

Appendix D

ECOLOGY



Land at Florida Farm, Haydock, WA11 0UZ

**ECOLOGICAL SURVEY AND ASSESSMENT
(including a Licensed Bat Survey)**

November 2017

[ERAP (Consultant Ecologists) Ltd ref: 2017-066]

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

Tel: 01772 750502

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



CONTENTS

Summary	4
1.0 Introduction	5
1.1 Background and Rationale	5
1.2 Scope of Works.....	5
2.0 Method of Survey.....	6
2.1 Desktop Study.....	6
2.2 Vegetation and Habitats	6
2.3 Animal Life	7
2.4 Survey Limitations.....	13
2.5 Evaluation Methodology	13
3.0 Survey Results.....	14
3.1 Desktop Study.....	14
3.2 Vegetation and Habitats	17
3.3 Animal Life	19
4.0 Evaluation and Assessment.....	29
4.1 Introduction and Description of Proposals.....	29
4.2 Designated Sites.....	29
4.3 Vegetation and Habitats.....	30
4.4 Protected Species and Other Wildlife.....	31
4.5 Assessment of Impacts.....	31
5.0 Recommendations and Ecological Enhancement	32
5.1 Introduction	32
5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layout.....	32
5.3 Invasive Species	32
5.4 Bats	33
5.5 Birds.....	34
5.6 Protection of Water Voles	35
5.7 Enhancement and Management of Retained Habitats and Landscape Planting	36
5.8 Habitat Connectivity	36
6.0 Conclusion	37
7.0 References	38
8.0 Appendix: Tables and Figures	40
8.1 Plant Species Lists	40
8.2 Photographs.....	47
8.3 Dusk Emergence Surveys, Raw Data	55
8.4 Transect Surveys.....	59
8.5 Breeding Bird Surveys.....	65

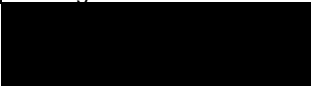
List of Tables

Table 2.1: Survey Equipment used during Daylight Bat Survey	8
Table 2.2: Consideration of Suitability of Foraging and Commuting Habitat for Bats	9
Table 2.3: Dusk Emergence Survey Dates, Weather Conditions and Surveyors	9
Table 2.4: Transect Survey Dates, Weather Conditions and Surveyors	10
Table 2.5: Static Detector Locations and Dates Deployed.....	11
Table 2.6: Important Habitat Characteristics for Reptiles	12
Table 3.1: Non-statutory Designated Sites within a One Kilometre Radius of the Study Site	15
Table 3.2: Records of Protected Species within a One Kilometre Radius of the Site	16
Table 3.3: Summary of Survey Results at Transects 1, 2 and 3, Repetition 1, 24 th May 2017.....	22
Table 3.4: Summary of Survey Results at Transects 1, 2 and 3, Repetition 2, 2 nd August 2017.....	23
Table 3.5: Summary of Survey Results at Transects 1, 2 and 3, Repetition 3, 19 th September 2017.....	23
Table 3.6: Total Recorded Bat Activity by Species and Transect	23
Table 3.7: Total Number of Recordings at Each Location By Species By Night.....	25
Table 3.8: Total Number of Recordings at Each Location Over the Whole Survey	25
Table 3.9: Bird species Detected on 5 th April 2017	27
Table 3.10: Summary of Bird species Detected in April and June 2017	28
Table 5.1: Suitable Native Species for Tree and Shrub Planting	36
Table 8.1: Plant Species List for Scrub at the South-western Area of the Site	40
Table 8.2: Plant Species List for Arable Field Margins.....	41
Table 8.3: Plant Species List for Improved Grassland	42
Table 8.4: Plant Species List for Clipsley Brook and Ditch	43
Table 8.5: Plant Species List for Tree Line 1 and 2	44
Table 8.6: Plant Species Composition, Frequency and Abundance for Hedgerows 1 and 2	45
Table 8.7: The Hedgerow Regulations 1997 Assessments Results of Hedgerows 1 and 2.....	46
Table 8.8: Table of Photographs	47
Table 8.9: 1 st Repetition, 18 th June 2017 (Sunset 21:29).....	55
Table 8.10: 2 nd Repetition, 7 th August 2017 (Sunset 20:56).....	57
Table 8.11: Activity by Point Count Location, 1 st Repetition, 24 th May 2017 (Sunset 21:19).....	59
Table 8.12: Activity by Point Count Location, 2 nd Repetition, 2 nd August 2017 (Sunset 21:05).....	61
Table 8.13: Activity by Point Count Location, 3 rd Repetition, 19 th September 2017 (Sunset 19:18).....	63
Table 8.14: Breeding Bird Survey 15 th April 2017	65
Table 8.15: Breeding Bird Survey 14 th June 2017.....	66

List of Figures

Figure 1: Google Earth Image to Illustrate the Site Boundary	67
Figure 2: Phase 1 Habitat and Vegetation Map	68
Figure 3: Building Plan	69
Figure 4: Bat Emergence Survey 18/07/2017	70
Figure 5: Bat Emergence Survey 07/08/2017	71
Figure 6: Plan to Illustrate Transect Routes and Anabat Locations	72
Figure 7: Results of Transect Survey 1 st Repetition 24 th May 2017	73
Figure 8: Results of Transect Survey 2 nd Repetition 2 nd August 2017	74
Figure 9: Results of Transect Survey 3 rd Repetition 19 th September 2017	75
Figure 10: Breeding Bird Survey 1, 15 th April 2017	76
Figure 11: Breeding Bird Survey 2, 14 th June 2017	77

Document Control

Survey Type:	Surveyors ¹	Survey Date(s)
Phase 1 Habitat	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	5 th April 2017
Daylight bat survey	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM	11 th April 2017
Bat activity surveys	Amy Sharples , Chris Schofield, Brian Robinson, Ryan Evans, Charlotte Harrison, Danielle Rowlands, Tracy Cumberbatch, Darren Graham, Jordan Prendergast	18 th July 2017 7 th August 2017
Transect surveys	Amy Sharples, Chris Schofield, Tracy Cumberbatch, Charlotte Harrison	24 th May 2017 2 nd August 2017 19 th September 2017
Breeding bird surveys	Chris Swindells B.Sc. (Hons)	15 th April and 14 th June 2017
Water Vole surveys	Chris Swindells	13 th April and 11 th July 2017
Reporting	Personnel	Date
Author	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM Ecologist	2 nd November 2017
Signature(s)		
Checked by	Brian Robinson B.Sc. (Hons) MCIEEM Senior Ecologist	20 th November 2017
Revised and issued by	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	24 th November 2017
Report issued to	Barratt Homes Manchester Division	
Copy Number	1	
¹ Licence reference numbers		
Bats		
<ul style="list-style-type: none"> • Victoria Burrows, Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-10390-CLS-CLS • Brian Robinson Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-13161-CLS-CLS 		
Barn Owl		
<ul style="list-style-type: none"> • Victoria Burrows Natural England Class Survey Licence Registration Number CL29/00061 		

SUMMARY

- i. This Ecological Appraisal presents the ecological, biodiversity and nature conservation status of the land at Florida Farm, Haydock WA11 0UZ. The appraisal was requested in connection with proposals to develop the site to housing.
- ii. The appraisal presents the results of a desktop study, extended Phase 1 Habitat Survey, a licensed daylight bat survey, bat activity surveys, breeding bird surveys and water vole surveys carried out in between April and September 2017. The scope of survey undertaken is appropriate to identify potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The site comprises scrub, arable fields, improved grassland, amenity grassland, Clipsley Brook and a ditch, tree lines and hedgerows and a farm house with associated outbuildings.
- iv. The proposals will have no adverse effect on statutory or non-statutory designated sites for nature conservation. It is concluded that the scrub habitat within the site is not characteristic of the Lowland Deciduous Woodland Priority Habitat.
- v. None of the habitats within the site are of significant interest in terms of their plant species composition, and none of the habitats present are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present. The site contains only common and widespread plant species.
- vi. Hedgerows 1 and 2 are examples of Priority Habitat. No other Priority Habitat is present within the site. The scrub and trees at the site are of local value as they contribute to a diversity of habitats at the site, and are suitable for use by nesting birds and foraging bats. It is recommended that the hedgerows, scrub and trees are retained and protected where feasible.
- vii. The Clipsley Brook and ditch within the site are of local value as they add structural diversity and provide habitat suitable for use by water vole. It is recommended that the Clipsley Brook and ditch are retained and protected.
- viii. Japanese Knotweed and Indian Balsam, both species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), were detected within the site. Guidance on the control and management of these species is described in the report (**Section 5.3**).
- ix. No roosting bats were detected at the site. The transect and static recorder surveys have confirmed that bat species (most frequently common and soprano pipistrelle) utilise the habitats within the site for foraging. Recommendations for enhancement for roosting bats are presented at **Section 5.4**.
- x. Habitats within the site are suitable for use by nesting birds; all wild birds are protected whilst they are breeding under the *Wildlife and Countryside Act 1981* (as amended). Recommendations for the protection of nesting birds and the enhancement of the site for use by nesting birds are presented at **Section 5.5**.
- xi. No water voles were detected at the site. Recommendations for the protection of water vole are presented at **Section 5.6**.
- xii. No other protected species have been detected.
- xiii. The recommendations in **Section 5.0** address all the mandatory measures and ecological recommendations to be applied to ensure compliance with wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.
- xiv. 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 birds and bats, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.
- xv. It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. Development at the site will provide an opportunity to secure ecological enhancement for wildlife associated with residential development.

1.0 INTRODUCTION

1.1 Background and Rationale

- 1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by Barratt Homes Manchester Division to carry out an ecological appraisal of the land at Florida Farm, Haydock WA11 0UZ (hereafter referred to as the 'site'). The Ordnance Survey (OS) grid reference at the centre of the site is SJ 5482 9741. An aerial image of the site and its surrounding habitats is appended at **Figure 1** (source image: Google Maps).
- 1.1.2 The appraisal was requested in connection with a planning application to develop the site to housing.
- 1.1.3 A desktop study including an ecological constraints and opportunities assessment was undertaken prior to the commencement of the Extended Phase 1 survey at the site. The results of the desktop study are presented at *2016-216 Land at Florida Farm, Haydock WA11 0UZ, Desktop Study (Including a Constraints and Opportunities Assessment)* (ERAP Ltd, October 2016).

1.2 Scope of Works

- 1.2.1 The scope of ecological surveys undertaken comprised:
- a. A desktop study for known ecological information at the site and the local area (October 2016);
 - 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 statutorily protected species and other wildlife including badger (*Meles meles*), barn owl (*Tyto alba*), great crested newt (*Triturus cristatus*), water vole (*Arvicola amphibius*), bird species and reptiles;
 - e. A licensed bat survey of the buildings and trees;
 - f. Bat emergence surveys at the buildings and bat activity surveys (transect and static) at the habitats within the site;
 - g. The 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
 - h. The identification of any further surveys or precautionary actions that may be required prior to the commencement of any development activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study

- 2.1.1 The following sources of information and ecological records were consulted for information:
- MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - Google Earth aerial imagery and Ordnance Survey maps;
 - Merseyside BioBank (MBB), the local ecological records centre for Merseyside; and
 - The North Merseyside Biodiversity Action Plan (BAP).

2.2 Vegetation and Habitats

- 2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM on 5th April 2017. The weather was overcast with a gentle breeze (Beaufort Scale 3) and an air temperature of 11°C. The conditions and time of year were favourable for the ecological survey.
- 2.2.2 A habitat and vegetation map was produced for the site and the immediate surrounding area at a scale of 1:2500 (refer to **Figure 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.
- 2.2.3 The 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.
- 2.2.4 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.
- 2.2.5 Hedgerows were assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape Criteria (H.M.S.O., 1997).
- 2.2.6 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).
- 2.2.7 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 A thorough search for badger activity was carried out. The survey area covered the site (as annotated on **Figure 1**) and extended to accessible land within a radius of 50 metres from the site boundary. Private gardens were excluded from the survey.
- 2.3.2 Surveys were conducted in accordance with guidance presented with *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
- Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - Large spoil heaps outside sett entrances;
 - Bedding outside sett entrances;
 - Badger footprints;
 - Badger paths;
 - Latrines;
 - Badger hairs on fences or bushes;
 - Scratching posts; and
 - Signs of digging for food.
- 2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Daylight Survey

Survey Personnel

- 2.3.5 The site was assessed for its suitability to support roosting bats by Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM (assisted by Amy Sharples) on 11th April 2017. The weather was dry and overcast with a gentle breeze (Beaufort Scale 3) and an air temperature of 9°C.
- 2.3.6 Victoria holds a Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-10390-CLS-CLS. The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).
- 2.3.7 The surveys were carried out in accordance with standard methodology including 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).

Buildings

- 2.3.8 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.
- 2.3.9 The internal survey involved an examination of the accessible internal areas (including roof voids) to find roosting bats or evidence of past use of the buildings by bats such as droppings and prey remains.

2.3.10 A list of equipment used is detailed at **Table 2.1**, below:

Table 2.1: Survey Equipment used during Daylight Bat Survey

Ladders
LED Lenser P14 torch
Clulite CB2 hand lamp
Canon Ixus digital camera
8x20 binoculars
Video borescope

2.3.11 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 the presence of gaps suitable for access by bats, the presence of 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

2.3.12 A preliminary assessment of the trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.

2.3.13 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.

2.3.14 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).

Habitat Assessment for Commuting / Foraging Bats

2.3.15 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 at **Table 2.2**, below.

Table 2.2: 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 or 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.

Presence / Absence Surveys: Dusk Emergence Surveys

- 2.3.16 Two dusk emergence surveys were conducted at the buildings between July and August 2017.
- 2.3.17 Six surveyors, experienced in conducting bat surveys, were positioned at suitable locations to maximise the coverage of the buildings and to determine any emergence from or entry into the buildings by roosting bats. Heterodyne detectors were used to identify any bat detected to species. Anabat Express (AE) and Anabat SD2 units were also used to record and analyse echolocation calls after the survey using AnalookW Bat call analysis software.
- 2.3.18 The dusk emergence surveys were conducted approximately fifteen minutes before sunset and continued for at least one hour after sunset.
- 2.3.19 Surveyor positions are annotated on **Figures 4** and **5**. 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 **Table 2.3**, below.

Table 2.3: Dusk Emergence Survey Dates, Weather Conditions and Surveyors

Date	18 th July 2017	7 th August 2017
Sunset	21:29	20:56
Start time	21:12	20:40
End time	22:45	22:15
Wind	Bft 2 (light breeze)	Bft 0 (calm)
Precipitation	Dry	Dry
Air temperature	21°C at 21:30	16 °C at 21:00
Survey Position	Surveyor and Detector	Surveyor and Detector ¹
1	Ryan Evans, Batbox Duet & AE	Ryan Evans, Batbox Duet & AE ¹
2	Amy Sharples, Batbox III & AE	Amy Sharples, Batbox III
3	Chris Schofield, Batbox Duet & AE	Chris Schofield, Batbox Duet
4	Charlotte Harrison, Anabat Walkabout & AE	Tracy Cumberbatch, Pettersson D200 & AE
5	Brian Robinson, Peersonic RPA3	Darren Graham, Batbox Duet & AE ¹
6	Danielle Rowlands, Batbox Duet & AE	Jordan Prendergast, Batbox Duet

¹AEs were positioned between two survey positions in order to record activity throughout the site during the survey.

Transect Activity Surveys

- 2.3.20 Habitats within and adjacent to the site were assessed as 'low' suitability for commuting and foraging bats in accordance with **Table 2.1**, above.
- 2.3.21 In accordance with Table 8.3 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016) three transect surveys have been conducted with one survey visit per season (between May and September 2017). The survey dates, weather conditions, surveyors and equipment used are presented at **Table 2.4**, below.
- 2.3.22 Three transect routes were walked on each survey occasion. Transect routes, as shown on **Figure 6**, were plotted to encompass the variety of habitats within the site and its surrounds. The walked transect surveys were conducted from dusk until two hours after sunset.
- 2.3.23 Heterodyne detectors and Anabat Express units were used to detect bats and identify them to species.
- 2.3.24 Point count surveys were conducted along each transect route to quantify levels of bat activity across the site. All bat activity was recorded at pre-determined and evenly spaced point count locations over five minute intervals. Bat counts were made by counting the number of bat passes by each species detected. In order to ensure consistency of recording, a bat 'pass' is defined as a single file made by an Anabat recording device during the spot count repetition.

Table 2.4: Transect Survey Dates, Weather Conditions and Surveyors

Date	24th May 2017	2nd August 2017	19th September 2017
Sunset	21.19	21.05	19:18
Start time	21.19	21.05	19:18
End time	23.20	23.05	21:20
Wind	Bft scale 0 (calm)	Bft scale 0 (calm)	Bft scale 0 (calm)
Precipitation	Dry	Overcast	Clear, dry
Air temperature	16°C at 22:00	18°C at 21:30	13°C at 20:15
Transect Route	Surveyor and Detector¹	Surveyor and Detector¹	Surveyor and Detector¹
1	Amy Sharples Batbox III & AE	Amy Sharples Batbox III & AE	Amy Sharples Batbox III & AE
2	Tracey Cumberbatch Batbox Duet & AE	Tracey Cumberbatch Batbox Duet & AE	Charlotte Harrison-Bryant Anabat Walkabout & AE
3	Chris Schofield Batbox Duet & AE	Chris Schofield Batbox Duet & AE	Chris Schofield Batbox Duet & AE

Automated/Static Surveys

- 2.3.25 Habitats within and adjacent to the site were assessed as 'low' suitability for commuting and foraging bats in accordance with **Table 2.2**, above.
- 2.3.26 In accordance with Table 8.3 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016) Anabat Express units were deployed at three locations to remotely detect bat activity for a minimum of five nights in May, August and September 2017. The locations of the three remote detectors are presented in **Figure 6**. One Anabat Express unit was located on each of the transect routes. The Anabat Express units were deployed following the completion of each transect survey.
- 2.3.27 The three Anabat Express units were placed at distinct points to provide a range of habitats within the site and surrounding area. It was considered that the placement of three units within the site provided sufficient information regarding bat usage of the site.

