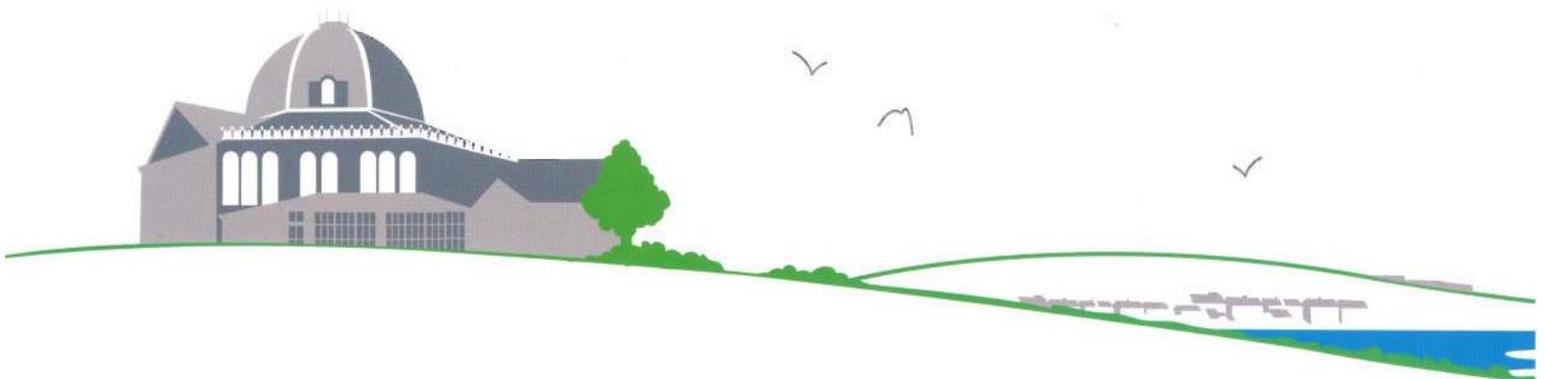




CHATSWORTH SETTLEMENT TRUSTEES
LAND OFF WORKSOP ROAD, MASTIN MOOR
BAT SURVEY REPORT



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BAT SURVEY REPORT

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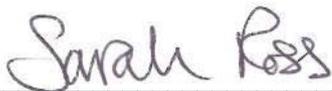
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October 2020

This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

Signed: _____



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1. INTRODUCTION

Background

Purpose

- 1.1 The purpose of this Report is to explain and support an outline planning application for residential development of land at Mastin Moor (Chesterfield) as submitted to Chesterfield Borough Council (CBC) as the local planning authority (LPA) concerned. It outlines the context within which the application is made and provides a detailed assessment of the main ecological considerations, together with a reasoned justification in support of the development.

Structure of Report

- 1.2 This Report addresses the following:
- Context;
 - The Site and surrounding area;
 - Development proposal;
 - Planning policy considerations;
 - Key benefits;
 - Assessment of ecology (specifically bats); and
 - Summary and conclusion.
- 1.3 The Report concludes that there are two confirmed bat roosts associated with trees (T2 and T7) but that both these trees will be retained within the parkland corridor, and overall the wider site supports relatively low levels of bat activity, with the stream being a key bat foraging habitat. Consequently there are no ecological reasons why residential development should not be supported on the site.

Other Reports

- 1.4 The proposal has been informed by a range of technical evidence. As such, the planning application comprises a suite of information which includes:
- Supporting Planning Statement;
 - Design and Access Statement;
 - Landscape and Visual Impact Assessment;
 - Transport Assessment;
 - Flood Risk Assessment;
 - Ecology Surveys (Extended Phase 1 Habitat, Bat, Bird and Badger Surveys);
 - Archaeological Assessment;
 - Geo-Environmental Assessment;
 - Noise and Vibration Assessment;
 - Air Quality Assessment; and

- Topographical Survey.

Author

- 1.5 This Report has been prepared by Penny Anderson Associates Ltd (PAA). PAA is a specialist ecological consultancy with extensive experience in ecology survey, evaluation and assessment. Our contact details are as follows:

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2. CONTEXT

Applicant

- 2.1 The land subject of this application is owned and managed by Devonshire Property (MM) Limited (DPMML). DPMML is part of the Devonshire Group.
- 2.2 The Devonshire Group, known technically as the Chatsworth Settlement Trustees (CST), owns the land and estates of the Dukedom of Devonshire. Its main estates are in the vicinity of Chatsworth in Derbyshire, and Bolton Abbey in North Yorkshire. It also runs visitor and other businesses on these estates including hotels, retail and catering outlets, forestry, livestock and arable farming. It employs over 600 full time employees. It is committed to quality in all its activities and takes a responsible approach to development; as such, it measures performance in social and environmental as well as financial terms.
- 2.3 Together with the Chatsworth House Trust (registered charity no.1511149), CST's Derbyshire Estate provides over 450 full time equivalent jobs and contributes c.£50m of enabled Gross Value Added to the local economy each year (Source: New Economics Foundation 2014). Its income funds socio-economic facilities (e.g. village shop/post office) and environmental management activities (e.g. architectural conservation) without grant support. CST thereby provides benefits far beyond 'just the estate'.
- 2.4 CST has a range of interests in the Borough of Chesterfield including: agricultural land supporting modern farming; commercial properties supporting local employment; farmsteads supporting smaller-scale rural enterprises; and the majority of the former Staveley Works site (including both the Clocktower Business Centre (leased to CBC and providing flexible term offices and workspaces) and the Devonshire Building (home to a gym and other enterprises)).
- 2.5 Whilst maintaining a long-term perspective, CST manages a diverse range of landholdings to achieve corporate and wider social and environmental objectives. It has thereby identified that the best long-term use for the land subject to this application would be for residential development. This will help deliver its own objective to deliver 1,000 new homes over the next ten years, and also meet the needs and aspirations of the local community and wider Borough, subject to securing a planning permission that is both attractive to the development market and commercially viable.

The Site

- 2.6 This section provides a summary of key features of the site. The site is more fully described within the Design and Access Statement submitted as part of the application.
- 2.7 The site is located at Mastin Moor, to the south of Worksop Road (A619) to both the east and west of Bolsover Road, with part of the site extending southwards to Woodthorpe Road. It encompasses some 46.2ha of mainly agricultural land. The overall site forms a shallow valley sloping from the ridge lines along Worksop Road and Woodthorpe Road towards a watercourse that runs in a westerly direction through the site. The highest part of the site is around 119m above ordnance datum (AOD) in the north-east with the lowest part in the south-west at around 56m AOD.
- 2.8 The site is primarily comprised of undulating arable fields with limited features. The main features of note include:
- An unnamed watercourse which flows in a westerly direction through the site;
 - Bolsover Road which runs through the site on a north-south axis;

- Pumphouse Farm (dwelling and curtilage) which is surrounded by the development proposal but does not form part of it;
- Field boundaries which are a mixture of hedgerows, stone walls and woodland; and
- Isolated trees.

2.9 The main part of the settlement of Mastin Moor is located to the north of the site, on the northern side of Worksop Road. The settlement of Woodthorpe is located generally to the west of the site. The site abuts a limited number of residential properties, as well as the Mastin Moor Community Garden.

Photo 1 View Over Site from South-Eastern Corner (adjacent Woodthorpe Road) looking towards Woodthorpe



Photo 2 View Over Site from Bolsover Road (Close to Community Garden) looking towards Woodthorpe



Photo 3 View Over Site from Bolsover Road looking North-west towards Worksop Road)



Photo 4 View Over Wite from Near North-eastern Boundary Adjacent to Worksop Road looking towards Bolsover Road and Woodthorpe



Design Process

- 2.10 CST first considered residential development options for its land at Mastin Moor in 2011 when it was identified in the Strategic Housing Land Availability Assessment by Chesterfield Borough Council. This formed part of the evidence base for what was at the time the emerging Local Plan: Core Strategy. CST appointed planning and masterplan specialists to explore these options. Outputs from that process formed part of CST's response to consultation on the Local Plan: Core Strategy.
- 2.11 Following adoption of the Local Plan: Core Strategy in 2013 which confirmed Mastin Moor as a focus for regeneration and growth, CST appointed an expanded team of specialists. Resulting technical surveys and reports contributed to a detailed appreciation of the development opportunity and potential constraints. These informed a masterplan-led approach that fully explored design options. The process had regard to the wider setting of the site and existing development in the locality.
- 2.12 Draft proposals were subject to extensive consultation with Chesterfield Borough Council, Derbyshire County Council and Staveley Town Council. Meetings were held with groups representing local residents and interest groups including Friends of Mastin Moor, the

Woodthorpe Village Community Group and Mastin Moor Gardens and Allotments (formerly Mastin Moor Allotments Association). The resulting proposals were presented at two community consultation events in July 2016, held at the Eventide Rest Room (Mastin Moor) and the Albert Inn (Woodthorpe), and were available to view at the same time on a website.

- 2.13 An outline planning application for 650 dwellings and other developments was subsequently submitted to Chesterfield Borough Council (ref. CHE/17/00469/OUT) in June 2017. Contrary to the unequivocal recommendation of the Officer's report, and despite no objections being received from any statutory consultees, the application was refused by the Council's Planning Committee in October 2019. At the time of writing, an appeal against that refusal remains extant.
- 2.14 Feedback received during the course of the determination of the above application has informed the current proposals. The design process that has led to the proposals for which planning permission is now sought is more fully described within the Design and Access Statement.

