinclus cinclus</i>	Dipper	Associated with the weir at the west side of the lodge (possibly nesting in culvert)	Yes	Amber
<i>Columba livia domestica</i>	Feral pigeon	At the buildings	Yes	-
<i>Columba palumbus</i>	Wood pigeon	In the woodland / scrub at the site margins	Yes	Green
<i>Corvus monedula</i>	Jackdaw	On roofs of buildings	Possible	Green
<i>Erithacus rubecula</i>	Robin	In the woodland / scrub at the site margins	Yes	Green
<i>Gallinula chloropus</i>	Moorhen	Single bird on the lodge	Yes	Green
<i>Phalacrocorax carbo</i>	Cormorant	Single bird on the lodge	No	Green
<i>Pica pica</i>	Magpie	In the woodland / scrub at the site margins	Yes	Green
<i>Prunella modularis</i>	Dunnock	In the woodland / scrub at the site margins	Yes	Amber
<i>Troglodytes troglodytes</i>	Wren	In the woodland / scrub at the site margins	Yes	Green
<i>Turdus merula</i>	Blackbird	In the woodland / scrub at the site margins	Yes	Green

¹BOCC: Birds of Conservation Concern (Eaton, et al., 2015).
Priority Species are presented in **bold** for ease of reference.

- 3.3.11 These data are supplemented by the data at **Tables 8.7 to 8.9** and presented on **Figures 8.4 and 8.5**, appended.

3.3.12 The 2018 breeding bird surveys confirmed the following:

- a. 35 species of bird were recorded over the two survey repetitions;
- b. Three breeding Priority Species namely song thrush, dunnoek and bullfinch were recorded at the woodland and scrub bordering the lodge;
- c. Waterfowl / wading species recorded as breeders at the lodge (or at the banks) comprise mallard, common sandpiper (*Actitis hypoleucos*) (one pair) and Canada goose (*Branta canadensis*) (family);
- d. Birds recorded visiting the lodge comprise heron, Muscovy duck (*Cairina moschata*), black-headed gull, grey wagtail (*Motacilla cinerea*) and golden plover (*Pluvialis apricaria*);
- e. Oystercatcher (*Haematopus ostralegus*) was recorded flying over the lodge on survey repetitions 1 and 2 and resting in the field of improved grassland to the north of the Tetrosyl site during survey repetition 2;
- f. Species associated with the buildings comprised feral pigeon associated with Buildings 4a, 5b and 7 and one kestrel (*Falco tinnunculus*) resting at Building 6 during both surveys;
- g. Swift were recorded nesting at Building 5a;
- h. Swallow (*Hirundo rustica*) and lesser black-backed gull (*Larus fuscus*) were recorded in flight over the site only;
- i. The other 18 bird species are passerine species associated with the woodland and shrub bordering the site and comprise the following breeders blackbird, blackcap (*Sylvia atricapilla*), blue tit (*Cyanistes caeruleus*), carrion crow (*Corvus corone corone*), chiff-chaff (*Phylloscopus collybita*), chaffinch (*Fringilla coelebs*), coal tit (*Periparus ater*), goldfinch (*Carduelis carduelis*), greenfinch (*Chloris chloris*), great spotted woodpecker (*Dendrocopos major*), great tit (*Parus major*), jay (*Garrulus glandarius*), long-tailed tit (*Aegithalos caudatus*), magpie, nuthatch (*Sitta europaea*), robin, wood pigeon and wren. As expected the species more typically associated with woodland habitats namely nuthatch, great spotted woodpecker and chiff-chaff were generally recorded within the established woodland habitats along the eastern and north-western margins of the lodge.

Great Crested Newt (GCN) and Other Amphibian Species

- 3.3.13 In accordance with the HSI, refer to **Table 8.10**, appended, Pond 1 is of 'poor' suitability for great crested newt. The poor result is influenced by the large size of the pond, the presence of coarse fish (a predator of great crested newt larvae and eggs) and the absence of macrophytes and opportunities for egg laying.
- 3.3.14 The consideration of this score, in combination with the absence of any known great crested newt records at the site (as informed by ecological surveys carried out to support planning applications made in 2003 and 2011), and the background information provided by Bury Council in their letter dated April 2011 which indicates surveys at the lodge undertaken in 2003 and 2005 that confirmed an absence of GCN, provides appropriate survey evidence to conclude that the presence of great crested newt at Pond 1 is not reasonably likely.
- 3.3.15 The reported presence of common toad, a Priority Species, and possible presence of common frog and smooth newt species is recognised in this assessment and is discussed in **Section 5.0**.

Reptiles

- 3.3.16 Random samples of debris suitable for sheltering and basking reptiles was examined during the survey; no reptile species were found.

- 3.3.17 The site is not adjacent or linked to any areas of favourable habitat for reptile species, and there are no records of reptile for the site or the wider area. The presence of reptiles within the site is reasonably discounted.

Water Vole

- 3.3.18 The banks of the channel leading from the M66 to the lodge are stone lined and unsuitable for use by water vole. The lodge retaining banks are constructed from large boulders and solid stone retaining walls, refer to **Photo 6**; none of these conditions are suitable for use by water vole. No evidence of water vole was detected during the survey in July 2018; the presence of this species is reasonably discounted.

Otter

- 3.3.19 No evidence of an otter holt was found at the margins of the lodge.
- 3.3.20 No field signs of otter (such as spraints or dead fish) were recorded at the site. There are no reported records of otter in the area and / or the lodges north of the site and the connectivity to other watercourses to the south is limited by the presence of culverts and existing developed land.
- 3.3.21 Owing to the presence of connectivity between the lodge at the site and the watercourse and fishing lodges north of the site (Baldingstone SBI and Gindles Farm BHS) use of the site by feeding otter cannot be entirely discounted, however, for reasons given above the presence of this species is not reasonably likely.

Aquatic Invertebrates

- 3.3.22 **Table 8.11**, appended presents a list of the aquatic invertebrates recorded at the lodge and inflow stream. Sixty species were recorded in total (41 at the lodge and 27 at the inflow stream).
- 3.3.23 One adult brown hawker dragonfly (*Aeshna grandis*) was observed. Larvae of brown hawker were found in the lodge together with larvae of the large red damselfly (*Pyrrosoma nymphula*); larvae of two other species of damselfly were found in the lodge but were too young and small for accurate identification.
- 3.3.24 A single adult specimen of the iron blue mayfly (*Baetis muticus*) was seen flying by the inflow stream where one other adult mayfly was seen but not caught. Adults of the Willow Stonefly (*Leuctra geniculata*) were seen by the inflow stream where their larvae were also seen. No adult caddisflies were detected.
- 3.3.25 None of the recorded species are European protected species, protected under the *Wildlife and Countryside Act 1981* (as amended), are Priority Species or Greater Manchester BAP species. None of the recorded species are listed as invasive species on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended).
- 3.3.26 The surveyors reported that the limited diversity of macroinvertebrate fauna is attributed to the low habitat diversity within the lodge and that the presence of abundant shredders of dead leaves; such as the water hoglouse is attributed to the overhanging trees and availability of leaf detritus.
- 3.3.27 No swan mussels were detected, although a single empty shell of the duck mussel (*Anodonta anatina*) was brought up by the dredge.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

- 4.1.1 The proposals comprise the redevelopment of the existing Tetrosyl site and the associated lodge to residential housing. The current proposals are illustrated on the Planning Layout drawing number 456/P/PL/02 Rev E prepared by Barratt Manchester. To create a viable site it is understood that the proposals will involve:
- a. Demolition of all buildings;
 - b. Remediation and re-grading of the site to create suitable development platforms;
 - c. Infilling of the lodge (to a greater extent than previously approved in 2012), in conjunction with the removal of a culvert to create an open channel and an on-line pond; and
 - d. Avoidance of any new development within the Green Belt and retention of the Green Belt land within the north-eastern area of the site as public open space / area for ecological mitigation and enhancement.
- 4.1.2 As detailed in **Section 5.2**, the ecological surveys carried out in 2017 and 2018 have informed the preparation of the detailed site layout to support this full planning application.
- 4.1.3 **Section 5.2** of this report and the separate Badger Survey and Assessment report (ERAP (Consultant Ecologists) Ltd, December 2018) present the measures that have been incorporated into the site layout to comply with principles of the National Planning Policy Framework (NPPF), local planning policy, relevant wildlife legislation, Natural England's standing advice in relation to protected species and best practice. The ecological input has paid particular consideration to conserving and creating wildlife links / Green Infrastructure and maximising opportunities for biodiversity within the built environment to satisfy local planning policy requirements and in accordance with good practice.

4.2 Designated Sites for Nature Conservation

Statutory Designated Sites

- 4.2.1 Due to the distance between the site and the statutory designated sites for nature conservation in the wider area and the absence of complementary habitats, adverse direct and indirect impacts on statutory designated sites are reasonably discounted.

Non-statutory Designated Sites

- 4.2.2 As the lodge is downstream of the Gindles Farm BHS and Baldingstone SBI on the opposite (northern) side of the M66 motorway it is imperative that any alterations to the current management of water and flow rates do not adversely affect the upstream and downstream habitats, particularly those associated with the non-statutory designated sites for nature conservation and their features of special interest.
- 4.2.3 This has been explored further and it is understood that the lodge (Pond 1) at the site has a neutral attenuation value (i.e. the same volume of water that enters the lodge from the north leaves the lodge via the weir overflow); the lodge is understood to have no storm water attenuation purpose. At this stage it is reasonably concluded that works at the site will have no adverse effect on the upstream designated sites.

4.3 Vegetation and Habitats

- 4.3.1 None of the habitats present are species-rich or of rare or restricted distribution with the UK. The NVC communities present are typical of the geographical area and conditions present.
- 4.3.2 Approximately 6 hectares (almost 60%) of the site is occupied by buildings and hard-standing which is devoid of vegetation and therefore of no ecological value in terms of plant species.
- 4.3.3 The woodland habitats, particularly the established woodland associated with the eastern and north-western margins of the lodge to total an area of c. 0.4 hectares is characteristic of the W10 woodland community and is therefore Lowland Mixed Deciduous Woodland Priority Habitat. The presence of Priority Habitat, albeit limited in area, and the habitat connectivity function and opportunities for biodiversity it provides is of value at the local level.
- 4.3.4 Owing to the reported presence of breeding common toad, a Priority Species, the lodge meets the criteria under the Pond Priority Habitat description.
- 4.3.5 The presence of invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), namely Japanese Knotweed, Indian Balsam, Rhododendron and Montbretia is a consideration. The redevelopment will provide a mechanism to eradicate these species from the site and / or prevent the risk of spread into the retained habitat in the site and habitats in the wider area; guidance is provided at **Section 5.5**.

4.4 Protected Species and Other Wildlife

Bats

- 4.4.1 As detailed at **Appendix 2**, appropriate and proportionate survey effort, in accordance with standard survey guidelines (Collins, J. (ed), 2016), has been applied to survey and assess the buildings / structures and trees for their suitability for use by roosting bats.
- 4.4.2 The common pipistrelle day roost recorded at Building 3 (Roost 1) is of 'low' conservation significance in accordance with Figure 4 of the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004), and appropriate and proportionate mitigation for the loss of the roost as a result of the demolition is entirely feasible.
- 4.4.3 No further survey or assessment in relation to bats is needed to inform the application for the relevant Natural England licence to facilitate the demolition, *provided* works are carried out before May 2019 (i.e. the next bat activity season). If commencement of works is delayed beyond May 2019, an updated bat activity survey will be required to inform the licence application.
- 4.4.4 Habitats within and adjacent to the site are suitable for foraging and commuting bats. Recommendations relating to the retention of features suitable for use by foraging and commuting bats, and features to enhance habitats for roosting bats at the site are presented at **Section 5.8**.

Badger

- 4.4.5 The Badger Survey and Assessment addendum (ERAP (Consultant Ecologists) Ltd, December 2018) provides an evaluation and assessment of the site and proposals in relation to badger.

Other Protected Species

- 4.4.6 Appropriate and proportionate survey effort and assessment have been applied to examine the site for other protected species.
- 4.4.7 The proposals can be achieved with no adverse effect on other relevant protected species namely water vole, otter, Schedule 1 birds, great crested newt and reptile species.

- 4.4.8 Habitats at the site are suitable for use by nesting birds, including Priority Species such as dunnoek. Guidance is presented at **Section 5.9** in relation to the protection of nesting birds and the conservation and enhancement of opportunities for nesting and foraging birds at the site in the long-term.

4.5 Summary of Assessment

- 4.5.1 The proposals can be achieved with no adverse direct or indirect effect on designated sites for nature conservation.
- 4.5.2 The presence of two Priority Habitats (Pond and Lowland Mixed Deciduous Woodland) is capable of being a material consideration in connection with a planning decision. The essential re-grading of the banks of the lodge and creation of a functioning drainage system at the redeveloped site will result in the temporary loss of the open water habitat from the site, however, in the long-term open water suitable for use by breeding common toad and invertebrates will be retained at the site, refer to **Figure 8.6**.
- 4.5.3 In addition, whilst the engineering works around the lodge are essential, through liaison between ERAP and the engineers all efforts have been made to avoid encroachment into the wooded areas bordering the existing lodge to ensure this Priority Habitat and its habitat connectivity function is conserved, refer to **Sections 5.2** and **5.11**.
- 4.5.4 Mitigation and compensation for protected species, namely roosting bats and badger, and Priority Species such as common toad and nesting birds, is entirely feasible, as detailed in **Section 5.0**, **Appendix 2** and the Badger Survey and Assessment addendum (ERAP (Consultant Ecologists) Ltd, December 2018).
- 4.5.5 The redevelopment proposals can be achieved whilst providing compensatory and enhanced opportunities for fauna such as nesting birds and roosting bats.
- 4.5.6 Provided the guidance in **Section 5.0** and **Appendix 2** of this report and the Badger Survey and Assessment addendum is implemented no significant ecological constraints on the demolition and redevelopment proposals have been identified.

5.0 MANDATORY ACTIONS, RECOMMENDATIONS AND ENHANCEMENT FOR BIODIVERSITY

5.1 Introduction

- 5.1.1 The mandatory actions and recommendations outlined below aim to ensure that the development is implemented in accordance with all wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.
- 5.1.2 The recommendations are appropriate and proportionate to the findings of the baseline ecological survey and the likely impacts of the redevelopment proposals.
- 5.1.3 This section of the report outlines the measures to be applied to protect Priority Habitat, protected species and Priority Species. Where impacts on these identified features of ecological interest are unavoidable, the mitigation and, where necessary, compensatory measures are described in appropriate detail to facilitate the progression of a planning application.
- 5.1.4 Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek a net gain for biodiversity through appropriate landscape planting and habitat creation have been identified, as required by the NPPF and other relevant planning documents.

5.2 Recommendations in Relation to Site Layout

5.2.1 The following ecological guidance has informed the preparation of the Planning Layout:

- a. Maximise the retention of areas of woodland and scrub, including the 0.4 hectare area of oak woodland identified as Priority Habitat and bring the retained areas into active management in accordance with conservation objectives, refer to **Sections 5.10 to 5.12**;
- b. Arrange the layout to ensure the protection of badger, their habitats and survival / welfare requirements as much as possible, refer to separate addendum (ERAP (Consultant Ecologists) Ltd, December 2018);
- c. Ensure an opportunity for breeding amphibians, nesting waterfowl, fish and a fresh source of drinking water for fauna such as badger is retained at the site and managed in accordance with conservation objectives in the long-term, refer to **Section 5.11**;
- d. Ensure the retention of a permanent area of open water and opportunity for breeding common toad and aquatic invertebrates and thereby conserve Pond Priority Habitat at the site (and secure active management in the long-term);
- e. Avoid culverting of watercourses and, where possible, maximise the length of open channel to be created;
- f. Use of native trees and shrubs in the landscape planting schedule, refer to **Sections 5.10 and 5.11**;
- g. Appropriate and sensitive use of lighting to avoid impacts on crepuscular wildlife, refer to **Section 5.8**;
- h. Arrangement of contiguous rear gardens at the new properties to maximise the value of greenspace created by gardens;
- i. Lifting of plot boundary fences by 0.1 to 0.15 metres from the ground to create a permeable site and permit passage of wildlife such as hedgehog and common toad;
- j. Alignment of new properties to face areas of retained habitats and ecological protection zones (rather than properties backing on to these areas) to minimise the likelihood of potentially harmful operations such as rear garden extensions and fly-tipping of invasive and non-native plant species; and
- k. Maximise the incorporation of opportunities for use by nesting birds and roosting bats at the site as part of good design (in addition to the mandatory provisions required by the Natural England licensing process) and to achieve a net gain for biodiversity in accordance with the principles of the NPPF, refer to **Sections 5.8 and 5.9**.