Table 2.5: Static Detector Locations and Dates Deployed

Location (Transect Number, OS Grid Reference)	Dates Deployed		
	Repetition 1: May 2017	Repetition 2: August 2017	Repetition 3: September 2017
Location 1 (Transect 1, SJ 5454 9728)	24 th to 31 st May 2017 (i.e. a total of eight recording nights)	2 nd to 6 th August 2017 (i.e. a total of five recording nights)	7 th to 12 th September 2017 (i.e. a total of six recording nights).
Location 2 (Transect 2, SJ 5501 9719)			
Location 3 (Transect 3, SJ 5504 9747)			

- 2.3.28 The aims of the survey were to determine the diversity of bat species which use the site and its surroundings and determine the frequency of that usage (i.e. each night, occasional usage, very occasional usage)¹.
- 2.3.29 Anabat files have been initially analysed using species-specific filters for common and soprano pipistrelle (*Pipistrellus pipistrellus* and *P. pygmaeus*), noctule (*Nyctalus noctula*) and *Myotis* species and brown long-eared bat (*Plecotus auritus*). The files have subsequently been checked individually to ensure the accuracy of the analysis.
- 2.3.30 The data collected by the Anabat Express units have been analysed with regards to the following considerations:
- a. Determining species presence: i.e. to provide species list for the site and its surrounds. Recorded bat calls were identified to species level (where possible) to determine the range of species using the three locations; and
 - b. Measuring presence to give an activity index: bat call data was used to give an indication of the relative level of species presence at the three locations.
- 2.3.31 In order to achieve point 'b', above, the frequency of Anabat recordings was counted by night, and the total amount of activity detected between the three locations compared.

Analysis of Anabat Data (Both Transect and Static Surveys)

- 2.3.32 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 checked individually to ensure the accuracy of the analysis and to locate and determine any calls of rarer or unusual species, such as Nathusius' pipistrelle.
- 2.3.33 The analysis has been informed by ERAP (Consultant Ecologists) Ltd's knowledge of the area 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.
- 2.3.34 Noctule, Leisler's (*Nyctalus leisleri*) and serotine all emit similar echolocation calls, however only noctule are of known occurrence in the Bury area; all bat calls resembling a noctule, Leisler's or serotine call have been assumed to be noctule bats.
- 2.3.35 *Myotis* species found 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*). Identification of *Myotis* bats to species level is not typically possible from echolocation calls, and it has been considered more accurate to term all calls which match the typical sonogram of a *Myotis* bat 'Myotis species'.

¹ In accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016), 'it is important to acknowledge that a bat pass or bat pulse is a measure of activity rather than a measure of the number of individuals in a population' and 'bat activity indices can be more accurately described as indices of the amount of use bats make of an area, and should be used to quantify bat activity, not abundance'.

2.3.36 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 any calls resembling long-eared bats have been considered to be those of the brown long-eared bat

Bird Species

2.3.37 Breeding bird surveys were conducted by Chris Swindells B.Sc. (Hons) on the morning of 15th April 2017 and 14th June 2017.

2.3.38 The weather conditions on 15th April 2017 were sunny with scattered cloud, a light breeze (Beaufort Scale 2) and a maximum air temperature of 16 °C. The weather conditions on 14th June 2017 were sunny with scattered cloud, a light air (Beaufort Scale 1) and a maximum air temperature of 17 °C.

2.3.39 All visible and audible birds were recorded during the site survey following the standard recording methodology and codes of the *British Trust for Ornithology (BTO) Common Birds Census* (Marchant, 1983).

2.3.40 The presence of any sign of barn owl within the buildings was searched for during the internal inspection of the buildings conducted on the 11th April 2017 by Victoria Burrows (Natural England Class Licence CL29/00061). All buildings were searched for pellets, faecal splashes and feathers which may indicate use by roosting or nesting barn owl in accordance within *The Barn Owl Conservation Handbook* (Barn Owl Trust, 2012).

Great Crested Newt

2.3.41 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. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.

2.3.42 There are no ponds within an unobstructed 500 metres radius from the site boundary; no further surveys for amphibian species are necessary.

Reptile Species

2.3.43 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 2.6**, 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

2.3.44 Clipsley Brook flows adjacent to the southern boundary of the site and an unnamed ditch leading to Clipsley Brook flows north to south through the centre of the site (refer to **Figure 2**).

- 2.3.45 The brook and ditch were examined for evidence of use by water vole by Chris Swindells on 13th April 2017 and 11th July 2017. 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 watercourse and associated banks were searched for burrows, latrines, feeding remains, runs, feeding lawns, nests and footprints.
- 2.3.46 Habitat assessment of the brook and unnamed ditch to determine their suitability for use by water vole was also conducted.
- 2.3.47 An assessment of the suitability of the brook and ditch 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).
- 2.3.48 The brook and ditch were 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).

2.4 Survey Limitations

- 2.4.1 All areas of the site were fully accessible at the time of the surveys, and the surveys were conducted at a suitable time of year. No survey limitations were experienced.
- 2.4.2 Two dusk emergence surveys were undertaken at the site, due to access restrictions and the nature of the site as an active farm undertaking a dawn re-entry survey at the site was not feasible. It is considered that two dusk surveys in combination with the results of the licenced daylight bat survey give a reliable indication of the status of roosting bats at the site.
- 2.4.3 Surveys using static detectors and bat detectors generally are likely to under-record species which may echolocate quietly, such as brown long-eared and Natterer's bats. This has been taken into account during the evaluation of the bat activity within the site.

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) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). 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 and Coastal, 2nd Edition* (CIEEM, 2016).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Great Britain Department for Communities and Local Government, 2012) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedule 1 and Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010* (as amended), 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 and the North Merseyside Biodiversity Action Plan has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study

Site Designations

Statutory Designations for Nature Conservation

- 3.1.1 No Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites lie within a 10 kilometre radius of the site boundary.
- 3.1.2 The site lies within the Site of Special Scientific Interest (SSSI) Impact Risk Zone for the Stanley Bank Meadow SSSI.
- 3.1.3 Stanley Bank Meadow SSSI lies within one kilometre of the site (Grid Reference SJ 535 9972, approximately 650 metres west of the site boundary). The SSSI comprises a species-rich unimproved meadow, dense areas of willow scrub and the wooded slope of the Black Brook valley. The habitats present support a wide range of insect and bird life; breeding birds include willow warbler (*Phylloscopus trochilus*), reed bunting (*Emberiza schoeniclus*), yellowhammer (*Emberiza citrinella*) and lesser redpoll (*Carduelis cabaret*).
- 3.1.4 In accordance with the SSSI Impact Risk Zone, Natural England should be consulted in relation to any developments falling within the following categories:

Airports, helipads and other aviation proposals. Any industrial / agricultural development that could cause air pollution including industrial processes, pig and poultry units, slurry lagoons more than 200m³ and manure stores more than 250 tonnes. General combustion processes more than 20 megawatts energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works, other incineration / combustion. Landfill including inert landfill, non-hazardous landfill and hazardous landfill. Any composting proposal with more than 75000 tonnes maximum annual operation throughput, including open windrow composting, in-vessel composting, anaerobic digestion and other waste management. (Ordnance Survey, 2017)

- 3.1.5 The proposed residential development of the site does not fall within these categories. The presence of the SSSI is considered further at **Section 4.1**.

Non-statutory Designated Sites for Nature Conservation

- 3.1.6 The site is not, and does not form any part of, a non-statutory designated site for nature conservation.
- 3.1.7 Three non-statutory Local Wildlife Sites (LWS) lie within a one kilometre radius of the site boundary. The details of these sites are presented in **Table 3.1**, below.

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

Site Name	Grid Reference	Distance from Site	Description
Stanley bank Meadow, Ponds and Wood	SJ 534 971	385 metres west	The site forms part of the Stanley Bank Local Nature Reserve with a diverse range of habitats and over 200 plant species.
Grassland West of Wagon Lane	SJ 545 962	780 metres south	Unimproved neutral grassland with a range of grass and herb species.
St. Helens Canal	SJ 534 967	One kilometre west	A disused stretch of the St. Helens canal with extensive emergent and aquatic vegetation.

3.1.8 The presence of non-statutory designated sites is considered further at **Section 4.2**, below.

Protected and Notable Species

- 3.1.9 MBB holds four records of water vole within the site boundary. Two records are from 2000 and two records are from 2005.
- 3.1.10 One record of hedgehog (*Erinaceus europaeus*) is reported adjacent to southern site boundary.
- 3.1.11 MBB also holds records for protected and notable species within a one kilometre radius of the site boundary. A summary of these records is presented in **Table 3.2**.

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

Group	Species & Designation	Notes
Amphibians	Great crested newt (<i>Triturus cristatus</i>) (EPS, WCA, S41, LBAP)	1 record from 2005, 900 metres north-east of site boundary and on the opposite side of the A580.
	Common toad (<i>Bufo bufo</i>) (WCA, S41)	12 records, the closest being 300 metres south of the site.
	Smooth newt (<i>Lissotriton vulgaris</i>)	17 records, the closest being 50 metres north of the site (on opposite side of the A580).
	Common frog (<i>Rana temporaria</i>)	9 records, the closest being 811 metres south-east of the site.
Terrestrial Mammals	Brown hare (<i>Lepus europaeus</i>) (S41, LBAP)	5 records, the closest being 590 metres west of the site.
	Brown long-eared bat (<i>Plecotus auritus</i>) (EPS, WCA, S41, LBAP)	2 records, the closest being 490 metres south-east of the site.
	Common pipistrelle (<i>Pipistrellus pipistrellus</i>) (EPS, WCA, LBAP)	19 records, the closest being 330 metres south of the site.
	Daubenton's bat (<i>Myotis daubentonii</i>) (EPS, WCA, LBAP)	1 record more than 1 kilometre south-west of the site.
	Noctule (<i>Nyctalus noctula</i>) (EPS, WCA, S41, LBAP)	12 records, the closest 815 metres west of the site.
	Pipistrelle species (<i>Pipistrellus</i> sp.) (EPS, WCA, LBAP)	28 records, the closest 500 metres south-east of the site.
	Bat species (EPS, WCA, LBAP)	7 records, the closest 250 metres east of the site.
	Hedgehog (<i>Erinaceus europaeus</i>) (S41)	9 records with one record adjacent to the southern site boundary.
	Water vole (<i>Arvicola amphibius</i>) (WCA, S41)	37 records with four records within the site boundary.
Birds	Bullfinch (S41), corn bunting (S41, LBAP), cuckoo (S41), dunnock (S41), grasshopper warbler (S41), grey partridge (S41, LBAP), house martin (LBAP), house sparrow (S41, LBAP), kingfisher (WCA), lapwing (S41, LBAP), lesser redpoll (S41), linnets (S41), reed bunting (S41), skylark (S41, LBAP), song thrush (S41, LBAP), starling (S41, LBAP), swift (LBAP), tree sparrow (S41), yellowhammer (S41)	
Flowering Plants	Bluebell (LBAP), Coral-necklace (S41),	
Insects	Scarce four-dot pin-palp (S41), wall (S41), white-letter hairstreak (WCA, S41), azure damselfly (LBAP), banded demoiselle (LBAP), blue-tailed damselfly (LBAP), broad-bodied chaser (LBAP), brown hawkler (LBAP), common blue damselfly (LBAP), common darter (LBAP), common emerald damselfly (LBAP), emperor dragonfly (LBAP), four-spotted chaser (LBAP), migrant hawkler (LBAP), southern hawkler (LBAP), moss carder-bee (S41), buff ermine (S41), dark brocade (S41), latticed heath (S41), sallow (S41), shoulder-striped wainscot (S41)	
Key to Designation Codes:		
EPS = European Protected Species under <i>The Conservation of Habitats and Species Regulations 2010</i> (as amended)		
WCA = Species receiving full protection under Schedule 1 or 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended)		
S41 = Priority Species listed under S41 of the NERC Act 2006		
LBAP = Local (i.e. North Merseyside) Biodiversity Action Plan Species		

3.1.12 The presence of protected and Priority Species within the site boundary and within a one kilometre radius of the site is considered further at **Section 4.0**.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately 22 hectare site is located at the north-western extremity of the town of Haydock in a suburban environment, and comprises scrub, arable fields, improved grassland, amenity grassland, Clipsley Brook and a ditch, tree lines and hedgerows and a farm house with associated outbuildings.
- 3.2.2 The northern site boundary is defined by a tree line associated with the East Lancashire Road (A580) beyond which lies arable field units similar to those within the site, existing residential properties and an industrial estate.
- 3.2.3 The eastern and western site boundaries are defined by garden fences of residential properties. Stanley Bank Wood lies beyond the residential properties to the west, and residential properties and a commercial development lie beyond the eastern site boundary.
- 3.2.4 The southern site boundary is defined by the plot boundary fences of residential properties in the south-western corner of the site. Further east Clipsley Brook defines the southern site boundary and Slag Lane defines the south-eastern corner of the site boundary. Residential properties lie beyond the southern site boundary.
- 3.2.5 For all habitat descriptions refer to the Phase 1 Habitat Survey map appended at **Figure 2**. Photographs are appended at **Table 8.8**.

Scrub at South-western Corner

- 3.2.6 The scrub at the south-western corner of the site is unmanaged (**Photos 1 and 2**); this area was formerly used for allotments and chicken sheds and runs. Google Earth imagery indicates that this activity ceased in 2015 or 2016.
- 3.2.7 The woody vegetation is characterised by occasional Alder (*Alnus glutinosa*), Hawthorn (*Crataegus monogyna*), Ash (*Fraxinus excelsior*), Cherry species (*Prunus* sp.), Pedunculate Oak (*Quercus robur*) and Crack Willow (*Salix fragilis*).
- 3.2.8 The ground flora is characterised by occasional Cleavers (*Galium aparine*), Indian Balsam (*Impatiens glandulifera*) and Bramble (*Rubus fruticosus* agg.) with locally abundant Hedge Bindweed (*Calystegia sepium*) and Creeping Buttercup (*Ranunculus repens*).
- 3.2.9 The woody vegetation is not characteristic of an NVC community. The ground flora is characteristic of a *W24 Bramble – Yorkshire-fog* underscrub community of the NVC (Rodwell, 1991). A plant species list is appended at **Table 8.1**.

Margins of Arable Fields

- 3.2.10 The arable fields (**Photos 3 and 4**) within the site boundary are planted to Barley (*Hordeum* sp.) with approximately 0.3 to 0.5 metre wide field margins (**Photo 4**).
- 3.2.11 The vegetation at the field margins is characterised by constant and abundant Perennial Rye-grass (*Lolium perenne*) with abundant Yorkshire-fog (*Holcus lanatus*) and occasional Smooth Meadow-grass (*Poa pratensis*) and Creeping Buttercup.
- 3.2.12 The field margins are characteristic of an *MG7 Perennial Rye-grass* community of the NVC (Rodwell, 1992). A plant species list is appended at **Table 8.2**.

Improved and Amenity Grassland

- 3.2.13 The field unit of improved grassland is managed but was not cut at the time of the survey (**Photo 5**). The area of amenity grassland within the site is associated with the farmhouse. The amenity grassland is short cut (**Photo 6**).
- 3.2.14 The improved and amenity grassland is characterised by constant and abundant Perennial Rye-grass with abundant Cock's-foot (*Dactylis glomerata*) and Yorkshire-fog and occasional Smooth Meadow-grass and Creeping Buttercup.
- 3.2.15 The boundary of the amenity grassland to the east of the farmhouse is demarcated by a line of Leyland Cypress (*Cupressus x leylandii*) and White Poplar (*Populus alba*).
- 3.2.16 The improved and amenity grassland is characteristic of an *MG7 Perennial Rye-grass* community of the NVC (Rodwell, 1992). A plant species list is appended at **Table 8.3**.

Clipsley Brook and Ditch

- 3.2.17 Clipsley Brook (**Photos 7 and 8**) flows along the southern site boundary and a ditch (**Photo 9**) flows through the middle of the site. The brook and ditch channel are approximately 0.5 metres deep and one metre wide, with the brook and ditch supporting a flow of approximately 0.2 metres depth. Both supported at flow rate of approximately 0.1 metres per second at the time of the survey.
- 3.2.18 The brook and ditch corridor and channel comprise brown earth soils with rocks. Where the brook is associated with the residential gardens to the south there are areas of fencing, flags, overhanging decking and other habitats associated with residential gardens (**Photo 8**). The brook corridor is variously shaded by trees or open, changing along the length of the brook corridor.
- 3.2.19 The brook and ditch do not support any aquatic or emergent vegetation. The vegetation at the brook and ditch banks is characterised by occasional Hawthorn, Cleavers, Indian Balsam and moss species with locally abundant Pedunculate Oak and Lesser Celandine (*Ranunculus ficaria*) and locally frequent Goat Willow (*Salix caprea*) and Grey Willow (*Salix cinerea*).
- 3.2.20 The habitats associated with the brook and the ditch are not characteristic of an NVC community. A plant species list is appended at **Table 8.4**.

Tree Lines

- 3.2.21 Tree Lines 1 and 2 (**Photos 10 and 11** respectively) are associated with the A580 (**Photos 13 and 14**) at the northern site boundary. The woody species associated with both tree lines are characterised by abundant Sycamore (*Acer pseudoplatanus*) and Hawthorn with frequent Silver Birch (*Betula pendula*) and Ash.
- 3.2.22 The ground layer of both tree lines is characterised by frequent Cleavers, Perennial Rye-grass and Barley species.
- 3.2.23 The vegetation associated with Tree Lines 1 and 2 is not characteristic of an NVC community. A plant species list is appended at **Table 8.5**.

Hedgerow 1 and 2

- 3.2.24 Hedgerow 1 (**Photo 17**) is associated with the residential properties on the western site boundary and is approximately 140 metres in length. Hedgerow 2 (**Photo 18**) is associated with Slag Lane at the eastern area of the site and is approximately 175 metres in length. Both hedgerows are regularly cut.
- 3.2.25 The woody vegetation at Hedgerow 1 is characterised by frequent Alder, Hawthorn and Holly (*Ilex aquifolium*). The ground layer is characterised by frequent Cleavers, Ivy (*Hedera helix*) and Barley species.

- 3.2.26 The woody vegetation at Hedgerow 2 comprises constant and abundant Hawthorn and rare Cherry species. The ground layer is characterised by abundant Cleavers and Perennial Rye-grass with frequent Cock's-foot and Yorkshire-fog.
- 3.2.27 The vegetation at Hedgerow 1 and 2 is characteristic of a *W21 Hawthorn – Ivy* scrub community of the NVC (Rodwell, 1991). A plant species list is appended at **Table 8.6**.
- 3.2.28 Neither hedgerow qualifies as 'important' when assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape criteria. Full assessments of both hedgerows are appended at **Table 8.7**.

Invasive Species

- 3.2.29 An area of Japanese Knotweed is present at the southern site boundary, refer to **Figure 2**. Indian Balsam is present throughout the habitats associated with the site boundaries. These species are listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) and it is an offence to spread or cause the spread of these species in the wild. Further consideration is presented at **Section 4.3**.

3.3 Animal Life

Badger

- 3.3.1 No badger or signs of badger were detected within the site. No evidence of badger such as setts / holes, prints, hairs, dung pits or snuffle holes were detected at the site or in the immediate surrounding area. No records of badger were returned in the data search, and therefore due to the absence of any field signs of badger, the presence of badger at the site is reasonably discounted. No further survey is required.