Development Proposal

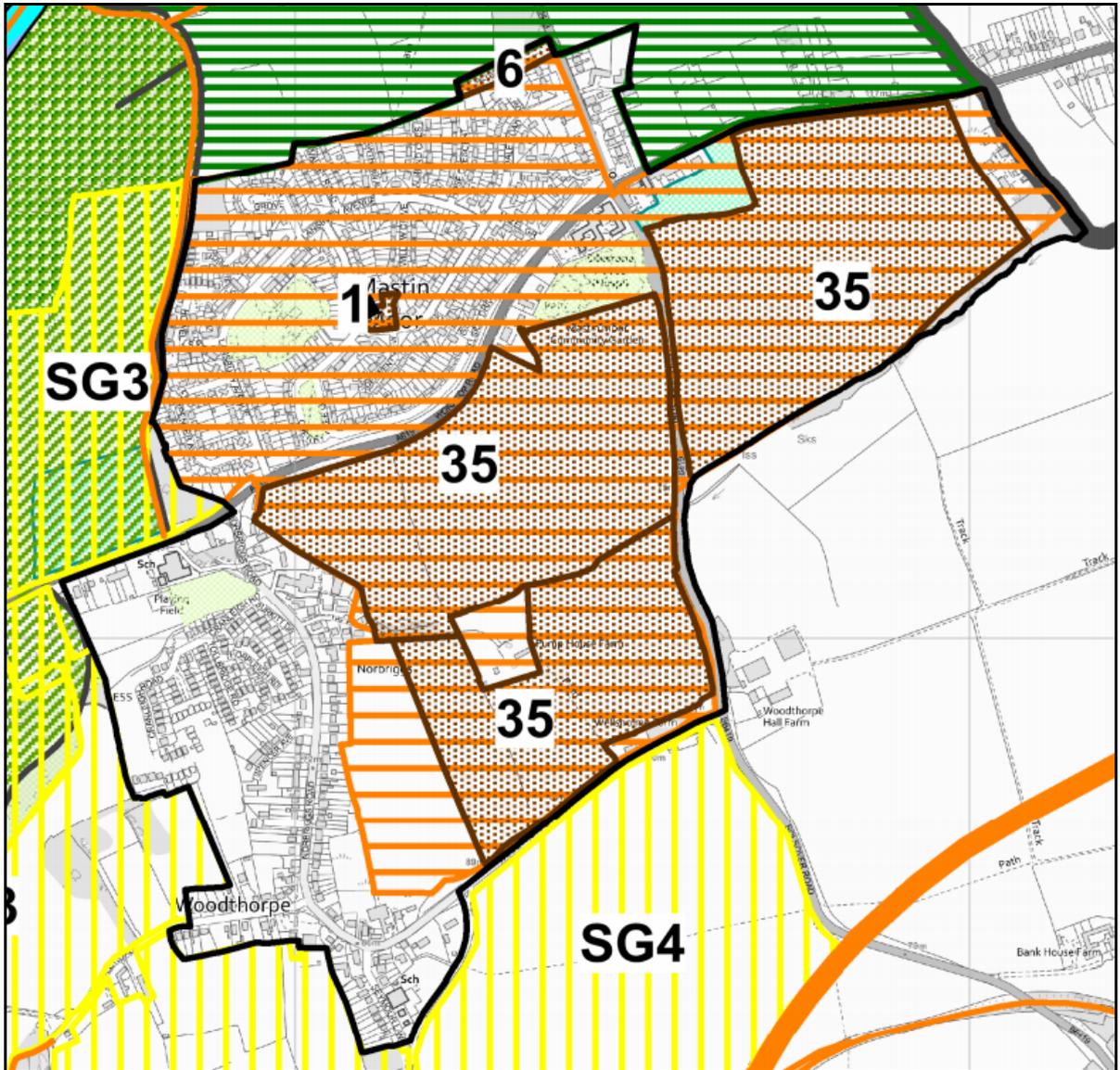
- 2.15 The proposed development seeks outline planning permission for residential development of up to 650 dwellings, a residential care facility with extra care, a Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services and offices), open space, community garden extension, community building, parking and associated infrastructure and earthworks with all matters reserved except access. Details of scale, layout and landscaping are reserved for future consideration.
- 2.16 For illustrative purposes, an indicative layout has been prepared to show how the site could be developed. Further explanation of the design principles that have been incorporated into the proposals, and how the design has been informed and influenced by the comprehensive suite of technical information and analysis, is set out in the Design and Access Statement.
- 2.17 Key aspects of the proposal include:
- Up to 650 dwellings located on land to the south of Worksop Road (east and west of Bolsover Road) extending to Woodthorpe Road;
 - A residential care facility with extra care;
 - A Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices) located adjacent to Worksop Road;
 - A new signal-controlled junction on Worksop Road providing access to the new Local Centre and residential areas, incorporating pedestrian and cyclist crossing facilities;
 - New priority-controlled junctions on Bolsover Road and Woodthorpe Road;
 - An extension to the Community Garden (approximately doubling its existing size), including provision for a new community building and associated car park;
 - Significant new areas of parkland, play areas and other open space;
 - Retention of existing hedgerows and trees wherever possible;
 - Additional landscape planting and ecological enhancements;
 - New walking and cycling connections;
 - New drainage infrastructure including surface water storage ponds; and
 - Financial contributions to allow the expansion of existing local services including Norbriggs Primary School.

- 2.18 The proposal therefore comprises a high quality development scheme designed to:
- address multiple deprivation issues at Mastin Moor;
 - help regenerate the area in line with key related Local Plan policy;
 - respect but integrate with the distinct communities of Woodthorpe and Mastin Moor; and
 - acknowledge and address the specific physical challenges and constraints of the site (e.g. topography, drainage).

Planning Policy

- 2.19 Section 38 (6) of the Planning and Compulsory Purchase Act 2004 requires that the determination of planning applications is undertaken in accordance with the development plan, unless material considerations indicate otherwise. The relevant document for this application is the Chesterfield Local Plan (2020) (the Local Plan).
- 2.20 The Local Plan allocates the site for development by way of Policy CLP3 Flexibility in Delivery of Housing. Table 4 within the Local Plan references the site as H35 (Land South of Worksop Road, and East and West of Bolsover Road, Mastin Moor), having a capacity of 650 dwellings, the extent of which is shown on the Local Plan Policies Map. Policy RP1 Regeneration Priority Areas sets out further specific requirements for any development within site H35.
- 2.21 Other relevant policies of the Local Plan include: CLP1 Spatial Strategy; CLP2 Principles for Location of Development; CLP4 Range of Housing; CLP6 Economic Growth; CLP8 Vitality and Viability of Centres; CLP9 Retail; CLP10 Social Infrastructure; CLP11 Infrastructure Delivery; CLP13 Managing the Water Cycle; CLP14 A Healthy Environment; CLP15 Green Infrastructure; CLP16 Biodiversity; Geodiversity and the Ecological Network; CLP17 Open Space; Play Provision; Sports Facilities and Allotments; CLP20 Design; CLP21 Historic Environment; and CLP22 Influencing the Demand for Travel.
- 2.22 An extract from the Local Plan Policies Map showing the extent of the allocation and the wider Mastin Moor Regeneration Priority Area is shown below.

Figure 1 Local Plan Policies Map (extract)



2.23 The National Planning Policy Framework (NPPF) ‘sets out the Government’s planning policies for England and how these are expected to be applied’. Paragraph 10 of the NPPF sets out that ‘at the heart of the [NPPF] is a presumption in favour of sustainable development’. Paragraph 11 states that ‘For decision-taking this means:

c) approving development proposals that accord with an up-to-date development plan without delay; or

d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:

i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or

ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.'

Planning Assessment

- 2.24 The proposal performs well against relevant Local Plan policies. In particular, it will deliver development in accordance with Policies CLP1 Spatial Strategy, CLP2 Principles for Location of Development, Policies CLP3 Flexibility in Delivery of Housing and Policy RP1 Regeneration Priority Areas.
- 2.25 It is also considered that there are no material considerations that indicate anything other than the fact that the LPA should determine the application in line with the extant plan as outlined above.
- 2.26 In addition, key benefits of the proposal would include:
- Provision of new, high quality housing;
 - New development in an area with acknowledged regeneration needs;
 - Greater variety of housing type and tenure (including Affordable Housing) to meet the diverse needs of the local community (including housing to buy and rent);
 - Extension of the Community Garden (approximately doubling its existing size) including provision for a new community building and parking area;
 - Improved local services and facilities (including provision for retail, health and other local and community services within a new Local Centre);
 - Significant new areas of parkland, play areas and other open greenspace available to existing and new residents;
 - New housing in a location where future residents will have a realistic choice of walking, cycling or using public transport, in preference to using private motor vehicles;
 - Additional capacity at local schools;
 - Opportunities for skills and learning through training programmes during construction and operational phases of the development;
 - New employment opportunities during construction and operational phases of the development;
 - Additional landscape planting and ecological enhancements;
 - New traffic signal-controlled junction on Worksop Road to include pedestrian and cyclist crossing facilities; and
 - On-site water storage to help reduce existing off-site flood risk.
- 2.27 The proposal will, therefore, provide opportunities and benefits for all sections of the local community, including existing and future residents. Benefits will accrue in the short- and longer-term. It will help to overcome issues that can lead to deprivation and will contribute to regeneration in line with Local Plan objectives.

3. BATS, THEIR ECOLOGY AND LEGISLATION

Introduction

- 3.1 Penny Anderson Associates Ltd was commissioned by Chatsworth Settlement Trustees to conduct a suite of bat activity surveys at Land off Worksop Road, Mastin Moor. The surveys were recommended following an Extended Phase 1 Habitat survey of the site in 2014 (PAA, June 2017).
- 3.2 The 2014 Extended Phase 1 Habitat survey highlighted two trees (T1 and T2) as having potential for roosting bats. It also recommended a further inspection of other mature trees across the site for potential to support bats. The linear features, such as hedgerows, watercourse and associated trees, were identified as providing opportunities for foraging/commuting bats. An update survey in 2020 re-assessed all trees.
- 3.3 This report presents the findings of the 2020 tree assessments, dusk/dawn surveys of trees found to have bat roost potential and bat activity surveys used to assess habitat use across the site, completed by PAA between July and August 2020. The results are placed in the context of the previous 2015 bat surveys, with the 2020 datasets updating the earlier results.

Bat Biology

- 3.4 There are 17 species of native bats known to be resident (i.e. breed) in the British Isles. British bats feed entirely on insects and have developed a complex sonar system, known as echolocation, which enables them to find prey and navigate around their environment at night.
- 3.5 Habitat requirements vary widely, both on an individual and species level, although certain features, such as woodland, parkland, traditional pasture, marshes and areas of freshwater, are often focal points for foraging, as insects are plentiful in these areas (Mitchell-Jones 2004). Bats use linear features, such as rivers, hedgerows, roads and woodland edges, as landmarks in order to commute from one location to another (Schofield and Mitchell-Jones 2003).
- 3.6 Bats utilise different roosts at different times of the year. Between late October and March, bats hibernate; this requires an unexposed roost with a stable temperature, typically a cave, cellar or tunnel. Around March, the bats emerge and gradually move to their summer roosts, typically within man-made structures or suitable crevices in trees. During the spring and summer period female bats gather together at maternity roosts to give birth and rear their young. Most births occur between late June and mid-July, with the young able to fly within three to five weeks (Altringham 2003; Waters and Warren 2003). By the end of August, most of the young bats are independent and the colony begins to break up (Schofield and Mitchell-Jones 2003). Mating takes place between August and December, either at the winter hibernation site or at autumn breeding sites. The numbers of bats utilising these roosts can vary from single bats to hundreds of bats in a nursery colony or hibernation site (Altringham 2003).

