

Northern Arc Avenue - Central Section

Ecological Impact Assessment

Homes England

Project number: 60610807

February 2025

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
00	24/01/25	Draft for client comment	24/01/25	JS	Technical Director
01	06/02/25	Final	06/02/25	JS	Technical Director

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1. Executive Summary

AECOM was instructed in 2022 by Homes England to complete a suite of updated ecological surveys at the Brookleigh site in relation to construction of the 'Central Section' of the Northern Arc avenue, which includes the location of upgrades to Cuckfield Road, and construction of drainage infrastructure. The area required for these works is collectively hereafter referred to as 'the Site'. AECOM was also instructed to complete an Ecological Impact Assessment (EclA) to appraise the potential effects of these works on Important Ecological Features (IEF's).

The Site is the proposed Central Section of the Northern Arc avenue. This will provide a link between the proposed Western Bridge and Link Road in the west, and the Eastern Bridge and Link Road to the east. The Central Section will cross the existing Cuckfield Road. The Central Section will typically comprise a new 6.5m carriageway, with one 3m shared footway-cycleway, and one 2m wide footway and two 2.75m verges. This will be constructed to an adoptable standard which will include soft landscaping, tree planting, utilities corridors, and drainage infrastructure. These works are collectively referred to as 'the Proposed Development'.

To inform the EclA, a desk-based study was completed including a review of ecological survey data collected for the Site and wider Brookleigh site by AECOM in 2019. Subsequently, the following updated ecological surveys were completed:

- Extended Phase 1 habitat survey in June 2022, August 2023 and September 2024;
- Initial bat roost suitability assessment of trees (later referred to as a Ground Level Tree Assessment (GLTA) in 2024) in June 2022, August 2023 and September 2024;
- Bat emergence surveys in August and September 2022, and August and September 2024;
- Bat activity surveys including walked transects and static automated detector surveys during April to October 2022;
- Badger (*Meles meles*) survey in June 2022, August 2023 and September 2024;
- Great crested newt (*Triturus cristatus*) Habitat Suitability Index (HSI) and environmental DNA (eDNA) surveys in April 2022 and June 2023;
- Great crested newt population class assessment survey of two ponds in April, May, and June 2022; and
- Hazel dormouse (*Muscardinus avellanarius*) during May to November 2022.

The majority of protected species surveys have been completed in 2022, however the 2022, 2023 and 2024 Phase 1 habitat survey updates did not find significant changes to the habitats present. Surveys completed in 2022, 2023 and 2024 did not find differences in the presence or likely absence of protected species to the 2019 data, with the exception of the presence of great crested newt in Pond 8a (which was not subject to survey in 2019), and a reduction in the number of active badger setts present. In addition, this EclA takes a precautionary approach in valuing IEFs, to ensure the assessment is based on a reasonable worst-case scenario. Therefore, the majority of ecological surveys being completed in 2022 is not considered to be constraint to identifying the significant effects of the Proposed Development.

The desk study found no internationally designated sites within 10km of the Site. Bedelands Farm Local Nature Reserve (LNR) is located approximately 0.8km east of the Site. There are six non-statutory designated sites for nature within 2km of the Site, the closest of which is Bedelands Local Wildlife Site (LWS), located 1.2km east of the Site. No impacts to statutory or non-statutory designated sites are anticipated.

The desk study found 33 areas of ancient woodland within 1km of the Site. Two areas of ancient woodland are of particular relevance to the Proposed Development: Bridge Farm Shaw North is within the Site and Bridge Farm Shaw 2 is immediately adjacent to the south of the Site. There is the potential for indirect impacts as a result of the Proposed Development; therefore, standard best practice measures in relation to construction will be in place through a Construction Environmental Management Plan (CEMP) to avoid construction impacts from dust, lighting, noise and pollution incidents.