Bat Species

Daylight Survey: Buildings

- 3.3.2 The buildings at the site comprise a farm house and six outbuildings. Refer to **Figure 3** for building locations.

Farmhouse

- 3.3.3 The farmhouse is a detached two storey brick building constructed in 1909 with a pitched slate roof. The roof coping is intact with no areas of missing mortar and the doors and windows are well sealed (**Photos 19 to 22**).
- 3.3.4 The roof void is constructed from traditional timber purlins and rafters, and insulated at the floor. The slate roofing supports horse-hair parging (**Photo 23 to 26**).
- 3.3.5 No bats or signs of bats were detected at the internal or external elevations.
- 3.3.6 Gaps suitable for bat access were detected at the following features:
- a. A hole in the brickwork at the southern elevation;
 - b. Lifted lead fascias at the southern elevation;
 - c. Decorative brickwork at eastern elevation; and
 - d. Gaps under the roofing slates.
- 3.3.7 It is concluded that (in combination with the suitability of the surrounding habitats for foraging and commuting bats), the farmhouse is of moderate suitability for use by roosting bats, and further activity surveys were required to determine the presence or absence of roosting bats, as described below.

Outbuilding 1

- 3.3.8 Outbuilding 1 is a dilapidated and 'u'-shaped single storey brick-built barn. The roof structure is comprises both pitched and mono-pitched stone tiles.
- 3.3.9 Section 1a comprises former animal pens with a mono-pitched roof at the north-eastern end of the building (**Photo 27**). The roof has collapsed in places. This section of Outbuilding 1 has cracks in the external walls (**Photo 28**). The interior walls are white washed with no evidence of cracking. Where the roof has not collapsed the animal pens are open to the unlined roof tiles. One old bird nest was detected.
- 3.3.10 Section 1b supports a pitched roof of stone tiles and comprises a large open barn / storage area at the centre of the building (**Photos 29 and 30**). Gaps are present around the door frames. The internal walls are white washed and have evidence of cracking. The internal area is open to the unlined roof, which is supported on timber trusses, purlins and rafters (**Photos 31 to 33**). One old swallow nest was detected.
- 3.3.11 Section 1c is located at the north-western end of the building and comprises a timber framed lean-to with a mono-pitched roof of corrugated metal sheeting. The eastern elevation of the building is open, the western elevation comprises a brick built wall and the northern elevation is constructed from corrugated metal sheeting. The southern elevation is attached to the northern elevation of Section 1b (**Photo 34**). Internally the brick wall is white washed and the building is open to the roof.
- 3.3.12 Section 1d is at the eastern end of Section 1b; the construction of this section is as described for Section 1b (**Photo 35**). Internally the walls are white washed and the roof is lined with timber sarking. Evidence of old bird nests was detected (**Photo 36**).
- 3.3.13 No bats or evidence of bats was detected at the time of the survey. Due to the presence of features suitable for use by low numbers of crevice dwelling species it is concluded that Sections 1a, 1b and 1d are of low suitability for use by roosting bats. Further activity surveys to determine the presence or absence of roosting bats were completed at these sections of Outbuilding 1, as described below. Section 1c is of negligible suitability for use by roosting bats and therefore no further survey is required at this section of Outbuilding 1.

Outbuilding 2

- 3.3.14 Outbuilding 2 is a steel-framed storage building with a pitched roof of corrugated metal sheeting. At the time of the survey the building was in use as a grain store (**Photos 37 to 39**).
- 3.3.15 The eastern elevation is open and the northern, southern and western elevations are constructed from corrugated metal sheeting. The building is open to the roof and there is evidence of use by pigeons.
- 3.3.16 A timber lean-to extension is located at the south-western end of the building; the lean-to supports a mono-pitched roof with a felt covering of bitumastic roofing felt (**Photo 40**).
- 3.3.17 No bats or evidence of bats was detected. It is concluded that Outbuilding 2 has negligible suitability for use by roosting bats and no further survey is required; the presence of roosting bats is reasonably discounted at Outbuilding 2.

Outbuilding 3

- 3.3.18 Outbuilding 3 is a barn constructed on a metal frame, which supports a pitched roof of corrugated metal sheeting. The eastern elevation is open and the northern, southern and western elevations are constructed from corrugated metal sheeting. The building is open to the roof (**Photo 41**).
- 3.3.19 No bats or evidence of bats was detected. It is concluded that Outbuilding 3 has negligible suitability for use by roosting bats and no further survey is required; the presence of roosting bats is reasonably discounted at Outbuilding 3.

Outbuilding 4

- 3.3.20 Outbuilding 4 is a barn constructed on a metal frame which supports a pitched roof of corrugated metal sheeting. The walls are also constructed of corrugated metal sheeting (**Photo 42**). The building is open to roof, which is supported on metal purlins (**Photo 43**).
- 3.3.21 No bats or evidence of bats was detected. It is concluded that Outbuilding 4 has negligible suitability for use by roosting bats and no further survey is required; the presence of roosting bats is reasonably discounted at Outbuilding 4.

Outbuilding 5

- 3.3.22 Outbuilding 5 is a former cottage with an attached storage area.
- 3.3.23 Section 5a is a former single storey brick built cottage with a pitched roof of slate. Two wooden bird boxes are located on the eastern elevation (**Photos 44 to 46**). Internally the walls are white washed. A timber ceiling is present which is collapsed in places exposing the slates, which are unlined (**Photos 47 and 48**).
- 3.3.24 Section 5b is a single storey brick built storage area at the southern end of Outbuilding 5 with a mono-pitched roof of slate. Internally the walls are white washed and the building is open to the roof.
- 3.3.25 No bats or evidence of bats was detected. Due to the presence of features suitable for use by low numbers of crevice dwelling species it is concluded that Outbuilding 5 has a low suitability for use by roosting bats and further survey is required to determine the presence or absence of roosting bats, as described below.

Outbuilding 6

- 3.3.26 Outbuilding 6 is a single storey former coal-store constructed from walls of brick with a mono-pitched roof of slate. The eastern elevation is open (**Photos 49 and 50**). Internally the brickwork is exposed and is open to the roof which is unlined.
- 3.3.27 No bats or evidence of bats was detected. It is concluded that Outbuilding 6 has negligible suitability for use by roosting bats and further survey is required. The presence of roosting bats is reasonably discounted at Outbuilding 6.

Trees

- 3.3.28 No trees within the site or on the site boundary support features suitable for use by roosting bats. The presence of roosting bats at trees within the site boundary is reasonably discounted.

Commuting / Foraging Bats

- 3.3.29 Habitats within the site such as the Clipsley Brook, ditch and scrub at the southern site boundary all provide suitable habitat for use by edge feeding species and provide some diversity of habitats within the site. The arable fields and the improved and amenity grassland do not provide edge habitat and are unlikely to provide a diversity or abundance of invertebrate prey. Habitats within the site are considered to be of low suitability for foraging and commuting bats (in accordance with the criteria listed in **Table 2.2**), due to the limited variation in habitat and the low suitability of habitat in the wider area.

Dusk Emergence Surveys

- 3.3.30 Dusk emergence surveys were undertaken at the site on 7th May and 18th July 2017. The surveys targeted the farmhouse and Outbuildings 1, 5 and 6.
- 3.3.31 No bat emergence was detected at the targeted buildings during either of the dusk emergence surveys.

3.3.32 Common pipistrelle (*Pipistrellus pipistrellus*) bats were detected foraging at site, in particular at the amenity grassland area and tree line associated with the farmhouse. Results of the dusk emergence surveys are presented at **Table 8.9** to **8.10** and **Figures 4** and **5**.

Transect Activity Surveys

3.3.33 The following bat species/species groups were recorded foraging and commuting on-site during the transect activity surveys:

- a. Common pipistrelle (*Pipistrellus pipistrellus*);
- b. Soprano pipistrelle (*Pipistrellus pygmaeus*); and
- c. Noctule (*Nyctalus noctula*).

3.3.34 Common and soprano pipistrelle were recorded during all survey repetitions. Noctule were recorded during the May and September transect surveys only.

3.3.35 Common pipistrelle social calls were also recorded during the September transect survey.

3.3.36 Raw data as recorded during the transect surveys is presented at **Tables 8.11** to **8.13**. All spot count locations are presented at **Figure 6**. Results of each transect survey are presented at **Figures 7** to **9**.

3.3.37 The survey results from each transect survey conducted between May and September 2017 are summarised below.

Table 3.3: Summary of Survey Results at Transects 1, 2 and 3, Repetition 1, 24th May 2017

Species	Earliest Call ¹	Latest Call ²	Total No. Anabat files ³	Maximum Pass Counts at Each Spot Count Location During any One Repetition					
				A	B	C	D	E	F
Transect 1									
Common pipistrelle	21:54	23:19	47	13	1	0	0	7	0
Soprano pipistrelle	22:24	22:24	1	0	0	0	0	0	0
Noctule	21:50	21:50	1	0	0	0	1	0	0
Transect 2									
Common pipistrelle	22:00	23:11	44	1	7	3	2	17	1
Soprano pipistrelle	23:00	23:00	1	0	0	0	0	0	1
Transect 3									
Common pipistrelle	21:52	23:16	25	1	1	1	0	5	3
Soprano pipistrelle	23:38	22:39	2	0	0	0	0	0	1
Noctule	21:50	21:56	2	0	0	0	0	1	1
¹ Sunset time: 21:19									
² Survey end time: 23:20									
³ Over the whole survey, including those recorded between spot count locations.									

Table 3.4: Summary of Survey Results at Transects 1, 2 and 3, Repetition 2, 2nd August 2017

Species	Earliest Call ¹	Latest Call ²	Total No. Anabat files ³	Maximum Pass Counts at Each Spot Count Location During any One Repetition					
				A	B	C	D	E	F
Transect 1									
Common pipistrelle	21:28	22:54	55	10	2	1	1	16	4
Transect 2									
Common pipistrelle	21:21	23:03	44	5	9	7	2	1	2
Soprano pipistrelle	21:49	22:46	3	0	0	2	0	2	0
Transect 3									
Common pipistrelle	21:27	23:00	133	3	10	2	3	14	16
¹ Sunset time: 21:05									
² Survey end time: 23:05									
³ Over the whole survey, including those recorded between spot count locations.									

Table 3.5: Summary of Survey Results at Transects 1, 2 and 3, Repetition 3, 19th September 2017

Species	Earliest Call ¹	Latest Call ²	Total No. Anabat files ³	Maximum Pass Counts at Each Spot Count Location During any One Repetition					
				A	B	C	D	E	F
Transect 1									
Common pipistrelle	19:40	20:36	27	5	0	0	6	1	3
Soprano pipistrelle	19:41	19:41	1	0	0	0	1	0	0
Noctule	20:14	20:14	1	0	0	0	0	0	0
Transect 2									
Common pipistrelle	19:37	20:34	15	2	1	5	1	0	0
Soprano pipistrelle	19:19	19:19	1	0	0	0	1	0	0
Transect 3									
Common pipistrelle	19:40	21:13	50	0	2	0	8	3	5
Soprano pipistrelle	19:43	20:27	20	0	0	0	0	17	0
Social calls	19:45	21:10	11	0	0	0	0	4	2
¹ Sunset time: 19:18									
² Survey end time: 21:20									
³ Over the whole survey, including those recorded between spot count locations.									

3.3.38 The total amount of bat activity is presented in terms of species and transects below.

Table 3.6: Total Recorded Bat Activity by Species and Transect

	Total Passes Recorded on Anabat Express (and Percentage of Total Calls) at Each Transect by Species on All Dates			
	Common Pipistrelle	Soprano Pipistrelle	Noctule	All Bats
Transect 1	116 (26%)	4 (14%)	3 (75%)	123 (26%)
Transect 2	232 (53%)	3 (10%)	0	235 (50%)
Transect 3	92 (21%)	22 (76%)	1 (25%)	115 (24%)
Total	440 (100%)	29 (100%)	4 (100%)	473 (100%)

- 3.3.39 473 bat passes were recorded at all three transects during all three survey repetitions. The total level of bat activity detected during the transect surveys is considered to be low, in accordance with the assessment of habitat suitability at the site.
- 3.3.40 In accordance with **Table 3.6**, the spread of bat activity is evenly distributed across the site, however a greater frequency of common pipistrelle activity was detected at Transect 2 than at Transects 1 and 3, a greater frequency of soprano pipistrelle activity was detected at Transect 3 than at Transects 1 and 2 and a greater frequency of noctule activity was detected at Transect 1 than at Transects 2 and 3, suggesting that different habitats are being utilised within the site by these species².
- 3.3.41 The greatest amount of common pipistrelle activity detected during the spot counts was located at spot count 1.E, corresponding to the scrub at the north-western site boundary associate with the East Lancashire Road.
- 3.3.42 The greatest amount of soprano pipistrelle activity detected during the spot counts was located at spot count 3.E, corresponding to the scrub at the north-eastern site boundary associated with the East Lancashire Road and existing residential gardens.

Automated / Static Surveys

Summary

- 3.3.43 The total number of recordings for common pipistrelle and noctule bats at each location is presented below. The Anabat Express units were left out for different durations during the survey repetitions; this has been taken into account when assessing the relative abundance of bat activity over each survey repetition.
- 3.3.44 The following bat species/species groups were recorded on-site during the automated / static surveys:
- a. Common pipistrelle;
 - b. Soprano pipistrelle;
 - c. Noctule; and
 - d. Myotis specis.

² Although the low number of noctule passes recorded in total (i.e. 4) is such that it is not considered any reliable conclusions can be made regarding noctule activity at the site.

Table 3.7: Total Number of Recordings at Each Location By Species By Night

Date	Location 1				Location 2				Location 3			
	P45	P55	Nn	My.	P45	P55	Nn	My.	P45	P55	Nn	My.
Repetition 1												
24.05.2017	91	25	0	0	473	0	0	0	23	2	0	0
25.05.2017	445	61	0	13	23	0	0	0	280	0	0	2
26.05.2017	503	44	0	11	11	0	0	0	145	3	0	4
27.05.2017	330	169	0	6	1560	0	0	0	323	0	0	0
28.05.2017	153	154	0	2	88	0	2	0	67	0	0	4
29.05.2017	188	116	0	0	588	3	0	0	123	0	0	0
30.05.2017	84	92	0	2	114	0	0	0	34	0	0	1
31.05.2017	69	102	1	0	21	0	0	4	44	0	0	0
Total	1863	763	1	34	2878	3	2	4	1039	5	0	11
Repetition 2												
02.08.2017	118	278	0	1	417	1	0	60	431	7	0	0
03.08.2017	400	296	0	1	698	3	0	6	1478	34	0	1
04.08.2017	164	209	0	1	477	1	0	0	513	8	0	1
05.08.2017	339	138	0	1	436	3	0	0	371	5	0	1
06.08.2017	15	1	0	0	2	0	0	0	233	1	0	0
Total	1036	922	0	4	2030	8	0	66	3026	55	0	3
Repetition 3												
07.09.2017	0	0	0	0	0	0	0	0	0	0	0	0
08.09.2017	35	61	0	0	63	14	0	0	1000	4	0	0
09.09.2017	30	29	0	1	57	15	0	0	608	2	1	0
10.09.2017	177	200	0	3	7	26	0	0	0	0	0	0
11.09.2017	10	7	0	2	4	1	0	0	-	-	-	-
12.09.2017	49	34	0	10	54	1	0	0	0	0	0	0
Total	301	331	0	16	185	57	0	0	1608	6	1	0

P45 = common pipistrelle, P55 = soprano pipistrelle, Nn = noctule bat and My. = *Myotis* species

3.3.45 Table 3.8 below shows the total number of bat calls detected at each location by species over the whole survey period.

Table 3.8: Total Number of Recordings at Each Location Over the Whole Survey

Location	No. Anabat Files (% of total) By Species				Total
	P45	P55	Nn	My.	
Location 1	3200 (23%)	2016 (94%)	1 (25%)	54 (39%)	5271 (32%)
Location 2	5093 (36%)	68 (3%)	2 (50%)	70 (51%)	5233 (32%)
Location 3	5673 (41%)	66 (3%)	1 (25%)	14 (10%)	5754 (35%)
Total	13966 (86%)	2150 (13%)	4 (<1%)	138 (1%)	16258 (100%)

P45 = common pipistrelle, P55 = soprano pipistrelle, Nn = noctule bat, My. = *Myotis* species

3.3.46 Of the 16258 echolocation calls detected (not including social calls, which could not be identified to species), 86% of all calls were of common pipistrelle, with 13% of calls of soprano pipistrelle, <1% of calls noctule and 1% of calls *Myotis* species.

3.3.47 Activity across all species was evenly spread across the site at Locations 1, 2 and 3, with 32%, 32% and 35% of all bat calls detected at the three locations respectively.

3.3.48 Common pipistrelle calls were evenly distributed across the three locations, with fewer calls detected at Location 1 and the greatest number of calls detected at Location 3.

3.3.49 The greatest number of soprano pipistrelle calls were detected at Location 1 (94%), with equal, low levels of activity detected at Locations 2 and 3. It is not considered that there are a sufficient number of noctule calls to make reliable deductions regarding their use of the site at the three locations. 51% of all *Myotis* species calls were detected at Location 2, with 39% at Location 1 and only 10% at Location 3.

3.3.50 Locations 1 and 2 (located within scrub and tall herb and close to the watercourse at the southern end of the site) appear to be of greater value to a wider variety of species than the tree line at Location 3, at which a greater frequency of common pipistrelle activity was detected, but fewer soprano pipistrelle and *Myotis* species were detected.

Repetition 1

3.3.51 During Repetition 1, 41% of the total bat activity detected was at Location 1 and 43% at Location 2, with 16% at Location 3.

3.3.52 In terms of species distribution within the overall levels of bat activity, 50% of the common pipistrelle activity recorded was detected at Location 2, with 32% and 18% recorded at Locations 1 and 3 respectively. 99% of the soprano pipistrelle activity recorded was at Location 1, with 0.4% and 0.6% recorded at Locations 2 and 3 respectively. 66% of all noctule activity was detected at Location 2, with 33% detected at Location 1; no noctule activity was recorded at Location 3. 69% of all *Myotis* activity was detected at Location 1, with 8% and 22% detected at Locations 2 and 3 respectively.

3.3.53 80% of the social calls were recorded at Location 1, with 8% and 12% recorded at Locations 2 and 3 respectively.

Repetition 2

3.3.54 During Repetition 2, 33% of the total bat activity detected was at Location 2 and 39% at Location 3, with 27% at Location 1.