Summary Legislation

- 3.7 All wild species of bat are protected under the Wildlife and Countryside Act (WCA) 1981, which has been amended by later legislation, including the Countryside and Rights of Way (CRoW) Act 2000 and this legislation is applicable to England and Wales.
- 3.8 Bat species are also listed under Annexes IIa and IVa of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

- 3.9 Under these Regulations it is an offence to damage or destroy a breeding site or resting place whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead bat or part of such an animal.
- 3.10 In addition, seven native British bat species, including the soprano pipistrelle (*Pipistrellus pygmaeus*) and the brown long-eared bat (*Plecotus auritus*), that are frequently found in trees, are listed as a 'Priority Species' under the 2011 biodiversity strategy for England. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England within Section 74 of the CRoW Act 2000, and Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006.
- 3.11 A range of international and national legislation has been established in the UK to protect important nature conservation sites and priority species. At the international level, European Union (EU) Directives require individual member states to implement their conservation provisions nationally for the benefit of Europe as a whole. These Directives have been transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (amended); further details can be obtained from the Joint Nature Conservation Committee (JNCC) web site at www.jncc.defra.gov.uk.
- 3.12 Other international conventions include: the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979), which requires the maintenance of populations of wild flora and fauna, giving particular protection to endangered and vulnerable species; and the Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979), which requires the protection of migratory species throughout their entire range. The above conventions are implemented in England and Wales via the Wildlife and Countryside Act (WCA) (1981) (as amended) and Countryside and Rights of Way (CRoW) Act 2000. This legislation also protects important habitats and sites such as Sites of Special Scientific Interest (SSSI).
- 3.13 At the national level, the UK Post-2010 Biodiversity Framework published in 2012 is the Government's response to the Convention on Biological Diversity (2010). It describes the UK's biological resources, commits a detailed plan for the protection of these resources within the UK's devolved framework across England, Wales, Scotland and Northern Ireland. The document identifies future priorities for nature conservation and adopts a more strategic approach, including ecosystem services and sustainability alongside biodiversity. Despite administrative changes following devolution, there is still an underlying objective of protecting and enhancing a range of priority species and habitats, often still based on the objectives and classifications of the original UK Biodiversity Action Plan. Biodiversity 2020 is England's national biodiversity strategy. Building on the Natural Environment White Paper published in 2011, this provides a means of delivering the international and EU commitments to biodiversity. Under Biodiversity 2020, Priority Species and Habitats referred to are those of 'Principal Importance' for the conservation of biodiversity in England listed on Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006.
- 3.14 Finally, the National Planning Policy Framework (NPPF 2019) provides guidance for local authorities on the content of the Local Plans and is a material consideration in determining planning applications. Briefly, with an overall focus on sustainable development, the NPPF states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. The NPPF states that the planning system should contribute to and enhance the natural environment through a range of actions, including:
- protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils;

- recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services; and
- minimising impacts on biodiversity and providing net gains for biodiversity including establishing coherent ecological networks that are more resilient to current and future pressures.

3.15 To protect and enhance biodiversity and geodiversity, plans should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

3.16 A summary of the legislation in relation to bats and their roosts is presented in Appendix 1.

4. METHODS

Tree Inspections for Bat Roost Potential

- 4.1 An initial assessment of trees to support roosting bats was carried out by Chloe Pritchard during the Extended Phase 1 habitat survey on 20th May 2014. A further assessment was completed by Sarah Ross (Level 2 Class Licence) on 9th July 2015. The latter survey was carried out from the ground during daylight hours using high quality close-focusing binoculars (Avian 8x42) and focused on mature trees within the site which had not already been assessed during the Extended Phase 1 habitat survey. The survey aimed to identify trees with suitable features that could support roosting bats, such as lifted bark, holes, cracks/crevices, dense ivy, along with any signs of bat use, such as droppings and staining from fur oils or urine around entrances to crevices and holes.
- 4.2 Trees were then subject to an update ground level inspection for Potential Roost Features (PRFs) on 8th July 2020 following published methodologies (Collins 2016, British Standards Institute 2015). This survey was completed by Rob Lamb (Level 1 Class Licence) under good weather conditions.

Evaluation

- 4.3 Trees were categorised in terms of their potential to support roosting bats (Table 1) depending on the number and combination of features based on criteria as published within Collins (2016) and BSI (2015), and with reference to the BTHK (2018).

Table 1 Visual Assessment Criteria for Trees

| Tree Category | Category Description | Indicator |
|-----------------|--|--|
| Confirmed Roost | Trees with current evidence of bats. | Sighting/hearing of bats (including emergence). Presence of fresh droppings/staining. Audible squeaking at dusk or in warm weather. |
| | Trees with recent use by bats. | Small numbers of old droppings/old staining, smoothing and lack of cobwebs. Roosts identified by personal communication from reliable source (e.g. property owner). |
| High | Trees with multiple, highly suitable features capable of supporting larger bat roost(s) on a more regular basis and over longer periods of time. | Natural holes. Woodpecker holes. Cracks/splits in major limbs. Loose bark. Hollows/cavities. Bird/bat boxes present. |
| Moderate | Trees with one or more suitable features for roosting bats but unlikely to support a roost of high conservation status. | Supporting fewer suitable features than High Category trees. |
| Low | Trees of sufficient size and age to contain roost | Limited features for roosting bats. May present with some features during |

| Tree Category | Category Description | Indicator |
|---------------|--|-------------------|
| | features but none seen from the ground or features with only limited roosting potential. | elevated surveys. |
| Negligible/No | Trees with little or no potential to support bats. | None observed. |

Limitations

- 4.4 Whilst the tree inspections were conducted during the late summer when the trees were in leaf, it was possible to carry out a robust inspection of potential roost features from the ground. As such there were no significant limitations to the tree inspection survey.

Dusk/Dawn Bat Activity Survey of Trees

- 4.5 Dusk and dawn bat activity surveys were carried out for trees T1, T2 and T3 between June and September 2015. The surveys were led by Sarah Ross (Level 2 Class Licence) and Jon Guarnaccio (Level 2 Class Licence) with assistance from experienced surveyors.
- 4.6 Update surveys were completed on a larger number of trees, as a result of more PRFs being identified during the update ground level tree inspections (as might be expected after five years). Trees surveyed in detail were T1, T2, T3, T6 and T7.
- 4.7 Each surveyor used a Batbox Duet or Petterson D230 to detect bats and determine species where possible. In addition, Anabat SD1 detectors were used to record calls for later species confirmation. A digital thermometer (hygro-thermometer 810-190 www.etilt.com) was used to get an accurate temperature and humidity reading.
- 4.8 The update surveys followed guidance within Collins (2016) and BSI (2015) and surveyors were positioned to gain the best advantage to observe notable features of the trees. The emergence activity surveys commenced approximately 15 minutes prior to sunset and continued for 1.5hrs after sunset. The dawn surveys commenced at approximately 1.5hrs before sunrise and terminated at 15 minutes after sunrise.
- 4.9 Surveyors watched for any emerging/re-entering bats, making a note of the time, species and numbers. Notes were also made of any other bat activity observed, such as commuting past or foraging around the area. For these records the species, the direction of flight, the bat's behaviour and the time of the pass were noted.
- 4.10 The survey dates, times and weather conditions for both the 2015 and 2020 bat activity surveys are presented in Tables 2 and 3 below.

Table 2 Weather Conditions for Dusk and Dawn Surveys in 2015

| Tree No. | Date | Survey Type | Sunrise/Sunset | Start Time | End Time | Weather |
|----------|------------|-------------|----------------|------------|----------|--|
| T1 | 22/07/2015 | Dawn | 05:06 | 03:12 | 05:10 | Dry and calm, humidity was 66% and temperature 14.5°C at the beginning and 72% and 13°C by the end. Cloud cover was 100% throughout. |
| | 30/07/2015 | Dawn | 05:17 | 03:45 | 05:17 | Dry and calm, temperature was 10.5°C at the beginning and 8.7°C by the end. Cloud cover was 40% increasing to 60%. |
| T2 | 29/06/2015 | Dusk | 21:42 | 21:12 | 23:15 | Dry and calm, humidity was 71% and temperature 17.3°C at the beginning and 87% and 12.8°C by the end. Cloud cover was 90% decreasing to 25%. |
| | 13/08/2015 | Dawn | 05:41 | 04:25 | 05:45 | Dry and calm, humidity was 47% and temperature 15.4°C at the beginning and 54% and 12.9°C by the end. Cloud cover was 30% increasing to 90% at survey end. |
| T3 | 21/07/2015 | Dusk | 21:18 | 20:57 | 22:48 | Dry and calm, humidity was 48% and temperature 17°C at the beginning and 57% and 15°C by the end. Cloud cover was 100% throughout. |
| | 29/07/2015 | Dusk | 21:07 | 20:52 | 22:33 | Dry with a moderate to light wind, temperature was 14.5°C at the beginning and 11.3°C by the end. Cloud cover was 65% decreasing to 50% by the end. |

Table 3 Weather Conditions for Dusk and Dawn Surveys in 2020

| Tree No. | Date | Survey Type | Sunrise/Sunset | Start Time | End Time | Weather |
|----------|------------|-------------|----------------|------------|----------|---|
| T1 | 14/07/2020 | Dusk | 21:26 | 21:00 | 22:40 | Dry and calm, humidity was 72% and temperature 13°C at the beginning and 79% and 11.8°C by the end. Cloud cover was 40-60%. |
| | 30/07/2020 | Dusk | 21:03 | 20:45 | 22:05 | Dry with a light breeze, temperature was 22°C and humidity 45%. Cloud cover was 20%. |

| Tree No. | Date | Survey Type | Sunrise/Sunset | Start Time | End Time | Weather |
|----------|------------|-------------|----------------|------------|----------|--|
| T2 | 13/07/2020 | Dusk | 21:42 | 21:12 | 23:15 | Dry and calm, humidity was 54% and temperature 18°C at the beginning and 79% and 15°C by the end. Cloud cover was 70% rising to 90%. |
| | 23/07/2020 | Dawn | 05:00 | 03:30 | 05:15 | Dry and calm, humidity was 40% and temperature 14.1°C decreasing to 13.4°C by the end. Cloud cover was 20-30%. |
| | 31/07/2020 | Dawn | 05:20 | 03:45 | 05:00 | Dry and calm, humidity was 54% and temperature 16.6°C decreasing to 9°C by the end. Cloud cover was 0%. |
| T3 | 14/07/2020 | Dawn | 04:56 | 03:30 | 05:05 | Dry and calm with 40-80% cloud cover. Temperature 15°C decreasing to 12.5°C by the end. |
| | 22/07/2020 | Dusk | 21:15 | 21:00 | 22:30 | Dry and calm with 40-70% cloud cover. Temperature 20°C and humidity 44%. |
| T6 | 14/07/2020 | Dusk | 21:26 | 21:00 | 22:40 | Dry and calm, humidity was 72% and temperature 13°C at the beginning and 79% and 11.8°C by the end. Cloud cover was 40-60%. |
| | 30/07/2020 | Dusk | 21:03 | 20:45 | 22:05 | Dry with a light breeze, temperature was 22°C and humidity 45%. Cloud cover was 20%. |
| T7 | 03/08/2020 | Dusk | 20:56 | 20:42 | 22:26 | Dry and calm, temperature was 16.6°C and humidity 5%. Cloud cover was 5-10%. |
| | 13/08/2020 | Dusk | 20:40 | 20:16 | 22:10 | Dry with a moderate breeze, temperature was 18°C and humidity 69%. Cloud cover was 100%. |
| | 20/08/2020 | Dusk | 20:21 | 20:01 | 21:51 | Dry and calm, temperature was 16-17°C and humidity 66-81%. Cloud cover was 15-20%. |

4.11 The types of bat roosts that might be detected on a site, against which the site results were compared, are summarised below (adapted from Collins 2016):

- Maternity day roost - breeding females and their young are present all summer with some species also accommodating adult males in these roosts.
- Satellite day roost - alternative roosts near to the main maternity roost also used by breeding females in varying numbers.