Embedded into the wider Brookleigh scheme is the requirement for a 15m 'no development' buffer around ancient woodland and an additional 10m buffer where only soft landscaping such as swales are permitted. However, specific incursions into the 15m buffer zone and ancient woodland itself were permitted through a Section 73 application. This included a short stretch of drainage infrastructure within Bridge Farm Shaw North, limited to works

within an existing track within the woodland with approximately 4m² of habitat loss anticipated. Ancient woodland is an irreplaceable habitat; however, this small amount of loss on an existing track is considered to be a **Minor adverse** effect on this ecological receptor that is not significant. No other incursions into the ancient woodland or associated buffer zone are permitted.

Himalayan balsam (*Impatiens glandulifera*) is present north of the Site, within a ditch in Bridge Farm Shaw North. Drainage proposals include an outfall into this ditch with a risk of surface water draining through this ditch spreading Himalayan balsam outside of the Site. Therefore, this species will be eradicated from this location prior to works commencing.

Other habitats present within the Site include species-poor semi-improved grassland, improved grassland, scattered broadleaved trees, amenity grassland, a pond (Pond 8), and hedgerows including hedgerows with trees. Hardstanding in the form of the existing Cuckfield Road is also present within the Site.

The Proposed Development will result in the loss of approximately 3.9ha semi-improved grassland; 0.9ha improved grassland; approximately 980m hedgerow and individual broadleaved trees which will be replaced through creation of approximately 0.39ha of wildflower grassland, 0.11ha of wetland mix, 0.11ha of groundcover verge planting, and approximately 77 trees along the proposed Central Section, and approximately 0.31ha of wildflower mix, and approximately 0.09ha of native shrub planting at the proposed SuDS pond and dry detention basin. Measures to be implemented within the CEMP will reduce the risk of disturbance to habitats through noise and light disturbance, and pollution. Created habitats will also be suitable for use by bats, badger, great crested newt, reptiles, birds and invertebrates.

Measures embedded into the wider Brookleigh site will reduce the risk of impacts from increased recreational pressure on retained habitats, including ancient woodland.

The Site supports trees suitable to support roosting bats, the majority of which will be retained with only one tree with roosting suitability (Ecology Ref T39; Arb. Survey Ref: H119) to be lost. A precautionary felling approach will be implemented including pre-felling surveys, and bat boxes will be installed in the wider Site. Measures to avoid disturbance impacts to foraging bats and bat flight lines have been recommended during construction and operation, along with planting of a 'bat crossing' to facilitate flight lines across the proposed Central Section where it bisects a hedgerow. This has already been planted to enable plants to further mature prior to operation of the road.

Two outlier badger setts are present within the Site. Sett closure will be required and will be completed using a Natural England badger licence supported by pre-construction surveys. There is the potential for severance impacts and increased badger vehicle collisions due to the presence of additional setts north and south of the Site. Therefore, a badger tunnel has been designed into the Proposed Development. Measures embedded into the CEMP will avoid mammals becoming trapped in excavations.

Pond 8 within the Site and Pond 8a within 250m of the Site support small populations of great crested newt. These will be retained; however, terrestrial habitat will be lost, and habitat severance will occur due to the presence of the proposed Central Section. Due to the risk of killing and injuring great crested newts, a great crested newt licence, either a European Protected Species Mitigation Licence (EPSML) or District Level Licence (DLL) through NatureSpace will be applied for and implemented. An amphibian tunnel will be constructed beneath the road to reduce severance impacts. The proposed SuDS pond has been designed to provide suitable aquatic habitat for great crested newt.

Surveys did not find presence of hazel dormouse; therefore, this species is considered absent from the Site.

The Site supports assemblages of breeding and non-breeding birds. Measures to avoid disturbance impacts, and damage or destruction of birds' nests have been recommended, as well as installation of bird boxes.

As a precaution it is assumed a small population of common reptile species is present in suitable habitat. To reduce the risk of killing and injury of reptiles, a precautionary working method will be implemented.

An assemblage of terrestrial invertebrates is present within the Site. To avoid disturbance from construction and operational lighting, measures will be implemented in the CEMP and operational lighting will avoid light spill onto retained habitats.

Given the embedded mitigation including the CEMP, landscape proposals and species-specific mitigation discussed in this document, no residual significant effects on ecology are anticipated. **Minor adverse** effects that are not significant are anticipated for ancient woodland, other habitats, bats, and great crested newt.