3.3.55 In terms of species distribution within the overall levels of bat activity, 50% of the common pipistrelle activity recorded was detected at Location 3, with 17% and 33% recorded at Locations 1 and 2 respectively. 94% of the soprano pipistrelle activity recorded was at Location 1, with 1% and 5% recorded at Locations 2 and 3 respectively. 90% of all *Myotis* activity was detected at Location 2, with 6% and 4% detected at Locations 1 and 3 respectively.

3.3.56 64% of the social calls were recorded at Location 2, with 27% and 9% recorded at Locations 1 and 3 respectively.

Repetition 3

3.3.57 During Repetition 3, 57% of the total bat activity detected was at Location 3 with 32% at Location 1 and 12% at Location 2.

3.3.58 In terms of species distribution within the overall levels of bat activity, 77% of the common pipistrelle activity recorded was detected at Location 3, with 14% and 9% recorded at Locations 1 and 2 respectively. 84% of the soprano pipistrelle activity recorded was at Location 1, with 14% and 2% recorded at Locations 2 and 3 respectively. All noctule activity (1 pass) was detected at Location 3. All *Myotis* activity (16 passes) was detected at Location 3.

3.3.59 64% of the social calls were recorded at Location 1, with 24% and 12% recorded at Locations 2 and 3 respectively.

Analysis

3.3.60 Common and soprano pipistrelle accounted for the most frequent activity (detected on seventeen out of eighteen survey nights). Small numbers of *Myotis* species were detected on fourteen out of eighteen survey nights. Small numbers of Noctule were detected on three out of eighteen survey nights.

3.3.61 Social calls were recorded on a total of seventeen out of eighteen survey nights, with a peak count of 289.

Bird Species

Habitat Assessment

- 3.3.62 The trees, scrub and buildings within the site are suitable for use by nesting and passerine (perching) species.
- 3.3.63 The habitats within the site (with the exception of the scrub) are intensively managed; the habitats within the site are utilised for agricultural feed production and therefore the site supports habitats suitable for use by ground nesting birds.

Results of Walkover and Breeding Bird Surveys

- 3.3.64 Birds detected during the walkover survey in April 2017 are listed in **Table 3.9**, below.

Table 3.9: Bird species Detected on 5th April 2017

Scientific Name	Common Name (number seen)	BOCC Status ¹	Priority Species?
<i>Columba palumbus</i>	Wood Pigeon (7)	Green	
<i>Corvus corone corone</i>	Carrion crow (1)	Green	
<i>Cyanistes caeruleus</i>	Blue Tit (2)	Green	
<i>Motacilla cinerea</i>	Grey wagtail (2)	Amber	
<i>Parus major</i>	Great tit (3)	Green	
<i>Passer domesticus</i>	House Sparrow (2)	Red	Yes
<i>Pica pica</i>	Magpie (2)	Green	
<i>Pyrrhula pyrrhula</i>	Bullfinch (2)	Amber	Yes
<i>Sturnus vulgaris</i>	Starling (8)	Red	Yes
<i>Troglodytes troglodytes</i>	Wren (1)	Green	
<i>Turdus merula</i>	Blackbird (3)	Green	

¹BOCC: Birds of Conservation Concern (Eaton, et al., 2015)

- 3.3.65 A summary of the birds detected at the site and in the wider area during the breeding bird surveys is presented in **Table 3.10**, below. The results of the breeding bird surveys are presented at **Figures 10** and **11**, and the raw data are presented at **Tables 8.14** and **8.15**.

Table 3.10: Summary of Bird species Detected in April and June 2017

Scientific Name	Common Name (number seen)	BOCC Status ¹	Priority Species?
<i>Aegithalos caudatus</i>	Long-tailed tit (6)	Green	
<i>Alauda arvensis</i>	Skylark (6)	Red	Yes
<i>Apus apus</i>	Swift (2)	Amber	
<i>Carduelis carduelis</i>	Goldfinch (12)	Green	
<i>Carduelis chloris</i>	Greenfinch (17)	Green	
<i>Columba palumbus</i>	Wood pigeon (49)	Green	
<i>Corvus corone corone</i>	Carrion crow (5)	Green	
<i>Corvus monedula</i>	Jackdaw (4)	Green	
<i>Cyanistes caeruleus</i>	Blue tit (18)	Green	
<i>Dendrocopos major</i>	Great spotted woodpecker (2)	Green	
<i>Emberiza schoeniclus</i>	Reed bunting (5)	Amber	Yes
<i>Erithacus rubecula</i>	Robin (18)	Green	
<i>Fringilla coelebs</i>	Chaffinch (31)	Green	
<i>Gallinago gallinago</i>	Snipe (1)	Amber	
<i>Garrulus glandarius</i>	Jay (2)	Green	
<i>Hirundo rustica</i>	Swallow (6)	Green	
<i>Larus fuscus</i>	Lesser black-backed gull (4)	Amber	
<i>Motacilla alba</i>	Pied wagtail (1)	Green	
<i>Parus ater</i>	Coal tit (3)	Green	
<i>Parus major</i>	Great tit (6)	Green	
<i>Passer domesticus</i>	House sparrow (27)	Red	Yes
<i>Phylloscopus collybita</i>	Chiffchaff (13)	Green	
<i>Phylloscopus trochilus</i>	Willow warbler (4)	Amber	
<i>Pica pica</i>	Magpie (14)	Green	
<i>Prunella modularis</i>	Dunnock (18)	Amber	Yes
<i>Pyrrhula pyrrhula</i>	Bullfinch (2)	Amber	Yes
<i>Regulus regulus</i>	Goldcrest (10)	Green	
<i>Sitta europaea</i>	Nuthatch (1)	Green	
<i>Streptopelia decaocto</i>	Collared dove (3)	Green	
<i>Sturnus vulgaris</i>	Starling (6)	Red	Yes
<i>Sylvia atricapilla</i>	Blackcap (13)	Green	
<i>Sylvia communis</i>	Whitethroat (1)	Amber	
<i>Troglodytes troglodytes</i>	Wren (32)	Green	
<i>Turdus merula</i>	Blackbird (46)	Green	
<i>Turdus philomelos</i>	Song thrush (4)	Red	Yes
<i>Turdus viscivorus</i>	Mistle thrush (2)	Amber	
<i>Vanellus vanellus</i>	Lapwing (2)	Red	Yes

¹BOCC: Birds of Conservation Concern (Eaton, et al., 2015)

- 3.3.66 No nesting birds (including ground nesting species), were detected within the site boundary, however it is considered that the habitats within the site are suitable for use by nesting birds and the detection of birds singing, alarm calling and with families suggests that the habitats within the site are used by nesting birds.
- 3.3.67 A total of 38 species were detected at the site, with a total of eight Priority Species detected during the breeding season. The surveys have not detected any rare or unusual species within the site. Species typically associated with arable fields, such as skylark and lapwing, and species typically associated with woodland, such as nuthatch and mistle thrush, were detected in relatively low numbers during the surveys.
- 3.3.68 The site does not support significant numbers of nesting birds or Priority Species and no evidence of ground nesting was detected during the surveys.

Barn Owl

3.3.69 No barn owl or signs of barn owl were detected within the site. No evidence of barn owl nesting or roosting such as nests, feeding pellets or faecal splashes were detected at the site. No barn owl were observed during the dusk bat emergence surveys or the transect surveys undertaken at the site. No records of barn owl were returned in the data search. The presence of barn owl at the site is reasonably discounted, and no further survey is required.

Reptiles

3.3.70 The regularly disturbed and heavily managed habitats within the site provide poor quality habitat for sheltering, basking and hibernating reptiles. The site supports an even topography and the homogenous vegetation supports little variation in its physiognomy. There are no piles of garden waste or other suitable debris for use by sheltering or hibernating reptiles, and the site supports no favourable habitat for basking reptiles. The species-poor habitats within the site are reasonably unlikely to support a large populations or a variety of invertebrate prey.

3.3.71 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

3.3.72 The Clipsley Brook and the ditch within the site are described at **Section 3.2** above. The section of Clipsley Brook and ditch within the site are suitable habitat for water vole, and the record centre returned historic records of water vole within the site boundary and in the wider area.

3.3.73 Two water vole surveys were undertaken at the Clipsley Brook and ditch within the site in April and July 2017. The survey extended within a 500 metre buffer of the site boundary.

3.3.74 No evidence of water voles was detected at the site or within the wider area. Extensive evidence of brown rat (*Rattus norvegicus*) was detected throughout the section of Clipsley Brook and the ditch within the site boundary and the habitats in the wider area.

3.3.75 Based on the evidence from the water vole surveys the presence of water voles at the site is reasonably discounted. Further consideration of water vole is presented at **Section 4.4**.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

4.1.1 It is proposed to develop the site to housing with associated roads and hard-standing, landscape planting and Public Open Space. At the time of reporting a site layout was not available. The advice contained within this report should be used to advise the final layout of the site.

4.1.2 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites in the wider area. The ecological value of habitats within the site are evaluated at **Section 4.3**, and the presence of protected and notable species is considered at **Section 4.4**.

4.1.3 Impacts upon the habitats within (and surrounding) the site, and upon the protected and notable species associated with the site, are quantified and assessed at **Section 4.5**.

4.2 Designated Sites

4.2.1 The proposals do not match any of the criteria for which further assessment would be required in respect of the SSSI Impact Risk Zone. The proposals will have no impact upon the SSSI.

- 4.2.2 The site is not connected to any of the LWS in the wider area. It is considered likely that all are sufficiently distant and disconnected from the study site that any impacts due to a future development of the site can be discounted.

4.3 Vegetation and Habitats

- 4.3.1 None of the habitats within the site are of significant interest in terms of their plant species composition. None of the habitats present are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present. The site contains only common and widespread plant species.
- 4.3.2 The hedgerows within the site do not qualify as 'important' when assessed in accordance with the *Hedgerow Regulations 1997* (H.M.S.O., 1997). Both Hedgerow 1 and 2 qualify as Priority Species. Retention and protection of the hedgerows is recommended at **Section 5.2**.
- 4.3.3 Two areas of the scrub within the south-western corner of the site are listed as Lowland Mixed Deciduous Woodland on the Priority Habitats Inventory (the total area comprises 0.66 hectares) in accordance with Magic Map Application (Natural England & Defra, 2017).
- 4.3.4 The *UK Biodiversity Action Plan Priority Habitats Descriptions, Lowland Mixed Deciduous Woodland* taken from UK Biodiversity Action Plan (2008) *Priority Habitat Descriptions* (BRIG (ed. Ant Maddock), 2008 (updated 2011)) states:

'Lowland mixed deciduous woodland includes woodland growing on the full range of soil conditions, from very acidic to base-rich, and takes in most semi-natural woodland in southern and eastern England, and in parts of lowland Wales and Scotland. It thus complements the ranges of upland oak and upland ash types. It occurs largely within enclosed landscapes, usually on sites with well-defined boundaries, at relatively low altitudes, although altitude is not a defining feature. Many are ancient woods and they include the classic examples of ancient woodland studied by Rackham (1980) and Peterken (1981) in East Anglia and the East Midlands. The woods tend to be small, less than 20ha. Often there is evidence of past coppicing, particularly on moderately acid to base-rich soils; on very acid sands the type may be represented by former wood-pastures of oak and birch.

There is great variety in the species composition of the canopy layer and the ground flora, and this is reflected in the range of associated NVC and Stand Types. Quercus robur is generally the commoner oak (although Quercus petraea may be abundant locally) and may occur with virtually all combinations of other locally native tree species.

In terms of the National Vegetation Classification the bulk of this type falls into W8 (mainly sub-communities a - c in ancient or recent woods; in the lowlands W8d mostly occurs in secondary woodland) and W10 (sub-communities a to d) with lesser amounts of W16 (mainly W16a). Locally, it may form a mosaic with other types, including patches of beech woodland, small wet areas, and types more commonly found in western Britain. Rides and edges may grade into grassland and scrub types.'

- 4.3.5 Based on the results of the survey at the site and the species list for the scrub habitat (appended at **Table 8.1**) it is concluded that the scrub habitat within the site is not characteristic of the Lowland Deciduous Woodland Priority Habitat. The scrub, trees and hedgerows within the site are of local value as they add structural diversity and provides habitat suitable for use by breeding birds.
- 4.3.6 The Clipsley Brook and ditch within the site are of local value as they add structural diversity and provide habitat suitable for use by water vole.
- 4.3.7 Retention and protection of the trees, scrub, Clipsley Brook and the ditch within the site is recommended at **Section 5.2**.
- 4.3.8 Japanese Knotweed and Indian Balsam, both invasive species as listed under Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), are present within the site. It is illegal to cause the spread of

these species in the wild, and is therefore proposed to eradicate both species as part of the proposed development, as recommended at **Section 5.3**.

4.4 Protected Species and Other Wildlife

- 4.4.1 No roosting bats were detected within the site.
- 4.4.2 The results of the transect and static surveys confirm the site is used by common and soprano pipistrelle bats for foraging. Noctule and *Myotis* species use the site more infrequently, and a greater diversity of species is associated with the ditch at the southern end of the site.
- 4.4.3 Recorded activity levels were fairly consistent across the site during the transect surveys, but have varied during the static surveys; high levels of bat activity (for all species detected) has not been regularly detected, and it is considered that the site is used by all species for foraging as part of a wider network of habitats. Recommendations for the protection of bats, and enhancement for roosting bats is presented at **Section 5.4**. Recommendations relating to site layout (at **Section 5.2**) will secure suitable habitats within the site for foraging bats.
- 4.4.4 Juvenile birds and family groups were detected in the wider area during the breeding bird surveys, and birds were detected singing, calling and alarm calling within the site (these behaviours are strongly linked to breeding due to the time of year). It is therefore concluded that the breeding bird surveys have confirmed that the habitats within the site and the wider area are suitable for use by nesting birds including species of ground nesting birds.
- 4.4.5 The trees, scrub and hedgerows provide favourable foraging and nesting habitat for the species of birds detected within the site and the wider area via the records search. Consideration of birds, including protection of breeding birds and recommended enhancements for Priority Species, are presented at **Section 5.5** of this report.
- 4.4.6 No water vole were detected during the surveys at the site, however the habitats within the site remain suitable for use by water vole. Precautionary recommendations for the protection of water vole are presented at **Section 5.6**.
- 4.4.7 Recommendations for the protection of other Priority Species, such as hedgehog, are presented at **Section 5.8**.

4.5 Assessment of Impacts

- 4.5.1 At the time of writing the proposed site layout is not available. The proposals will involve the development of the site to residential dwellings. The guidance provided within this report should be used to inform the design of the site layout.
- 4.5.2 Any light pollution from the site could impact upon the ecological value of the Clipsley Brook and ditch within the site. Recommendations for the suitable use of lighting at the site are presented at **Section 5.4** of this report.
- 4.5.3 Recommendations for the compensation for the loss of scrub habitat within the site are presented at **Section 5.7** of this report.
- 4.5.4 The proposals present an opportunity to enhance the wildlife potential of the site for foraging and commuting bats, Priority Species of bird associated with the habitats present within the site and for hedgehog by the planting of native species of trees and shrubs and by incorporating bat boxes and bird boxes into the design of the site.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

- 5.1.1 These recommendations 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 address the potential impacts identified in **Section 4.0** and are appropriate and proportionate. Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified, as required by the NPPF and other relevant planning documents.
- 5.1.3 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the site post-construction) and take into consideration the end use of the site as a residential development.

5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layout

- 5.2.1 It is recommended that the site layout is designed to retain and protect the trees, scrub and hedgerows within the site boundary. Compensatory native linear planting equal to or greater than any length of hedgerow removed will be required within the site if any section of hedgerow is scheduled for removal.
- 5.2.2 Where feasible the site layout should be designed to avoid new residential properties backing on to the Clipsley Brook, ditch and retained areas of scrub in the south-western corner of the site.
- 5.2.3 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and shrubs to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all area have been developed to ensure protection is provided throughout the construction phase.
- 5.2.4 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Protection of Clipsley Brook and Ditch

- 5.2.5 The section of the Clipsley Brook and the ditch within the site should be protected during the construction and operational phase through implementation of a minimum eight metre undeveloped buffer and best practice. Mitigation measures will be discussed and agreed with the Environment Agency. In particular, 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).

5.3 Invasive Species

- 5.3.1 It is an offence under the *Wildlife and Countryside Act 1981* (as amended) to cause the spread of Japanese Knotweed and Indian Balsam in the wild. An Invasive Species Management Plan will be prepared to describe the management of both species in relation to the proposed development at the site. Japanese Knotweed must be treated in accordance with Environment Agency guidance. It is recommended that the Indian Balsam is controlled during site clearance works and subsequently managed. It is recommended that a specialist contractor is appointed to provide the Invasive Species Management Plan and to undertake the removal of the invasive species within the site.

5.4 Bats

Demolition of Buildings

- 5.4.1 No updated or further surveys are required to inform the assessment or planning decision. If the demolition works do not commence prior to May 2018 (i.e. the next bat active season) updated bat activity surveys will be required prior to the commencement of works.
- 5.4.2 It is recognised that bats are occasionally found in unexpected locations. The following best-practice precautionary measures should be observed during the demolition of the buildings.
- 5.4.3 No timing measures are recommended for the demolition of the buildings, however the optimal time for the demolition of Buildings 1 to 6 and the Farmhouse is between September and late February inclusive. There is no requirement for a licensed bat surveyor to supervise the demolition works, however it is recommended that ridge tiles, roof slates etc. are removed carefully and by hand.
- 5.4.4 If at any time during the works a bat is discovered or suspected all contractors must withdraw from the area and ERAP Ltd (01772 750502) or Natural England must be contacted for further guidance.

Lighting

- 5.4.5 Paragraph 125 in Chapter 11 (conserving and enhancing the natural environment) of the National Planning Policy Framework (NPPF) states:

“By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.

Construction Phase

- 5.4.6 Any lighting to be used at the site during construction should be directional and screened where possible, this specification should be included within a Construction Environment Management Plan (CEMP), or similar.

Development Lighting Design

- 5.4.7 The lighting scheme to be implemented at the developed site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the Clipsley Brook and ditch, the retained scrub, any proposed areas of ecological enhancement and any landscape planting, as lighting overspill may deter use by wildlife such as foraging bats.
- 5.4.8 The lighting scheme will be designed with reference to current guidance, namely:
- a. *Artificial lighting and wildlife. Interim Guidance: Recommendations to help minimise the impact of artificial lighting.* (Bat Conservation Trust, 2014); and
 - b. *Bats and lighting: Overview of current evidence and mitigation guidance* (Stone, 2014).

Enhancing Habitats for Roosting Bats

- 5.4.9 It is recommended that the development incorporates the installation of commercially available bat access panels at the new buildings.
- 5.4.10 The bat access panels should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting or existing linear features. The access panels should not be positioned over windows or doorways where bat droppings may become a nuisance. Once the development layout has been finalised, an Ecologist should advise on appropriate number and 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 at **Insert 1**, below:



Insert 1: Example of commercially available bat access panels.