5.3 Preparation of a Construction Environmental Management Plan (CEMP) for Biodiversity

5.3.1 The detail of the measures to be applied for the protection of biodiversity during the construction phase will be presented in a Construction Environmental Management Plan (CEMP) for Biodiversity. The CEMP can form the subject of a suitably worded planning condition and at this site will include:

- a. Detail of the tree protection fencing, refer to **Section 5.4**;
- b. Cross-reference to the Invasive Species Management Plan, refer to **Section 5.5**;
- c. Compliance with and implementation of the relevant Pollution Prevention Guidelines (PPG) prepared by the Environment Agency, refer to **Section 5.4**;
- d. Cross-reference to the Badger Mitigation Strategy and works to be licensed by Natural England, refer to separate addendum report (ERAP (Consultant Ecologists) Ltd, December 2018);

- e. Cross-reference to the Lodge Drainage and Fish Rescue Strategy to be applied, refer to **Section 5.7**;
- f. Cross-reference to a common toad mitigation strategy to be applied during the draining of the lodge and site preparation works;
- g. Cross-reference to the Bat Mitigation Strategy and works to be licensed by Natural England, refer to **Appendix 2**; and
- h. The protection afforded to nesting birds and the mandatory actions to be applied during building demolition and vegetation clearance, refer to **Section 5.9**.

5.4 Protection of Existing Vegetation and Water Quality During Construction

Woodland, Trees and Habitats to be Retained

- 5.4.1 During the construction phase, temporary protective demarcation fencing will be used to protect the woodland, trees, shrubs and other vegetation to be retained. The fencing must remain in position until construction operations are completed to ensure protection is provided throughout the construction phase.
- 5.4.2 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Water Quality

- 5.4.3 To protect water quality during construction, the following Pollution Prevention Guidelines (PPG) will be adhered to:
 - a. PPG1: Basic good environmental practices (Environment Agency, 2013);
 - b. PPG5: Works in, near or over watercourses (Environment Agency, 2014);
 - c. PPG6: Construction and demolition sites (Environment Agency, 2012); and
 - d. PPG7: Operating refuelling sites (Environment Agency, 2011).

5.5 Invasive Species

- 5.5.1 It is an offence under the *Wildlife and Countryside Act 1981* (as amended) to cause the spread of Japanese Knotweed, Indian Balsam, Montbretia and Rhododendron in the wild.
- 5.5.2 The preparation of an Invasive Species Management Plan will be necessary to describe how the plants will be managed and eradicated. Owing to the presence of protected species it is not recommended that all the Rhododendron is removed from the retained areas of woodland. The Rhododendron may be managed in selected areas and this will be dealt with under the Habitat Management Plan to be prepared for the site, refer to **Section 5.12**.
- 5.5.3 In consideration of the Indian Balsam and Japanese Knotweed ERAP (Consultant Ecologists) Ltd recommend a specialist firm is appointed, such as Knotweed Eradication (<http://www.knotweederadication.co.uk> / 01772 621013), to provide guidance and prepare the Plan.
- 5.5.4 Montbretia should be eradicated by grubbing out by the roots / bulbs during construction works and appropriate disposal; no other operations are necessary.

5.6 Badger

- 5.6.1 The strategy as outlined in the Badger Survey and Assessment addendum (ERAP (Consultant Ecologists) Ltd, December 2018) has been incorporated into the site layout and the specific actions for the protection of badger both during the construction phase and in the long-term will be applied.

5.7 Lodge Drainage and Fish Rescue Strategy and Common Toad Mitigation Strategy

- 5.7.1 To ensure the protection of biodiversity, a Lodge Drainage and Fish Rescue Strategy will be prepared. The Strategy will detail:
- a. The appropriate timing of works to avoid adverse effects on breeding waterfowl, invertebrates and amphibians;
 - b. The services of a Fish Handler such as Blue Slate Fisheries (<http://blueslatefishery.co.uk/contact/>) will be commissioned to ensure the appropriate permits are obtained and measures are applied for the protection of fish welfare. ERAP (Consultant Ecologists) Ltd has been in discussion with the fish handler in relation to the strategy to be applied;
 - c. The sequence of works to minimise disruption to wildlife; and
 - d. Measures to be applied to attempt to deter mass predation by gulls of relatively immobile aquatic fauna such as molluscs.
- 5.7.2 A Common Toad Mitigation Strategy will be prepared to describe the measures to be applied to avoid impacts on common toad during the draining down of the lodge and site preparation works.

5.8 Bats

Mitigation Strategy

- 5.8.1 A Bat Mitigation Strategy and consideration of licensing requirements are detailed at **Appendix 2**.

Updated Surveys

- 5.8.2 The 2017 and 2018 survey data are only valid until May 2019. As detailed in **Section 9.11**, and in accordance with Natural England guidance, if a licence application is delayed beyond May 2019, an updated bat activity survey will be required to support the licence application and facilitate the demolition works.

Lighting

- 5.8.3 Paragraph 180, bullet point 'c' in Chapter 15 (conserving and enhancing the natural environment) of the NPPF states that development should:

'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

- 5.8.4 The lighting scheme to be implemented at the redeveloped site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over habitats identified to be of value for use by foraging bats and other fauna such as the retained woodlands, the new pond and the new open water channel, as lighting overspill may deter use by wildlife.
- 5.8.5 The lighting scheme will be designed with reference to current guidance, namely:

- a. *Guidance Note 8: Bats and Artificial Lighting in the UK* (Institution of Lighting Professionals & Bat Conservation Trust, 2018); and
- b. Bats and lighting: Overview of current evidence and mitigation guidance (Stone, 2014).

Enhancing the Site for Use by Roosting Bats

- 5.8.6 In addition to the mandatory compensatory provisions for roosting bats, required as part of the licensing process detailed at **Appendix 2**, it is recommended that the redeveloped site incorporates the installation of commercially available bat access panels at the new properties.
- 5.8.7 The bat access panels should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting and existing linear features. The access panels should not be positioned over windows or doorways where bat droppings may become a nuisance. Once the site layout has been finalised, an ecologist will advise on appropriate positions for the bat access panels. Suitable bat access panels are available from NHBS Ecology (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com) and are presented below:



Insert 1: Examples of commercially available bat access panels and externally mounted boxes
Left to right: IBstock Enclosed Bat Box 'c' (left); Habibat Bat Access Panels (centre left and centre right) and Greenwood's Ecohabitats box (right)

Enhancing Habitats for Roosting Bats within the Retained and Created Habitats

- 5.8.8 The details of the measures to be applied to enhance the retained woodland habitats for roosting bats, such as the installation of bat boxes, are annotated on **Figure 8.6**.
- ## 5.9 Birds
- ### Protection
- 5.9.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are nesting.
 - 5.9.2 It is advised that any works such as building demolition and vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-work nesting bird survey, carried out by a suitably experienced ecologist. The bird breeding season typically extends between March to August inclusive.
 - 5.9.3 If breeding birds are detected the ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the site until the young birds have fledged.

Enhancing Habitats for Nesting Birds within the Built Environment

- 5.9.4 In addition to the installation of opportunities for nesting birds at the retained areas of woodland, refer to **Section 5.10**, it is recommended that provision for nesting birds is provided at the built environment.

House Sparrow

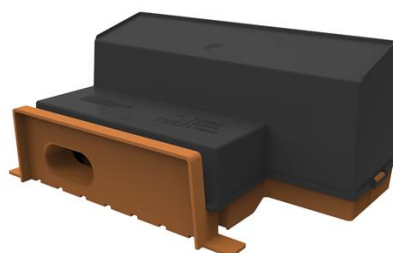
- 5.9.5 House sparrows are associated with suburban areas. Monitoring suggests a severe decline in the UK house sparrow population, estimated as dropping by 71 per cent between 1977 and 2008 with substantial declines in both rural and urban populations (RSPB, 2018).
- 5.9.6 The installation of house sparrow terrace nest boxes is recommended at the new properties. The boxes will be not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. An example of a suitable house sparrow bird box is given below, in **Insert**, below:



Insert 2: Schwegler 1SP House Sparrow Nesting Terrace

Swift

- 5.9.7 Swift nest boxes should be installed beneath the eaves of taller properties, as shown in **Insert 3**, below.



Insert 3: Manthorpe GSWB Swift Nest Box

- 5.9.8 ERAP (Consultant Ecologists) Ltd will advise on the siting of the bird boxes, as required.

Enhancing Habitats for Nesting Birds within the Retained and Created Habitats

- 5.9.9 The details of the measures to be applied to enhance the retained woodland habitats and created habitat such as the open water channel and new pond for nesting birds are described below and annotated on **Figure 8.6**.

5.10 Enhancement of Existing / Retained Habitats

Retained Woodland

- 5.10.1 It is recommended that the retained woodland habitat is brought into active management and enhanced in accordance with conservation objectives. Suggested recommendations comprise:
- Selective felling / thinning of self-seeded Ash and Goat Willow shrubs and saplings to permit light penetration to the herb layer;
 - Installation of bird boxes suitable for a range of species i.e. boxes with hole entrances for blue tit and open-fronted boxes suitable for use by robin;
 - Installation of bat boxes;
 - Creation of dead wood habitat piles for colonisation by invertebrates, fungi and small mammals including hedgehog (*Erinaceus europaeus*), a Priority Species; and
 - Introduction of native woodland herb plug plants typically present in a W10 woodland such as Red Campion (*Silene dioica*), native bluebell (*Hyacinthoides non-scripta*) and Wood Anemone (*Anemone nemorosa*).

Retained Grassland

- 5.10.2 In addition to its amenity function, the ecological value of the retained grassland in the north-eastern corner of the site will be enhanced by the seeding of areas of wildflower grassland and native scrub planting. The grassland lies adjacent to the land allocated as a Wildlife Links and Corridor and Link in the Bury UDP; the landscape planting will seek to supplement the function and value of the corridor.

5.11 Habitat Creation and Enhancement and Landscape Planting

New Pond

- 5.11.1 The proposed redevelopment will involve the loss of the existing lodge. To ensure the function of this Priority Habitat and an opportunity for breeding waterfowl, amphibians, foraging bats and a fresh water drinking water source is retained at the site, the inflow at the north-eastern area of the site will be modified to create a new pond. The new pond will be constructed and enhanced in accordance with the following principles and will be managed to promote Priority Habitat:
- An area of at least 1000m²;
 - Shallow sloping margins on at least one side to facilitate access by wildlife and colonisation by marginal plants;
 - Invert levels to achieve a water depth of 0.8 metres (and a maximum of 1.1 metres);
 - A profile and outflow channel / pipe invert level that ensures the creation of calm water;
 - Introduction of native aquatic plants, as appropriate;
 - Seeding of the pond banks with wildflower grassland, as appropriate.

New Open Water Brook Channel

- 5.11.2 The redevelopment provides an opportunity to open up the culverted sections of brook and create an open channel to provide habitat connectivity and habitats for flora and fauna. The exact detail of the channel is not known at this stage but the channel will be created and landscaped in accordance with the following principles:

- a. A meandering course to create a varied flow and areas of riffles and pools;
- b. Landscape planting to be complementary to the Oak and Birch woodland in the local area; and
- c. Marginal seeding of native low maintenance grassland with wildflowers.

Habitat Between the New Pond and the M66

- 5.11.3 As annotated on **Figure 8.6**, the woodland belt between the new pond and the M66 motorway will be planted with native trees and shrubs to complement the existing habitats and enhance and supplement the wildlife corridor function.

New Hedgerow

- 5.11.4 It is recommended that the demarcation between the residential development and the open space to the north is demarcated with a native hedgerow, refer to **Figure 8.3**.

Landscape Planting within the Residential Areas

- 5.11.5 It is recommended that the landscape planting within the residential site is composed from native species and species known to be of value for the attraction of wildlife.
- 5.11.6 It is recommended that trees which support blossom and fruit which will attract insects are selected. Suitable species are presented below.

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acer campestre</i>	Field Maple	<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel	<i>Rosa arvensis</i>	Field Rose
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa canina</i>	Dog-rose
<i>Ilex aquifolium</i>	Holly	<i>Sambucus nigra</i>	Elder
<i>Malus sylvestris</i>	Crab Apple	<i>Sorbus aucuparia</i>	Rowan
<i>Prunus avium</i>	Wild Cherry	<i>Ulmus glabra</i>	Wych Elm
<i>Prunus padus</i>	Bird Cherry	<i>Viburnum opulus</i>	Gelder Rose

- 5.11.7 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.11.8 Planting schemes that include flowering species such as *Viburnum*, *Ceanothus*, *Hebe*, *Lavandula*, *Lonicera*, *Potentilla*, *Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.

5.12 Landscape and Habitat Management Plan

- 5.12.1 To secure the long-term benefits for biodiversity associated with the scheme a Landscape and Habitat Management Plan will be prepared. The Plan will detail the objectives and prescriptions to be applied to maximise the biodiversity value of retained and new habitats and can be secured by an appropriately worded planning condition.

6.0 CONCLUSION

- 6.1 This ecological appraisal has demonstrated that demolition and re-development proposals at the Tetrosyl site can be achieved with no adverse effect on designated sites for nature conservation.

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- 6.2 The protection of woodland Priority Habitat and retention of the conservation function of pond Priority Habitat will be retained at the site.
- 6.3 Mitigation for protected species, namely roosting common pipistrelle bats and badger and Priority Species such as common toad and nesting birds is entirely feasible. This report demonstrates that the relevant tests of the Habitats Regulations will be satisfied (**Appendix 2**).
- 6.4 Protection of nesting birds and recommendations for the provision of compensatory and enhanced habitats and opportunities for nesting birds are feasible and can be accommodated (**Sections 5.2, 5.9 to 5.12**).
- 6.5 Measures to conserve the habitat connectivity and Green Infrastructure function through and around the site are entirely feasible (**Section 5.2 and 5.10 to 5.11**).
- 6.6 Redevelopment at the site will provide an opportunity to secure ecological enhancement for fauna typically associated with residential areas such as breeding birds and roosting bats and the positive management of retained and created habitats in accordance with conservation objectives.