No cumulative effects are anticipated with other nearby schemes.

2. Introduction

2.1 Project Background

AECOM was instructed in 2022 by Homes England to complete updated ecological surveys at the Brookleigh site in relation to construction of the 'Central Section' of the Northern Arc avenue, which includes the location of upgrades to Cuckfield Road, and construction of drainage infrastructure. The area required for these works is collectively hereafter referred to as 'the Site'. AECOM was also instructed to complete an Ecological Impact Assessment (EclA) to appraise the potential effects of these works on Important Ecological Features (IEF's).

The Site is the proposed Central Section of the Northern Arc avenue. This will provide a link between the proposed Western Bridge and Link Road in the west, and the Eastern Bridge and Link Road to the east. The Central Section will cross the existing Cuckfield Road. The Central Section will typically comprise a new 6.5m carriageway, with one 3m shared footway-cycleway, and one 2m wide footway and two 2.75m verges. This will be constructed to an adoptable standard, together with associated crossing points, earthworks and vegetation removal, surface water and foul drainage infrastructure, utilities corridors and diversions, road lighting, soft landscaping, including tree-planting and temporary fencing, on-street parking and provision of in-line bus stops for bus services. These works are collectively referred to as 'the Proposed Development'. Where required within the EclA, the proposed new carriageway with associated footways, cycleways and verges is referred to as the 'proposed Central Section'.

The Site is approximately 7.6ha in size and is located between grid reference TQ 29642 20682 in the west, and TQ 30774 20835 in the east with a central grid reference of TQ 30229 20828. The Site is shown in Figure 1.

2.2 Scope

The Site is shown in Figure 1. The purpose of this report is to assess impacts on ecological receptors and inform the planning application.

This assessment is informed by the following update surveys:

- Extended Phase 1 habitat survey;
- Bat roost suitability assessment and emergence surveys;
- Bat walked transect and static automated detector surveys;
- Badger survey;
- Great crested newt Habitat Suitability Index (HSI), environmental DNA (eDNA) and population class assessment survey; and
- Hazel dormouse presence/ likely absence survey.

This report details the findings of the surveys undertaken to date. It gives recommendations for best ecological practice as required for the Proposed Development and an assessment of impacts is made using best practice guidelines, following the mitigation hierarchy of avoidance, mitigation, compensation and enhancement.

2.3 Objectives of the EclA

The purpose of the EclA was to:

- Identify baseline conditions and determine IEF's (or those that could be present) which may be impacted;
- provide an objective and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate objective and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity; make high-level recommendations to inform options for the avoidance, mitigation or
- compensation of the potential impacts of the Proposed Development (where known) on the identified ecological receptors, and potential enhancements to biodiversity and ecosystem services supported by the Site; and

- set out what steps would be taken to adhere to legal requirements relating to the relevant ecological features concerned.

3. Wildlife Legislation and Planning Policy

3.1 Wildlife Legislation

The following legislation has been considered in respect of the ecology assessment:

- The Wildlife and Countryside Act 1981 (as amended) (Her Majesty's Stationary Office (HMSO), 1981);
- The Protection of Badgers Act 1992 (HMSO, 1992);
- The Countryside and Rights of Way Act 2000 (HSMO, 2000);
- The Natural Environment and Rural Communities Act 2006 (as amended) (HMSO, 2006);
- The Conservation of Habitats and Species Regulations 2017 (as amended) (HMSO, 2017);
- The Invasive Alien Species Act (Enforcement and Permitting) Order 2019 (as amended) (HMSO, 2019); and
- The Environment Act 2021 (Legislation.gov.uk, 2021).

The relevance of this legislation is discussed in Appendix A.

3.2 Planning Policy

The following planning policy and guidance documents at a national and local scale have been considered in this EclA:

- National Planning Policy Framework;
- Mid Sussex District Plan 2014 - 2031 (Adopted March 2018);
- Burgess Hill Neighbourhood Plan 2015 – 2031 (Adopted January 2016);
- Sussex Biodiversity Opportunity Areas; and
- Sussex Biodiversity Action Plan.