5.4.11 It is recommended that bat boxes are erected onto suitable retained trees within the site. An ecologist will advise on the number and siting of the bat boxes once the site layout is finalised.

5.4.12 Suitable bat boxes are the Schwegler 1FF and Schwegler 1FD, see **Insert 2**, below.



Insert 2: Schwegler 1FF and Schwegler 1FD bat boxes

5.5 Birds

Protection

5.5.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is mandatory that the buildings, trees, shrubs, hedgerows or other suitable breeding bird habitat which are to be removed as part of the proposals are only removed outside the bird breeding season. The bird breeding season typically extends between March to August inclusive.

5.5.2 If any vegetation is scheduled for removal in the bird breeding season it is advised that advice from an Ecologist is sought. It may be necessary to carry out a walkover survey to demonstrate satisfactorily that no breeding birds, active nests, eggs or fledglings are present in the area to be cleared.

5.5.3 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

5.5.4 The installation of bird boxes suitable for use by swifts, house sparrow, starling and general bird species is recommended at the proposed new housing. 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. Once the development layout has been finalised, an Ecologist should advise on appropriate number and positions for the nest boxes. Example of suitable bird boxes are given below, at **Insert 3**:



Insert 3: Ibstock Eco-habitat for Swifts, Vivara Pro WoodStone Starling Nest Box, House Sparrow Nesting Terrace and Schwegler 1MR Avianex

5.5.5 Such bird boxes are available from the NHBS (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com). ERAP Ltd will advise on the siting of bird boxes.

Woodland Birds

5.5.6 It is recommended that bird boxes associated with woodland bird species are to be installed at the retained trees within the site. Once the development layout has been finalised, an Ecologist should advise on appropriate number and positions for the nest boxes. 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. The boxes should be at least four metres from ground level.

5.5.7 Examples of suitable nest boxes are presented at **Insert 4**, below.



Insert 4: Schwegler 3SV, Schwegler 1N, Schwegler 2M and Schwegler 2H bird boxes, suitable for a variety of woodland birds.

5.6 Protection of Water Voles

5.6.1 No water voles were detected at the site during the surveys, however the habitat within the site remains suitable for use by water vole. It is recommended that a minimum eight metre protective undeveloped buffer is implemented at the Clipsley Brook and ditch. If any section of the Clipsley Brook or ditch is scheduled to be affected by development works an updated water vole survey will be required at an appropriate time of year prior to commencement of works.

5.7 Enhancement and Management of Retained Habitats and Landscape Planting

Enhancement and Management of the Retained Habitats

5.7.1 It is recommended that the retained belt of scrub, hedgerows and tree lines are brought into active management for biodiversity and to promote the longevity of these habitats. A Habitat Management Plan would be prepared to include the following:

- a. Specification of the removal/control and safe disposal of invasive species such as Indian Balsam etc.
- b. Installation of bird boxes including boxes of a design for specific species such as nuthatch and robin;
- c. Creation of dead wood habitat piles for colonisation by invertebrates, fungi and small mammals including hedgehog (Priority Species); and
- d. Plug planting of woodland herbs such as native Bluebell (*Hyacinthoides non-scripta*).

Landscape Planting

5.7.2 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

5.7.3 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**, 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>	Guelder Rose

5.7.4 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.

5.7.5 Planting schemes that include flowering species such as *Viburnum*, *Ceanothus*, *Hebe*, *Lavendula*, *Lonicera*, *Potentilla*, *Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.

5.7.6 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the site ensures that a variety of flowering species are available throughout the year.

5.8 Habitat Connectivity

5.8.1 In addition to the landscape planting described at **Section 5.7**, it is recommended that the opportunities for continued movement of animal life such as hedgehog (Priority Species) through the site is maximised. This can be achieved by ensuring that plot boundary fences are not installed flush to ground level but are raised to leave a gap of 0.1 to 0.15 metres beneath the fence panels.

6.0 CONCLUSION

- 6.1 This ecological appraisal has demonstrated that a residential development at the site is feasible and acceptable in accordance with ecological considerations and the National Planning Policy Framework.
- 6.2 It is possible to implement reasonable actions for the protection and long-term conservation of fauna such as roosting bats, nesting birds and commuting/foraging bats associated with the site.
- 6.3 Measures to conserve the habitat connectivity through the site are entirely feasible.
- 6.4 Development 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.

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8.0 APPENDIX: TABLES AND FIGURES

8.1 Plant Species Lists

Table 8.1: Plant Species List for Scrub at the South-western Area of the Site

Scientific Name	Common Name	DAFOR ¹	Cover
Woody species			
	Garden escapes	VLA	<1%
<i>Acer pseudoplatanus</i>	Sycamore	LF	<1%
<i>Alnus glutinosa</i>	Alder	O	20%
<i>Betula pendula</i>	Silver Birch	LA	<1%
<i>Crataegus monogyna</i>	Hawthorn	O	10%
<i>Fraxinus excelsior</i>	Ash	O	20%
<i>Ilex aquifolium</i>	Holly	LF	<1%
<i>Malus</i> sp.	Apple species	R	<1%
<i>Pinus</i> sp.	Pine species	R	<1%
<i>Prunus laurocerasus</i>	Cherry Laurel	R	<1%
<i>Prunus</i> sp.	Cherry species	O	5%
<i>Quercus robur</i>	Pedunculate Oak	O	20%
<i>Salix caprea</i>	Goat Willow	LA	<1%
<i>Salix cinerea</i>	Grey Willow	LA	<1%
<i>Salix fragilis</i>	Crack Willow	O	5%
Herb Species			
	Moss species	LA	<1%
<i>Artemisia vulgaris</i>	Mugwort	LF	<1%
<i>Calystegia sepium</i>	Hedge Bindweed	LA	2%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLF	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	VLA	<1%
<i>Cirsium arvense</i>	Creeping Thistle	LF	<1%
<i>Dryopteris filix-mas</i>	Male-fern	LF	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	<1%
<i>Festuca rubra</i>	Red Fescue	LF	<1%
<i>Galium aparine</i>	Cleavers	O	2%
<i>Geranium robertianum</i>	Herb-Robert	VLA	<1%
<i>Hedera helix</i>	Ivy	LF	<1%
<i>Heracleum sphondylium</i>	Hogweed	VLF	<1%
<i>Hyacinthoides</i> sp.	Non-native Bluebell	VLA	<1%
<i>Impatiens glandulifera</i>	Indian Balsam	O	10%
<i>Lolium perenne</i>	Perennial Rye-grass	VLA	<1%
<i>Mercurialis perennis</i>	Dog's Mercury	LF	<1%
<i>Myosotis arvensis</i>	Field Forget-me-not	LA	<1%
<i>Narcissus pseudonarcissus</i> ssp <i>pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	VLF	<1%
<i>Poa annua</i>	Annual Meadow-grass	VLA	<1%
<i>Ranunculus ficaria</i>	Lesser Celandine	VLA	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	LA	1%
<i>Rubus fruticosus</i> agg.	Bramble	O	5%
<i>Senecio jacobaea</i>	Common Ragwort	LF	<1%
<i>Silene dioica</i>	Red Campion	VLA	<1%
<i>Stellaria media</i>	Common Chickweed	LA	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%
<i>Trifolium repens</i>	White Clover	VLA	<1%
<i>Urtica dioica</i>	Common Nettle	VLA	<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 Arable Field Margins

Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	LF	<1%
<i>Alopecurus pratensis</i>	Meadow Foxtail	LF	<1%
<i>Arabidopsis thaliana</i>	Thale Cress	VLF	<1%
<i>Barbarea vulgaris</i>	Winter-cress	VLF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLA	<1%
<i>Cirsium vulgare</i>	Spear Thistle	VLF	<1%
<i>Crataegus monogyna</i>	Hawthorn	LA	<1%
<i>Dactylis glomerata</i>	Cock's-foot	A	20%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	<1%
<i>Equisetum arvense</i>	Field Horsetail	VLF	<1%
<i>Fallopia japonica</i>	Japanese Knotweed	LA	<1%
<i>Festuca rubra</i>	Red Fescue	LF	<1%
<i>Hedera helix</i>	Ivy	VLA	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	A	20%
<i>Hyacinthoides</i> sp.	Non-native Bluebell	VLF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	A*	35%
<i>Myosotis arvensis</i>	Field Forget-me-not	VLA	<1%
<i>Narcissus pseudonarcissus</i> ssp <i>pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Poa annua</i>	Annual Meadow-grass	LA	5%
<i>Poa pratensis</i>	Smooth Meadow-grass	O	10%
<i>Ranunculus repens</i>	Creeping Buttercup	O	10%
<i>Rubus fruticosus</i> agg.	Bramble	LA	<1%
<i>Rumex acetosa</i>	Common Sorrel	VLF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLF	<1%
<i>Stellaria media</i>	Common Chickweed	VLA	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%
<i>Urtica dioica</i>	Common Nettle	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 8.3: Plant Species List for Improved Grassland

Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	LF	<1%
<i>Alnus glutinosa</i>	Alder	LA	<1%
<i>Alopecurus pratensis</i>	Meadow Foxtail	LF	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLA	<1%
<i>Crataegus monogyna</i>	Hawthorn	LA	<1%
<i>Cupressus x leylandii</i>	Leyland Cypress	LF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	A	20%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	<1%
<i>Fagus sylvatica</i>	Beech	R	<1%
<i>Festuca rubra</i>	Red Fescue	LF	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	A	20%
<i>Hyacinthoides</i> sp.	Non-native Bluebell	VLF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	A*	30%
<i>Myosotis arvensis</i>	Field Forget-me-not	VLA	<1%
<i>Narcissus pseudonarcissus</i> ssp <i>pseudonarcissus</i>	Daffodil	VLF	<1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	VLA	<1%
<i>Poa annua</i>	Annual Meadow-grass	LA	5%
<i>Poa pratensis</i>	Smooth Meadow-grass	O	10%
<i>Populus alba</i>	White Poplar	O	5%
<i>Ranunculus repens</i>	Creeping Buttercup	O	10%
<i>Rubus fruticosus</i> agg.	Bramble	LA	<1%
<i>Rumex acetosa</i>	Common Sorrel	VLF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	VLF	<1%
<i>Stellaria media</i>	Common Chickweed	VLA	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%
<i>Urtica dioica</i>	Common Nettle	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 8.4: Plant Species List for Clipsley Brook and Ditch

Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	O	10%
<i>Allium oleraceum</i>	Field Garlic	VLA	<1%
<i>Arabidopsis thaliana</i>	Thale Cress	VLA	<1%
<i>Artemisia vulgaris</i>	Mugwort	VLF	<1%
<i>Cirsium vulgare</i>	Spear Thistle	LF	<1%
<i>Crataegus monogyna</i>	Hawthorn	O	20%
<i>Dryopteris filix-mas</i>	Male-fern	LA	<1%
<i>Festuca rubra</i>	Red Fescue	LA	<1%
<i>Galium aparine</i>	Cleavers	O	5%
<i>Heracleum sphondylium</i>	Hogweed	VLF	<1%
<i>Impatiens glandulifera</i>	Indian Balsam	O	15%
<i>Mercurialis perennis</i>	Dog's Mercury	VLF	<1%
<i>Myosotis arvensis</i>	Field Forget-me-not	VLA	<1%
<i>Poa pratensis</i>	Annual Meadow-grass	LF	<1%
<i>Quercus robur</i>	Pedunculate Oak	LA	25%
<i>Ranunculus ficaria</i>	Lesser Celandine	LA	5%
<i>Ranunculus repens</i>	Creeping Buttercup	VLA	<1%
<i>Rubus fruticosus</i> agg.	Bramble	VLA	<1%
<i>Rumex acetosa</i>	Common Sorrel	LF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	LF	<1%
<i>Sagina procumbens</i>	Procumbent Pearlwort	VLF	<1%
<i>Salix caprea</i>	Goat Willow	LF	5%
<i>Salix cinerea</i>	Grey Willow	LF	5%
<i>Sisymbrium officinale</i>	Hedge Mustard	VLF	<1%
<i>Trifolium repens</i>	White Clover	VLA	<1%
<i>Urtica dioica</i>	Common Nettle	LA	10%

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: Plant Species List for Tree Line 1 and 2

Scientific Name	Common Name	Tree Line 1		Tree Line 2	
		DAFOR ¹	Cover	DAFOR ¹	Cover
Woody species					
<i>Acer pseudoplatanus</i>	Sycamore	A	20%	A	20%
<i>Aesculus hippocastanum</i>	Horse-chestnut	-	-	O	10%
<i>Betula pendula</i>	Silver Birch	F	10%	F	10%
<i>Crataegus monogyna</i>	Hawthorn	A	20%	A	15%
<i>Fraxinus excelsior</i>	Ash	F	10%	F	10%
<i>Ilex aquifolium</i>	Holly	LA	5%	LA	<1%
<i>Quercus robur</i>	Pedunculate Oak	O	10%	O	10%
<i>Salix caprea</i>	Goat Willow	O	5%	O	5%
<i>Salix cinerea</i>	Grey Willow	O	5%	O	5%
Ground Flora					
	Moss species	LA	<1%	LA	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	VLA	<1%	VLA	<1%
<i>Dactylis glomerata</i>	Cock's-foot	LA	<1%	LA	<1%
<i>Dryopteris filix-mas</i>	Male-fern	VLF	<1%	VLF	<1%
<i>Galium aparine</i>	Cleavers	F	<1%	F	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	LA	<1%	LA	<1%
<i>Hordeum</i> sp.	Barley species	F	5%	F	5%
<i>Impatiens glandulifera</i>	Indian Balsam	LA	<1%	LA	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	F	10%	F	10%
<i>Rubus fruticosus</i> agg.	Bramble	LA	<1%	LA	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%	LF	<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 8.6: Plant Species Composition, Frequency and Abundance for Hedgerows 1 and 2

Scientific Name	Common Name	Hedgerow 1		Hedgerow 2	
		DAFOR ¹	% ²	DAFOR ¹	% ²
Woody Species					
	Garden escapes	LA	<1%	-	-
<i>Alnus glutinosa</i>	Alder	F	35%	-	-
<i>Crataegus monogyna</i>	Hawthorn	F	40%	A*	80%
<i>Ilex aquifolium</i>	Holly	F	15%	-	-
<i>Prunus laurocerasus</i>	Cherry Laurel	LA	<1%	-	-
<i>Prunus</i> sp.	Cherry species	-	-	R	<1%
Ground Layer					
	Garden escapes	LA	<1%	-	-
<i>Dactylis glomerata</i>	Cock's-foot	VLF	<1%	F	5%
<i>Epilobium hirsutum</i>	Great Willowherb	-	-	LF	<1%
<i>Galium aparine</i>	Cleavers	F	<1%	A	5%
<i>Hedera helix</i>	Ivy	F	5%	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	VLF	<1%	F	5%
<i>Hordeum</i> sp.	Barley species	F	5%	-	-
<i>Lolium perenne</i>	Perennial Rye-grass	VLA	<1%	A	5%
<i>Narcissus pseudonarcissus</i> ssp <i>pseudonarcissus</i>	Daffodil	VLF	<1%	-	-
<i>Phalaris arundinacea</i>	Reed Canary-grass	-	-	LF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	-	-	LA	<1%
<i>Sisymbrium officinale</i>	Hedge Mustard	VLA	<1%	-	-
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%	-	-
<i>Urtica dioica</i>	Common Nettle	LA	<1%	O	<1%
Total Qualifying Woody Species		3		1	
Total Qualifying Woodland Species		0		0	
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and *denotes a constant species ² % =Percentage Cover Species shaded grey are those listed as either woody or woodland species in <i>The Hedgerows Regulations 1997</i>					

Table 8.7: The Hedgerow Regulations 1997 Assessments Results of Hedgerows 1 and 2

Hedgerow Name	Hedgerow 1			Hedgerow 2		
Height x width (metres)	2.5 x 1			1.5 x 1		
Length (metres)	140			175		
Continuity	100%			90%		
Management	Cut			Cut		
Total Number of woody species	3			1		
Average Number of Qualifying Woody Species:						
Section number	1	2	3	1	2	3
Qualifying woody species	1	2	-	1	1	-
Average number	2			1		
Number of Features Present:						
(a) Bank or wall along at least ½ length	No			No		
(b) Gaps which in agg. do not exceed 10%	Yes			Yes		
(e) 1 standard tree per 50m	No			No		
(f) At least 3 woodland species within 1 metre	No			No		
(g) Ditch along at least ½ its length	No			No		
(h) Connections scoring 4 points or more	No			No		
(i) Parallel hedge within 15m	No			No		
Total Features	1			1		
Criteria for Hedgerow Importance 1: Hedgerow contains species listed as:						
(1) Part 1 of Schedule 1, Schedule 5 or Schedule 8 of W&C act 1981	No			No		
(2) Declining breeders in 'Red Data Birds of Britain'	No			No		
(3) Categorised as 'endangered', 'extinct' or 'vulnerable'	No			No		
Criteria for Hedgerow Importance 2: Hedgerow Includes (all woody species mentioned in (i)-(iv) reduced by one Lancashire for this criteria only):						
(i) At least 7 woody species	No			No		
(ii) At least 6 woody species and at least 3 features	No			No		
(iii) At least 6 woody species, inc. one of: Black Poplar, L-leaved Lime, S-leaved Lime or Wild Service Tree	No			No		
(iv) At least 5 woody species, and has 4 features	No			No		
Criteria for Hedgerow Importance 3: Is adjacent to is adjacent to a bridleway, footpath or byway <i>and</i> includes at least 4 woody species on average and 2 features from (a) to (g):						
Qualifies:	No			No		
Hedgerow Classed as Important?	No			No		

8.2 Photographs

Table 8.8: Table of Photographs


 <p>A photograph showing a dense thicket of bare trees and shrubs in a wooded area. The ground is covered with fallen leaves and some small green plants are visible in the foreground.</p>	 <p>A photograph showing a close-up view of a wooded area with many bare trees and a ground covered in fallen leaves and some green plants.</p>
<p>Photo 1: Scrub in south-western corner</p>	<p>Photo 2: Scrub in south-western corner</p>
 <p>A wide-angle photograph of a large, flat, green arable field under a cloudy sky. The field is mostly uniform in color with some faint tracks or paths visible.</p>	 <p>A photograph showing the edge of a green field. A wooden fence runs along the right side, with several trees and shrubs growing behind it. The sky is overcast.</p>
<p>Photo 3: Arable field</p>	<p>Photo 4: Field margin at arable field</p>
 <p>A photograph of a large, open grassland area. The grass is a vibrant green, and there are some trees in the background under a cloudy sky.</p>	 <p>A photograph showing a grassy area next to a brick building. There are several trees, including some evergreens, and the grass appears to be well-maintained.</p>
<p>Photo 5: Improved grassland</p>	<p>Photo 6: Amenity grassland associated with the farmhouse</p>