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8.0 APPENDIX 1: TABLES AND FIGURES

Table 8.1: Plant Species List for the Mown Grassed Verges Within the Tetrosyl Site

Scientific Name	Common Name	DAFOR ¹	Cover
Woody Species			
<i>Acer campestre</i>	Field Maple	LF	2%
<i>Acer pseudoplatanus</i>	Sycamore	O	<1%
<i>Betula pendula</i>	Silver Birch	O	<1%
<i>Corylus avellana</i>	Hazel	VLF	<1%
<i>Fraxinus excelsior</i>	Ash	VL	<1%
<i>Populus</i> sp.	Poplar species	LA	2%
<i>Prunus</i> sp.	Cherry species	O	1%
<i>Salix caprea</i>	Goat Willow	VLF	<1%
Grassland Species			
<i>Achillea millefolium</i>	Yarrow	VLF	<1%
<i>Agrostis capillaris</i>	Common Bent	LA/F*	5%
<i>Anthriscus sylvestris</i>	Cow Parsley	VLF	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	VLA	1%
<i>Dactylis glomerata</i>	Cock's-foot	LA/F*	5%
<i>Festuca rubra</i>	Red Fescue	LA/F*	5%
<i>Galium aparine</i>	Cleavers	VLA	<1%
<i>Geranium robertianum</i>	Herb-robert	VLA	<1%
<i>Hedera helix</i>	Ivy	VLA	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F	10%
<i>Lolium perenne</i>	Perennial Rye-grass	F/LA*	60%
<i>Plantago lanceolata</i>	Ribwort Plantain	LF	1%
<i>Poa annua</i>	Annual Meadow-grass	VLA	<1%
<i>Poa pratensis</i>	Smooth Meadow-grass	F	5%
<i>Poa trivialis</i>	Rough Meadow-grass	F	5%
<i>Prunella vulgaris</i>	Self-heal	VLF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	LF	1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF/O*	1%
<i>Trifolium pratense</i>	Red Clover	O	<1%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and *denotes a constant species			

Table 8.2: Plant Species List for the Scrub and Tall-herb Vegetation Around the Site Margins

Scientific Name	Common Name	DAFOR ¹	Cover
Woody Species			
<i>Acer platanoides</i>	Norway Maple	LF	2%
<i>Betula pendula</i>	Silver Birch	F	5%
<i>Buddleja davidii</i>	Butterfly-bush	LF	5%
<i>Cornus sanguinea</i>	Dogwood	F/LA	5%
<i>Corylus avellana</i>	Hazel	LF	5%
<i>Crataegus monogyna</i>	Hawthorn	O	<1%
<i>Fraxinus excelsior</i>	Ash sapling	O	<1%
<i>Populus x canescens</i>	Grey Poplar	LF	10%
<i>Prunus laurocerasus</i>	Cherry Laurel	VLF	<1%
<i>Quercus robur</i>	Pedunculate Oak sapling	O	<1%
<i>Salix caprea</i>	Goat Willow	LF/A*	50%
<i>Salix cinerea</i>	Grey Willow	LF	2%
<i>Sambucus nigra</i>	Elder	VLF	<1%
Herb Species			
<i>Agrostis stolonifera</i>	Creeping Bent	LF	5%
<i>Arrhenatherum elatius</i>	False Oat-grass	LF/A*	15%
<i>Calystegia sepium</i>	Hedge Bindweed	VLF	<1%
<i>Carex hirta</i>	Hairy Sedge	VLF	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	VLF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	O	<1%
<i>Crocsmia x crocosmiiflora</i>	Montbretia	VLF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	LF/LA*	15%
<i>Dactylorhiza praetermissa</i>	Southern Marsh-orchid	VLF	<1%
<i>Dryopteris filix-mas</i>	Male-fern	O	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	1%
<i>Festuca rubra</i>	Red Fescue	F/LA*	15%
<i>Fragaria vesca</i>	Strawberry	VLA	<1%
<i>Galium aparine</i>	Cleavers	VLA	<1%
<i>Geranium molle</i>	Dove's-foot Crane's-bill	VLA	<1%
<i>Geranium robertianum</i>	Herb Robert	VLA	<1%
<i>Hedera helix</i>	Ivy	VLA	<1%
<i>Heracleum sphondylium</i>	Common Hogweed	O	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F/LA*	5%
<i>Impatiens glandulifera</i>	Indian Balsam	O/VLF	<1%
<i>Iris pseudacorus</i>	Yellow Iris	VLF	<1%
<i>Juncus effusus</i>	Soft-rush	O	<1%
<i>Plantago lanceolata</i>	Ribwort Plantain	LF/O	2%
<i>Pteridium aquilinum</i>	Bracken	VLA	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	VLF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	LVA/LA*	20%
<i>Rumex conglomeratus</i>	Clustered Dock	O	<1%
<i>Scrophularia nodosa</i>	Common Figwort	VLF	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	O	<1%
<i>Trifolium pratense</i>	Red Clover	O	<1%
<i>Tussilago farfara</i>	Colt's-foot	VLA	<1%
<i>Urtica dioica</i>	Common Nettle	LF	1%
<i>Vicia cracca</i>	Tufted Vetch	VL	<1%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and * denotes a constant species			

Table 8.3: Plant Species List for Established Woodland in the Eastern Area of the Site

Scientific Name	Common Name	DAFOR ¹	Cover
Woody Species			
<i>Acer pseudoplatanus</i>	Sycamore	LF	5%
<i>Betula pendula</i>	Silver Birch	LF	5%
<i>Crataegus monogyna</i>	Hawthorn	F*	5%
<i>Fagus sylvatica</i>	Beech	VLF	<1%
<i>Fraxinus excelsior</i>	Ash sapling	O	<1%
<i>Ilex aquifolium</i>	Holly	LF	2%
<i>Quercus robur</i>	Pedunculate Oak	F/LA*	50%
<i>Rhododendron ponticum</i>	Rhododendron	F/LA	20%
<i>Salix caprea</i>	Goat Willow	LF/LA	5%
<i>Salix cinerea</i>	Grey Willow	LF	5%
<i>Sambucus nigra</i>	Elder	O	1%
<i>Sorbus aucuparia</i>	Rowan	VLF	<1%
<i>Tilia</i> sp.	Lime species	LF	1%
<i>Viburnum opulus</i>	Guelder Rose	VLF	<1%
Herb Species			
<i>Asplenium scolopendrium</i>	Hart's Tongue	O	<1%
<i>Carex remota</i>	Remote Sedge	O	<1%
<i>Dactylis glomerata</i>	Cock's-foot	LA	1%
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	LF	1%
<i>Deschampsia flexuosa</i>	Wavy Hair-grass	VLF	<1%
<i>Digitalis purpurea</i>	Foxglove	VLF	<1%
<i>Dryopteris dilatata</i>	Broad Buckler-fern	LF	5%
<i>Dryopteris filix-mas</i>	Male Fern	O/LF	1%
<i>Epipactis helleborine</i>	Broad-leaved Helleborine	R	<1%
<i>Equisetum arvense</i>	Field Horsetail	VLF	<1%
<i>Festuca rubra</i>	Red Fescue	LA	2%
<i>Geum urbanum</i>	Wood Avens	VLA	<1%
<i>Hedera helix</i>	Ivy	LVA	5%
<i>Heracleum sphondylium</i>	Common Hogweed	O	<1%
<i>Holcus mollis</i>	Creeping Soft-grass	LF	5%
<i>Impatiens glandulifera</i>	Indian Balsam	VLA	1%
<i>Juncus effusus</i>	Soft-rush	VLF	<1%
<i>Lonicera periclymenum</i>	Honeysuckle	LF	1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	VLA	<1%
<i>Polypodium vulgare</i>	Common Polypody	R	<1%
<i>Pteridium aquilinum</i>	Bracken	LA	2%
<i>Rubus fruticosus</i> agg.	Bramble	F/LA*	60%
<i>Rubus idaeus</i>	Raspberry	VLA	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	O	<1%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and * denotes a constant species			

Table 8.4: Plant Species List for the Field of Improved Grassland in the North-eastern Area of Site

Scientific Name	Common Name	DAFOR ¹	Cover
Herb Species			
<i>Bellis perennis</i>	Daisy	LF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLA	<1%
<i>Cynosurus cristatus</i>	Crested Dog's-tail	O	5%
<i>Festuca rubra</i>	Red Fescue	LA	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	LA	2%
<i>Juncus effusus</i>	Soft-rush	VLA	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	F	10%
<i>Plantago lanceolata</i>	Ribwort Plantain	A*	70%
<i>Poa annua</i>	Annual Meadow-grass	LF	<1%
<i>Poa pratensis</i>	Smooth Meadow-grass	LA	2%
<i>Poa trivialis</i>	Rough Meadow-grass	LA	2%
<i>Pteridium aquilinum</i>	Bracken	VLA	1%
<i>Ranunculus repens</i>	Creeping Buttercup	F	10%
<i>Rumex acetosa</i>	Common Sorrel	VLA	<1%
<i>Trifolium repens</i>	White Clover	LA	1%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and * denotes a constant species			

Table 8.5: Transect Survey Data Repetition 1: 9th August 2018 (Sunset 20:57, Amy Sharples and Leah Hart)

Spot Count Locations	Start time	End time	Number of Passes Recorded (all common pipistrelle)
1	20:50:00	21:00:00	0
Between point 1 and point 2	21:00:00	21:00:00	0
2	21:00:00	21:10:00	0
Between point 2 and point 3	21:10:00	21:11:00	0
3	21:11:00	21:21:00	1
Between point 3 and point 4	21:21:00	21:21:00	0
4	21:21:00	21:31:00	18
Between point 4 and point 5	21:31:00	21:33:00	3
5	21:33:00	21:43:00	2
Between point 5 and point 4	21:43:00	21:45:00	0
4	21:45:00	21:55:00	27
Between point 4 and point 3	21:55:00	21:55:00	0
3	21:55:00	22:05:00	0
Between point 3 and point 2	22:05:00	22:06:00	0
2	22:06:00	22:16:00	0
Between point 2 and point 1	22:16:00	22:16:00	0
1	22:16:00	22:26:00	4
Between point 1 and point 2	22:26:00	22:27:00	0
2	22:27:00	22:37:00	1
Between point 2 and point 3	22:37:00	22:38:00	0
3	22:38:00	22:48:00	5
Between point 3 and point 4	22:48:00	22:49:00	0
4	22:49:00	22:55:00	3
Total Number of Passes Recorded:			64
Total Number of Passes Recorded at Spot Count Locations			61
Total Number of Passes Records Between Spot Count Locations			3

Table 8.6: Transect Survey Data Repetition 2: 24th August 2018 (Sunset 20:19: Amy Sharples & Leah Hart)

Spot Count Locations	Start time	End time	Number of Passes Recorded (all common pipistrelle)
1	20:19:00	20:29:00	0
<i>Between point 1 and point 2</i>	20:29:00	20:30:00	0
2	20:30:00	20:40:00	0
<i>Between point 2 and point 3</i>	20:40:00	20:41:00	0
3	20:41:00	20:51:00	0
<i>Between point 3 and point 4</i>	20:51:00	20:53:00	0
4	20:53:00	21:03:00	0
<i>Between point 4 and point 5</i>	21:03:00	21:06:00	0
5	21:06:00	21:16:00	0
<i>Between point 5 and point 4</i>	21:16:00	21:20:00	0
4	21:20:00	21:30:00	1
<i>Between point 4 and point 3</i>	21:30:00	21:32:00	1
3	21:32:00	21:42:00	0
<i>Between point 3 and point 2</i>	21:42:00	21:44:00	0
2	21:44:00	21:54:00	1
<i>Between point 2 and point 1</i>	21:54:00	21:56:00	0
1	21:56:00	22:06:00	0
<i>Between point 1 and point 2</i>	22:06:00	22:06:00	0
2	22:06:00	22:16:00	0
<i>Between point 2 and point 3</i>	22:16:00	22:16:00	0
3	22:16:00	22:26:00	0
Total			3
Total at spot counts			2
Total between spot counts			1

Table 8.7: Summary of All Bird Species Detected Over Both Survey Repetitions

Common Name	Repetition 1 (05/07/2018)		Repetition 2 (20/07/2018)	
	Total Number Seen	Breeding?	Total Number Seen	Breeding?
Blackbird	4	4	2	1
Blackcap	1	1	1	1
Bullfinch	1	1	3	1
Black-headed gull	4	0	4	0
Blue tit	1	1	1	1
Carrion crow	1	1	2	2
Chiffchaff	2	2	-	-
Canada goose	3	3	3	3
Chaffinch	2	2	3	3
Common sandpiper	1	1	-	-
Coal tit	1	1	-	-
Duncock	3	3	-	-
Feral pigeon	22	0	34	0
Grey wagtail	-	0	1	0
Goldfinch	2	2	2	2
Golden plover	-	-	1	0
Greenfinch	1	1	-	-
Great spotted woodpecker	1	0	1	1
Great tit	-	-	1	1
Grey heron	1	0	1	0
Jay	2	2	1	1
Kestrel	1	0	1	0
Lesser black-backed gull	-	-	1	0
Long-tailed tit	1	1	-	-
Mallard	4	0	2	1
Magpie	1	1	2	0
Muscovy duck	1	0	-	-
Nuthatch	1	0	1	1
Oystercatcher	1	0	2	0
Robin	3	3	5	1
Swift	1	1	-	-
Swallow	9	1	10	0
Song thrush	1	1	1	0
Wood pigeon	2	2	1	1
Wren	5	5	5	5
Total Number of Birds Seen:	84		91	
Total Number of Species Present:	31		27	
¹ i.e. Number of birds either of confirmed or probable breeding status; birds detected engaged in activity associated with breeding birds within the survey area. Activity associated with breeding birds comprises singing and alarm calling (i.e. marking territory), male and female pairs observed together, family units and birds carrying food for young. Birds highlighted in Bold are Priority Species.				

Table 8.8: Breeding Bird Survey Repetition 1, 5th July 2018: Raw Survey Data

Scientific Name	Common Name	Times observed	Total seen	BOCC	Singing	Calling	Alarm call	In flight	Male	Male & female	None	Family
<i>Actitis hypoleucos</i>	Common sandpiper	1	1	Amber	0	0	1	0	0	0	0	0
<i>Aegithalos caudatus</i>	Long-tailed tit	1	1	Green	0	0	0	0	0	0	0	1
<i>Anas platyrhynchos</i>	Mallard	1	4	Amber	0	0	0	0	0	0	4	0
<i>Apus apus</i>	Swift	1	1	Amber	0	0	0	0	0	0	1	0
<i>Ardea cinerea</i>	Grey heron	1	1	Green	0	0	0	0	0	0	1	0
<i>Branta canadensis</i>	Canada goose	1	2	Green	0	0	0	0	0	1	0	2
<i>Cairina moschata</i>	Muscovy duck	1	1	Green	0	0	0	0	0	0	1	0
<i>Carduelis carduelis</i>	Goldfinch	2	2	Green	1	0	0	0	0	0	0	1
<i>Carduelis chloris</i>	Greenfinch	1	1	Green	0	0	1	0	1	0	0	0
<i>Chroicocephalus ridibundus</i>	Black-headed gull	1	4	Amber	0	0	0	0	0	0	4	0
<i>Columba livia</i>	Feral pigeon	2	22	Green	0	0	0	0	0	0	22	0
<i>Columba palumbus</i>	Wood pigeon	2	2	Green	2	0	0	0	0	0	0	0
<i>Corvus corone corone</i>	Carrion crow	1	1	Green	0	0	0	0	0	0	0	1
<i>Dendrocopos major</i>	Great spotted woodpecker	1	1	Green	0	1	0	0	0	0	0	0
<i>Erithacus rubecula</i>	Robin	3	3	Green	3	0	0	0	0	0	0	0
<i>Falco tinnunculus</i>	Kestrel	1	1	Amber	0	0	0	0	1	0	1	0
<i>Fringilla coelebs</i>	Chaffinch	2	2	Green	2	0	0	0	0	0	0	0
<i>Garrulus glandarius</i>	Jay	2	2	Green	0	1	0	0	0	0	0	1
<i>Haematopus ostralegus</i>	Oystercatcher	1	1	Amber	0	0	0	1	0	0	0	0
<i>Hirundo rustica</i>	Swallow	3	9	Green	0	0	0	8	0	0	0	1
<i>Parus caeruleus</i>	Blue tit	1	1	Green	0	0	0	0	0	0	0	1
<i>Parus ater</i>	Coal tit	1	1	Green	0	0	1	0	0	0	0	0
<i>Phylloscopus collybita</i>	Chiffchaff	2	2	Green	2	0	0	0	0	0	0	0
<i>Pica pica</i>	Magpie	1	1	Green	0	0	0	0	0	0	0	1
<i>Prunella modularis</i>	Dunnock	3	3	Amber	3	0	0	0	0	0	0	0
<i>Pyrrhula pyrrhula</i>	Bullfinch	1	1	Amber	0	0	1	0	1	0	0	0
<i>Sitta europaea</i>	Nuthatch	1	1	Green	0	1	0	0	0	0	0	0
<i>Sylvia atricapilla</i>	Blackcap	1	1	Green	1	0	0	0	0	0	0	0
<i>Troglodytes troglodytes</i>	Wren	5	5	Green	5	0	0	0	0	0	0	0
<i>Turdus merula</i>	Blackbird	4	4	Green	4	0	0	0	0	0	0	0
<i>Turdus philomelos</i>	Song thrush	1	1	Red	1	0	0	0	0	0	0	0

¹ i.e. Number of birds either of confirmed or probable breeding status; birds detected engaged in activity associated with breeding birds within the survey area. Activity associated with breeding birds comprises singing and alarm calling (i.e. marking territory), male and female pairs observed together, family units and birds carrying food for young. Birds highlighted in **Bold** are Priority Species.