Details of these documents are provided in Appendix A.

4. Methodology and Impact Significance Criteria

4.1 Standards and Guidance

The '*Guidelines for Ecological Impact Assessment in the UK and Ireland, Version 1.3*' issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (hereafter 'the CIEEM EclA guidelines') provide guidance on the process of identifying the value of ecological features, characterising impacts upon them and assessing whether these impacts are significant. The 'mitigation hierarchy' of avoidance, mitigation, compensation and enhancement underpin the CIEEM EclA guidelines.

As per the CIEEM EclA guidelines, the following definitions are used for the terms 'impact' and 'effect':

- **Impact** – 'Actions resulting in changes to an ecological feature'; and
- **Effect** – 'Outcome to an ecological feature from an impact'

This EclA follows the same impact assessment methodology as the 2018 Environmental Statement for the wider Brookleigh development (formerly 'Northern Arc').

4.2 Assessment Methodology

4.2.1 Methodology for Determining Baseline Conditions and Sensitive Receptors

4.2.1.1 Desk Study

A desk study was undertaken to place the site in context of the ecological value of the local area. The desk study was carried out to identify nature conservation designations including international statutory designated sites (i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites) within a 2km radius of the Site. Details of national level designated statutory sites (e.g. Site of Special Scientific Interest (SSSI)) and non-

statutory designated sites (e.g. Local Wildlife Sites (LWS) were also sought within a search area of 2km from the Site.

Records of all legally and/or otherwise notable species previously recorded within a 2km radius of the Site were requested from Sussex Biodiversity Records Centre. The search area was extended to a 5km radius for bat species.

In addition, AECOM undertook a full suite of ecological surveys at the Site in 2018 and 2019 as reported in the *Northern Arc Allocation Planning Application: Environmental Statement Addendum* (AECOM, 2019a). The results from these have been considered in this assessment where appropriate.

The desk study was carried out using the data sources detailed in Table 1.

Table 1. Desk study data sources

Data source	Accessed	Data obtained
Sussex Biodiversity Records Centre	31/01/2024	- Records of non-statutory designated sites within 2km of the Site - Records of protected/notable species within 2km - Bat records within 5km
Multi-Agency Geographic Information for the Countryside (MAGIC) website	31/01/2024	- International statutory designations within 10km of the Site - Other statutory designations within 2km of the Site - Ancient woodland and notable habitats within 1km. Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential

4.2.1.2 Phase 1 Habitat Survey

A Phase 1 habitat survey of the Site was undertaken by experienced ecologists from AECOM on 28th June 2022 and 17th August 2023, updated on 12th September 2024. The survey was carried out in accordance with standard survey methodology (Joint Nature Conservation Committee, 2010). The aim of the Phase 1 habitat survey was to note any updates to habitats within the Site since the survey undertaken in 2018 for the wider Brookleigh site and map habitats for new areas.

The ecologists recorded and mapped all habitat types present within the Site, along with any associated relevant ecological receptors observed. Where relevant ecological receptors were present, target notes were recorded (Appendix B) and the position of these shown on the Phase 1 habitat map (Figure 1).

Also included within the survey was a search for any invasive plant species included within Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) including Japanese knotweed (*Reynoutria japonica*) and giant hogweed (*Heracleum mantegazzianum*).

Botanical nomenclature used in this report follows Stace (2019).

4.2.1.3 Initial Bat Roost Suitability of Trees

A detailed inspection of the trees within the Site and a 10m buffer surrounding this was undertaken on 28th June 2022 and 17th August 2023. The survey was conducted in line with the best practice bat survey guidelines (Collins, 2016) and BS 8596 Surveying for bats in trees and woodlands (British Standards, 2015). The survey was updated on 12th September 2024 and was completed in line with the 4th edition of the Bat Conservation Trust (BCT) guidelines (Collins, 2023).