Photo 7: Clipsley Brook



Photo 8: Example of residential gardens backing on to Clipsley Brook



Photo 9: Ditch through centre of site



Photo 10: Tree Line 1



Photo 11: Tree Line 2



Photo 12: Tree line at improved grassland



Photo 13: Tree Line 1 and pavement associated with A580



Photo 14: A580



Photo 15: Slag Lane with Leyland Cypress associated with the amenity grassland



Photo 16: Line of White Poplar associated with the amenity grassland



Photo 17: Hedgerow 1



Photo 18: Hedgerow 2



Photo 19: Northern elevation of farmhouse



Photo 20: Eastern elevation of farmhouse



Photo 21: Southern elevation of farmhouse



Photo 22: Southern and western elevation of farmhouse



Photo 23: Roof void at farmhouse



Photo 24: Roof void at farmhouse



Photo 25: Roof void at farmhouse



Photo 26: Roof void at farmhouse



Photo 27: Northern elevation of Outbuilding 1, Section 1a



Photo 28: Crack at northern elevation of Outbuilding 1, Section 1a



Photo 29: Outbuilding 1, Section 1b



Photo 30: Collapsed roof at Outbuilding 1, Section 1b



Photo 31: Interior at Outbuilding 1, Section 1b



Photo 32: Crack at interior of Outbuilding 1, Section 1b



Photo 33: Interior at Outbuilding 1, Section 1b



Photo 34: Outbuilding 1, Section 1c



Photo 35: Eastern elevation of Outbuilding 1, Section 1d



Photo 36: Interior of Outbuilding 1, Section 1d



Photo 37: Outbuilding 2



Photo 38: Eastern elevation and interior of Outbuilding 2



Photo 39: Northern elevation of Outbuilding 2



Photo 40: Timber lean-to at south-west corner of Outbuilding 2



Photo 41: Southern and eastern elevations of Outbuilding 3



Photo 42: Southern and western elevation of Outbuilding 4



Photo 43: Interior at Outbuilding 4



Photo 44: Northern elevation of Outbuilding 5



Photo 45: Northern and western elevation of Outbuilding 5



Photo 46: Eastern elevation of Outbuilding 5



Photo 47: Interior of Outbuilding 5



Photo 48: Exposed roof at Outbuilding 5



Photo 49: Southern and western elevation of Outbuilding 6



Photo 50: Eastern elevation of Outbuilding 6

8.3 Dusk Emergence Surveys, Raw Data

Table 8.9: 1st Repetition, 18th June 2017 (Sunset 21:29)

Surveyor 1: Ryan Evans

Time	Species	Notes
21:45	Common pipistrelle	Foraging over farm yard
21:57	Common pipistrelle	Foraging over farm yard
22:02	Common pipistrelle	Heard not seen
22:11	Common pipistrelle	Heard not seen
22:17	Common pipistrelle	Foraging over farm yard
22:34	Common pipistrelle	Foraging over farm yard
<i>Anabat Express detected:</i> 30 common pipistrelle passes between 21:49 and 22:36.		

Surveyor 2: Amy Sharples

Time	Species	Notes
21:49	Common pipistrelle	Commuting from west to east
21:50	Common pipistrelle	Foraging over garden area
21:51	Common pipistrelle	Foraging over garden area
21:56	Common pipistrelle	Heard not seen
21:57	Common pipistrelle	Foraging over farm yard
21:58	Common pipistrelle	Foraging over garden area
21:59	Common pipistrelle	Foraging between buildings 1 and 5, 6 and 7
22:01	Common pipistrelle	Foraging over garden area
22:02	Common pipistrelle	Foraging over garden area
22:02	Common pipistrelle	Foraging over garden area
22:02	Common pipistrelle	Foraging over farm yard
22:03	Common pipistrelle	Foraging over garden area
22:05	Common pipistrelle	Foraging over garden area
22:05	Common pipistrelle	Foraging over garden area
22:06	Common pipistrelle	Foraging over garden area
22:06	Common pipistrelle	Foraging over garden area
22:06	Common pipistrelle	Foraging over garden area
22:08	Common pipistrelle	Foraging over garden area
<i>Anabat Express detected:</i> 56 common pipistrelle passes between 21:49 and 22:43.		

Surveyor 3: Chris Schofield

Time	Species	Notes
21:39 to end of survey	Common pipistrelle	Constant foraging over garden area
22:03	2 x common pipistrelle	Foraging over garden area
<i>Anabat Express detected:</i> 79 common pipistrelle passes between 21:43 and 22:39.		

Surveyor 4: Charlotte Harrison

Time	Species	Notes
21:39 to end of survey	2 x common pipistrelle	Constant foraging over garden area
21:58	Common pipistrelle	Foraging over garden area
<i>Anabat Express detected:</i> 235 common pipistrelle passes between 21:39 and 22:41.		

Surveyor 5: Brian Robinson

Time	Species	Notes
21:41 to 22:09	Common pipistrelle	Foraging bats heard not seen
21:53	Common pipistrelle	Foraging at tree line
22:01 to 22:27	Common pipistrelle	Foraging at tree line and along building
<i>Personic RPA3 detected:</i> 43 common pipistrelle passes between 21:54 and 22:30.		

Surveyor 6: Danielle Rowlands

Time	Species	Notes
21:55	Common pipistrelle	Heard not seen
22:00	Common pipistrelle	Foraging over garden area
22:03	Common pipistrelle	Foraging over garden area
22:07	Common pipistrelle	Foraging over garden area
22:11	Common pipistrelle	Foraging over garden area
22:22	Common pipistrelle	Foraging over garden area
22:39	Common pipistrelle	Foraging over garden area
<i>Anabat Express detected:</i> 24 common pipistrelle passes between 22:00 and 22:43.		

Table 8.10: 2nd Repetition, 7th August 2017 (Sunset 20:56)

Surveyor 1: Ryan Evans

Time	Species	Notes
21:09	Common pipistrelle	Foraging over farm yard
21:16	Common pipistrelle	Foraging over farm yard
21:30	Common pipistrelle	Foraging over farm yard
21:32	Common pipistrelle	Foraging over farm yard
21:34	Common pipistrelle	Foraging over farm yard
21:45	Common pipistrelle	Foraging over farm yard
21:50	Common pipistrelle	Foraging over farm yard

Anabat Express results presented at Surveyor 2, below.

Surveyor 2: Amy Sharples

Time	Species	Notes
21:09	Common pipistrelle	Foraging over farm yard
21:16	Common pipistrelle	Observed in flight, no echolocation detected
21:18	Common pipistrelle	Heard not seen
21:31	Common pipistrelle	Foraging over farm yard
21:34	Common pipistrelle	Foraging over garden area
21:36	Common pipistrelle	Foraging over garden area
21:45	Common pipistrelle	Heard not seen
21:46	Common pipistrelle	Foraging over garden area
21:49	Common pipistrelle	Foraging over garden area
21:50	Common pipistrelle	Foraging over garden area
21:50	Common pipistrelle	Heard not seen

Anabat Express detected:

10 common pipistrelle passes between 21:09 and 21:50.

Surveyor 3: Chris Schofield

Time	Species	Notes
21:07 to 21:33	Common pipistrelle	Constant foraging over garden area
21:11	Common pipistrelle	Foraging over garden area
21:16	Common pipistrelle	Foraging over garden area
21:17	Common pipistrelle	Foraging over garden area
21:17	Common pipistrelle	Foraging over garden area
21:19	Common pipistrelle	Foraging over garden area
21:19	Common pipistrelle	Foraging over garden area
21:23	Common pipistrelle	Foraging over garden area
21:24	Common pipistrelle	Foraging over garden area
21:25	Common pipistrelle	Foraging over garden area
21:28	2 x common pipistrelle	Foraging over garden area
21:29 to 21:32	Common pipistrelle	Foraging over garden area
21:33	Common pipistrelle	Foraging over garden area
21:36	Common pipistrelle	Foraging over garden area
21:45	Common pipistrelle	Foraging over garden area
21:47	Common pipistrelle	Heard not seen
21:50	Common pipistrelle	Heard not seen
21:52	Common pipistrelle	Heard not seen
21:54	Common pipistrelle	Foraging over garden area
21:56	Common pipistrelle	Foraging over garden area
22:02	Common pipistrelle	Heard not seen

Anabat Express results presented at Surveyor 4, below.

Surveyor 4: Tracy Cumberbatch

Time	Species	Notes
20:54	Common pipistrelle	Heard not seen
21:00 to end of survey	Common pipistrelle	Constant foraging over garden area
<i>Anabat Express detected:</i> 88 common pipistrelle passes between 21:07 and 22:03		

Surveyor 5: Darren Graham

Time	Species	Notes
20:54	Common pipistrelle	Foraging over garden area
21:07	Common pipistrelle	Foraging over garden area
21:09	Common pipistrelle	Foraging over garden area
21:09	Common pipistrelle	Foraging over garden area
21:23	Common pipistrelle	Foraging over garden area
21:25	Common pipistrelle	Foraging over garden area
21:27	Common pipistrelle	Foraging over garden area
21:30	Common pipistrelle	Foraging over garden area
21:34	Common pipistrelle	Foraging over garden area
21:34	Common pipistrelle	Foraging over garden area
<i>Anabat Express results presented at Surveyor 6, below.</i>		

Surveyor 6: Jordan Prendergast

Time	Species	Notes
20:54	Common pipistrelle	Foraging at shrubs
21:10	Common pipistrelle	Heard not seen
21:17	Common pipistrelle	Foraging over garden area
21:19	Common pipistrelle	Foraging over garden area
21:23	Common pipistrelle	Heard not seen
21:23	Common pipistrelle	Foraging over garden area
21:24	Common pipistrelle	Foraging at shrubs
21:26	Common pipistrelle	Foraging over garden area
21:29 to end of survey	3 x common pipistrelle	Foraging at shrubs
<i>Anabat Express detected:</i> 160 common pipistrelle passes between 21:10 and 22:05.		

8.4 Transect Surveys

Table 8.11: Activity by Point Count Location, 1st Repetition, 24th May 2017 (Sunset 21:19)

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 1	1.A	21:25:00	0	0	0	0
	1.B	21:32:00	0	0	0	0
	1.C	21:40:00	0	0	0	0
	1.D	21:47:00	0	0	1	0
	1.E	21:54:00	7	0	0	0
	1.F	22:00:00	0	0	0	0
	1.A	22:10:00	10	0	0	0
	1.B	22:19:00	1	0	0	0
	1.C	22:27:00	0	0	0	0
	1.D	22:35:00	0	0	0	0
	1.E	22:42:00	0	0	0	0
	1.F	22:49:00	0	0	0	0
	1.A	23:00:00	13	0	0	0
	1.B	23:07:00	0	0	0	0
	1.C	23:13:00	0	0	0	0
Total passes at each spot count location			31	0	1	0
No. Anabat recordings over whole transect			47	1	1	0

¹Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule
 Observations of bat activity noted during the transect surveys and between spot count locations have been added to **Figure 7**.

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 2	2.A	21:20:00	0	0	0	0
	2.B	21:29:00	0	0	0	0
	2.C	21:38:00	0	0	0	0
	2.D	21:51:00	0	0	0	0
	2.E	22:00:00	17	0	0	0
	2.F	22:09:00	0	0	0	0
	2.A	22:17:00	0	0	0	0
	2.B	22:27:00	7	0	0	0
	2.C	22:35:00	3	0	0	0
	2.D	22:44:00	2	0	0	0
	2.E	22:53:00	2	0	0	0
	2.F	23:00:00	1	1	0	0
	2.A	23:07:00	1	0	0	0
	2.B	23:13:00	0	0	0	0
	2.C	23:20:00	0	0	0	0
Total passes at each spot count location			33	1	0	0
No. Anabat recordings over whole transect			44	1	0	0

¹Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule
 Observations of bat activity noted during the transect surveys and between spot count locations have been added to **Figure 7**.

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 3	3.A	21:20:00	0	0	0	0
	3.B	21:27:00	0	0	0	0
	3.C	21:35:00	0	0	0	0
	3.D	21:42:00	0	0	0	0
	3.E	21:49:00	5	0	1	0
	3.F	21:56:00	3	0	1	0
	3.A	22:04:00	0	0	0	0
	3.B	22:11:00	0	0	0	0
	3.C	22:20:00	1	0	0	0
	3.D	22:26:00	0	0	0	0
	3.E	22:32:00	1	0	0	0
	3.F	22:39:00	0	1	0	0
	3.A	22:46:00	1	0	0	0
	3.B	22:53:00	1	0	0	0
3.C	23:00:00	1	0	0	0	
Total passes at each spot count location			13	1	2	0
No. Anabat recording over whole transect			25	2	2	0
¹ Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule Observations of bat activity noted during the transect surveys and between spot count locations have been added to Figure 7 .						

Table 8.12: Activity by Point Count Location, 2nd Repetition, 2nd August 2017 (Sunset 21:05)

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 1	1.A	21:06:00	0	0	0	0
	1.B	21:14:00	0	0	0	0
	1.C	21:23:00	0	0	0	0
	1.D	21:31:00	0	0	0	0
	1.E	21:38:00	16	0	0	0
	1.F	21:44:00	4	0	0	0
	1.A	21:52:00	10	0	0	0
	1.B	21:58:00	2	0	0	0
	1.C	22:06:00	1	0	0	0
	1.D	22:13:00	1	0	0	0
	1.E	22:22:00	0	0	0	0
	1.F	22:29:00	0	0	0	0
	1.A	22:37:00	6	0	0	0
	1.B	22:43:00	0	0	0	0
1.C	22:50:00	1	0	0	0	
Total passes at each spot count location			41	0	0	0
No. Anabat recording over whole transect			55	0	0	0

¹Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule
 Observations of bat activity noted during the transect surveys and between spot count locations have been added to **Figure 8**.

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹				
			P45	P55	Nn	Myotis	
Transect 2	2.A	21:17:00	1	0	0	0	
	2.B	21:26:00	1	0	0	0	
	2.C	21:34:00	0	0	0	0	
	2.D	21:43:00	2	0	0	0	
	2.E	21:52:00	1	0	0	0	
	2.F	22:00:00	2	0	0	0	
	2.A	22:09:00	5	0	0	0	
	2.B	22:18:00	9	0	0	0	
	2.C	22:26:00	7	2	0	0	
	2.D	22:35:00	0	0	0	0	
	2.E	22:44:00	1	2	0	0	
	2.F	22:51:00	2	0	0	0	
	Total passes at each spot count location			31	4	0	0
	No. Anabat recording over whole transect			45	6	0	0

¹Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule
 Observations of bat activity noted during the transect surveys and between spot count locations have been added to **Figure 8**.

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 3	3.A	21:13:00	0	0	0	0
	3.B	21:20:00	0	0	0	0
	3.C	21:28:00	0	0	0	0
	3.D	21:34:00	3	0	0	0
	3.E	21:40:00	14	0	0	0
	3.F	21:47:00	13	0	0	0
	3.A	21:55:00	1	0	0	0
	3.B	22:02:00	4	0	0	0
	3.C	22:10:00	2	0	0	0
	3.D	22:17:00	0	0	0	0
	3.E	22:24:00	8	0	0	0
	3.F	22:32:00	16	0	0	0
	3.A	22:39:00	3	0	0	0
	3.B	22:47:00	10	0	0	0
Total passes at each spot count location			74	0	0	0
No. Anabat recording over whole transect			133	0	0	0
¹ Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule Observations of bat activity noted during the transect surveys and between spot count locations have been added to Figure 8 .						

Table 8.13: Activity by Point Count Location, 3rd Repetition, 19th September 2017 (Sunset 19:18)

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 1	1.A	19:18:00	0	0	0	0
	1.B	19:25:00	0	0	0	0
	1.C	19:33:00	0	0	0	0
	1.D	19:40:00	6	1	0	0
	1.E	19:47:00	1	0	0	0
	1.F	19:53:00	3	0	0	0
	1.A	20:01:00	5	0	0	0
	1.B	20:08:00	0	0	0	0
	1.C	20:16:00	0	0	0	0
	1.D	20:24:00	6	0	0	0
	1.E	20:31:00	0	0	0	0
	1.F	20:38:00	0	0	0	0
	1.A	20:46:00	0	0	0	0
	1.B	20:53:00	0	0	0	0
1.C	21:03:00	0	0	0	0	
Total passes at each spot count location			21	1	0	0
No. Anabat recording over whole transect			27	1	0	0
¹ Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule Observations of bat activity noted during the transect surveys and between spot count locations have been added to Figure 9 .						

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 2	2.A	19:18:00	0	0	0	0
	2.B	19:26:00	0	0	0	0
	2.C	19:34:00	5	0	0	0
	2.D	19:42:00	0	1	0	0
	2.E	19:50:00	0	0	0	0
	2.F	19:57:00	0	0	0	0
	2.A	20:04:00	2	0	0	0
	2.B	20:14:00	1	0	0	0
	2.C	20:22:00	0	0	0	0
	2.D	20:30:00	1	0	0	0
	2.E	20:40:00	0	0	0	0
	2.F	20:48:00	0	0	0	0
	2.A	20:55:00	0	0	0	0
	2.B	21:06:00	0	0	0	0
Total passes at each spot count location			9	1	0	0
No. Anabat recording over whole transect			15	1	0	0
¹ Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule Observations of bat activity noted during the transect surveys and between spot count locations have been added to Figure 9 .						

Transect	Point count location	Time	Number of Bat Passes Recorded by Species ¹			
			P45	P55	Nn	Myotis
Transect 3	3.A	19:16:00	0	0	0	0
	3.B	19:24:00	0	0	0	0
	3.C	19:31:00	0	0	0	0
	3.D	19:38:00	8	0	0	0
	3.E	19:44:00	2	17	0	0
	3.F	19:50:00	5	0	0	0
	3.A	19:59:00	0	0	0	0
	3.B	20:06:00	1	0	0	0
	3.C	20:13:00	0	0	0	0
	3.D	20:20:00	0	0	0	0
	3.E	20:27:00	3	2	0	0
	3.F	20:34:00	5	0	0	0
	3.A	20:42:00	0	0	0	0
	3.B	20:50:00	2	0	0	0
	3.C	20:58:00	0	0	0	0
Total passes at each spot count location			26	19	0	0
No. Anabat recording over whole transect			51	20	0	0
¹ Key to Species Codes: P45 = common pipistrelle, P55 = soprano pipistrelle, Myotis = Myotis species, Nn= Noctule Observations of bat activity noted during the transect surveys and between spot count locations have been added to Figure 9 .						