Table 8.9: Breeding Bird Survey Repetition 2, 20th July 2018: Raw Survey Data

Scientific Name	Common Name	Times observed	Total seen	BOCC	Singing	Calling	Alarm call	In flight	Male	Male & female	None	Family
<i>Anas platyrhynchos</i>	Mallard	1	2	Amber	0	0	0	0	0	1	2	0
<i>Ardea cinerea</i>	Grey heron	1	1	Green	0	0	0	0	0	0	1	0
<i>Branta canadensis</i>	Canada goose	1	2	Green	0	0	0	0	0	1	0	2
<i>Carduelis carduelis</i>	Goldfinch	2	2	Green	0	0	0	0	0	0	0	2
<i>Chroicocephalus ridibundus</i>	Black-headed gull	1	4	Amber	0	0	0	0	0	0	4	0
<i>Columba livia</i>	Feral pigeon	3	34	Green	0	0	0	0	0	0	34	0
<i>Columba palumbus</i>	Wood pigeon	1	1	Green	1	0	0	0	0	0	0	0
<i>Corvus corone</i>	Carrion crow	2	2	Green	0	0	0	0	0	0	0	2
<i>Dendrocopos major</i>	Great spotted woodpecker	1	1	Green	0	0	1	0	0	0	0	0
<i>Erithacus rubecula</i>	Robin	5	5	Green	1	4	0	0	0	0	0	0
<i>Falco tinnunculus</i>	Kestrel	1	1	Amber	0	0	0	0	1	0	1	0
<i>Fringilla coelebs</i>	Chaffinch	3	3	Green	2	0	1	0	0	0	0	0
<i>Garrulus glandarius</i>	Jay	1	1	Green	0	0	0	0	0	0	0	1
<i>Haematopus ostralegus</i>	Oystercatcher	2	2	Amber	0	0	0	1	0	0	1	0
<i>Hirundo rustica</i>	Swallow	2	10	Green	0	0	0	10	0	0	0	0
<i>Larus fuscus</i>	Lesser black-backed gull	1	1	Amber	0	0	0	1	0	0	0	0
<i>Motacilla cinerea</i>	Grey wagtail	1	1	Amber	0	0	0	0	0	0	1	0
<i>Parus caeruleus</i>	Blue tit	1	1	Green	0	0	0	0	0	0	0	1
<i>Parus major</i>	Great tit	1	1	Green	0	0	0	0	0	0	0	1
<i>Pica pica</i>	Maggie	1	2	Green	0	0	0	0	0	0	2	0
<i>Pluvialis apricaria</i>	Golden plover	1	1	Amber	0	0	0	0	1	0	1	0
<i>Pyrrhula pyrrhula</i>	Bullfinch	2	3	Amber	0	1	0	0	1	1	2	0
<i>Sitta europaea</i>	Nuthatch	1	1	Green	0	0	1	0	0	0	0	0
<i>Sylvia atricapilla</i>	Blackcap	1	1	Green	0	0	0	0	0	0	0	1
<i>Troglodytes troglodytes</i>	Wren	5	5	Green	5	0	0	0	0	0	0	0
<i>Turdus merula</i>	Blackbird	2	2	Green	0	1	0	0	1	0	0	1
<i>Turdus philomelos</i>	Song thrush	1	1	Red	0	0	0	0	0	0	1	0

¹ i.e. Number of birds either of confirmed or probable breeding status; birds detected engaged in activity associated with breeding birds within the survey area. Activity associated with breeding birds comprises singing and alarm calling (i.e. marking territory), male and female pairs observed together, family units and birds carrying food for young. Birds highlighted in **Bold** are Priority Species.

Table 8.10: HSI Assessment

General Description		Pond 1 (Lodge)	
Photograph			
HSI Calculation		Description	Score
SI ₁	Geographic Location	Zone A	1.0
SI ₂	Pond area	11100m ²	-
SI ₃	Permanence	Never	0.9
SI ₄	Water quality	Moderate	0.67
SI ₅	Shade	50%	1.0
SI ₆	Waterfowl	Minor	0.33
SI ₇	Fish	Major	0.01
SI ₈	Pond count ²	1 pond	0.4
SI ₉	Terrestrial habitat	Poor	0.33
SI ₁₀	Macrophytes	0%	0.3
HSI Score¹		Poor	0.34
¹ Calculated by $(SI_1 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/9}$ (Criteria SI ₂ has been omitted from this calculation as there are no data for such large ponds)			
² Ponds within an unobstructed one kilometre radius of the site divided by 3.14			

Table 8.11: Aquatic Invertebrate Survey Data 2018

Order and Higher Taxa	Family	Genus and Species	Common Name (where known)	Waterbody	
				Lodge	Inflow
Turbellaria: Tricladida	Dendrocoelidae	<i>Dendrocoelum lacteum</i>	-	✓	
	Dugesidae	<i>Dugesia tigrina</i>	-	✓	
	Planariidae	<i>Polycelis felina</i>	-		✓
	Planariidae	<i>Polycelis</i> sp. (nigra/tenuis)	-	✓	
Annelida: Oligochaeta	Tubificidae	Not identified further	-	✓	
Annelida: Hirudinea	Glossiphoniidae	<i>Glossiphonia complanata</i>	-	✓	
	Glossiphoniidae	<i>Helobdella stagnalis</i>	-	✓	
	Glossiphoniidae	<i>Theromyzon tessulatum</i>	-	✓	
	Erpobdellidae	<i>Erpobdella octoculata</i>	-	✓	
Mollusca: Gastropoda	Bithyniidae	<i>Bithynia tentaculata</i>	Common bithynia	✓	✓
	Hydrobiidae	<i>Potamopyrgus antipodarum</i>	Jenkin's spire shell	✓	
	Limnaeidae	<i>Radix balthica</i>	Wandering pond snail	✓	✓
	Limnaeidae	<i>Limnaea stagnalis</i>	Great pond snail	✓	
	Planorbidae	<i>Planorbis carinatus</i>	Keeled ram's-horn	✓	
	Planorbidae	<i>Anisus vortex</i>	Whirlpool ram's-horn	✓	
	Planorbidae	<i>Gyraulus albus</i>	White ram's-horn		✓
	Planorbidae	<i>Ancylus fluviatilis</i>	River limpet		✓
Mollusca: Bivalvia	Unionidae	<i>Anodonta anatina</i>	Duck mussel	✓	
	Sphaeriidae	<i>Sphaerium corneum</i>	Horny orb mussel	✓	
	Sphaeriidae	<i>Pisidium</i> sp.	-	✓	
Crustacea: Amphipoda	Crangonyctidae	<i>Crangonyx pseudogracilis</i>	-	✓	
	Gammaridae	<i>Gammarus pulex</i>	Freshwater shrimp		✓
Crustacea: Isopoda	Asellidae	<i>Asellus aquaticus</i>	Freshwater hoglouse	✓	✓
Insecta: Ephemeroptera	Baetidae	<i>Baetis muticus</i>	Iron blue		✓
	Leptophlebiidae	<i>Habrophlebis fusca</i>	Ditch dun		✓
	Ephemerellidae	<i>Seratella ignita</i>	Blue winged olive		✓
Insecta: Odonata	Coenagriidae	<i>Pyrrhosoma nymphula</i>	Large red damselfly	✓	
	Coenagriidae	Unidentified small larvae	-	✓	
	Aeshnidae	<i>Aeshna grandis</i>	Brown hawk	✓	
Insecta: Plecoptera	Leuctridae	<i>Leuctra fusca</i>	Late needle fly		✓
	Leuctridae	<i>Leuctra geniculata</i>	Willow fly		✓
Insecta: Hemiptera	Hydrometridae	<i>Hydrometra stagnorum</i>	Water measurer	✓	✓
	Gerridae	<i>Gerris lacustris</i>	Pond skater	✓	
	Nepidae	<i>Nepa cinerea</i>	Water scorpion	✓	
	Notonectidae	<i>Notonecta glauca</i>	Water boatman	✓	
	Corixidae	<i>Corixa</i> sp.	-	✓	
Insecta: Megaloptera	Sialidae	<i>Sialis lutaria</i>	Alder fly	✓	
Insecta: Trichoptera	Rhyacophilidae	<i>Rhyacophila dorsalis</i>	Sand fly		✓
	Polycentropodidae	<i>Cyrnus trimaculatus</i>	-	✓	✓
	Polycentropodidae	<i>Plectrocnemia conspersa</i>	-		✓
	Psychomyiidae	<i>Lype phaeopa</i>	Micro black sedge	✓	✓
	Phryganeidae	Empty larval cases only	-	✓	
	Limnephilidae	<i>Drusus annulatus</i>	-		✓
	Limnephilidae	<i>Chaetopteryx villosa</i>	-		✓
	Limnephilidae	<i>Anabolia nervosa</i>	Brown sedge	✓	
	Limnephilidae	<i>Glyptotaelius pellucidus</i>	Mottled sedge	✓	
	Limnephilidae	<i>Limnephilus lunatus</i>	Cinnamon sedge	✓	
	Limnephilidae	<i>Halesus digitatus</i>	Caperer	✓	✓
	Limnephilidae	<i>Halesus radiatus</i>	Caperer	✓	
	Limnephilidae	<i>Potamophylax latipennis</i>	Large cinnamon sedge		✓
	Sericostomatidae	<i>Sericostoma personatum</i>	Welshman's button		✓
	Molannidae	<i>Molanna angustata</i>	-	✓	
	Leptoceridae	<i>Athripsodes</i> sp.	-		✓
	Leptoceridae	<i>Mystacides longicornis</i>	Grouse wing	✓	
Insecta: Coleoptera	Gyrinidae	<i>Gyrinus substriatus</i>	Whirligig beetle	✓	
	Dytiscidae	<i>Platambus maculatus</i>	-		✓
	Dytiscidae	<i>Oreodytes sanmarkii</i>	-		✓
Insecta: Diptera	Tipulidae	Not identified further	-	✓	✓
	Chironomidae	Not identified further	-	✓	
	Muscidae	<i>Limnophora</i> sp.	-		✓
			Total	41	27

Table 8.12: Table of Photographs

Note: Photographs of the buildings are presented at **Table 9.4, Appendix 2**

	
Photo 1: Row of mature Poplar and planted Birch over mown amenity grassland verges at the site entrance off Walmersley Old Road	Photo 2: Mown grassed verges (and west and north elevation of Building 11)
	
Photo 3: Tall-herb vegetation, Bramble scrub and scattered shrubs on site margins	Photo 4: Scrub around the buildings
	
Photo 5: Field of improved grassland in the north-eastern area of the site with marginal Bramble scrub (M66 embankment to the right)	Photo 6: Stone and concrete boulders at the banks of the lodge (Pond 1)



Photo 7: Broadleaf woodland around the inflow to the lodge at the northern end of the site



Photo 8: Site boundary at the palisade fence (right) and stone wall between the site and Pond 2 to the left



Photo 9: Hard-standing around the operational Tetrosyl site

Figure 8.1: Google Earth and MAGic Map Extracts to Show Site Boundary and Surrounds and Location of Ponds 1 to 10

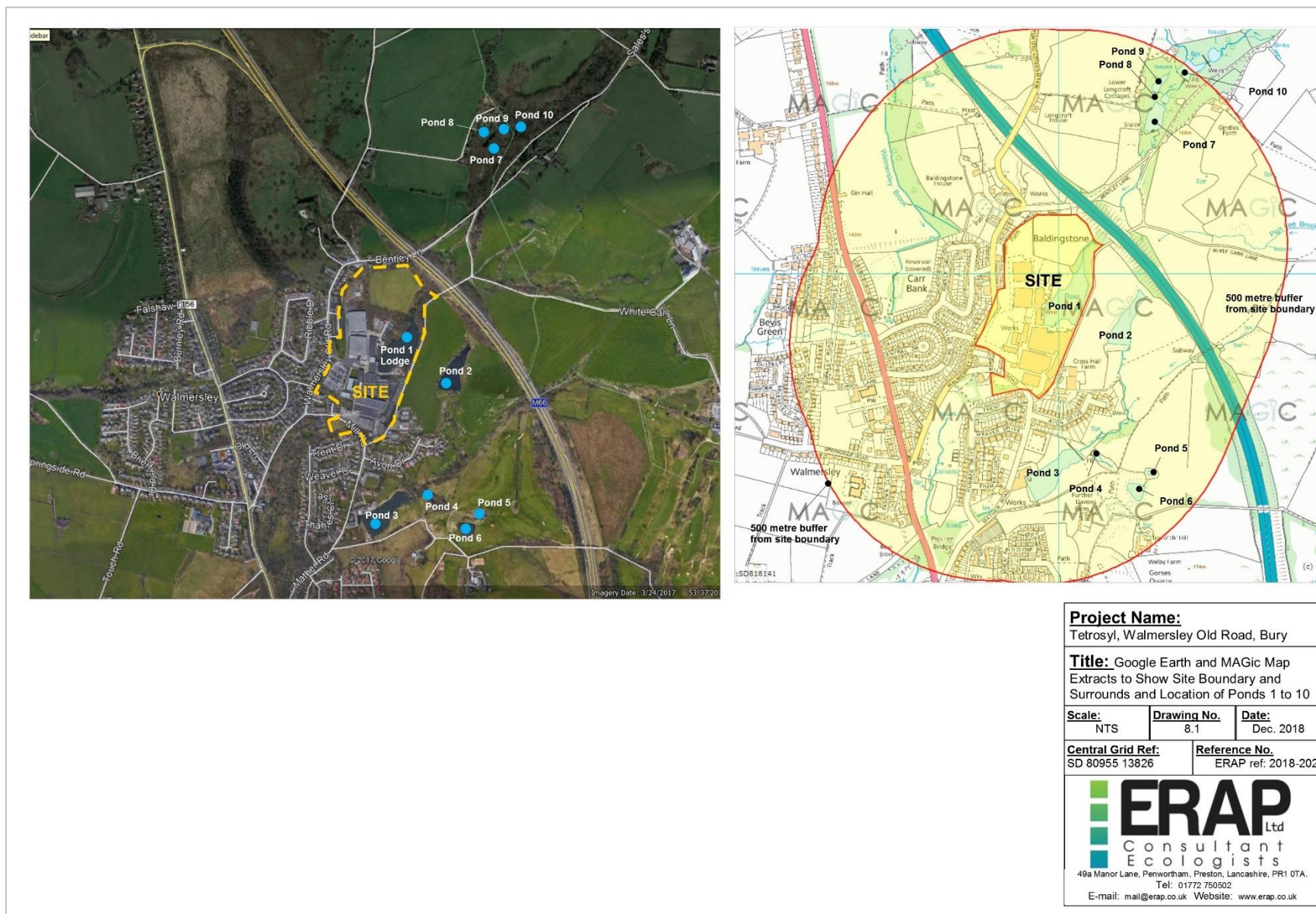


Figure 8.2: Phase 1 Habitat Survey and Vegetation Map



Figure 8.3: Results of Bat Transect Survey Repetitions 1 and 2 (August 2018)