All trees within the Site were examined from the ground using close focusing binoculars for PRFs such as loose bark, cavities and ivy that could be utilised by bats. Trees were also checked for any signs of bats such as droppings and scratch marks. Based on this inspection, each tree was initially classified as having negligible, low, moderate or high suitability to support roosting bats (see Appendix C). The 2024 survey updated this classification to be in line with current best practice guidance (Collins, 2023), with trees being classified as none (i.e. no suitability), PRF-I (i.e. suitable to support individual or small numbers of bats), or PRF-M (i.e. suitable to support multiple bats and therefore a maternity roost).

4.2.1.4 Bat Emergence Survey

The aim of bat emergence surveys is to identify bats leaving and/or returning to any roost that may be present. In accordance with the BCT best practice survey guidelines available at the time of survey (Collins, 2016) the dusk

emergence survey covered the period from 15 minutes before sunset to at least 1.5 hours after sunset. The dawn re-entry survey commenced one and a half hours before sunrise and ended up to 15 minutes after sunrise.

During these time periods surveyors observed potential roost features on the tree. Surveyors carried echolocation detectors (Elekon Batlogger) to help determine which species are present. Infra-red cameras (Canon XA11 and XA60) were used to allow review of footage to assist with verifying any bats emerging from, or re-entering the tree.

The time, location, number, species (where possible) and direction of flight was recorded for each bat pass (either echolocation heard or activity seen) encountered during the survey. The echolocation calls detected were recorded to an Edirol digital recorder or Elekon Batlogger to allow the use of Batsound analysis software (v4.2) or Bat Explorer to verify bat calls where required.

The above survey methodology remains in line with the 4th edition of the BCT best practice survey guidelines (Collins, 2023). Surveys of tree P12-1 also used the above methodology and were in line with updated survey guidelines (Collins 2023).

The dates, times and weather conditions of the bat emergence survey visits conducted are presented in Table 2.

Table 2 Bat emergence survey weather conditions

Ecology Tree number (Arb. Survey Ref)	Date of survey and type	Sunset/ sunrise	Survey start	Survey end	Weather conditions
T39 (H119)	15 th August 2022, Dusk	20:22	19:52	21:52	Hot hazy day, cooling down with thunderstorms expected
	31 st August 2022, Dawn	06:13	04:43	06:13	Cool, clear sky, calm, no wind, dry
	20 th September 2022, Dusk	19:04	18:34	20:34	Cool, overcast, dry
T95 (T79)	16 th August 2022, Dawn	05:48	04:18	06:03	Mild, humid, overcast, still
	30 th August 2022, Dusk	19:50	19:35	21:20	Warm, dry, minimal cloud cover, light breeze
T96 (T74)	15 th August 2022, Dusk	20:22	19:52	21:52	Mild, humid, light breeze.
	6 th September 2022, Dawn	06:21	04:51	06:26	Significant rainfall previous night, warm, muggy morning from start of survey
T97 (T90)	15 th August 2022, Dusk	20:22	19:52	21:52	Mild, humid, light breeze.
	6 th September 2022, Dawn	06:21	04:51	06:26	Significant rainfall previous night, warm, muggy morning from start of survey
	13 th August 2024, Dusk	20:24	20:09	21:54	Warm, dry, clear
P12-1 (T191)	29 th August 2024, Dusk	19:51	19:36	21:21	Calm, partly cloudy, dry and warm
	23 rd September 2024, Dusk	18:55	18:40	20:25	Mild, recent rainfall, mostly overcast, very light breeze

4.2.1.5 Bat Activity Survey

The number of survey visits, transects and automated static detectors used was determined through consideration of the size of the Site and its relative quality, in line with the current guidance at the time of survey (Collins, 2016). This led to a conclusion that the Site contains moderate quality habitat for bats and therefore a single activity survey visit per month was deemed appropriate survey effort. Due to the size of the Site two transect routes were required to gain suitable coverage of all areas. Activity surveys were conducted on the following dates:

Transect 1: West side

- Visit 1 – 28th April 2022 – Dusk
- Visit 2 – 31st May 2022 – Dusk
- Visit 3 – 28th June 2022 – Dusk
- Visit 4 – 19th July 2022 – Dusk
- Visit 5 – 11th August 2022 – Dusk
- Visit 6 – 12th August 2022 – Dawn
- Visit 7 – 21st September 2022 – Dusk
- Visit 8 – 19th October 2022 – Dusk

Transect 2: East side

- Visit 1 – 28th April 2022 – Dusk
- Visit 2 – 31st May 2022 – Dusk
- Visit 3 – 28th June 2022 – Dusk
- Visit 4 – 19th July 2022 – Dusk
- Visit 5 – 11th August 2022 – Dusk
- Visit 6 – 21st September 2022 – Dusk
- Visit 7 – 22nd September 2022 – Dawn
- Visit 8 – 19th October 2022 – Dusk

Each activity survey involved two surveyors walking a pre-defined transect route which included a series of 'listening points' located at potentially important features with regards to bats. At each 'listening point', surveyors recorded bat activity for at least three minutes using bat echolocation detectors. Any additional activity encountered whilst walking between points was also noted. The survey route was designed to include potential flight paths or foraging areas within the Site, and also mature trees, which offer suitable roost sites. The starting point and direction of the transect was varied during each survey visit in order to ensure all areas of the transect were walked close to dusk. The transect route is shown in Figure 4.

Surveyors carried echolocation detectors (Petterson D240x or Elekon Batlogger) to help determine which species were present. Bat activity was plotted in the field on a GPS enabled mobile mapper using FieldMaps software.

Surveys should be started from sunset but can be adjusted to start earlier based on professional judgement (Collins, 2016). As such, due to the potential presence of bat species that emerge from roosts prior to sunset (such as pipistrelle *Pipistrellus* species), the dusk surveys commenced a quarter of an hour before sunset and continued to at least two hours after sunset.

The time, location, number, species (where possible) and direction of flight were recorded for each bat pass (discrete burst of echolocation heard, or bat activity observed) encountered during the survey. The surveyor recorded the echolocation calls detected to an Edirol digital recorder to allow use of Batsound analysis software to verify bat calls where required.

The surveys completed in 2022 are considered to still be in line with requirements of the updated BCT guidelines, 4th edition (Collins, 2023).

Survey visits were scheduled to avoid nights with cold, wet or windy conditions. All surveys were undertaken during favourable weather conditions which are summarised in Table 3. While the temperature on 22nd September was lower at 7°C, this survey was conducted at dawn where a lower temperature is anticipated. The temperature did not reduce further during the survey; therefore this was not considered to be a constraint.

Table 3 Bat activity survey weather conditions

Date of survey	Temperature (°C) at start of survey	Weather conditions
28th April 2022	14	Overcast, gentle breeze, dry
31st May 2022	11	Scattered clouds, light breeze, dry but light rain before survey start

Date of survey	Temperature (°C) at start of survey	Weather conditions
28th June 2022	16	Warm, humid, dry, heavy cloud but not completely overcast
19th July 2022	25	Overcast, still, recent rain
11th August 2022	22	Clear, still, dry, very hot day
12th August 2022	16	Clear, still, dry
21st September 2022	19	Cool, moderate breeze, dry
22 nd September 2022	7	Cool, dry, clear, slight breeze
19th October 2022	17	Overcast, very windy, dry

4.2.1.6 Bat Static Automated Detector Survey

Automated bat detector surveys were completed in April, May, June, July, August and September 2022. The surveys were conducted in line with current best practice at the time of survey (Collins, 2016); however, the survey method is still in line with the updated 4th edition of the BCT guidelines (Collins, 2023).

In line with the current guidance at the time of survey (Collins, 2016), four SM2bat+ or SM4bat FS static automated bat echolocation detectors were placed in the Site at the following locations, based on where the Proposed Development will require hedgerow removal (shown in Figure 4):

- Location A – In a hedgerow on the western side of the central section (approximate grid reference TQ 29889 20718)
- Location B – In a hedgerow towards the western side of the central section (approximate grid reference TQ 30105 20820)
- Location C – In a hedgerow on the western side of Cuckfield Road (approximate grid reference TQ 30387 20896)
- Location D – In a hedgerow on the eastern side of Cuckfield Road (approximate grid reference (TQ 30527 20755).