8.5 Breeding Bird Surveys

Table 8.14: Breeding Bird Survey 15th April 2017

Scientific Name	Common Name	Times Observed	Total Seen	Singing	Calling	Alarm Call	In Flight	Male	None
<i>Aegithalos caudatus</i>	Long-tailed tit	2	4	0	2	0	0	0	2
<i>Alauda arvensis</i>	Skylark	4	4	4	0	0	0	0	0
<i>Carduelis chloris</i>	Greenfinch	11	11	0	7	4	0	0	0
<i>Columba palumbus</i>	Wood pigeon	11	13	9	0	0	0	0	4
<i>Corvus corone corone</i>	Carrion crow	2	3	0	0	0	0	0	3
<i>Corvus monedula</i>	Jackdaw	2	3	0	1	0	2	0	0
<i>Cyanistes caeruleus</i>	Blue tit	10	11	0	6	2	0	0	3
<i>Emberiza schoeniclus</i>	Reed bunting	2	2	0	2	0	0	0	0
<i>Erithacus rubecula</i>	Robin	18	18	18	0	0	0	0	0
<i>Fringilla coelebs</i>	Chaffinch	16	16	15	1	0	0	0	0
<i>Gallinago gallinago</i>	Snipe	1	1	0	0	0	0	0	1
<i>Garrulus glandarius</i>	Jay	1	2	0	0	0	0	0	2
<i>Motacilla alba</i>	Pied wagtail	1	1	0	0	0	0	0	1
<i>Parus major</i>	Great tit	2	2	0	0	2	0	0	0
<i>Passer domesticus</i>	House sparrow	8	8	0	7	1	0	0	0
<i>Phylloscopus collybita</i>	Chiffchaff	7	7	7	0	0	0	0	0
<i>Phylloscopus trochilus</i>	Willow warbler	1	1	1	0	0	0	0	0
<i>Pica pica</i>	Magpie	3	5	0	0	0	0	0	4
<i>Prunella modularis</i>	Dunnock	10	10	10	0	0	0	0	0
<i>Regulus regulus</i>	Goldcrest	5	5	5	0	0	0	0	0
<i>Streptopelia decaocto</i>	Collared dove	2	2	2	0	0	0	0	0
<i>Sturnus vulgaris</i>	Starling	5	5	0	3	1	0	0	1
<i>Sylvia atricapilla</i>	Blackcap	5	5	5	0	0	0	0	0
<i>Troglodytes troglodytes</i>	Wren	20	20	20	0	0	0	0	0
<i>Turdus merula</i>	Blackbird	13	17	9	0	0	0	2	6
<i>Turdus philomelos</i>	Song thrush	4	4	4	0	0	0	0	0
<i>Vanellus vanellus</i>	Lapwing	2	2	2	0	0	0	0	0

Table 8.15: Breeding Bird Survey 14th June 2017

Scientific Name	Common Name	Times Observed	Total Seen	Singing	Calling	Alarm Call	In Flight	Male	Female	None	Family	Food
<i>Aegithalos caudatus</i>	Long-tailed tit	2	2	0	0	0	0	0	0	0	2	0
<i>Alauda arvensis</i>	Skylark	2	2	2	0	0	0	0	0	0	0	0
<i>Apus apus</i>	Swift	1	2	0	0	0	2	0	0	0	0	0
<i>Carduelis carduelis</i>	Goldfinch	7	12	2	0	0	0	0	0	10	0	0
<i>Carduelis chloris</i>	Greenfinch	6	6	0	4	1	0	1	0	0	0	0
<i>Columba palumbus</i>	Wood pigeon	17	38	5	0	0	4	0	0	29	0	0
<i>Corvus corone corone</i>	Carrion crow	1	2	0	0	0	0	0	0	2	0	0
<i>Corvus monedula</i>	Jackdaw	1	1	0	0	0	1	0	0	0	0	0
<i>Cyanistes caeruleus</i>	Blue tit	7	7	0	2	0	0	0	0	1	4	0
<i>Dendrocopos major</i>	Great spotted woodpecker	2	2	0	1	0	0	0	0	0	0	1
<i>Emberiza schoeniclus</i>	Reed bunting	3	3	0	1	0	0	1	1	0	0	0
<i>Erithacus rubecula</i>	Robin	9	9	8	0	0	0	0	0	1	0	0
<i>Fringilla coelebs</i>	Chaffinch	15	15	15	0	0	0	0	0	0	0	0
<i>Hirundo rustica</i>	Swallow	1	6	0	0	0	6	0	0	0	0	0
<i>Larus fuscus</i>	Lesser black-backed gull	3	4	0	0	0	4	0	0	0	0	0
<i>Parus ater</i>	Coal tit	3	3	1	1	1	0	0	0	0	0	0
<i>Parus major</i>	Great tit	4	4	0	1	0	0	0	0	0	2	1
<i>Passer domesticus</i>	House sparrow	14	19	0	12	0	0	1	0	6	0	0
<i>Phylloscopus collybita</i>	Chiffchaff	6	6	6	0	0	0	0	0	0	0	0
<i>Phylloscopus trochilus</i>	Willow warbler	3	3	3	0	0	0	0	0	0	0	0
<i>Pica pica</i>	Magpie	4	9	0	0	0	0	0	0	8	1	0
<i>Prunella modularis</i>	Dunnock	8	8	8	0	0	0	0	0	0	0	0
<i>Pyrrhula pyrrhula</i>	Bullfinch	2	2	0	2	0	0	0	0	0	0	0
<i>Regulus regulus</i>	Goldcrest	5	5	5	0	0	0	0	0	0	0	0
<i>Sitta europaea</i>	Nuthatch	1	1	0	1	0	0	0	0	0	0	0
<i>Streptopelia decaocto</i>	Collared dove	1	1	1	0	0	0	0	0	0	0	0
<i>Sturnus vulgaris</i>	Starling	1	1	0	1	0	0	0	0	0	0	0
<i>Sylvia atricapilla</i>	Blackcap	8	8	8	0	0	0	0	0	0	0	0
<i>Sylvia communis</i>	Whitethroat	1	1	1	0	0	0	0	0	0	0	0
<i>Troglodytes troglodytes</i>	Wren	19	19	19	0	0	0	0	0	0	0	0
<i>Turdus merula</i>	Blackbird	26	29	21	0	0	0	2	1	4	0	1
<i>Turdus viscivorus</i>	Mistle thrush	1	2	0	0	0	0	0	0	2	0	0