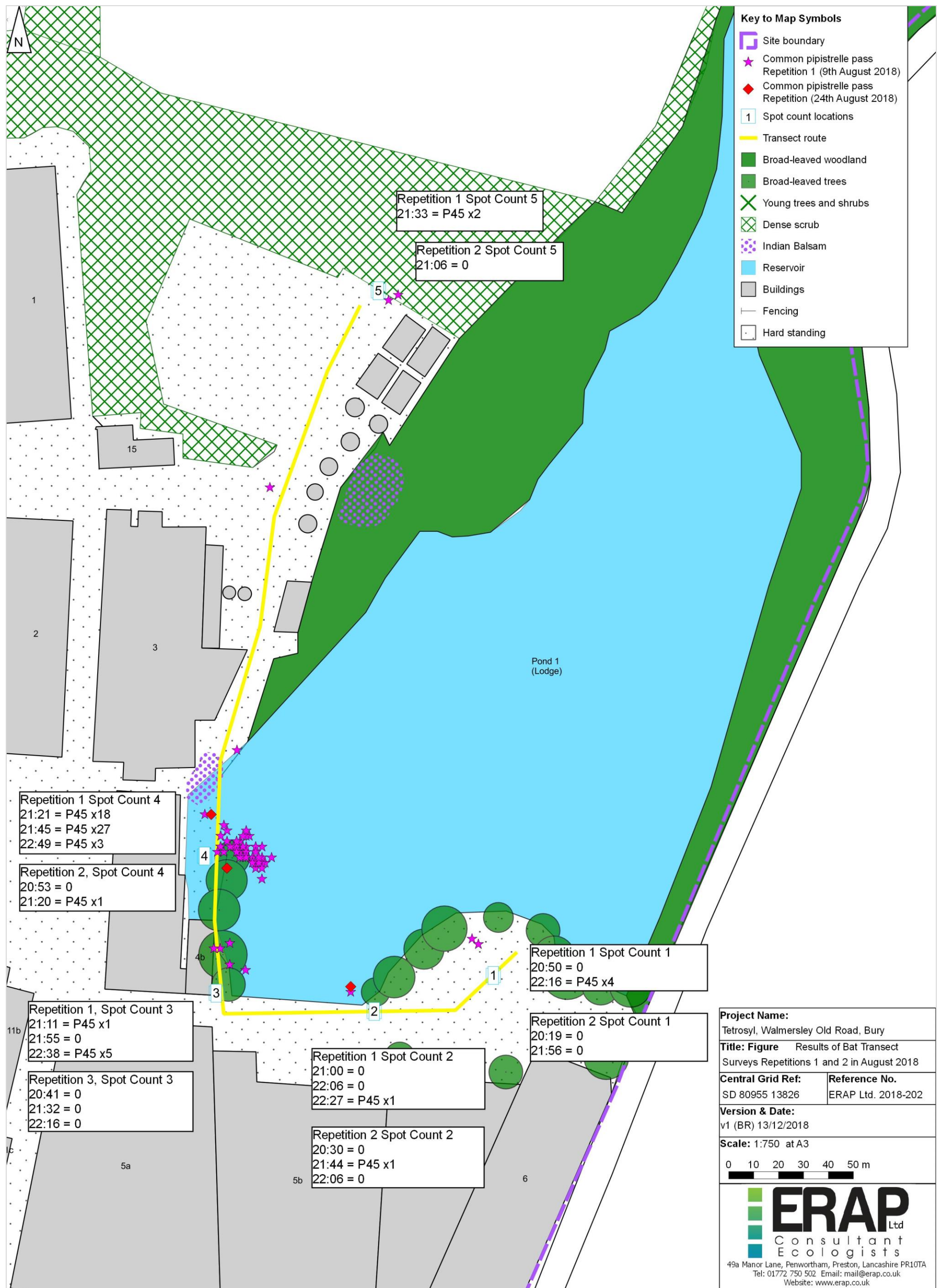


Figure 8.4: Breeding Bird Survey Repetition 1: 5th July 2018

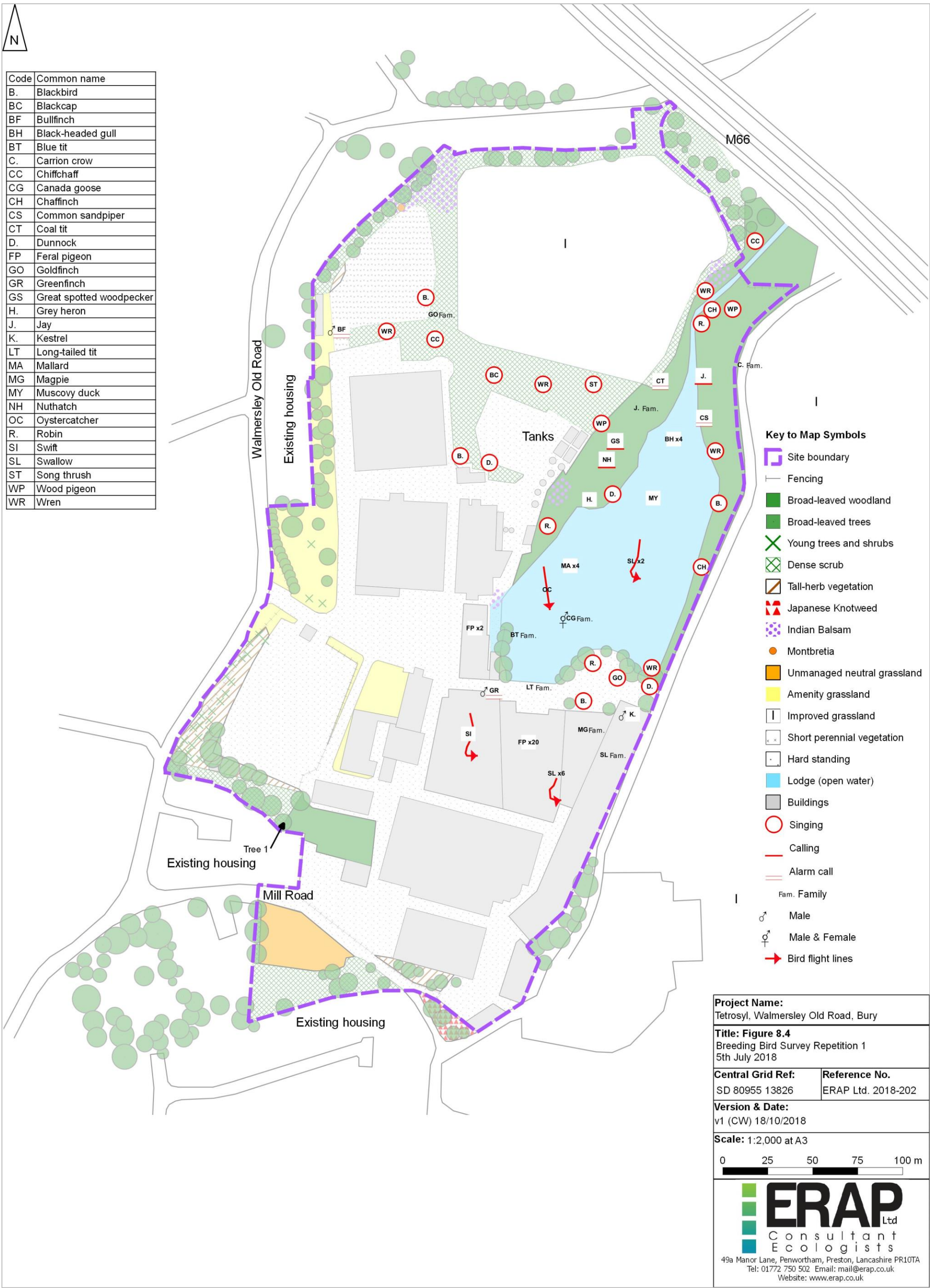


Figure 8.5: Breeding Bird Survey Repetition 2: 20th July 2018

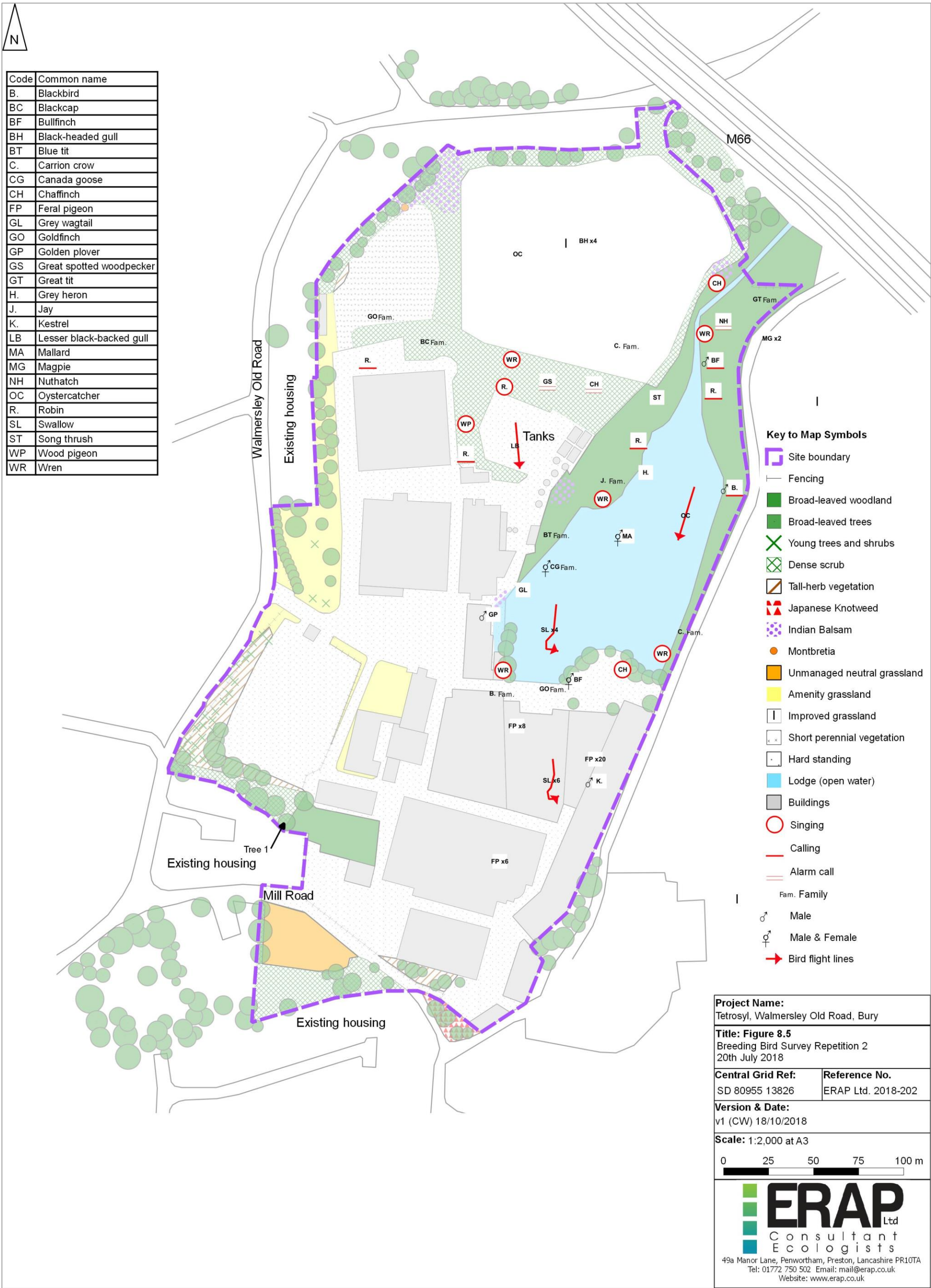
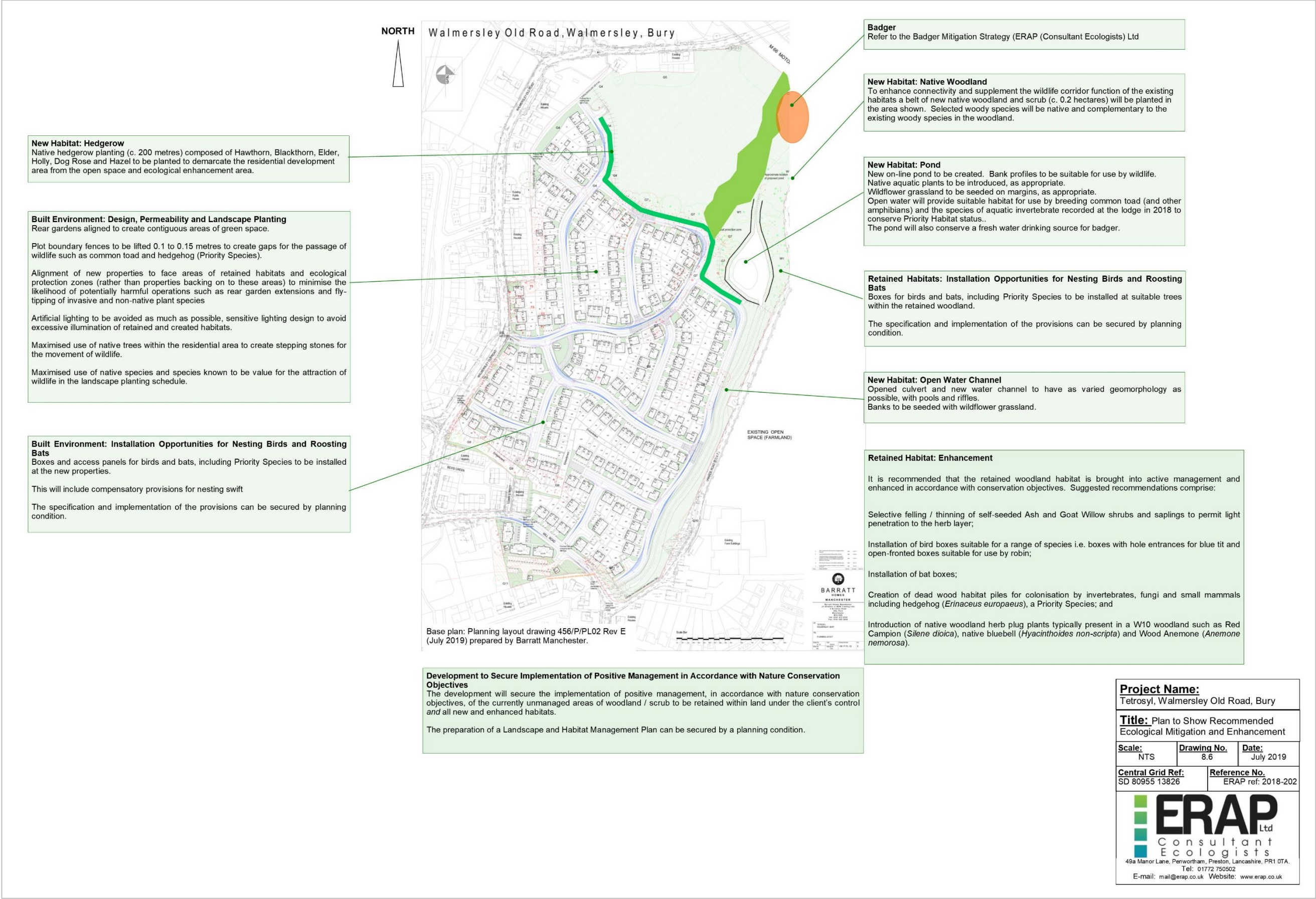


Figure 8.6: Plan to Show Recommended Ecological Mitigation and Enhancement



9.0 APPENDIX 2: LICENSED BAT SURVEY AND ASSESSMENT

9.1 Introduction and Objectives

Survey Approach and Objectives

- 9.1.1 This section of the report describes the objectives and methods of survey applied to survey and assess the buildings, trees and culvert for roosting bats.
- 9.1.2 The licensed bat survey and assessment was carried out in accordance with standard methodology described in the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004), the *Bat Workers' Manual 3rd Edition* (Mitchell-Jones & Mcleish, 2004) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn) (Collins, J. (ed), 2016).
- 9.1.3 The objectives of the initial daylight licensed bat survey were to:
- Assess the suitability of the buildings / structures to support roosting bat species at any time of year;
 - Examine the exterior and interior (where relevant) of the buildings / structures for evidence of the current and previous presence of roosting bat species;
 - Examine the status and condition of the previously identified roosts (Roosts A to C) as described in **Section 3.1** of this of this Ecological Survey and Assessment report and the Bat Survey Report prepared in 2010 (Baker Shepherd Gillespie, October 2010);
 - Examine the status and condition of the previously identified roosts (D and E) as described in **Section 3.1** of this Ecological Survey and Assessment report and the bat survey carried out by BSG in 2015 (BSG Ecology, September 2015);
 - Determine the scope of nocturnal bat survey necessary, in accordance with site conditions, access limitations and the survey guidelines;
 - Provide guidance in accordance with wildlife legislation, *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, February 2019), *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn) (Collins, J. (ed), 2016), and best practice in relation to the proposed works;
 - Detail the scope of any further actions, if necessary, that may be required prior to and during the demolition works; and
 - Collate sufficient survey data to facilitate the planning application and an application for the relevant Natural England licence, as appropriate.

9.2 Method of Survey

Survey Area

- 9.2.1 The survey area comprised:
- All buildings (Buildings 1 to 16) within the Tetrosyl site;
 - All trees within the footprint of the proposed re-development; and
 - A culvert that takes water from an overflow at the lodge (Pond 1) downstream and off site, refer to **Figure 9.1**

Daylight Survey

Survey Date and Conditions

- 9.2.2 The daylight survey and assessment was carried out on 18th July 2017. The weather conditions were warm (22°C), sunny and calm (Beaufort Scale 0).
- 9.2.3 The survey was updated by Victoria Burrows and Amy Sharples on 8th November 2017. The weather was dry but overcast, with light air (Beaufort Scale 1) and 8°C at 9am.
- 9.2.4 In addition, external observations of the buildings and a search for bat droppings was carried out after the dawn surveys in August and September 2017 and July 2018.

Survey Personnel

- 9.2.5 The survey area was assessed for its suitability to support roosting bats by Victoria Burrows. Victoria holds a Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-10390-CLS-CLS.
- 9.2.6 The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).

Buildings

- 9.2.7 An inspection of the external surfaces, walls and roofs of the buildings was carried out to find potential bat roosting habitat or accesses into internal areas where roosts may be present. Searches for evidence of bat presence in the form of droppings, urine stains, feeding signs, grease marks and other evidence were also carried out.
- 9.2.8 Owing to the dilapidated roof and reportedly unsafe condition of the internal areas of Buildings 5c, 6, 11c, 13 and 14, an internal survey was not permitted. Where possible, the internal areas were carefully viewed from open window apertures and damaged doorways around the perimeter of the buildings.
- 9.2.9 A list of equipment used is detailed at **Table 9.1**, below:

Table 9.1: Survey Equipment Used During Daylight Bat Survey

Ladders
LED Lenser P14 torch
Clulite CB2 hand lamp
Canon Ixus digital camera
8x20 binoculars
Ridgid Micro Inspection Camera Borescope CA-300

- 9.2.10 The suitability of each building has been assessed in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016), taking into account any presence of gaps suitable for access by bats, features suitable for use by roosting bats within the building (including crevice dwelling and species which can roost in the open in roof voids), and the suitability of the surrounding habitats for use by foraging and commuting bats.