- Non-breeding day roost - occupied by small numbers of males and/or non-breeding female bats during the active season.
- Transitional day roost - occupied by small numbers of bats immediately prior to or following hibernation.
- Night roost - used as a night-time resting place between foraging bouts by varying numbers of individuals.
- Feeding roost - used as a night-time resting place during foraging bouts for species that feed on larger prey items which cannot be eaten in flight, the prey are taken to the feeding roost for handling and consumption.
- Mating roost - established by the males of some species to attract females for mating in late summer and autumn.
- Swarming sites - areas where large numbers of several species congregate in late summer and autumn, appear to be important for mating and also indicate some hibernation use of the area/locality is very likely.
- Hibernation roost - occupied by varying numbers of bats throughout the autumn and winter, used both day and night.

Limitations

- 4.12 No significant limitations were identified for the dusk/dawn bat activity surveys.

Transect and Static Detector Surveys for Bat Activity across the Site

- 4.13 A series of three walked transect surveys were completed in 2015 with the aim of assessing bat species and activity levels across the site. The route was designed to encompass the range of habitats present, but concentrating along the edge of woodland, watercourses and boundary hedgerows. The first transect survey was led by Chloe Pritchard with the second and third led by Gerard Hawley and Sacha Rogers under the guidance of Sarah Ross (Level 2 Class Licence) and accompanied by competent assistants. The surveyors used Batbox Duet bat detectors and an Anabat SD1 detector to record bat echolocation calls.
- 4.14 The transect surveys were completed on 9th July, 12th August and 8th September 2015 and involved walking the transect whilst mapping and recording three minute point counts of any bat activity at predetermined locations (see Figures 2 to 4). Additional observations between point counts were recorded and mapped as target notes. The start position and direction of surveyor travel was alternated between visits. In addition, due to access constraints (see Limitations section below), the route was varied slightly during each survey visit. The timing and weather conditions during the surveys are presented in Table 4.

Table 4 Dates and Weather Conditions for the Transect Surveys 2015

| Date | Survey Type | Sunset/ Sunrise | Start Time | End Time | Weather |
|------------|-------------|--------------------|------------|----------|---|
| 09/07/2015 | Dusk | 21:32 | 21:20 | 00:17 | Dry and calm, humidity at 49% and temperature at 15°C at the beginning of the survey and 92% and 8.8°C by the end, cloud cover throughout was 30%. |
| 12/08/2015 | Dusk | 20:40 | 20:19 | 23:30 | Dry with a light wind, humidity at 32% and temperature at 18.6°C at the beginning of the survey and 32% and 15°C by the end, cloud cover throughout was 0%. |
| 08/09/2015 | Dusk | 19:41 | 19:37 | 21:55 | Dry and calm, humidity at 48% and temperature at 16.7°C at the beginning of the survey and 56% and 10.2°C by the end, cloud cover throughout was 0-5% throughout. |

- 4.15 In addition, two static detectors were placed on the Site in 2020 to collect additional data on the bat activity on the wider site, to support and expand those datasets collected in 2015. Two SM2BAT+ units were placed either side of the main road within habitat suitable for use by commuting and/or foraging bats (Figure 5) and left to record all bat calls for a minimum period of 10 consecutive nights. The survey was completed on 22nd to 31st July 2020 (10 nights) and repeated on the 11th to 20th August (10 nights) under suitable weather conditions.

Evaluation

- 4.16 For transect surveys in 2015, the point count locations used during the transect surveys were mapped onto a suitably scaled basemap. Due to a different start point and slightly different route being used during each survey visit (see constraints noted below), the point counts and target notes are numbered and mapped consecutively, starting with Point Count 1 each time.
- 4.17 Following the static bat detector surveys in 2020, data were downloaded and analysed on a nightly basis for numbers of bat calls recorded.
- 4.18 For both datasets, species were confirmed, where possible, by echolocation calls recorded and analysed using AnalookW 3.9c software. These data were used to identify areas of habitat used by foraging and commuting bats, the range of species present and to estimate the relative abundance of different species/species groups using the site.

Limitations

- 4.19 During the 2015 surveys, access to the northern site boundary was limited during the first activity transect visit due to the crop (oilseed rape) height and cover, and the transect was curtailed at point count positions 2, 3 and 4 (see Figure 2) where the surveyor had to double back. The northern boundary runs alongside Worksop Road for much of its length and is relatively noisy and well lit. Very little bat activity was recorded along this boundary during subsequent visits and it is not considered that the lack of survey data from the first survey visit is a significant constraint in this instance.
- 4.20 No constraints were identified for the 2020 static bat detector surveys.

5. RESULTS

The Site

- 5.1 The site consists of large cereal fields, primarily oilseed rape with wheat grown in the southern-most field in 2015 and remained under agricultural use in 2020. The fields are bordered with mature, species poor hedgerows dominated by hawthorn. A small stream runs through the site from east to west. It is bordered by woodland in the eastern section of the site with a small broad-leaved woodland at the far eastern end. Bolsover Road dissects the site in a north-south direction, with Worksop Road on the northern boundary. Residential properties are located beyond Worksop Road and, to the west of the site boundary, mixed farmland is located to the east and south of the site.

Tree Inspections for Bat Roost Potential

- 5.2 The location of trees is shown in Figure 5 and detailed tree inspection results presented in Appendix 2.
- 5.3 In 2015, three trees (T1, T2 and T3) were categorised as having some suitable features for roosting bats or with potential for use by single bats. All other trees on site were categorised as holding limited or no obvious potential for roosting bats.
- 5.4 In 2020, trees T1, T2 and T3 remained as having Moderate or High potential for roosting bats, along with T7 which had developed some additional PRFs (see Appendix 2). Furthermore, T6 was classed as holding Low to Moderate potential and was therefore subject to further assessment. All other trees were assessed as having Low or No/Negligible potential to support roosts and therefore were not subject to further survey.

Dusk/Dawn Activity Survey of Trees

- 5.5 Results are summarised below and presented on Figure 5 and in Appendix 3.
- 5.6 Roosting was confirmed in T2 during the dawn survey visit on 13th August 2015 when a single brown long-eared bat (*Plecotus auritus*) was observed re-entering the roost at 05:20hrs. This species was also recorded on the dusk survey of 29th June 2015 as were two further possible emergences of individual brown long-eared bats recorded at 22:25hrs and 22:26hrs. Two common pipistrelle bats were also recorded as probably emerging from T2 during the dusk survey on 29th June 2015 at 22:08hrs and at 22:10hrs.
- 5.7 Bat roosts were subsequently re-confirmed for this tree during 2020 surveys, with up to three common pipistrelle bats recorded as emerging from the tree on 13th July 2020 survey and a single common pipistrelle bat showing interest in the PRF of the tree during the dawn survey on 23rd July 2020 (although not entering it at this time). No roosting brown long-eared bats were detected in 2020 however the PRFs are deemed still suitable for this species and a roost of this species is considered likely to still be present at the tree.
- 5.8 Tree T2 is therefore a confirmed roost for up to three brown long-eared bats and also for up to three common pipistrelle bats.
- 5.9 Furthermore, T7 was confirmed as a roost for up to three common pipistrelle bats as three bats were confirmed as emerging from the tree between 21:49hrs and 21:57hrs, during the survey completed on 3rd August 2020.
- 5.10 Common pipistrelle foraging and commuting activity was recorded around all trees subject to surveys, as well as activity from brown long-eared bat and *Myotis* species (likely whiskered (*Myotis mystacinus*) and Daubenton's (*Myotis daubentonii*)).

Transect and Static Bat Detector Surveys for Bat Activity across the Site

Transect Surveys 2015

- 5.11 Figures 2 to 4 show the transect routes, point count locations and observed bat activity recorded in 2015. The detailed survey results are presented in Appendix 4.
- 5.12 Common pipistrelles were recorded regularly across the site during Visit 1 and Visit 2 in July and August 2015 respectively, but levels of bat activity of all species reduced significantly during Visit 3 in September 2015. The total number of bat passes during each visit was 28 (Visit 1), 27 (Visit 2) and five (Visit 3).
- 5.13 A number of common pipistrelle calls are early, suggesting that they may be roosting locally. A small number of soprano pipistrelle (*Pipistrellus pygmaeus*) were recorded later on in the night-time during Visit 1 and Visit 2 suggesting that this species uses the site for foraging/commuting but roosts are unlikely to be local. Activity was largely focussed on the stream corridor and the hedgeline to the south of the stream (H2) along the B6419 Bolsover Road.
- 5.14 Two *Myotis* calls were recorded during Visit 2 along with a single noctule (*Nyctalus noctula*) pass during Visit 3.
- 5.15 In total, the transect survey resulted in three confirmed species, i.e. common and soprano pipistrelle and noctule bats, plus two possible *Myotis* species which are likely to be whiskered (*Myotis mystacinus*) and possibly also Daubenton's (*Myotis daubentonii*).
- 5.16 Bat behaviour indicates largely foraging and commuting activity with the likelihood of local roosting for common pipistrelle (including possibly associated with T2). Commuting use only was confirmed for noctule, with no foraging behaviour discerned.
- 5.17 All observed bat activity was confined to the field boundaries with no activity heard or observed in the field interiors. The noctule was recorded on the automatic detectors but not seen by the surveyors, indicating it was likely commuting high above the site – this species having a lesser requirement to follow hedgelines and other linear landscape features. Few bat calls were recorded along the northern and western site boundaries where the site abuts Worksop Road to the north and a residential area to the west. Activity was most frequently recorded along the hedgerow and stream which runs through the site from east to west and along the central and southern site boundaries.

Static Bat Detector Surveys 2020

- 5.18 Static bat detectors were left in place for 10 consecutive nights in July and again in August, to record any bats using the site. A similar array of bat species were recorded as were identified during the transect survey (Table 5). Please note that the number of bat 'passes' recorded does not equate to the number of individual bats using the Site, as one bat can make very many 'passes' during the course of foraging in a favoured area.
- 5.19 The vast majority of bat calls were typical of the common pipistrelle bat. The *Myotis* group of bats are very difficult to separate into species on call sonogram analysis alone, so are generally reported as a 'group'. The majority of calls have characteristics similar to that expected for whiskered bats, with far fewer calls showing similarities to the other *Myotis* bats such as Brandt's (*Myotis brandtii*), Daubenton's and Natterer's (*Myotis nattereri*) bats.
- 5.20 There was a greater amount of bat calls recorded along the stream as compared to along the hedge forming a field boundary, with good numbers of bat 'passes' recorded most nights along the stream. In contrast the hedge location had several nights with low or no bat activity detected.

5.21 In addition, the species range was more restricted at the hedge locations, although common pipistrelle bats still dominated the dataset. This suggests the stream corridor is used more consistently by the local bat population, probably for extended periods of feeding as well as commuting, while field hedges likely function more as occasional commuting features for smaller numbers bats.