The automated detector survey was intended to provide supplementary information on bat activity in addition to the walked activity transect surveys undertaken.

In accordance with Collins (2016), the static automated detectors were left on Site for a minimum of five nights with each deployment. Data were recorded onto a SD card in zero crossing format for subsequent echolocation call analysis using Analook software.

The automated detectors were set up to record bat echolocation over the following periods:

- 12/05/2022 – 17/05/2022
- 25/05/2022 – 31/05/2022
- 22/06/2022 – 28/06/2022
- 19/07/2022 – 25/07/2022
- 11/08/2022 – 16/08/2022
- 21/09/2022 – 29/09/2022
- 19/10/2022 – 24/10/2022

4.2.1.7 Badger Survey

A walkover survey to search for signs of badger was conducted by two AECOM ecologists on 28th June 2022, and updated on 11th August 2023 and 12th September 2024, in accordance with the methodology described by Harris *et al.* (1989), with the updated survey also in accordance with guidance from the Badger Trust (2023). This survey comprised an update to the previous survey undertaken by AECOM in February 2019, reported in *Northern Arc Allocation Planning Application: Environmental Statement Addendum* (AECOM, 2019a).

The survey involved searching the Site and adjacent areas of suitable habitat, paying particular attention to areas of woodland/tree line edge, hedgerows and field margins where setts and other signs of badger activity are commonly found. The following signs of badgers were sought:

- Setts;
- Bedding material;
- Footprints;
- Paths;
- Latrines;
- Hairs; and
- Foraging signs including 'snuffle holes'.

The location of any setts and other signs of badger activity identified were recorded and subsequently mapped in order to establish the distribution of badger activity across the Site.

Any setts found were classified according to the standard survey methodology (Harris *et al.*, 1989) based in part on the number of entrance holes. Setts are classified as 'main', 'annexe', 'subsidiary' or 'outlying'. These and other relevant terms are defined in Appendix D.

4.2.1.8 Great Crested Newt Habitat Suitability Index (HSI) Assessment

The Habitat Suitability Index (HSI) is a method of quantifying the suitability of a waterbody to support great crested newt (*Triturus cristatus*) (Oldham *et al.*, 2000). Waterbodies situated within the Site or within 250m of the Site were subject to HSI assessment on 20th April 2022 by ecologists who hold a Natural England WML-CL08 Class 1 licence for survey of great crested newt. Two additional waterbodies (Ponds 29 and 30) were subject to HSI assessment on 30th June 2023. All waterbodies identified during the surveys previously undertaken by AECOM in 2019 within 250m of the Site were subject to HSI assessment. Ponds that were dry at the time of survey and were considered to regularly dry out during the spring / summer months were not given an HSI score and were 'scoped out' of further consideration for great crested newt.

The calculation of the HSI score of a waterbody requires that the following ten key variables are recorded and assigned a numerical value:

- Location within Britain;
- Pond area;
- Pond drying (based on both local knowledge and field evidence);
- Water quality;
- Percentage perimeter shaded;
- Presence or absence of waterfowl;
- Presence or absence of fish;
- Number of ponds situated within 1km;
- Suitability of terrestrial habitat; and
- Percentage of macrophyte cover.

The results of the HSI assessment are scored in accordance with the criteria specified in Table 4 below.

Table 4. Habitat Suitability Index score and interpretation (based on methodology of Amphibian and Reptile Group of the UK, 2010)

HSI Score	Pond suitability for great crested newt
>0.8	Excellent
0.7	Good
0.6	Average
0.5	Below average
<0.5	Poor

4.2.1.9 Great Crested Newt Environmental DNA (eDNA) Survey

Based on the outcomes of the HSI assessment and a review of the elements of the Proposed Development with the potential to result in impacts on any great crested newt populations present, a subset of waterbodies was selected for great crested newt environmental DNA (eDNA) survey to confirm their presence/absence.

eDNA refers to DNA that can be extracted from environmental samples such as water, soil or faeces without first isolating any target organism. All living organisms leave traces of their DNA within the environment, enabling the detection of great crested newt through collection and testing of water samples from waterbodies.