Trees

- 9.2.11 A preliminary assessment of the trees within the footprint of the proposed redevelopment was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.
- 9.2.12 Trees were assessed from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (*Hedera helix*) with stem diameters in excess of 50mm and bat, bird or dormouse (*Muscardinus avellanarius*) boxes.

9.2.13 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013) and *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-care and Ecology Professionals* (BTHK, 2018).

9.2.14 The requirement for further presence / absence surveys at each tree was then considered.

Presence / Absence Surveys: Dawn Re-entry Surveys

9.2.15 Following the consultation of the previous bat survey report (Baker Shepherd Gillespie, October 2010), the daylight survey and the assessment of the surrounding habitats, Buildings 1, 2, 8, 10, 11a, 11b, 11d, 12, 15 and 16 was assessed to have no suitability for use by roosting bats. No further survey was considered necessary at these buildings. although some of the building elevations were visible during the further dawn surveys at other buildings.

9.2.16 Buildings 3, 5a to 5c, 6, 7, 9 and 11c are assessed to have moderate or high suitability for use by roosting bats. Buildings 4, 13 and 14 have low suitability but internal access was not possible. In accordance with the guidelines (Collins, J. (ed), 2016), and to ensure sufficient survey effort has been applied to overcome the access limitations and apply reasonable effort to determine the presence (or likely absence) of a bat roost, three dawn re-entry surveys were conducted using up to 10 surveyor positions on one survey.

9.2.17 Surveyors, experienced in conducting bat surveys, were positioned at suitable locations to maximise the coverage of the buildings to determine any entry into the buildings by roosting bats. Heterodyne detectors were used to determine any bat detected to species. Recording bat detectors units (Anabat Express, Anabat Walkabout and Anabat SD2) were also used to record and analyse echolocation calls after the survey using AnalookW Bat call analysis software.

9.2.18 The dawn re-entry surveys commenced approximately 1.5 hours before sunrise and ended at sunrise, provided all bat activity had ceased by this point. Following the completion of three dawn surveys in summer 2017, an updated dawn re-entry survey was carried out in July 2018 to updated and validate the survey data and conclusions.

9.2.19 Surveyor positions are annotated on **Figure 9.1**. Any bat emergence or re-entry activity was recorded. All surveys were conducted under suitable conditions. The dates of the surveys, surveyors and equipment used and weather conditions present are presented at **Tables 9.2** and **9.3**, below.

9.2.20 As dawn surveys were carried out, the surveyors were not stationary at the surveyor positions; if bats were observed entering the site from the wider area or circling a specific feature at a building the bats were tracked to ensure re-entry activity was not missed.

Table 9.2: Dawn Re-entry Survey Dates, Weather Conditions and Surveyors in 2017

Date	16 th August 2017	30 th August 2017	14 th September 2017
Sunrise	05:48	06:14	06:40
Start time	03:30	04:00	05:00
End time	06:00	06:20	06:47
Wind	Bft 0 (calm)	Bft 0 (calm)	Bft 0 (calm)
Precipitation	Dry	Dry	Dry and overcast
Air temperature	12°C at 03:30	12°C at 04:00	9°C at 05:30
Surveyor Position and (Main Target Building / Feature)	Surveyor and Detector¹	Surveyor and Detector¹	Surveyor and Detector¹
1 (North elevation of Building 3)	Richard Lowe Petersson D100 and SD2	Richard Lowe Petersson D100 and AE	Tracy Cumberbatch Batbox Duet & AE

Date	16 th August 2017	30 th August 2017	14 th September 2017
2 (West elevation of Building 3 and north and west elevation of Building 4)	Tracy Cumberbatch Batbox Duet & AE	Aidan Pickering Batbox Duet & AE	-
3 (Culvert and north elevations of Buildings 5a and 5b)	Aidan Pickering Batbox Duet & AE	Amy Sharples Batbox Duet and SD2	Chris Walsh Anabat Walkabout
4 (Buildings 6, 5c and east elevation of 5b)	Victoria Burrows Batbox Duet & AE	-	Chris Schofield Batbox Duet & AE
5 (West elevation of Building 5a (Roost A), south elevation of 5a and north elevation of 7)	Carol Flaxman Batbox Duet & Peersonic	Carol Flaxman Batbox Duet & AE	Richard Lowe Petersson D100 and SD2
6 (South elevations of Building 5 and east elevation of Building 7 (Roost C))	Danielle Rowlands Batbox Duet & Anabat Walkabout	Danielle Rowlands Batbox Duet & Anabat Walkabout	Danielle Rowlands Batbox Duet & Anabat Walkabout
7 (South and east elevation of Building 7 (Roost B) and west and south elevation of Building 6)	Darren Graham Batscanner & AE	Darren Graham Batscanner & AE	Marie Pickering Batbox Duet & AE
8 (South elevation Building 7)	Jordan Prendergast Batscanner & SD2	Marie Pickering Batbox Duet & AE	-
9 (Building 9)	Rebecca Whitmore Batscanner & AE	Ryan Evans Magenta and AE	-
10 (East elevation of Building 6 and tracking bats entering site from east)	Chris Schofield Batbox Duet & AE	Chris Schofield Batbox Duet & AE	-
11 (East elevation of Buildings 3 and 4 and tracking any bats moving off lodge)	-	Victoria Burrows Batbox Duet & SD2	Victoria Burrows Batbox Duet
12 (Buildings 13 and 14)	-	-	Aidan Pickering Batbox Duet & AE

¹: AE = Anabat Express, SD2 = Anabat SD2

Table 9.3: Dawn Re-entry Survey Date, Weather Conditions and Surveyors in 2018

Date	12 th July 2018
Sunrise	04:54
Start time	03:10
End time	05:00
Wind	Beaufort Scale 1 (light air)
Precipitation	Dry and overcast
Air temperature	16°C at 03:30
Surveyor Position and (Main Target Building / Feature)	Surveyor and Detector ¹
1	Carol Flaxman: Batbox Duet & AE
2	John Harrison-Bryant: Batbox Duet & Anabat Walkabout
4	Amy Sharples: Batbox III and AE
6	Danielle Rowlands: Batbox Duet & Anabat Walkabout
7	Chris Wilkinson: Batbox Duet & AE
8	Chris Swindells: Petersson D100 & AE
11	Victoria Burrows: Batbox Duet & AE

¹: AE = Anabat Express, SD2 = Anabat SD2

Bat Activity

9.2.21 In addition to the recording of bat activity at the surveyor positions, Anabat SD2 detectors were positioned facing the lodge on each survey date to record any bat activity over the lodge during the survey period, refer to **Figure 9.1**.

Barn Owl and Other Birds

- 9.2.22 Recordings of any observations of birds entering the buildings during the dawn bat surveys were made.

Survey Limitations

- 9.2.23 The inability to access the interior of Buildings 5c, 6, 11c, 13 and 14 for health and safety reasons was addressed by the completion of the relevant number of dawn re-entry surveys. Sufficient survey effort has been conducted at the site to reliably determine the presence or absence of roosting bats and use of the site by foraging bats. No significant survey limitations were experienced.

9.3 Results

Daylight Survey

Buildings

- 9.3.1 Buildings locations are annotated at **Figure 9.1**. Photographs are presented at **Table 9.4**.

Building 1: Warehouse

- 9.3.2 Building 1 is a large (50 metres long by 50 metres wide) steel framed warehouse with lower elevations walls of brick supporting upper sections of corrugated metal sheeting and a shallow pitched and unlined corrugated sheeting roof, refer to **Photos 1 to 3**.
- 9.3.3 No gaps or opportunities for use by roosting bats were found around the external elevations of the building.
- 9.3.4 Internally the steel framed building has no roof void and the wall tops are filled with mortar; no gaps or opportunities for roosting bats are present.
- 9.3.5 Building 1 is assessed to have negligible suitability for use by roosting bats.

Building 2: Warehouse

- 9.3.6 Building 2 is the same construction as Building 1 with an additional loading bay canopy on the south elevation, refer to **Photo 4**.
- 9.3.7 No gaps or opportunities for use by roosting bats were found at Building 2; the building is assessed to have negligible suitability for use by roosting bats.

Building 3: North Lights

- 9.3.8 Building 3 is a single storey stone north lights building with three slate covered roofs with ridges in a north to south alignment, refer to **Photos 5 to 6**. Concrete copings are present to create a parapet end wall which limits the opportunities for bats to access gaps beneath the slates at the wall top. The walls are well-sealed with the exception of a number of cracks and crevices in the north and east facing elevations.
- 9.3.9 A three sided and single-leaf brick built annex is attached to the east elevation and a cement fascia is present at the south elevation, refer to **Photo 6**; careful examination of this feature confirmed an absence of opportunities for use by roosting bats.
- 9.3.10 An internal inspection confirmed that the underside of the slates is lined with timber sarking and the internal walls are unlined, refer to **Photo 7**. No bat droppings were found during a search of the internal areas of the building.
- 9.3.11 Owing to its proximity to the lodge and woodland and the presence of crevices for bat access into the stone walls and beneath the slates and ridge copings, Building 3 is assessed to be of high suitability for use by crevice roosting bats.

Buildings 4a and 4b: Derelict Offices

- 9.3.12 The northern section of Building 4a comprises a two storey brick office with a shallow pitched corrugated sheeting covered roof, refer to **Photos 8 and 9**. The elevation walls and roof covering offer no opportunities for use by roosting bats. A section of fascia is missing from the north elevation, refer to **Photo 11**, this feature was observed by Surveyor Position 2 during the dawn bat surveys. Inspection of the void above the suspended ceiling confirmed that the roof covering is unlined; no bats or evidence of bat access was observed, refer to **Photo 12**.
- 9.3.13 The single storey section supports a hipped, slate covered roof. No gaps or opportunities for bat access were observed but a lifted section of lead flashing is present at the west side where the single storey section meets the two storey section, refer to **Photo 10**. Closer inspection from a ladder with the endoscope confirmed that the feature has a limited depth; no bats or evidence of previous use by bats. This feature was observed by Surveyor Positions 2 and 11.
- 9.3.14 Inspection of the void beneath the hipped roof confirmed the presence of timber sarking beneath the slates. No bats or bat droppings were observed but it was only possible to inspect the void above the suspended ceiling in three positions.

Building 4b

- 9.3.15 Attached to the east elevation of Building 4a is a timber framed portacabin office with a flat roof and a tightly sealed timber fascia, refer to **Photo 13**. Building 4b has no opportunities for use by roosting bats.
- 9.3.16 In summary, Building 4 has low suitability for use by roosting bats owing to the presence of limited features comprising the missing fascia at the north end and the lifted lead flashing.

Building 5: North Lights

- 9.3.17 Building 5 is divided into three sections:
- 5a is a stone building with a north lights and slate covered roof. Gaps are frequent in the elevation stonework. Internally the building has no roof void. Timber sarking is present beneath the roof slates;
 - 5b is similar to 5a and comprises a stone building with pitched slate covered roofs with hipped ends to the east. Gaps are present between the elevation stones. Gaps suitable for bat access are also present beneath the stone window lintels between the lintel and the concrete blockwork, particularly on the south elevation, refer to **Photo 20**; and
 - 5c is a single storey stone building with a multi-pitched slate covered north-lights roof. The glass panes on the roof are dilapidated and holes are frequent. Gaps are present in the stone elevation walls.
- 9.3.18 Buildings 5a to 5c support numerous gaps and opportunities for access by crevice roosting bat species; the buildings are assessed to have a high suitability for use by roosting bats.

Building 6: Workshop

- 9.3.19 Along the eastern boundary of the site is a dilapidated stone workshop with a north-lights slate covered roof. The wall ends have parapets that are capped with stone copings. The building has timber framed windows bordered by stone lintels and sills.
- 9.3.20 The window apertures on the east elevation are entirely bricked up; no gaps or opportunities for bat access were observed, refer to **Photo 17**.
- 9.3.21 Gaps suitable for bat access are present at the west elevation and possibly beneath the roof slates and ridge copings.
- 9.3.22 Building 6 is assessed to have a high suitability for use by crevice roosting bats.

Building 7: Warehouse

- 9.3.23 Building 7 is a stone built warehouse with north lights and slate covered roofs with hipped ends. Frequent gaps are present in the stonework on all elevations. Gaps are also present around the stone window lintels where the lintels meet the stones and where a gap has been left above concrete blockwork at bricked up windows, refer to **Photo 21**. Gaps were also observed around dilapidated timber window frames.
- 9.3.24 Building 7 is assessed to have a high suitability for use by crevice roosting bats.

Building 8: Warehouse

- 9.3.25 Building 8 is a single storey steel framed and brick warehouse with a shallow pitched corrugated sheeting covered roof, refer to **Photo 22**. Fascia over hang the gable ends at the east and west elevations and a gap is present above the doorway at the west elevation but closer inspection did not detect any evidence of use by roosting bats.
- 9.3.26 An internal inspection confirmed that the roof is unlined and a large hole is present in the roof, refer to **Photo 23**. Evidence of use of the building by feral pigeon was recorded.
- 9.3.27 Building 8 has negligible suitability for use by roosting bats.

Building 9: Offices

- 9.3.28 The offices comprise a two storey stone building with a hipped slate covered roof that supports stone chimney stacks with lead flashing at the base. The edge of the roof has a parapet wall, refer to **Photo 24**.
- 9.3.29 The window frames are pvc and a timber framed porch with a sloping felt covered roof is present at the south elevation. No bat droppings were found around the external elevations of Building 9.
- 9.3.30 A single roof void is present over the whole footprint of the building, refer to **Photo 25**. The underside of the slates are unlined and the pargework is visible. The ridgeboard, all roof trusses and floor of the void were carefully searched for bats and droppings; none were found. The void is dusty and draughty owing to the presence of large holes in the slate roof at the east side. No insulation is present.
- 9.3.31 Building 9 is assessed to have a moderate suitability for use by crevice roosting bats but the use of the roof void by free hanging bats such as brown long-eared is reasonably discounted owing to the absence of suitable conditions.

Building 10: Offices

- 9.3.32 Building 10 is a two-storey brick building with a flat roof and timber and pvc framed windows, refer to **Photo 26**. No opportunities for use by roosting bats were found and the building is assessed to have negligible suitability.

Building 11a to 11d: Offices

- 9.3.33 Building 11 is divided into four parts. Buildings 11a and 11b are similar in construction to Building 10 and have no suitability for use by roosting bats, refer to **Photo 29**.
- 9.3.34 Building 11d, refer to **Photo 28**, comprises a single storey timber cabin with a pitched tile covered roof. No opportunities for use by roosting bats were found and the building is assessed to have no suitability.
- 9.3.35 Building 11c is a stone built structure with a pitched slate covered roof with parapet walls at the south facing gable end (the north elevation keys into Building 11b). Gaps are present in the stone elevation wall and where 11c meets 11b at the east elevation. Building 11c is assessed to have a moderate suitability for use by roosting bats.

Building 12: Gatehouse

- 9.3.36 The gatehouse at Building 12 is a single storey brick building with a flat roof, refer to **Photo 30**. No opportunities for use by roosting bats were found and the building is assessed to have negligible suitability.

Building 13: Derelict Workshop

- 9.3.37 Building 13 is a single storey stone building with a slate covered north lights roof, refer to **Photo 31**. The building is very dilapidated and holes are frequent at the broken window panes and roof. A brief internal inspection confirmed that the internal stone walls are well-sealed; no gaps of opportunities for bat access were found.
- 9.3.38 Owing to the presence of a slate covered roof and ridge copings, Building 13 is assessed to have a low suitability for use by crevice roosting bats owing to the draughty and exposed conditions present.

Building 14: Store

- 9.3.39 Building 14 is a brick built store with a pitched corrugated sheeting covered roof with skylights, refer to **Photo 33**. Steel lintels are present on the elevation walls. The window apertures along the east elevation are bricked up. A gap is present at the top but closer inspection confirmed the gap only extends approximately 0.03m to 0.08m and does not lead into a deeper cavity and has no opportunity for bat access.
- 9.3.40 Building 14 is assessed to have a low suitability for use by crevice roosting bats owing to the limited value of the features present.

Building 15: Store

- 9.3.41 Building 15 is a metal hopper with a brick outbuilding with a single pitched roof at the western side, refer to **Photos 34 and 35**. No opportunities for use by roosting bats were found.

Building 16: Sub-station

- 9.3.42 The sub-station is a brick building with a flat felt covered roof and a timber fascia, refer to **Photo 36**. No opportunities for use by roosting bats were found.