Table 5 Summary of the Static Bat Detector Results 2020

| Location | Date | Number of Bat Passes Recorded | | | | |
|-----------------|--------|-------------------------------|---------------------|-----------------------|------------------|---------|
| | | Common Pipistrelle | Soprano Pipistrelle | <i>Myotis</i> species | Brown Long-eared | Noctule |
| Stream Corridor | July | 1418 | 20 | 69 | 0 | 38 |
| | August | 847 | 20 | 99 | 12 | 7 |
| Field Hedge | July | 323 | 3 | 2 | 0 | 3 |
| | August | 58 | 1 | 10 | 0 | 0 |

6. EVALUATION AND RECOMMENDATIONS

Evaluation

- 6.1 In total five species of bat have been recorded on site as follows:
- Common pipistrelle – small numbers roosting in Tree 2 and Tree 7 and commuting/foraging in reasonable numbers more widely across the site.
 - Brown long-eared bat – small numbers roosting in Tree 2 and commuting more locally around the roost site. This species is a Species of Principal Importance under S41 of the NERC Act 2012.
 - Soprano pipistrelle – small numbers recorded commuting and foraging, associated with the stream and the hedge (H2) running south of the stream along B6419. This species is a Species of Principal Importance under S41 of the NERC Act 2012
 - *Myotis* species – very small numbers of two different species, likely whiskered and possibly Natterer's and Daubenton's bats based on the characteristics of the bat call sonograms, are only occasionally commuting and foraging across the site associated mostly with the habitat around Tree 1 and Tree 2.
 - Noctule – single pass commuting overhead, recorded on 2015 transect survey V3 only. This species is a Species of Principal Importance under S41 of the NERC Act 2012.
- 6.2 Tree T2 is a confirmed roost for a small number of (up to three) brown long-eared bats and a roost for common pipistrelle (three individuals). Tree T7 is also confirmed as a roost used by three common pipistrelle bats. Both species are relatively widespread in Derbyshire (www.derbyshiremammalgroup.com). It is judged that the trees are used as non-breeding day roost for these species and roosts of this type are identified as being of lower conservation value (Mitchell-Jones 2004).
- 6.3 Other trees assessed on site showed no evidence of use by roosting bats following detailed surveys in both 2015 and 2020, although some had features potentially able to be used by roosting bats (Trees T1, T3 and T6).
- 6.4 The site overall provides a foraging resource for low numbers of bats, with only relatively low levels of activity recorded throughout the survey season. Common pipistrelle was by far the most frequently recorded species, with occasional soprano pipistrelle, brown long-eared bat and *Myotis* species also recorded. There were no obvious 'hotspots' of activity, although the stream corridor and boundary hedgerows in the central and southern parts of the site were more frequently used than the northern and western boundaries which abut Worksop Road and a residential area respectively. The site is considered to provide a resource of value to foraging and commuting bats at a site/local level only.
- 6.5 A single noctule bat pass was recorded at the site during the September 2015 transect survey and a small number of calls were recorded during the static detector surveys. The bat was not observed by surveyors at the time indicating it was most likely flying high over the site. This species is not particularly associated with, or reliant on, any linear landscape feature for commuting between roosts and forage areas, and is unlikely to use the site in any significant way.

Potential Impacts

- 6.6 Potential effects of the proposed development include disturbance to small numbers of roosting bats in T2 and T7 if site clearance and development occur in the proximity of the roosts, along with the loss of or disturbance to foraging and commuting corridors for bats from the local

populations. Construction of access routes across/through the stream corridor and internal hedgerows have the potential to result in fragmentation of foraging and commuting corridors.

- 6.7 During the operational phase of development, the introduction of residential development and associated lighting has the potential to disrupt roosting and feeding behaviour for certain, light sensitive species, though other species are known to habituate readily to increased light levels.
- 6.8 Impacts of this nature are considered to be of low to medium scale without appropriate mitigation and compensation measures in place (<https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects>, last viewed 06/10/2020).
- 6.9 The creation of gardens and areas of public open space has the potential to increase the habitat resource for roosting and foraging bats compared with the intensively managed interiors of the arable fields.

Mitigation Recommendations

- 6.10 The following recommendations are made to safeguard and enhance the roosts in T2 and foraging/commuting habitat for bats:
- retain T2 and T7 with a suitable undeveloped buffer zones to safeguard the roost *in situ*. This buffer zone should be extended along the adjacent stream corridor to ensure uninterrupted access to foraging habitats, and continuity with off-site habitats;
 - retain a substantial buffer zone (8-10m) along the stream corridor as a key foraging/commuting corridor for bats and other wildlife (particularly breeding birds and badger), to be managed as public open space;
 - retain existing boundary hedgerows and internal hedgerows with suitable undisturbed buffer zones (3-5m) to maintain connectivity of bat foraging habitats. These can be incorporated into areas of public open space and managed for biodiversity benefits;
 - adopt a lighting strategy which minimises impacts on key bat foraging habitats, in particular the stream corridor and hedgerows in the central and southern parts of the site;
 - selected areas of the buffer/boundary habitats could be left as unmanaged grassland and tall herbs to encourage abundant invertebrates as food source for bats; and
 - plant areas of landscaping with nectar rich shrubs to encourage invertebrates, in particular night-flying insects.
- 6.11 With the recommended mitigation measures in place it is anticipated that there would be no significant harm to the local bat population, and that the introduction of a greater diversity of nectar (and insect) rich landscape planting may increase the value of the site for certain bat species.
- 6.12 In line with current good practice, the suite of bat surveys should be repeated if development has not begun within two years of this report, to re-assess the features for bat use.

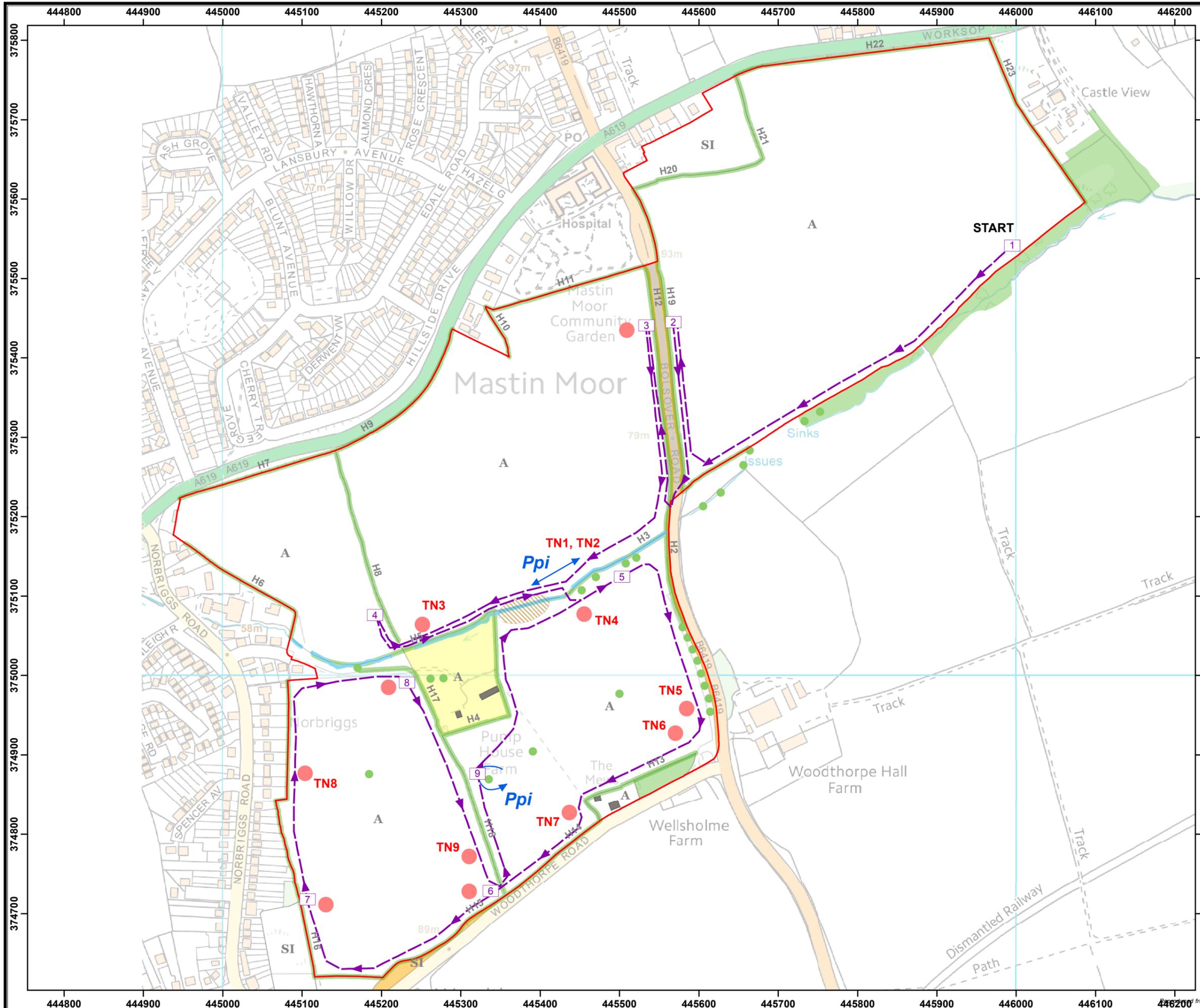
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8. ABBREVIATIONS

| | |
|-------|---|
| AOD | Above Ordnance Datum |
| EU | European Union |
| JNCC | Joint Nature Conservation Committee |
| WCA | Wildlife and Countryside Act |
| CRoW | Countryside and Rights of Way |
| SSSI | Site(s) of Special Scientific Interest |
| NERC | Natural Environment and Rural Communities |
| NPPF | National Planning Policy Framework |
| CBC | Chesterfield Borough Council |
| LPA | Local Planning Authority |
| DPMML | Devonshire Property (DMM) Limited |
| CST | Chatsworth Settlement Trustees |
| PAA | Penny Anderson Associates Ltd |
| PRF | Potential Roost Feature(s) |

FIGURES



Legend

- Site boundary
- Transect route
- Point count location
- Bat activity (seen)
- Bat activity (heard not seen)
- TN1 Target notes

Habitats

- Broadleaved woodland;
- Neutral semi-improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Arable
- Amenity grassland
- Building
- Hardstanding
- Running water
- Hedgerow
- Broadleaved tree

Ppi = Common pipistrelle

British National Grid
 Projection: Transverse Mercator
 False Easting: 400000.000000
 False Northing: 100000.000000
 Central Meridian: 2.000000
 Scale Factor: 0.999601
 Latitude Of Origin: 49.000000

ISO A3

Metres

0 25 50 100 150

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 Chatsworth Estate Office
 Bakewell
 DE45 1PJ