Figure 1: Google Earth Image to Illustrate the Site Boundary



Figure 2: Phase 1 Habitat and Vegetation Map



Figure 3: Building Plan

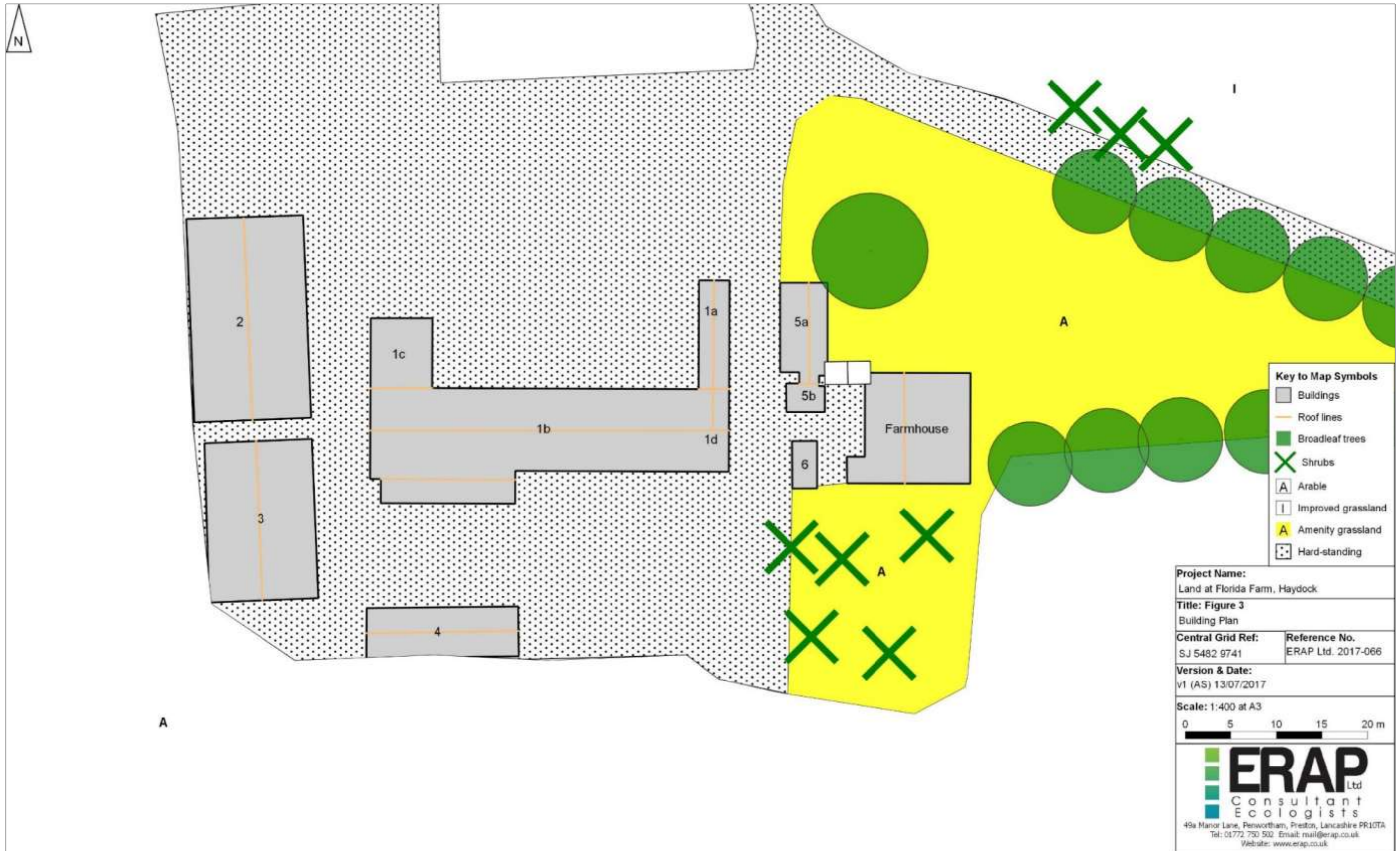


Figure 4: Bat Emergence Survey 18/07/2017

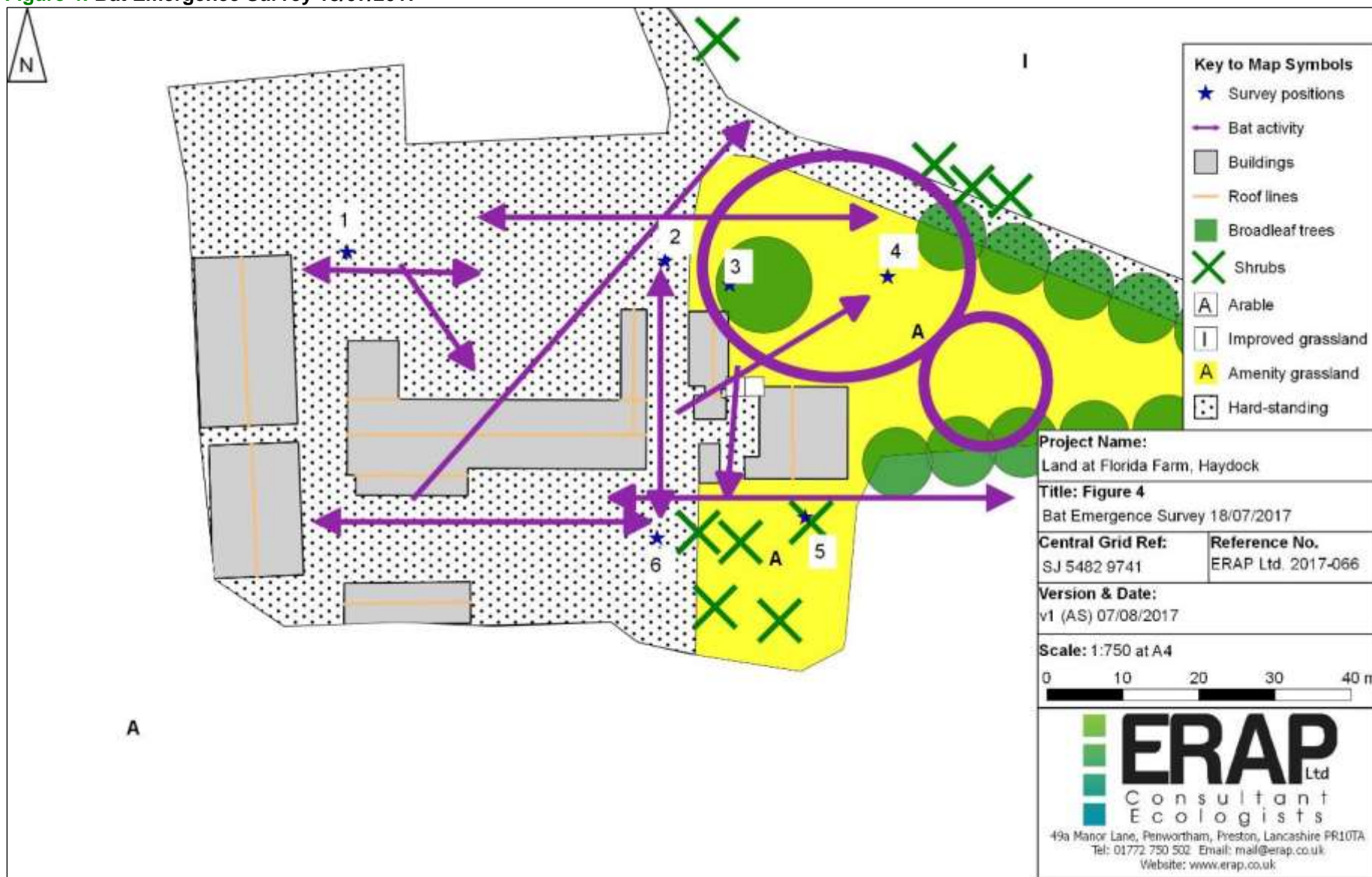


Figure 5: Bat Emergence Survey 07/08/2017

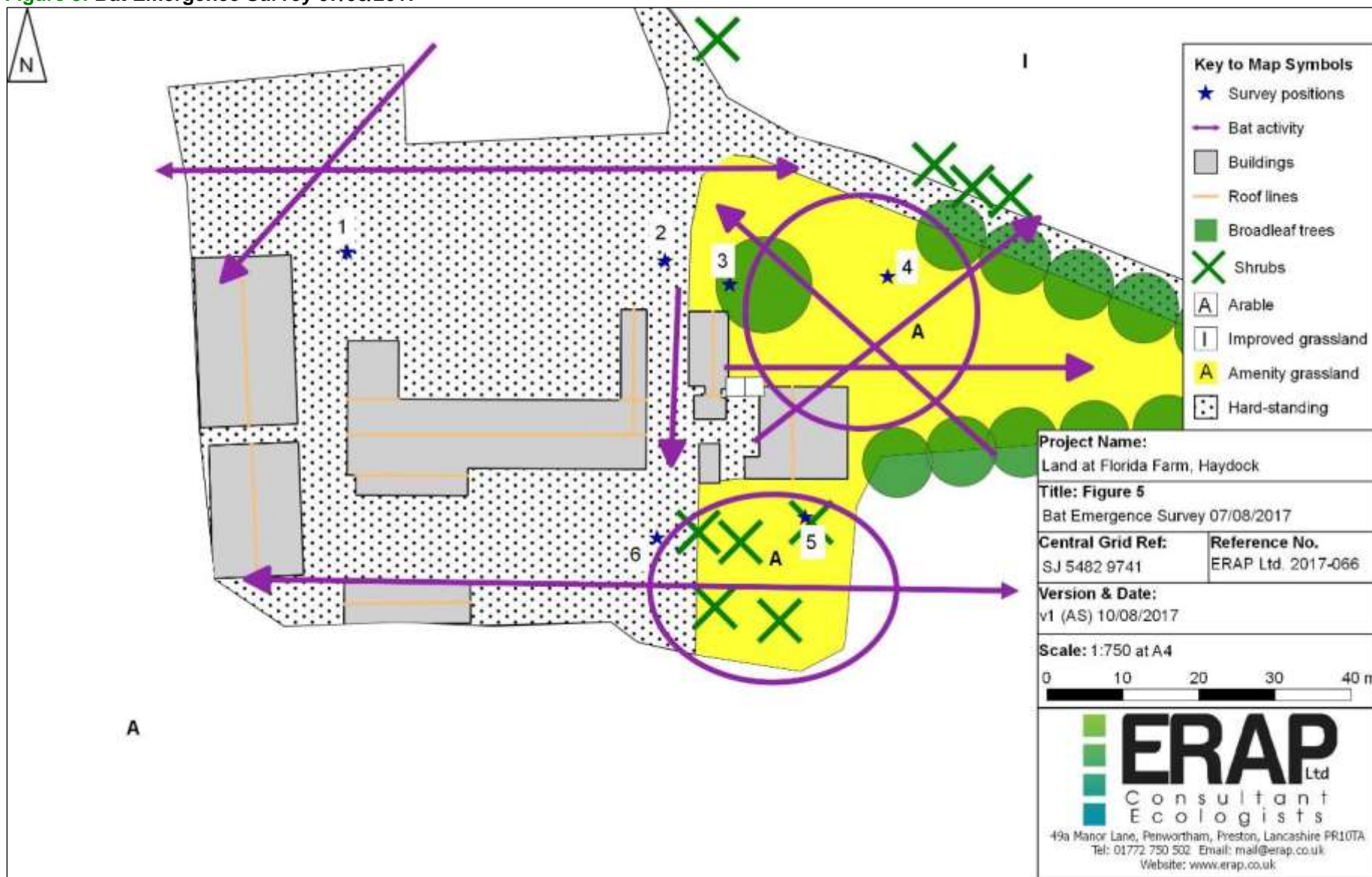


Figure 6: Plan to Illustrate Transect Routes and Anabat Locations

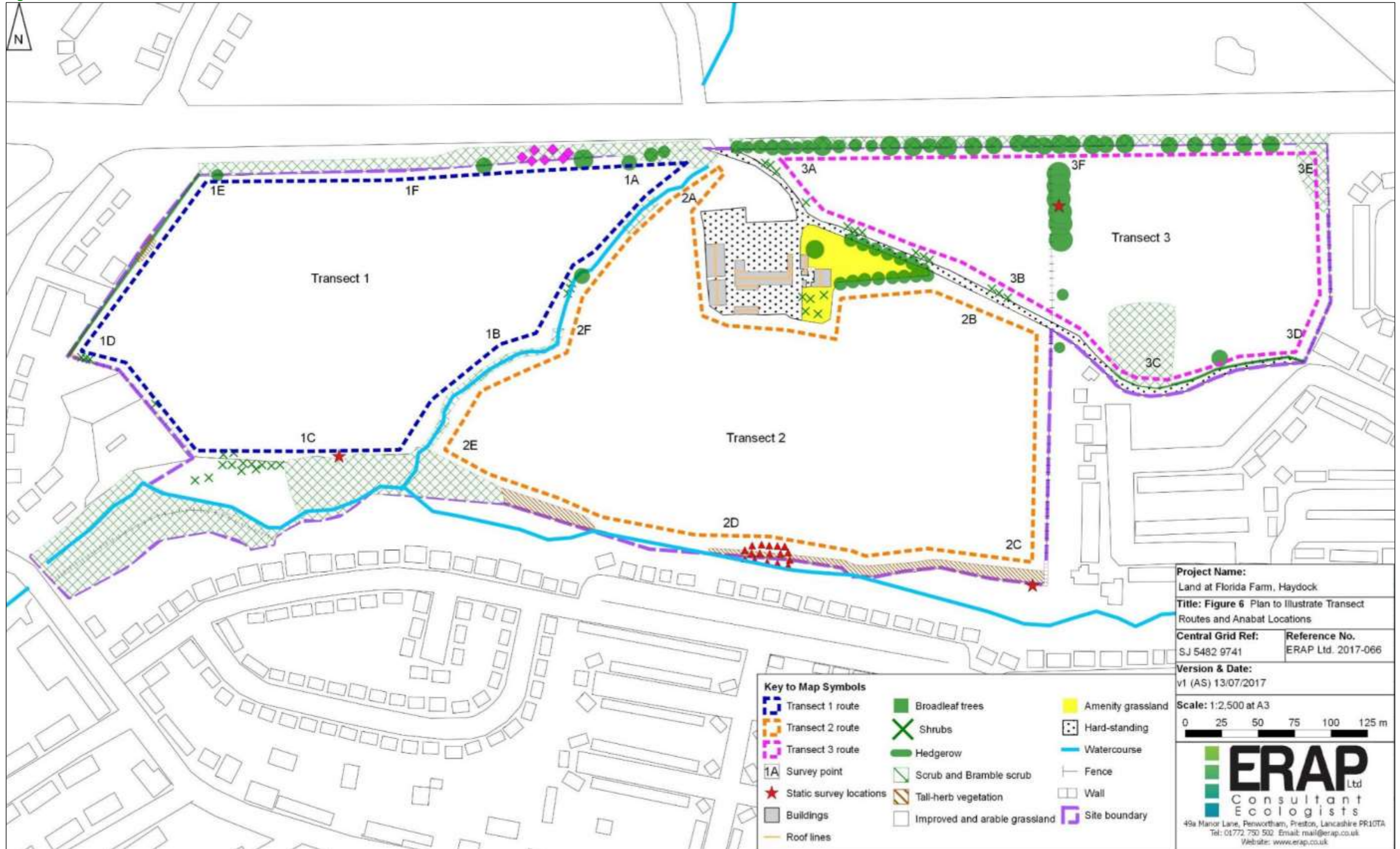


Figure 7: Results of Transect Survey 1st Repetition 24th May 2017

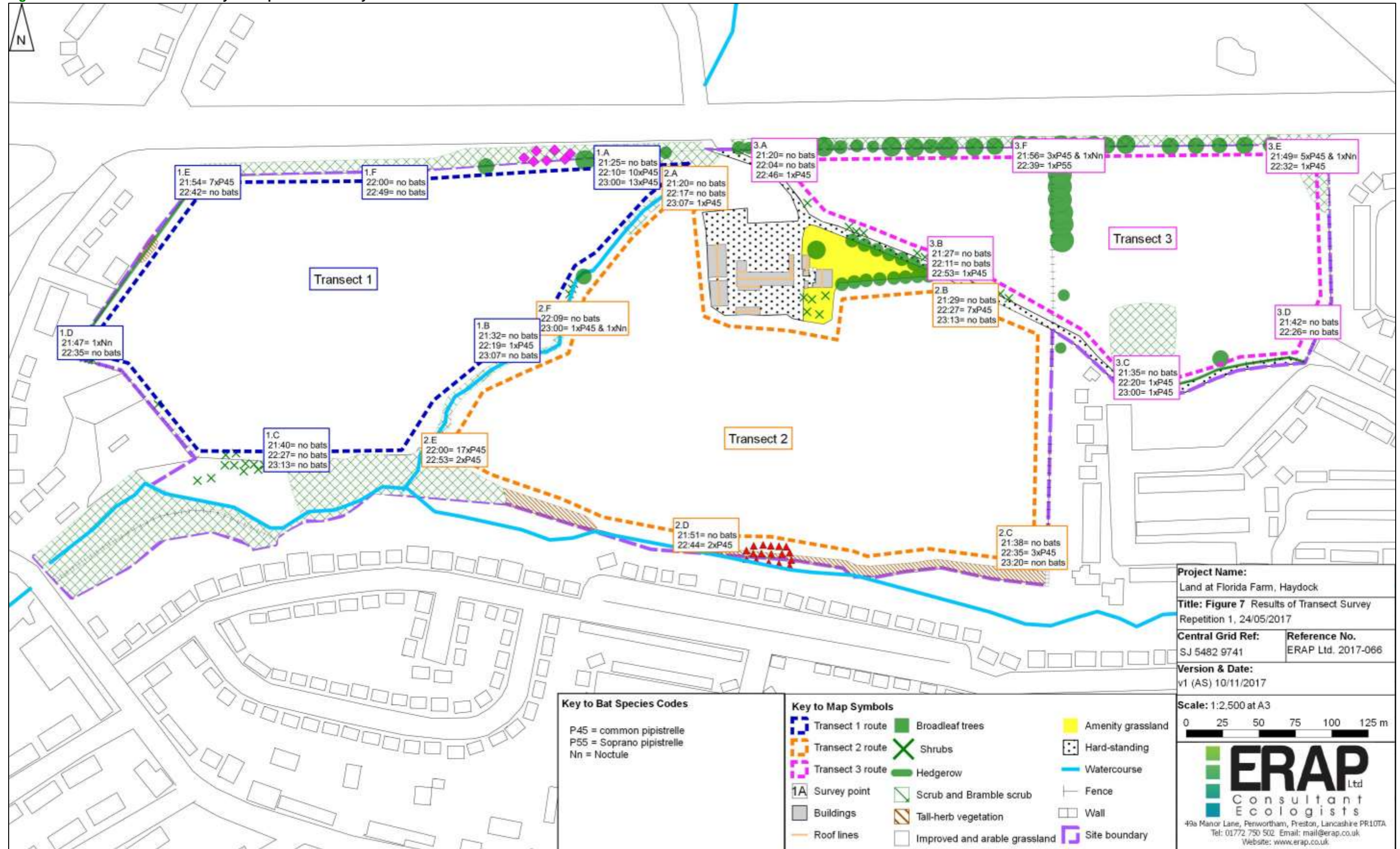


Figure 8: Results of Transect Survey 2nd Repetition 2nd August 2017

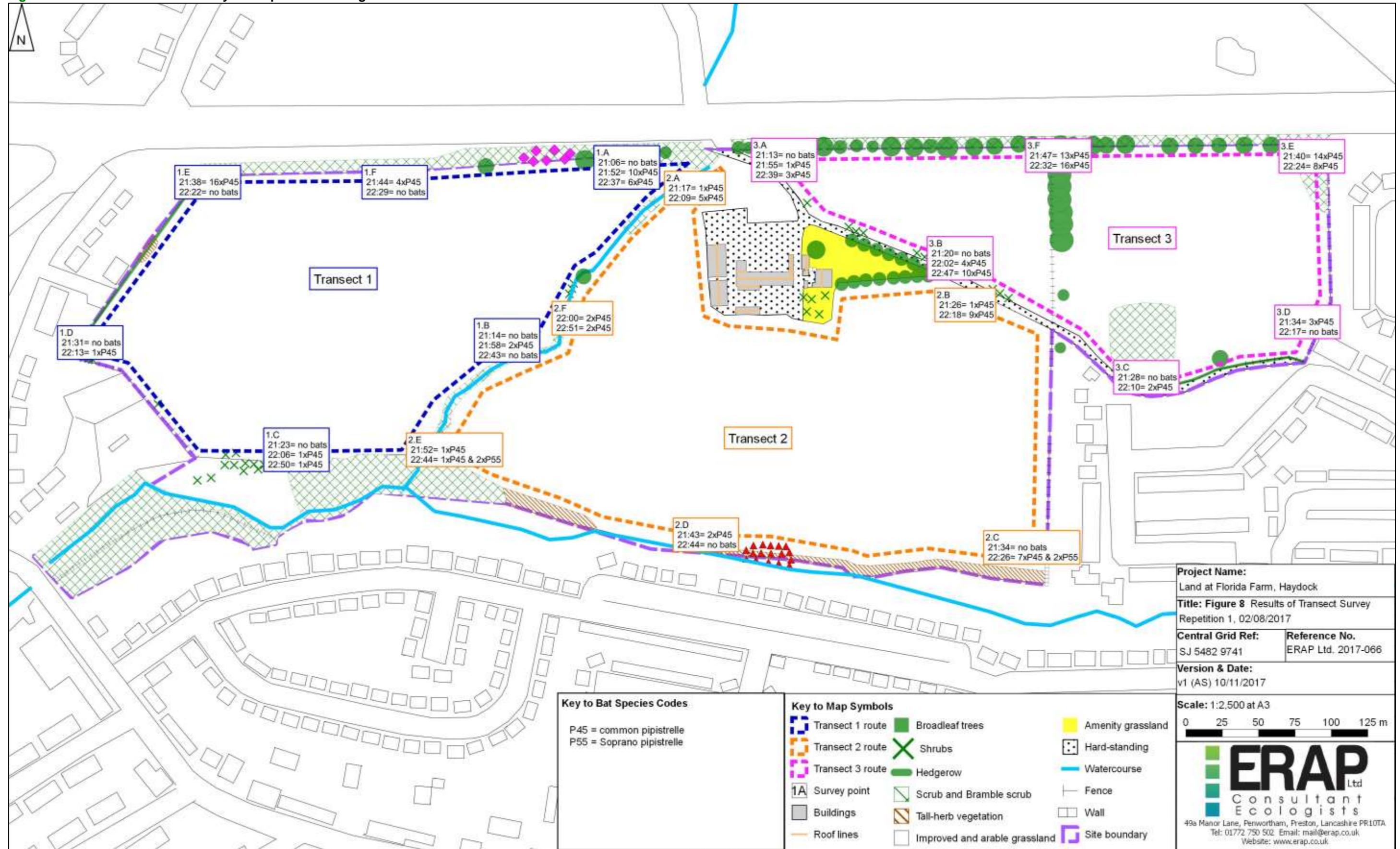


Figure 9: Results of Transect Survey 3rd Repetition 19th September 2017

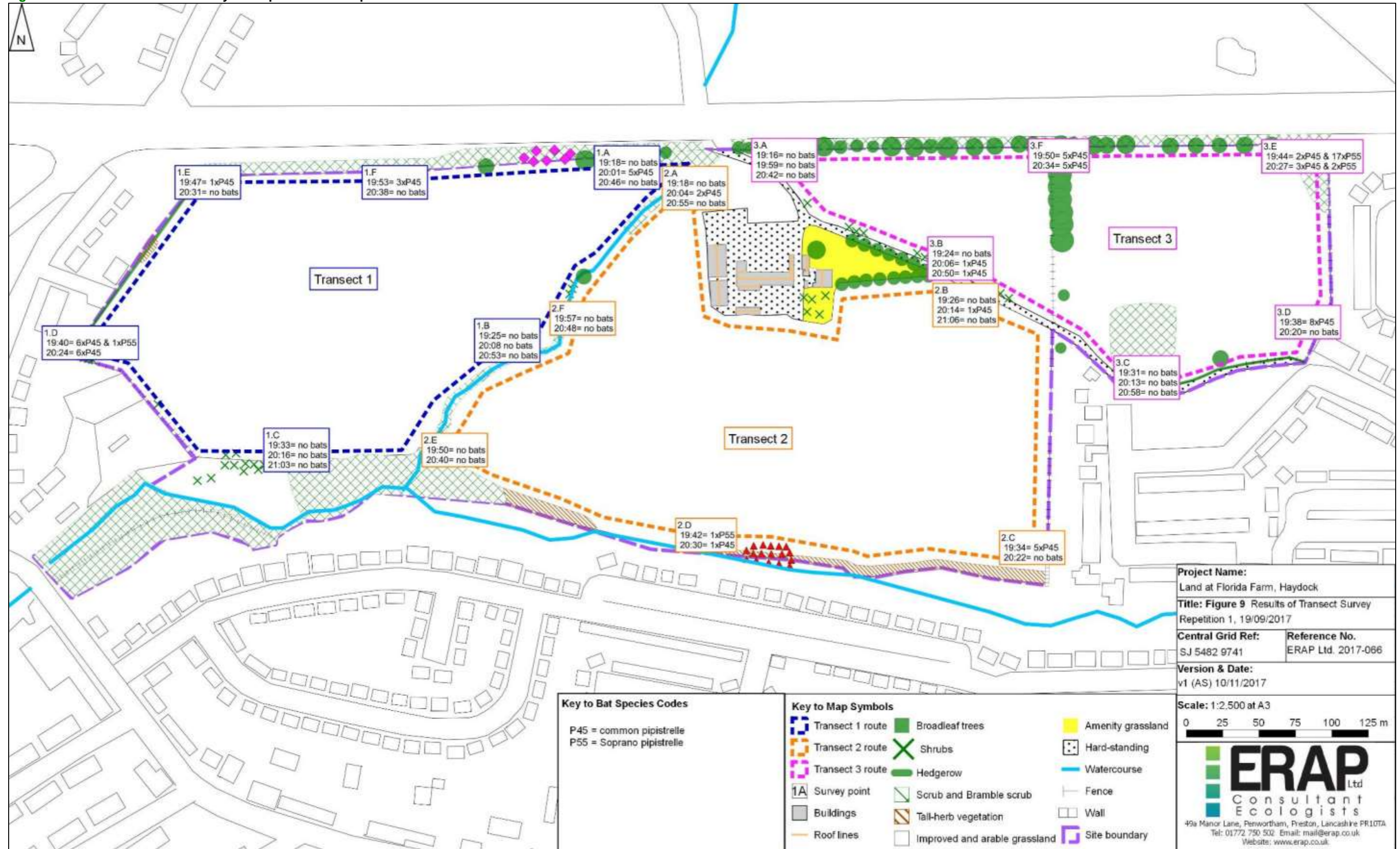


Figure 10: Breeding Bird Survey 1, 15th April 2017

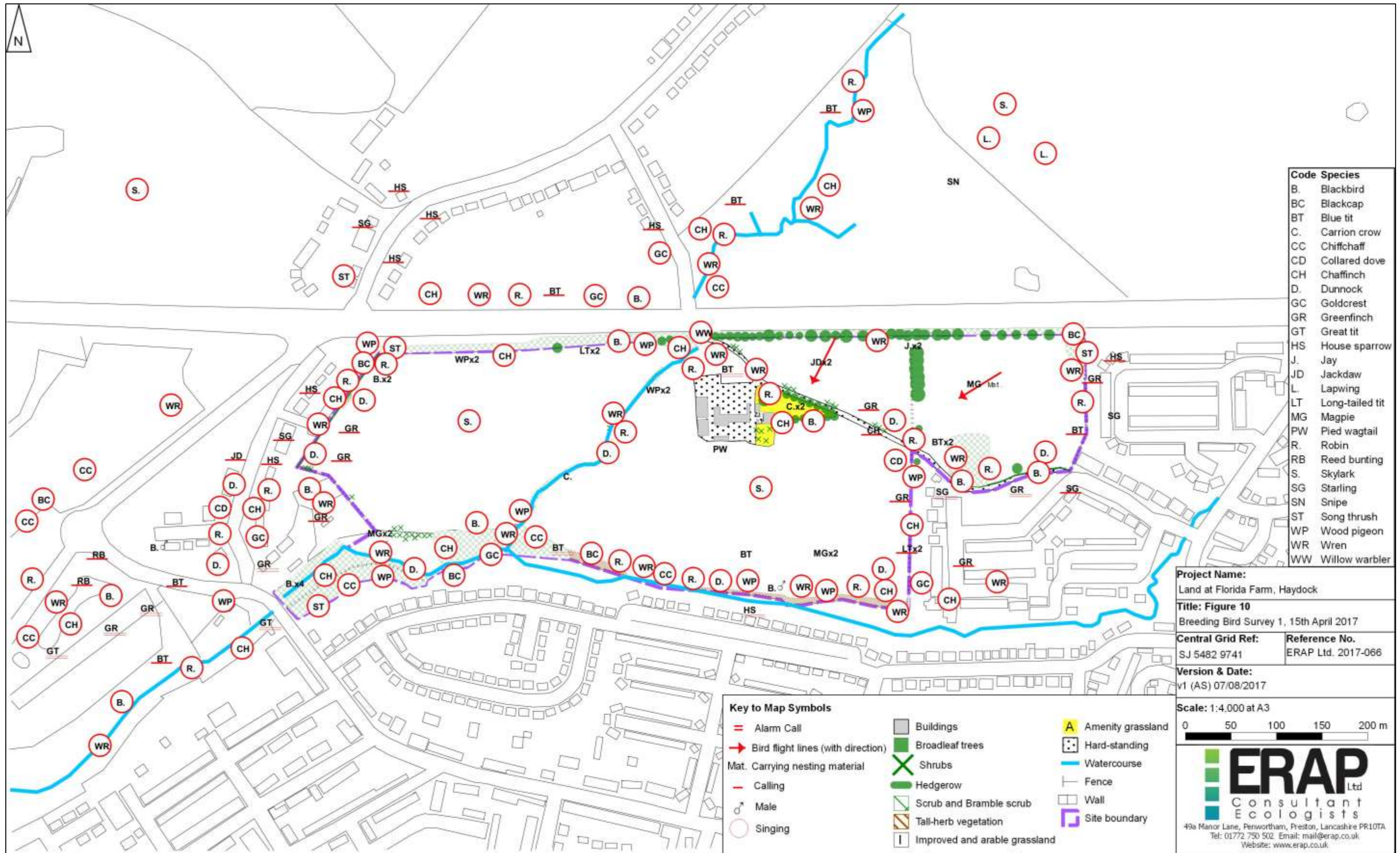


Figure 11: Breeding Bird Survey 2, 14th June 2017