Stone Culverts

- 9.3.43 The stone culverts beneath the buildings, refer to **Photo 38**, were not accessed. From examination of the culvert from the exterior it is concluded that the culverts support cracks and crevices and opportunities for bat access, particularly at the underarch.

Trees

- 9.3.44 Tree 1 (**Photo 37**), a Pedunculate Oak, located immediately south-west of Building 10 supports dense Ivy cover which can obscure opportunities for bat access. Tree 1 is assessed to have a low suitability for use by roosting bats.
- 9.3.45 None of the other trees within the footprint of the proposed re-development support potential roost features (PRFs) suitable for use by roosting bats.

Dawn Re-entry Surveys

- 9.3.46 Refer to the raw data at **Tables 9.5 to 9.8**, appended.

First Survey: 16th August 2017

- 9.3.47 Three common pipistrelle bats were observed entering a hole in the stone wall (Roost 1) at the northern elevation of Building 3 between 05:23 and 05:31 (25 to 17 minutes before sunrise). The roost is annotated on **Figure 9.1**.

9.3.48 No other bat re-entry or emergence activity was recorded.

Second Survey: 30th August 2017

9.3.49 Three common pipistrelle bats were observed entering Roost 1 at Building 3 (two at 05:55 and one at 06:01).

9.3.50 No other bat re-entry or emergence activity was recorded.

Third Survey: 14th September 2017

9.3.51 Two common pipistrelle bats were observed entering Roost 1 at Building 3 at 06:26.

9.3.52 No other bat re-entry or emergence activity was recorded.

Fourth Survey: 12th July 2018

9.3.53 One common pipistrelle bat entered Roost 1 at Building 3 at 04:53 (1 minute before sunrise).

9.3.54 No other bat re-entry or emergence activity was recorded.

Bat Activity (All Surveys)

9.3.55 Other bat activity recorded at the survey area is summarised as follows:

- a. Common pipistrelle was the only species recorded flying over the buildings at the site on the survey dates;
- b. Common pipistrelle social calls were detected;
- c. The bat detector on the south side of the lodge recorded two brief *Myotis* sp, bat passes on 30th August 2017;
- d. No bat activity was recorded at the culvert entrances;
- e. Bat activity levels is regarded to be 'low' at the site, as it was limited to single passes or single bats present in an area for only a few minutes (compared with 'high' bat activity levels, which would be indicated by constant bat activity throughout the survey period / until re-entry time); this is comparable with the survey data recorded during the transect surveys carried out in August 2018; and
- f. The bat activity (species diversity) recorded in 2017 is similar to that reported in the 2010 and 2015 bat survey reports.

9.3.56 Surveyor notes are reproduced at **Tables 9.5 to 9.8**. Analysis of the Anabat Express and SD2 recordings confirmed all surveyor observations; no other bat species was recorded at the surveyor positions.

Assessment of Habitats Suitability for Use by Foraging and Commuting Bats

9.3.57 In accordance with guidance at Table 4.1 of the *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016) and **Table 9.2**, above, the built area of the site is assessed to have low suitability for use by foraging and commuting bats. The established woodland and the lodge are more suitable and are assessed to have a moderate suitability.

9.4 Interpretation and Evaluation

Bats

Building 3: Roost 1

9.4.1 The bat surveys in 2017 and 2018 have confirmed that the northern elevation of Building 3 supports a common pipistrelle bat day roost, with a maximum count of three bats. An appropriate Natural England licence is required to legally demolish Building 3 and destroy the roost.

Buildings 5a and 7

- 9.4.2 No evidence of use of the previously recorded Roosts A to C (recorded in 2010) at Buildings 5a and 7 was found in 2015, 2017 or 2018; it is reasonably concluded that these roost positions are in longer 'in use'. No further actions are necessary but precautionary, best practice measures will be applied during the demolition.

Buildings 5a/5b and 6

- 9.4.3 No evidence of use of the possible roosts at Roosts D and E (detected in 2015) was recorded in 2017 or 2018; it is reasonably concluded that these roost positions are in longer 'in use'. No further actions are necessary but precautionary, best practice measures will be applied during the demolition.

Other Buildings / Culvert

- 9.4.4 No evidence of use of the other buildings and culvert by roosting bats was found; no further actions are necessary, although best practice precautionary measures will be applied during the demolition at relevant buildings, refer to **Section 9.10**.
- 9.4.5 Following surveys in summer 2010, 2015, 2017 and 2018, the presence of a maternity roost is reasonably discounted.
- 9.4.6 No evidence of use of the culverts by bats was recorded in summer 2017 or 2018 but the stone underarch may provide opportunities for use by hibernating bats. Precautionary measures to exclude bats, if present, from the culvert prior to removal are necessary and are described in this report.
- 9.4.7 Appropriate and proportionate survey effort, in accordance with standard survey guidelines (*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016)) has been applied. No further surveys are necessary to comply with the survey guidelines or best practice or to inform the demolition notice application / planning decision and licence application / registration.
- 9.4.8 The bat survey data presented in this report are only valid until May 2019. In accordance with best practice and Natural England guidance, if a licence application is delayed beyond May 2019 an updated bat survey will be required to support the licence application.
- 9.4.9 Importantly, appropriate and proportionate mitigation for roosting bats which will be mandatory in the event of the loss of Roost 1 is entirely feasible, refer to **Section 9.11**.

Birds

- 9.4.10 The buildings and vegetation within the site are suitable for use by nesting birds; breeding birds are protected under the *Wildlife and Countryside Act 1981* (as amended). **Section 5.9** of this Ecological Survey and Assessment report provides guidance in relation to nesting birds.

9.5 Assessment of Impacts

Brief Description of Proposals

- 9.5.1 This assessment of impacts on bats has considered of the loss of Roost 1 as a result of the demolition of Building 3 and then redevelopment proposals.
- 9.5.2 Guidance in relation to the preparation of a site layout that aims to conserve, and create, opportunities for the attraction of foraging and roosting bats to the site in the long-term is provided in **Sections 5.2** and **5.8** of this Ecological Survey and Assessment report.

Short-term Impacts: Disturbance

- 9.5.3 The proposals will involve the disturbance and loss of Roost 1.

- 9.5.4 In the absence of mitigation, the scale of impact is assessed as *low*; a maternity roost has not been identified and the roost has only been recorded to be used by a low (max. 3) number of common pipistrelle bats.

9.6 Long-term Impacts: Roost Modification and Roost Loss

- 9.6.1 In the absence of mitigation, the loss of Roost 1 is assessed to be of a *low* scale of impact, in accordance with the *Bat Mitigation Guidelines* (2004) and the status of the bat species in the local area.
- 9.6.2 The mitigation measures proposed will ensure that there is no loss of suitable roost opportunity at any point in the scheme and importantly, secure the creation of permanent opportunities for access by roosting bats at the site.

9.7 Long-term Impacts: Fragmentation and Isolation

- 9.7.1 The bat surveys identified use of the site by common pipistrelle bats and brief *Myotis* sp. passes.
- 9.7.2 As detailed in **Section 5.2** of this Ecological Survey and Assessment report, measures such as the sensitive use of lighting at the redeveloped site, conservation of woodland, open water and landscape planting using native species aim to conserve opportunities for the attraction of foraging bats at the site in the long-term. No significant impacts on the local bat population as a result of isolation and fragmentation are expected.

9.8 Post-development interference impacts

- 9.8.1 The level of human activity in the local area is not likely to cause a significant impact on the roost opportunities to be provided.
- 9.8.2 The sensitive use of lighting, as specified in **Section 5.8** of this Ecological Survey and Assessment report will avoid any adverse effects on opportunities to attract bats to the site.
- 9.8.3 No significant post-development interference impacts are expected.

9.9 Predicted Scale of Impact

- 9.9.1 In the absence of mitigation, the predicted scale of impact is assessed to be *low* as a result of the loss of one common pipistrelle bat day roost.
- 9.9.2 In the long-term, the impact at the local level is assessed to be *neutral*, as opportunities for roosting and foraging bats will be conserved at the site.
- 9.9.3 At the Greater Manchester and regional level the impacts are assessed to be *low*, as all efforts to retain the bats at the site are detailed in the mitigation strategy (refer to **Section 9.11**).
- 9.9.4 The site, the roost status and the proposed works meet the criteria to be registered under the Natural England Bat Mitigation Class Licence (BMCL).

9.10 Recommendations at all Buildings / Features Except Building 3

Buildings 1, 2, 4, 8, 10, 11a, b & d, 12, 13, 14, 15 and 16

- 9.10.1 Subject to the absence of nesting birds, there is no timing constraint on the commencement of works at Buildings 1, 2, 8, 10, 11a, b & d, 12, 15 and 16 in relation to bats.

Buildings 5, 6, 7, 9 and 11c

- 9.10.2 It is recommended that the slates and other features such as bricks beneath the stone lintels at the relevant buildings are removed, by hand, under the supervision of the licensed ecologist.
- 9.10.3 As precaution, during demolition works, all contractors must wear gloves.

- 9.10.4 If at any time a bat is found or suspected, all works in the area must stop and ERAP (Consultant Ecologists) Ltd must be contacted for guidance.

Tree 1

- 9.10.5 In accordance with best practice, current guidelines (Collins, J. (ed), 2016), if Tree 1 is scheduled for removal it is recommended that the following actions are applied:

Timing

- 9.10.6 The optimal time for tree removal is between September and late February inclusive.

Working Procedure

- 9.10.7 Tree 1 must be section / soft felled under the supervision of a licensed bat surveyor. The licensed bat surveyor will be present to supervise the following works:
- a. Careful section-felling of the tree. The sectioning must avoid cutting through or close to any cavities, this is likely to involve climbing the tree;
 - b. Cut sections will be lowered to the ground with the use of ropes;
 - c. Once on the ground the cavity will be inspected by the licensed bat surveyor and guidance issued; and
 - d. Allow all felled sections to lie on the ground for 24 hours before removing Ivy.

Culvert Entrances

- 9.10.8 As a precaution, the culvert will be excluded to bats during the bat activity season using the sheeting exclusion method. The exclusion works can only be carried out in the bat activity season. Note: Owing to the possible use of the culverts by nesting bird such as dipper an grey wagtail, this work must either be carried out outside the bird nesting season or following a pre-works inspection and confirmation of the absence of nesting birds.

9.11 Bat Mitigation Strategy: Building 3 / Roost 1

Natural England Licence and the Three Tests

- 9.11.1 The demolition works at Building 3 must only be carried out under an appropriate Natural England European Protected Species Mitigation (EPSM) licence granted under Regulation 55 of *The Conservation of Habitats and Species Regulations 2017*. The licence permits the destruction of bat roosts which would otherwise be an offence.
- 9.11.2 The site meets the criteria to be registered under the Natural England BMCL. Victoria Burrows is a Registered Consultant under the BMCL (RC038).
- 9.11.3 To comply with the terms and conditions of the BMCL it is necessary to demonstrate that the following three tests of Regulation 55 (as stated below) are addressed and satisfied:

Test 1: *That the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range* [Regulation 55 (9)(b)];

Test 2: *Demonstration that the proposals for which a licence is sought are for the purposes of '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 55(2)(e)]; and

Test 3: Consideration '*That there is no satisfactory alternative*' including the implications of the 'do-nothing' option [Regulation 55 (9)(a)].

- 9.11.4 Test 1 is addressed below under the Mitigation Strategy section below.

- 9.11.5 In consideration of Tests 2 and 3, the proposal is an imperative reason of over-riding public interest (IROPI).
- 9.11.6 The principle of the redevelopment of the site to residential accommodation has been agreed by the previously approved outline planning permission for the site, achieved in 2012 (Bury Council reference: 53762).
- 9.11.7 The statements made in the planning statement submitted with the former application remain applicable. For example, Tetrosyl has operated from the site off Walmersley Old Road for c. 50 years, during that time two other sites within the Bury area have been established and are working to capacity owing to their modern facilities and appropriate location. The Walmersley Old Road site is restricting the ability of the company to grow as the buildings are incapable of being brought up to date to provide the form and standard required to accommodate new production systems.
- 9.11.8 To enable the company to grow, provide competitive prices to the market and its customers and also serve the international market, more modern facilities are required in a more sustainable and accessible location.
- 9.11.9 It is understood that disposal of the site for residential purposes would provide significant capital receipt, which, when accompanied by significant investment via working capital from Tetrosyl would enable the delivery of new modern and suitable facilities to ensure the continued and future success of the company.
- 9.11.10 In consideration of alternatives, including the 'do-nothing' option, it was agreed at Public Inquiry held for an earlier planning application at the site for residential development in 2003 that the old mill buildings are beyond further economic use as manufacturing or storage buildings. The 'do nothing' option is not viable and would not enable Tetrosyl to relocate, continue to invest in the business and to provide competitively priced products.
- 9.11.11 The topography, age condition and nature of the Walmersley Old Road site does not enable Tetrosyl to meet its accommodation needs at a reasonable cost or within the prospect of economic return on any further investment to try and upgrade the facilities at the site. Tetrosyl needs to relocate the remaining production and other activities from this site to more suitable locations.
- 9.11.12 In consideration of the suitability of the site for residential use, it is confirmed that the site lies within an existing urban and residential area. The proposals provide an opportunity to contribute towards sustainable communities. In addition, through the previous planning applications it has been agreed that the site currently has adequate infrastructure to serve a residential site.
- 9.11.13 In consideration of alternatives to the site design, the proposed site layout is the most viable option that utilises the existing developed land and protects the green belt.
- 9.11.14 It is concluded that, in combination with the measures outlined below, the three tests of the Regulations are satisfied.

Mitigation Strategy: Works to be Carried Out Prior to / In Advance of Demolition

- 9.11.15 The works described below must only be carried out under the advice of the Registered Consultant and terms and conditions of the BMCL.
- 9.11.16 This mitigation strategy draws on the following available information:
- Natural England guidance;
 - Information presented in the *BCT Mitigation Conference Proceedings* (BCT, 2007), arranged by the Bat Conservation Trust;
 - Implemented and monitored activities/specifications carried out by ERAP (Consultant Ecologists) Ltd at other sites / properties; and
 - Information presented on the 'Roost' website provided by the Bat Conservation Trust.

Bat Box Installation

- 9.11.17 To compensate for the loss of Roost 1, and prior to the commencement of demolition and the likelihood of the construction of any new buildings, it is essential that one tree-mounted bat box is installed within the site

(more than one box will be provided but this is treated as enhancement in accordance with the licensing process, refer to **Section 5.8** of this Ecological Survey and Assessment report).

9.11.18 Installation of the box will be overseen by the Registered Consultant. The box must be positioned a height of over four metres from ground level, ideally facing east, south or west and away from dense understorey or risk of future Ivy cover. This specification will be provided in more detail once the scheme is finalised.

9.11.19 In accordance with the terms and conditions of the BMCL, the box must be in place within two months of the confirmation of site registration.

Toolbox Talk

9.11.20 Prior to the commencement of demolition works (including asbestos works) the Registered Consultant will inform all contractors of the following:

- a. The wildlife legislation and protection afforded to bats and their roosts;
- b. The presence of the licence and method statement and the need to abide by the content;
- c. The licensable actions;
- d. Good working practices;
- e. The presence of the bat box(es) and the need for them to remain undisturbed;
- f. The protocol to be followed if a bat is discovered when the licensed bat worker is not on site; and
- g. An outline of the proposals and timescales.

Mitigation Strategy: Works to be Carried Out Immediately Prior to / During Demolition

Retention and Protection of Existing Roosts

9.11.21 No existing roosts will be retained.

Capture and Exclusion

Roost 1

9.11.22 As Roost 1 has a discrete and single access it is feasible to install a one-way exclusion device. Once the device has been in place for 5 consecutive nights in the bat active season and during suitable weather conditions the Registered Consultant will supervise the soft strip / demolition, by hand, of the stone wall around Roost 1, as needed. If a bat is found it will be carefully collected and moved to a bat box at the site.

9.11.23 The Registered Consultant will also supervise the removal of other potential roost features around the building, as needed.

9.11.24 Once the Registered Consultant is satisfied that all soft demolition works have been carried out the instruction will be provided to continue the demolition in accordance with the Toolbox Talk guidance.

Discovery of a Bat

9.11.25 If at any time during the works a bat is discovered, or suspected, when the Registered Consultant is not on site, all contractors must withdraw from the area and ERAP (Consultant Ecologists) Ltd or Natural England must be contacted for further advice.

Mechanism for Ensuring Implementation / Success

9.11.26 If the licensed bat surveyor / Registered Consultant has any concerns regarding the quality of workmanship or there is non-compliance with the Natural England BMCL, this Mitigation Strategy and / or guidance provided by the licensed bat worker than this will result in additional site visits to make inspections.