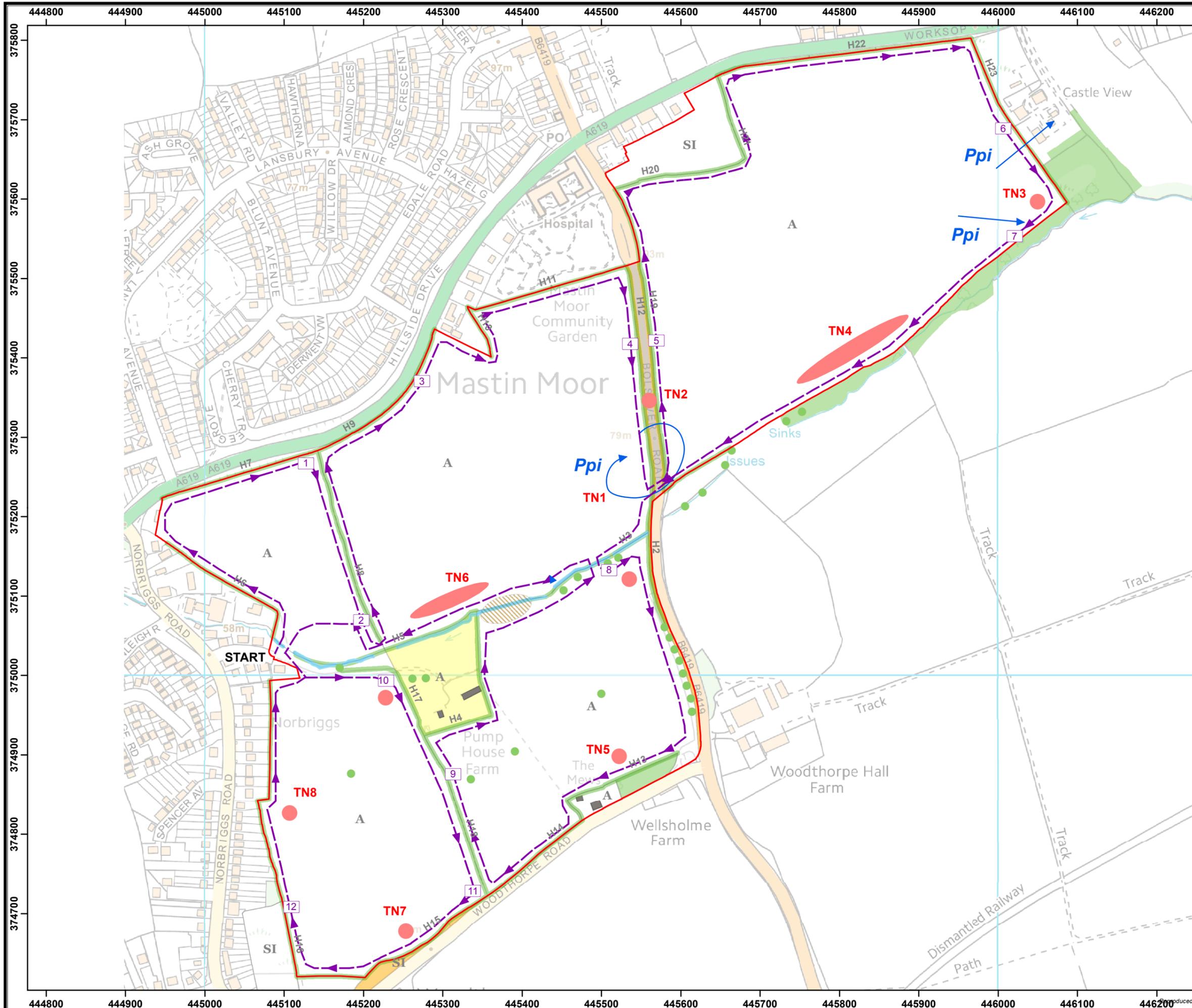
Penny Anderson Associates Ltd
 Parklea, 60 Park Road
 Buxton, Derbyshire, SK17 6SN.
 Telephone 01298 270866

Project Name
Land off Worksop Road, Mastin Moor

Discipline
 Ecology

**BAT ACTIVITY TRANSECT
 VISIT 1
 09/07/2015**

| | | | |
|----------|--|-------------|------------|
| Scale | 1:4,500 | Drawing No. | Figure 2 |
| Drawn By | CC | Originator | SRG |
| | | Date | 13/06/2017 |
| PAA Ref | G:\CHST04_MastinMoor_Chesterfield\Maps | Revision | 1.0 |



Legend

- Site boundary
- Transect route
- Point count location
- Bat activity (seen)
- Bat activity (heard not seen)
- TN1 Target notes

Habitats

- Broadleaved woodland;
- Neutral semi-improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Arable
- Amenity grassland
- Building
- Hardstanding
- Running water
- Hedgerow
- Broadleaved tree

Ppi = Common pipistrelle

British National Grid
 Projection: Transverse Mercator
 False Easting: 400000.000000
 False Northing: 100000.000000
 Central Meridian: 2.000000
 Scale Factor: 0.999601
 Latitude Of Origin: 49.000000

ISO A3

Metres

0 25 50 100 150

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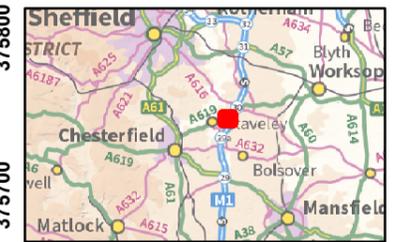
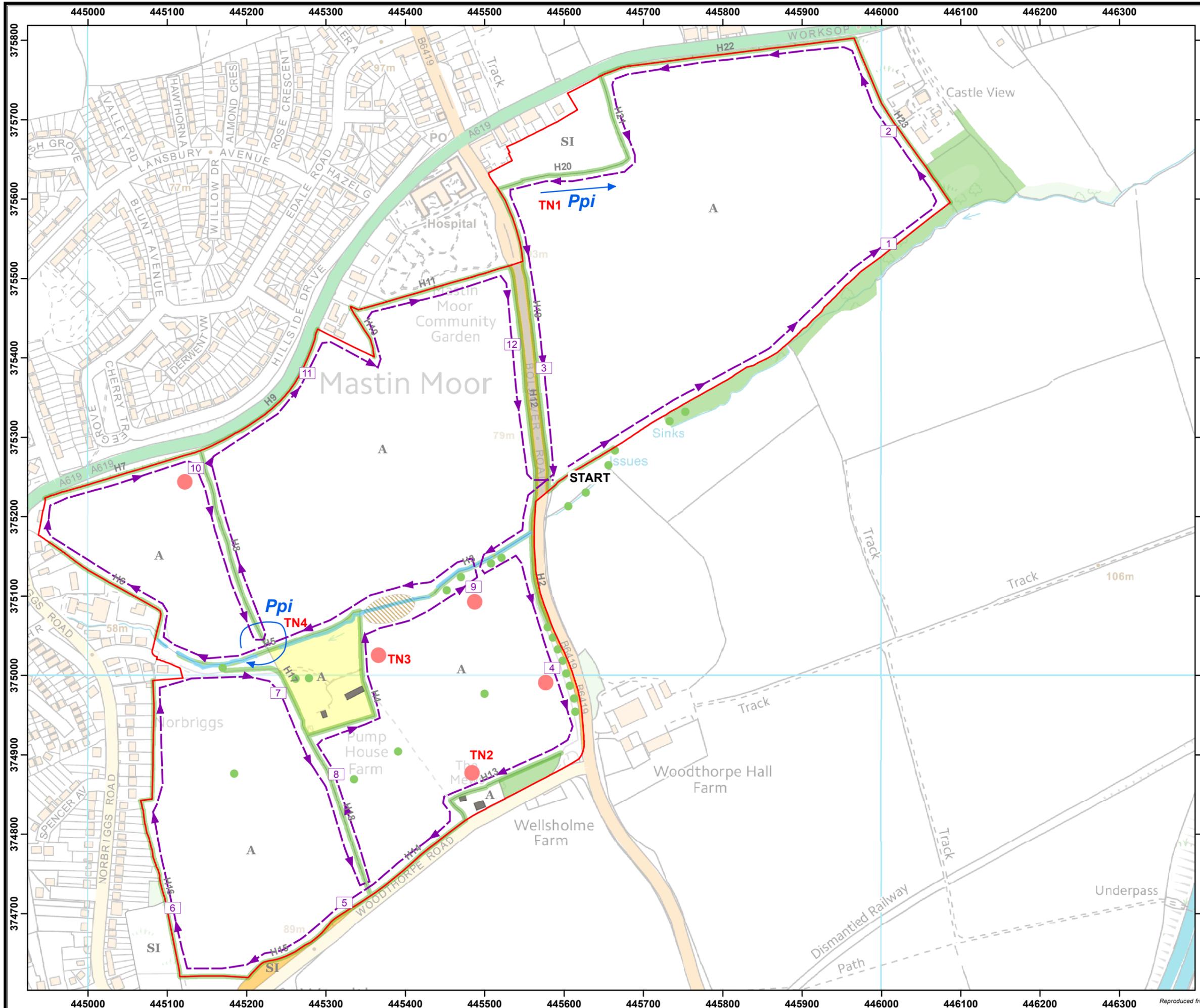
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 Buxton, Derbyshire, SK17 6SN.
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Project Name
Land off Worksop Road, Mastin Moor

Discipline
Ecology

Title
**BAT ACTIVITY TRANSECT
 VISIT 2
 12/08/2015**

| | | | |
|----------|--|-------------|------------|
| Scale | 1:4,500 | Drawing No. | Figure 3 |
| Drawn By | CC | Originator | SRG |
| | | Date | 13/06/2017 |
| PAA Ref | G:\CHST04_MastinMoor_Chesterfield\Maps | Revision | 1.0 |



Legend

- Site boundary
- Transect route
- Point count location
- Bat activity (seen)
- Bat activity (heard not seen)
- TN1 Target notes

Habitats

- Broadleaved woodland;
- Neutral semi-improved grassland
- Poor semi-improved grassland
- Tall herb and fern - ruderal
- Arable
- Amenity grassland
- Building
- Hardstanding
- Running water
- Hedgerow
- Broadleaved tree

Ppi = Common pipistrelle

British National Grid
 Projection: Transverse Mercator
 False Easting: 400000.000000
 False Northing: -100000.000000
 Central Meridian: -2.000000
 Scale Factor: 0.999601
 Latitude Of Origin: 49.000000

ISO A3

Metres

0 25 50 100 150

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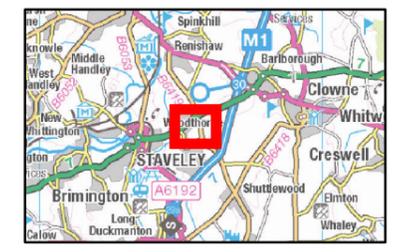
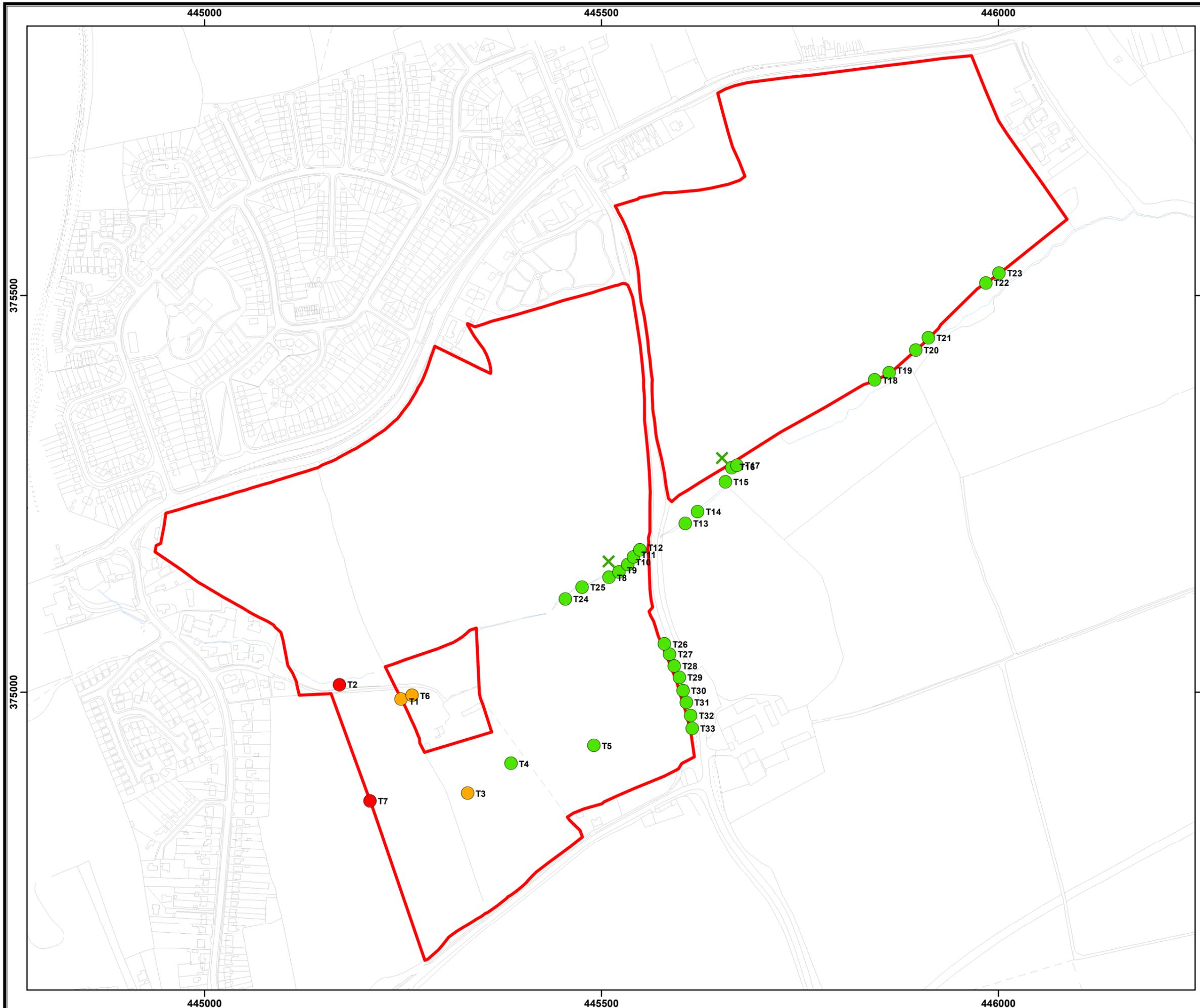
Project Name
Land off Worksop Road, Mastin Moor

Discipline
Ecology

Title
**BAT ACTIVITY TRANSECT
 VISIT 3
 07/09/2015**

| | | | |
|----------|--|-------------|------------|
| Scale | 1:4,500 | Drawing No. | Figure 4 |
| Drawn By | CC | Originator | SRG |
| | | Date | 13/06/2017 |
| PAA Ref | G:\CHST04_MastinMoor_Chesterfield\Maps | Revision | 1.0 |

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Legend

- Planning boundary
- Low/no potential
- Moderate potential
- Confirmed bat roost
- × Static detectors

British National Grid
 Projection: Transverse Mercator
 False Easting: 400000.000000
 False Northing: -100000.000000
 Central Meridian: -2.000000
 Scale Factor: 0.999601
 Latitude Of Origin: 49.000000

ISO A3

Metres

0 20 40 80 120

Penny Anderson Associates Ltd
 CONSULTANT ECOSYSTEMS

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Project Name
Mastin Moor

Discipline
Ecology

Title:
**Location of Static
 Bat Detectors and
 Trees**

| | | | |
|----------|-------------------------------------|-------------|------------|
| Scale | 1:4,500 | Drawing No. | Figure 5 |
| Drawn By | MDM | Originator | CB |
| | | Date | 06/10/2020 |
| PAA Ref. | G:\CHST04_Mastin_Moor\Maps\Figures\ | Revision | 1.0 |

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APPENDICES

APPENDIX 1

Summary of Legislation Relating to Bats

SUMMARY OF THE LEGISLATION RELATING TO BATS

All wild species of bat are protected under the Wildlife and Countryside Act (WCA) 1981, which has also been amended by later legislation, including the Countryside and Rights of Way (CROW) Act 2000 and the Conservation of Habitats and Species Regulations 2017 (amended), and this legislation is applicable to England and Wales. Bats are listed on Schedule 5 of the WCA and are therefore subject to some the provisions of Section 9 which, with the amendments, make it an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a bat (S9:4c).

There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.

Bat species are also listed under Annexes IIa and IVa of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017 (amended).

The Conservation of Habitats and Species Regulations 2017 (amended) state that a person commits an offence if they:

- (a) deliberately capture, injure or kill any wild animal of a European protected species,
- (b) deliberately disturb wild animals of any such species, in such a way as –
 - (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or
 - (iii) to affect significantly the local distribution or abundance of the species to which they belong;
- (c) deliberately take or destroy the eggs of such an animal, or
- (d) damage or destroy a breeding site or resting place of such an animal.

Under these Regulations it is an offence to damage or destroy a breeding site or resting place whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead bat or part of such an animal.

In addition, seven native British bat species, including the soprano pipistrelle (*Pipistrellus pygmaeus*) and the brown long-eared bat (*Plecotus auritus*), that are frequently found in buildings, are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*, under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CROW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.

In addition, the National Planning Policy Framework (NPPF 2019) has an overall focus on sustainable development, and states that developments should aim to engender positive outcomes for habitats and biodiversity, with a particular focus on the maintenance and creation of ecological networks. Furthermore, the NPPF also states that any planning proposals for which significant negative impacts on biodiversity cannot be avoided, mitigated or compensated for should be refused. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.

The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Please note: the above text provides a brief summary of the legislation in relation to bats in England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.

APPENDIX 2

Tree Inspection Results 2020

Appendix 2 Tree Inspection Results 2020

| Tree Ref. | Species | Location | Description | Bat Roost Potential Assessment 2020 |
|------------------|--|---------------------------------------|---|--|
| T1 | Ash (<i>Fraxinus excelsior</i>) | Field boundary | Multi-stemmed, rot holes and bark damage. | Moderate |
| T2 | Ash | Field boundary | Veteran ash tree with numerous features. <u>*A confirmed roost</u> for common pipistrelle (<i>Pipistrellus pipistrellus</i>) and brown long-eared bat (<i>Plecotus auritus</i>) species in 2015. | High - (*previously confirmed roost) |
| T3 | Pedunculate oak (<i>Quercus robur</i>) | In field | Mature oak tree. Lower branch on south side and also a small hole on upper branch. | Moderate |
| T4 | Pedunculate oak | In field | Mature oak tree. Slight limb tear on south side but no roost feature present. A limb split with bark torn back on the east side is present but seen to be shallow. No other features visible from ground level. | Low |
| T5 | Pedunculate oak | In field | Mature oak tree. Thin layer of ivy (<i>Hedera helix</i>) on trunk. Tree of sufficient size but no features visible from ground level. | Low |
| T6 | Ash | Amenity garden area | Mature ash tree with possible features higher up. Unable to be inspected from all angles due to land access. | Low-Moderate |
| T7 | Pedunculate oak | In field | Mature oak tree. Large rot hole present (possibly not deep but suitable feature) as well as exposed (possibly woodpecker) holes present on trunk where limb has torn. | Moderate |
| T8-12 and T24-25 | Ash | Field boundary | Semi-mature ash trees lacking suitable features. Some moderate ivy cover, but trees not of typical sufficient size. | Negligible |
| T13 | Pedunculate oak | Field boundary | Mature ash tree of sufficient size but no suitable features visible at ground level. | Low |
| T14 | Ash | Field boundary | Mature ash tree with some dense ivy cover. No features visible. | Low |
| T15 | Pedunculate oak | In field | Mature oak tree. Crown relatively bare. Bark stripping at end of southern limb with only very limited roosting potential. | Low |
| T16 | Ash | Field boundary | Tall ash tree lacking features from ground level. | Low |
| T17 | Ash | Field boundary | Dead ash tree. Limb split on south side but superficial with no feature created. | Low |
| T18-23 | Ash Sycamore (<i>Acer pseudoplatanus</i>) | Field boundary | Semi-mature to early-mature ash and sycamore trees with no features observed. Lacking sufficient size and age for potential roost features (PRFs). | Negligible |
| T26-33 | Ash Wych elm (<i>Ulmus glabra</i>) | Field boundary/ roadside tree line | Line of semi-mature sycamore and wych elm. Trees lacking sufficient size or visible features. | Negligible |

APPENDIX 3

Dust and Dawn Bat Activity Survey Results 2015 and 2020

Appendix 3 Dusk and Dawn Bat Activity Survey Results 2015 and 2020

| Tree No. | Date | Survey Type | Bats Emerging or Re-entering | Observations |
|----------|------------|-------------|------------------------------|--|
| T1 | 22/07/2015 | Dawn | No | Foraging and commuting common pipistrelle (<i>Pipistrellus pipistrellus</i>) and a <i>Myotis</i> species. |
| | 30/07/2015 | Dawn | No | No bat activity observed. |
| | 14/07/2020 | Dusk | No | Small number of common pipistrelle foraging and commuting. |
| | 30/07/2020 | Dusk | No | Small number of common pipistrelle foraging and commuting. |
| T2 | 29/06/2015 | Dusk | Possible | Probable emergence of one brown long-eared (<i>Plecotus auritus</i>) and a further possible emergence of two brown long-eared bats. Probable emergence of two common pipistrelle. Common pipistrelle observed commuting and foraging as well as some <i>Myotis</i> species and brown long-eared bats. |
| | 13/08/2015 | Dawn | Yes | Re-entry by one brown long-eared , just before sunrise on south side of tree. Frequent foraging activity by common pipistrelle. |
| | 13/07/2020 | Dusk | Yes | Emergence of three common pipistrelle bats just after sunset. Good levels of bat foraging in the location. |
| | 23/07/2020 | Dawn | No | No re-entry confirmed but a single common pipistrelle bat showing interest in the potential roost feature (PRF) at 04:47. |
| | 31/07/2020 | Dawn | No | Very little bat activity noted. |
| T3 | 21/07/2015 | Dusk | No | Common pipistrelle observed commuting and foraging. |
| | 29/07/2015 | Dusk | No | No bat activity observed. |
| | 14/07/2020 | Dawn | No | Very little bat activity noted. |
| | 22/07/2020 | Dusk | No | Very little bat activity noted. |
| T6 | 14/07/2020 | Dusk | No | Small number of common pipistrelle foraging and commuting. |
| | 30/07/2020 | Dusk | No | Small number of common pipistrelle foraging and commuting. |
| T7 | 03/08/2020 | Dusk | Yes | Emergence of three common pipistrelle bats just after sunset. Good levels of bat foraging in the location. |
| | 13/08/2020 | Dusk | No | Moderate levels of bat commuting and foraging around tree. |
| | 20/08/2020 | Dusk | No | Small number of common pipistrelle foraging and commuting. |