9.11.27 It is always the intention to ensure all parties are aware of the importance of the Natural England licence and compliance with the Mitigation Strategy and this is achieved through good communication. However in extreme / significant cases of non-compliance the licensed bat surveyor will report the issue to Natural England and further action may be taken.

Monitoring

9.11.28 There is no requirement for any post-development monitoring under the BMCL, nor in accordance with Figure 4 of the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004).

Provision of Enhancement

9.11.29 The compensatory measures described above are proportionate and appropriate to the likely impacts and are in accordance with Annex B (Table B) of the BMCL.

9.11.30 However, as the site will remain favourable for the attraction of foraging bats, including common pipistrelle bats, to provide enhanced opportunities for bats and comply with the principles of the National Planning Policy Framework it is feasible to accommodate additional opportunities for roosting bats at the redeveloped site.

9.11.31 This will comprise the installation of bat access panels at the new properties, refer to **Section 5.8** of this Ecological Survey and Assessment report.

Work Schedule

9.11.32 A work schedule can be provided to demonstrate feasibility once the planning permission is obtained.

9.12 Conclusion

9.12.1 An appropriate scope and level of survey has been carried out in 2017 and 2018 to inform the scope of the Bat Mitigation Strategy.

9.12.2 Roost 1 at Building 3, a common pipistrelle day roost, will be removed by the scheduled demolition; this is assessed as a *low* scale of impact.

9.12.3 A Bat Mitigation Strategy (**Section 9.11**) has been prepared to demonstrate that the demolition of Building 3 and all other buildings can be achieved in accordance with wildlife legislation, planning policy, Natural England guidance and good practice.

9.12.4 The site and bat roost status meet the conditions of the Bat Mitigation Class Licence (BMCL) and an application to register the site will be made to facilitate demolition in 2019.

9.12.5 If demolition has not commenced prior to May 2019 the bat activity surveys will need to be updated.

9.12.6 The Bat Mitigation Strategy demonstrates that appropriate mitigation for the roost is entirely feasible. The 'three tests' of *The Conservation of Habitats and Species Regulations 2017* have been met and the appropriate Natural England licence will be obtained to facilitate the works.

9.12.7 Enhancement measures are proposed and importantly, in the long-term, it is the intention that will be no net loss of opportunities for use by roosting and foraging bats at the site.

9.13 Tables

Table 9.4: Photographs



Photo 1: South and east elevation of Building 1



Photo 2: No gaps present beneath the cladding or in the blockwork at Building 1

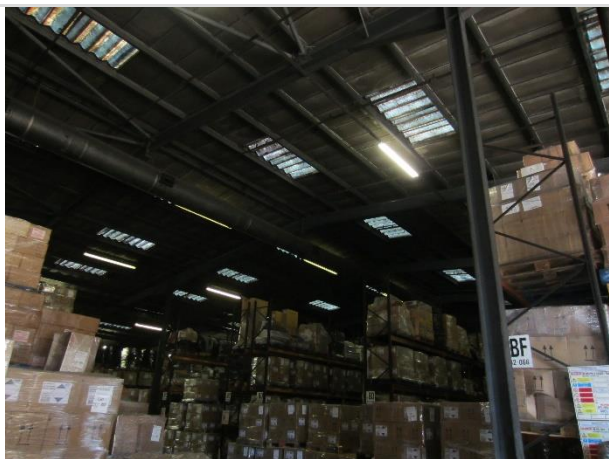


Photo 3: Interior of Building 1 showing steel frame and skylights



Photo 4: South elevation of Building 2



Photo 5: West and south elevation of Building 3



Photo 6: East elevation of Building 3 showing holes in stone elevation wall and cement sheeting fascia at a brick annex



Photo 7: Interior of Building 3 showing sarking, north lights and exposed stone walls



Photo 8: East elevation of Building 4 and lodge (Pond 1)



Photo 9: West and south elevation of Building 4



Photo 10: Minor gaps at lifted lead flashing on Building 4

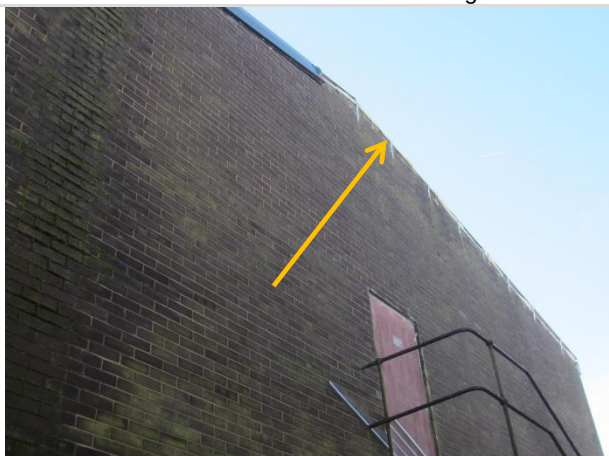


Photo 11: North elevation of Building 4a and missing fascia



Photo 12: Roof void above suspended ceiling at two-storey section of Building 4a



Photo 13: Building 4b, portacabin attached to the east elevation of Building 3



Photo 14: North elevation of Building 5a



Photo 15: Building 6, 5c and 5b (left to right)



Photo 16: Buildings 5b (left) and 7 (right)



Photo 17: East elevation of Building 6 showing tightly sealed window apertures



Photo 18: West elevation of Building 6; gaps present at broken window panes



Photo 19: West elevation of Building 7



Photo 20: South elevation of Building 7 (5b in background)



Photo 21: Gaps beneath window lintels at south elevation of Building 7



Photo 22: North and west elevation of Building 8



Photo 23: Interior of Building 8



Photo 24: West and south elevation of Building 9



Photo 25: Roof void at Building 9



Photo 26: North and west elevation of Building 10



Photo 27: East elevation of Building 11b



Photo 28: South elevation of Building 11c (11d to the left)



Photo 29: West elevation of Building 11b and north elevation of 11a



Photo 30: Building 12



Photo 31: West elevation of Building 13



Photo 32: Interior of Building 13



Photo 33: North and west elevation of Building 14



Photo 34: Building 15

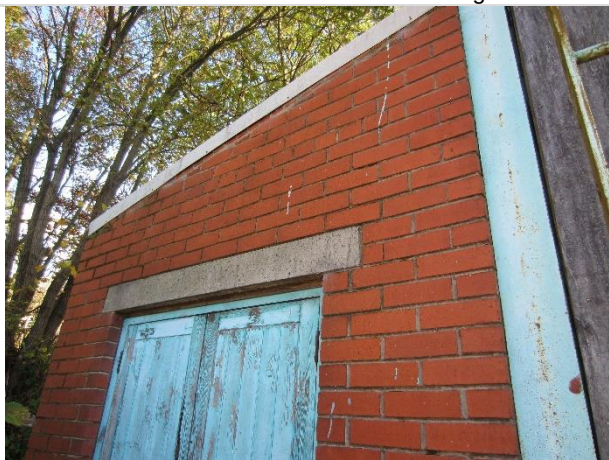


Photo 35: West elevation of Building 15



Photo 36: Building 16



Photo 37: Tree 1



Photo 38: Culvert entrance near weir

Table 9.5: Bat Activity Detected During Dawn Re-entry Survey on 16th August 2017

Surveyor Position	Time	Species	Observations / Anabat Recordings (assumes one bat unless stated)
1	04:51 to 05:25	P45	Calls on Anabat recordings including social calls
	05:23, 05:26 and 05:31	P45	Three bats entered a gap (one at each time) in the stone wall at the north elevation of the most eastern wall end at Building 3 (Roost 1)
2	04:42	P45	Brief pass
	04:48	P45	Brief pass
3	03:59	P45	Pass
	04:00	P45	Pass
	04:49	P45	Pass
4	04:28	P45	Pass
	04:33	P45	Pass
	04:57	P45	Pass over Building 5c
	05:02	P45	Headed off site
	05:07	P45	Flew over Building 5b and left site
	05:14	P45	Two bats over lodge
	05:27	P45	Flew over Building 5b
5	No bat passes		
6	05:21	P45	Pass recorded on Anabat
	05:22	My.	Pass recorded on Anabat
7	03:56	P45	Pass recorded on Anabat
	04:01	P45	Pass recorded on Anabat
	04:27	P45	Pass recorded on Anabat
	04:33	P45	Pass recorded on Anabat
	04:48	P45	Pass recorded on Anabat
	04:50	P45	Pass recorded on Anabat
	04:55	P45	Pass recorded on Anabat
	04:57	P45	Pass recorded on Anabat
	05:02	P45	Pass recorded on Anabat
	05:04	P45	Pass recorded on Anabat
	05:18	P45	Pass recorded on Anabat
	05:21 to 05:28	P45	Pass recorded on Anabat
8	05:18	P45	Pass and foraging along lane
9	05:18	P45	Pass and foraging along lane
10	04:00	P45	Pass and foraging along lane
	04:40	P45	Pass and foraging along lane
	04:47	P45	Pass and foraging along lane
	04:51	P45	Pass and foraging along lane
	04:52	P45	Pass and foraging along lane
	04:58	P45	Pass and foraging along lane
	04:59	P45	Pass and foraging along lane
	05:00	P45	Pass and foraging along lane
	05:01	P45	Pass and foraging along lane
	05:04	P45	Pass and foraging along lane
	05:05 to 05:21	P45	Pass and foraging along lane
SD2 over southern side of lodge	04:26 to 05:20	P45	Passes

P45 = Common pipistrelle, My. = *Myotis* sp.

Table 9.6: Bat Activity Detected During Dawn Re-entry Survey on 30th August 2017

Surveyor Position	Time	Species	Observations / Anabat Recordings (assumes one bat unless stated)
1	04:57	P45	Pass
	05:11	P45	Pass
	05:14	P45	Pass
	05:17 to 05:30	P45	Pass
	05:54	P45	Entered and immediately left Roost 1 (hole in stonework at north facing elevation of Building 3)
	05:55	P45	One bat entered Roost 1
	06:01	P45	Two bats entered Roost 1
2	05:09	P45	Brief pass
	05:14	P45	Pass
	05:17	P45	Pass
	05:48	P45	Brief pass
3	04:53	P45	Pass
	05:08	P45	Pass
	05:30	P45	Pass
	05:42	P45	Pass
5	04:41	P45	Pass
	05:18	P45	Pass
6	04:12	P45	Pass
	04:36	P45	Pass
	04:44	P45	Pass
	04:52	P45	Pass
	05:50	P45	Pass
	05:06	P45	Pass
7	05:10	P45	Pass
	04:06	P45	Pass recorded on Anabat
	05:15	P45	Pass recorded on Anabat
	04:29	P45	Pass recorded on Anabat
	04:47	P45	Pass recorded on Anabat
	04:49	P45	Pass recorded on Anabat
	04:50	P45	Pass recorded on Anabat
	05:56	P45	Pass recorded on Anabat
	05:07	P45	Pass recorded on Anabat
	05:08	P45	Pass recorded on Anabat
	05:09	P45	Pass recorded on Anabat
	05:10 to 05:35	P45	Passes recorded on Anabat
8	06:00	P45	Pass recorded on Anabat
	04:50	P45	Pass
9	05:48	P45	Pass
	05:49	P45	Pass
10	05:49	P45	Pass
	04:16	P45	Pass and foraging along lane
	04:38	P45	Pass and foraging along lane
	04:55	P45	Pass and foraging along lane
	04:58	P45	Pass and foraging along lane
	05:07	P45	Pass and foraging along lane
	05:11	P45	Pass and foraging along lane
	05:12 until 05:20	P45	Pass and foraging along lane
	05:38	P45	Pass and foraging along lane
11	05:40 until 05:51	P45	Pass and foraging along lane
	04:56	P45	Brief pass
	05:08	P45	Brief pass
	05:13	P45	Brief pass
SD2 over southern side of lodge	04:56 and 05:18	My.	Brief pass
	05:13	P45	Brief pass

P45 = Common pipistrelle, My. = *Myotis* sp.

Table 9.7: Bat Activity Detected During Dawn Re-entry Survey on 14th September 2017

Surveyor Position	Time	Species	Observations / Anabat Recordings (assumes one bat unless stated)
1	06:26	P45	Two bats entered Roost 1
3	No bat passes	-	-
4	06:05	P45	Brief pass
	06:08	P45	Foraging over track outside site boundary
	06:13	P45	Pass
5	No bat passes	-	-
6	No bat passes	-	-
7	05:52 to 05:53	P45	Passes
11	No bat passes	-	-
12	05:51	P45	Pass
	06:15	P45	Pass
SD2 over western side of lodge	05:51	P45	Pass
	05:54	P45	Pass

P45 = Common pipistrelle

Table 9.8: Bat Activity Detected During Dawn Re-entry Survey on 12th July 2018

Surveyor Position	Time	Species	Observations / Anabat Recordings (assumes one bat unless stated)
1	03:26	P45	Very brief pass, heard not seen
	03:30	P45	Heard not seen
	03:34	P45	In flight from south-west to north-east
	03:45	P45	Heard not seen
	04:08	P45	Heard not seen
	04:11	P45	Heard not seen
	04:16	P45	In flight from east to north
	04:23	P45	Brief pass, heard not seen
	04:23	P45	In flight from north to south
2	04:53	P45	One bat entered Roost 1
	03:15	P45	In flight north to west
	04:15	P45	Two bats in flight south to west
	04:20	P45	Two bats in flight over lodge
4	04:31	P45	In flight north to south
	03:10 to 03:40	P45	Constant social calls, at least two bats seen circling over buildings.
	03:45	P45	Social calls, heard not seen
	03:52	P45	Social calls, heard not seen
	03:54	P45	Social calls, heard not seen
	04:26	P45	Social calls, heard not seen
	04:37	P45	Very brief pass, heard not seen
6	-	P45	The Anabat Express made the following recordings: 12 common pipistrelle recordings between 03:07 and 04:34.
	03:17	P45	Brief pass, heard not seen
	03:19	P45	Brief pass, heard not seen
	03:21	P45	Brief pass, heard not seen
	03:26	P45	Brief pass, heard not seen
	03:27	P45	Brief pass, heard not seen
	03:28	P45	Brief pass, heard not seen
	03:29	P45	Brief pass, heard not seen
	03:31	P45	Brief pass, heard not seen
	03:35	P45	Very brief pass, heard not seen
	03:38	P45	Brief pass, heard not seen
	03:41	P45	Heard not seen
	02:42	P45	Heard not seen
	03:43	P45	Heard not seen

	03:52	P45	Brief pass, heard not seen
	03:53	P45	Very brief pass, heard not seen
	04:19	P45	Very brief pass, heard not seen
	04:24	P45	Brief pass, heard not seen
	04:36	P45	Brief pass, heard not seen
		P45	The Anabat Express made the following recordings: 18 common pipistrelle recordings between 03:07 and 04:37.
7	03:14	P45	Pass
	03:16	P45	Pass
	03:18	P45	Pass
	03:19	P45	Pass
	03:20	P45	Pass
	03:20	P45	Pass
	03:21	P45	Pass
	04:36	P45	Pass
	-	P45	The Anabat Express made the following recordings: 291 common pipistrelle recordings between 03:09 and 04:37.
8	03:17	P45	Pass
	03:19	P45	Pass
	03:19 to 03:22	P45	Pass
	03:34 to 03:35	P45	Pass
	03:36	P45	Pass
	03:39	P45	Pass
	03:41	P45	Pass
	03:43	P45	Pass
	03:45	P45	Pass
	03:56	P45	Pass
	03:58	P45	Pass
	04:02	P45	Pass
	04:03	P45	Pass
	04:13	P45	Pass
	-	P45	The Anabat Express made the following recordings: 21 common pipistrelle recordings between 03:14 and 04:14.
11	03:10	P45	Pass
	03:10 to 04:20	P45	Occasional passes
	04:20	P45	Two bats flying over weir
	04:15 to 04:30	P45	Constant foraging
	04:30 onwards	No bats recorded	-
	-	P45	The Anabat Express made the following recordings: 76 common pipistrelle recordings between 03:12 and 04:30.
	05:13	P45	Brief pass
SD2 over southern side of lodge	03:36 and 04:24.	P45	9 common pipistrelle recordings between 03:36 and 04:24.
SD2 at weir	03:37 and 04:56	P45	63 common pipistrelle recordings between 03:37 and 04:56

P45 = Common pipistrelle,

9.14 Figure

Figure 9.1: Plan to Show All Buildings, Surveyor Locations and Position of Roost 1 (2017 & 2018), Roosts A to C (2010) and Roosts D to E (2015)