APPENDIX 4
Transect Survey Results 2015

Appendix 4a Bat Activity Transect Survey Results for Mastin Moor

| Survey No. | Survey Type | Date | Weather | Point Count | Target Note | Time | Species | No. of Bats | No. of Passes | Activity | Findings | | | |
|------------|-------------|------------|---|-------------|-------------|--------------------|--|-------------|---------------|-----------------------------|----------------------------------|---------|--|----------------------|
| 1 | Dusk | 09/07/2015 | Dry and calm, humidity at 49% and temperature at 15°C at the beginning of the survey and 92% and 8.8°C by the end, cloud cover throughout was 30%. | 1 | | 21:38 | | | | | | No bats | | |
| | | | | W | | | | | | | | | | |
| | | | | 2 | | 22:00 | | | | | | | | No bats |
| | | | | W | TN1 | | Common pipistrelle | 1 | 2 | F/C | Flying along hedgerow | | | |
| | | | | 3 | | 22:18 | Unknown bat | | | | | | | Possible distant bat |
| | | | | W | TN2 | | Common pipistrelle | 1 | 2 | F/C | | | | |
| | | | | 4 | | 22:40 | | | | | | | | No bats |
| | | | | W | TN3 | | Common pipistrelle | 1 | 1 | F | HNS | | | |
| | | | | W | TN4 | | Pipistrelle sp. | 2 | 2 | F/C | HNS | | | |
| | | | | 5 | | 22:56 | | | | | | | | No bats |
| | | | | W | TN5 | | Pipistrelle bat | 1 | 2 | C | HNS, further bat species nearby? | | | |
| | | | | W | TN6 | 23:06 | Soprano pipistrelle | 1 | Several | F | Distant bat heard | | | |
| W | TN7 | 23:16 | Common pipistrelle | 1 | | C/F | | | | | | | | |
| 6 | | 23:22 | Common pipistrelle | 1 | 2 | C/F | No bats | | | | | | | |
| W | | | | | | | | | | | | | | |
| 7 | | | Common pipistrelle | 1 | 2+ | F | HNS | | | | | | | |
| W | TN8 | | Common pipistrelle | ? | Several | F | Distant calls | | | | | | | |
| 8 | | 23:49 | Common pipistrelle | 1 | 1 | F/C | No bats | | | | | | | |
| W | TN9 | | Myotis sp. | 1 | 1 | C | Short call | | | | | | | |
| 9 | | 00:03 | Common pipistrelle | 1 | 3 | F | Foraging around tree | | | | | | | |
| 1 | Dusk | 12/08/2015 | Dry with a light wind, humidity at 32% and temperature at 18.6°C at the beginning of the survey and 32% and 15°C by the end, cloud cover throughout was 0%. | 1 | | 20:30 | | | | | | No bats | | |
| W | | | | | | | | | | | | | | |
| 2 | | | | | 20:39 | | | | | | | | | No bats |
| W | | | | | | | | | | | | | | |
| 3 | | | | | 20:50 | | | | | | | | | No bats |
| W | | | | | | | | | | | | | | |
| 4 | | | | | 21:02 | | | | | | | | | No bats |
| W | | | | TN1 | 21:11 | Common pipistrelle | 1 or 2 | 3 | F/C | Seen over road | | | | |
| W | | | | TN2 | 21:15 | Common pipistrelle | 1 | 1 | F | Not seen, assumed over road | | | | |
| 5 | | | | | 21:17 | | | | | | | | | No bats |
| 6 | | | | | 21:37 | Common pipistrelle | 1 | 1 | F/C | Flying east | | | | |
| W | | | | TN3 | 21:40 | Common pipistrelle | 1 | 2 | F | HNS | | | | |
| 7 | | 21:43 | Common pipistrelle | 1 | 1 | F/C | Foraging along hedgeline | | | | | | | |
| W | TN4 | 21:49 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| W | | 21:50 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| W | | 21:51 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| W | | 21:57 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| W | | 21:58 | Common pipistrelle | 1 | 1 | F | Assumed all along hedgerow - v. sporadic | | | | | | | |
| 8 | | 22:00 | Common pipistrelle | 1 | 2 | F | HNS - assume along hedgerow | | | | | | | |
| W | TN5 | 22:06 | Common pipistrelle | 1 | 1 | F/C | HNS | | | | | | | |
| 9 | | 22:15 | | | | | | | | | No bats | | | |
| W | TN6 | 22:29 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| W | | 22:32 | Common pipistrelle | 1 | 2 | F | | | | | | | | |
| W | | 22:33 | Pipistrelle sp. | 1 | 1 | F | Not seen, v. faint, possible Soprano pipistrelle | | | | | | | |
| W | | 22:35 | Common pipistrelle & Myotis | 2 | 3 | F | | | | | | | | |
| 10 | | 22:50 | Common pipistrelle | | | F | Not seen, foraging around tree? | | | | | | | |
| 11 | | 22:59 | | | | | | | | | No bats | | | |
| W | TN7 | 23:05 | Common pipistrelle | 1 | 1 | C | HNS | | | | | | | |
| 12 | | 23:09 | | | | | | | | | No bats | | | |
| W | TN8 | 23:14 | Common pipistrelle | 1 | 1 | F | HNS | | | | | | | |
| 3 | Dusk | 07/09/2015 | Dry and calm, humidity at 48% and temperature at 16.7°C at the beginning of the survey and 56% and 10.2°C by the end, cloud cover throughout was 0-5%. | 1 | | 19:48 | | | | | | No bats | | |
| W | | | | | | | | | | | | | | |
| 2 | | | | | 19:55 | | | | | | | | | No bats |
| W | | | | TN1 | 20:08 | Common pipistrelle | 1 | 1 | C | Flying east | | | | |
| 3 | | | | | 20:11 | | | | | | | | | No bats |
| W | | | | | | | | | | | | | | |
| 4 | | | | | 20:23 | Common pipistrelle | 1 | 1 | C | HNS | | | | |
| W | | | | TN2 | 20:30 | Common pipistrelle | 1 | 1 | C | HNS | | | | |
| 5 | | | | | 20:33 | | | | | | | | | No bats |
| W | | | | | | | | | | | | | | |
| 6 | | | | | 20:40 | | | | | | | | | No bats |
| W | | | | | | | | | | | | | | |
| 7 | | 20:50 | | | | | | | | | No bats | | | |
| W | | | | | | | | | | | | | | |
| 8 | | 20:59 | | | | | | | | | No bats | | | |
| W | TN3 | 21:06 | Unknown bat | 1 | 1 | C | Very faint, HNS | | | | | | | |
| 9 | | 21:10 | Common pipistrelle | 1 | 1 | C | Very faint, HNS | | | | | | | |
| W | TN4 | 21:17 | Common pipistrelle | 1 | 2 | F | | | | | | | | |
| 10 | | 21:27 | | | | | | | | | HNS, very faint | | | |
| W | | | | | | | | | | | | | | |
| 11 | | 21:40 | | | | | | | | | No bats | | | |
| W | | | | | | | | | | | | | | |
| 12 | | 21:49 | | | | | | | | | No bats | | | |

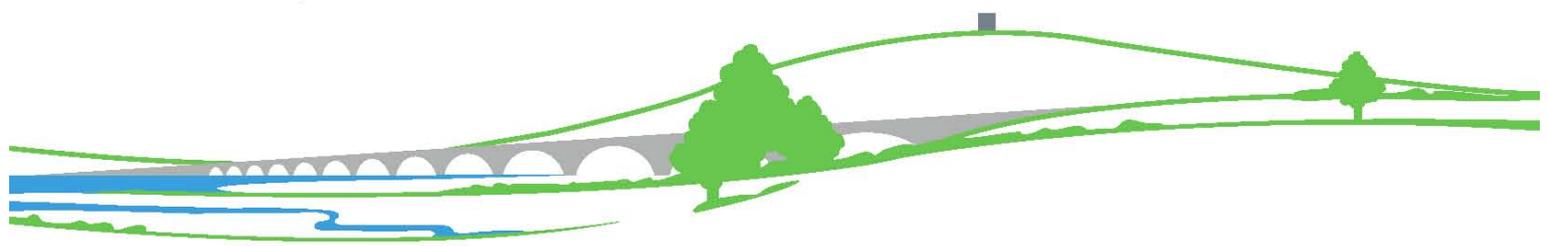
Key
HNS = Heard not seen W = walk between point counts
C = commuting PC = 3 minute point counts
F = foraging TN = target note (between point counts)

Species
Common pipistrelle *Pipistrellus pipistrellus*
Soprano pipistrelle *Pipistrellus pygmaeus*
Myotis species *Myotis sp*

Appendix 4b Bat Activity Transect Survey Results Summary Data from Anabat Recordings

| Visit 1 | | Visit 2 | | Visit 3 | |
|--------------------|-----------|--------------|-----------|--------------|----------|
| Time | Species | Time | Species | Time | Species |
| P7092207.14# | Pip45 | P8122111.47# | Pip45 | P9072010.49# | Pip45 |
| P7092207.28# | Pip45 | P8122112.05# | Pip45 | P9072109.39# | Pip45 |
| P7092209.49# | Pip45 | P8122112.40# | Pip45 | P9072112.54# | Pip45 |
| P7092210.32# | Pip45 | P8122116.33# | Pip45 | P9072120.35# | Pip45 |
| P7092243.28# | Pip45 | P8122137.53# | Pip45 | | |
| P7092252.17# | Pip45 | P8122141.12# | Pip45 | | |
| P7092302.08# | Pip45 | P8122141.45# | Pip45 | | |
| P7092310.53# | Pip45 | P8122142.08# | Pip45 | | |
| P7092316.23# | Pip45 | P8122150.02# | Pip45 | | |
| P7092334.45# | Pip45 | P8122152.28# | Pip45 | | |
| P7092335.18# | Pip45 | P8122158.38# | Pip45 | | |
| P7092335.39# | Pip45 | P8122159.29# | Pip45 | | |
| P7092335.54# | Pip45 | P8122201.56# | Pip45 | | |
| P7092336.31# | Pip45 | P8122203.41# | Pip45 | | |
| P7092336.43# | Pip45 | P8122205.11# | Pip45 | | |
| P7092337.19# | Pip45 | P8122205.24# | Pip45 | | |
| P7092343.05# | Pip45 | P8122206.56# | Pip45 | | |
| P7092349.49# | Pip45 | P8122230.29# | Pip45 | | |
| P7092357.12# | Pip45 | P8122233.13# | Pip45 | | |
| P7100003.08# | Pip45 | P8122233.28# | Pip45 | | |
| P7100003.23# | Pip45 | P8122235.40# | Pip45 | | |
| P7100003.40# | Pip45 | P8122235.40# | Pip45 | | |
| | | P8122242.49# | Pip45 | | |
| | | P8122254.05# | Pip45 | | |
| Pip45 Sum | 22 | | 24 | | 4 |
| P7092250.36# | Pip55 | P8122232.51# | Pip55 | | |
| P7092302.08# | Pip55 | | | | |
| P7092302.33# | Pip55 | | | | |
| P7092303.22# | Pip55 | | | | |
| P7092305.56# | Pip55 | | | | |
| P7092307.53# | Pip55 | | | | |
| Pip55 Sum | 6 | | 1 | | 0 |
| | | P8122145.34# | Myotis | | |
| | | P8122236.32# | Myotis | | |
| Myotis Sum | | | 2 | | |
| | | | | P9072005.59# | Noct |
| Noctule Sum | | | | | 1 |
| Total | 28 | | 27 | | 5 |

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