Collection of water samples for eDNA analysis was undertaken in accordance with the methodology recommended by Technical Advice Note WC1067 prepared by Biggs *et al.* (2014). In line with this guidance water samples were collected from several locations within each waterbody. From these combined water samples a subsample from each waterbody was preserved using ethanol for subsequent laboratory analysis.

For eDNA samples taken within the optimum survey window (15th April to 30th June), negative results from eDNA surveys are accepted as evidence of likely absence of great crested newt from the waterbody in question, and further survey is not then required. As all samples were taken within the optimum survey window (on 20th April 2022 and 30th June 2023), a negative result can be relied upon for confirming absence of great crested newt. Positive results indicate that great crested newt DNA is present within a waterbody, and therefore further surveys are required to inform an estimation of population size.

Great crested newt eDNA survey was undertaken for the following waterbodies on 20th April 2022: Ponds 8, 8a, 9, 10, 12, 13, 15, 26, 27, 28 and Drain 8, and two waterbodies on 30th June 2023; Ponds 29 and 30 (see Figure 7 for waterbody locations).

4.2.1.10 Great Crested Newt Population Class Assessment Survey

Based on the results of the eDNA survey, waterbodies confirmed as containing great crested newt (i.e. Ponds 8 and 8a) were subject to further surveys to enable estimation of population sizes for each waterbody, following the approach recommended within the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001).

Six survey visits were undertaken for each waterbody during April to June 2022. Each visit was undertaken by two AECOM ecologists, one of whom holds a Natural England WML-CL08 Class 1 licence for survey of great crested newt. Following the approach recommended within the *Great Crested Newt Mitigation Guidelines*, at least three survey techniques (bottle trapping, egg searches, torch surveys) were used during each survey visit. Where it was not possible to complete one of these survey techniques, netting was used as an alternative technique.

Bottle trapping involved the installation of bottle traps at targeted locations. Bottle traps, constructed from 2 litre plastic bottles supported on bamboo canes, were located at approximately 1-2m intervals around the edge of the waterbody. On each survey visit traps were set out 1 to 2 hours before dusk and emptied and removed the next day between 6am and 9am. Traps were always $\frac{3}{4}$ submerged so that they contained at least $\frac{1}{4}$ air, and air holes were punched in the exposed ends of each bottle trap.

Egg searches were conducted in daylight when the bottle traps were removed. Egg searching was targeted at all areas of accessible submerged vegetation suitable for egg laying. In the event that a great crested newt egg was found, that waterbody was not subject to further egg searching.

Torch surveys ('torching') were undertaken using 1,000,000 candle power torches, commencing at least an hour after sunset.

Netting was conducted during trap removal in daylight hours. Netting with a 2mm mesh professional dipping net was targeted at both open water and areas of suitable egg-laying vegetation. Time spent netting was dependent on waterbody size, averaging 10 minutes in total.

Where possible the abundance, sex and life stage of all amphibians encountered was recorded.

All surveys were carried out during suitable weather conditions, at overnight temperatures between 5°C and 16°C. The conditions during the population estimate surveys are shown in Table 5 and Table 6.

Table 5. Pond 8 - environmental survey conditions for population estimate surveys

Visit Number	Date	Overnight temperature (°C)	Air temperature at time of torching (°C)	Conditions
1	27/04/2022	5	10	Still, overcast, dry, humid
2	12/05/2022	12	13	Dry, still, moderate cloud
3	16/05/2022	14	14	Mild, dry, still, overcast
4	18/05/2022	15	17	Humid, warm, overcast, light rain (stopped during survey)
5	08/06/2022	10	14	Humid, dry, overcast
6	16/06/2022	16	19	Warm, humid, overcast, dry

Table 6. Pond 8a - environmental survey conditions for population estimate surveys

Visit Number	Date	Overnight temperature	Air temperature at time of torching	Conditions
1	12/05/2022	12	13	Dry, still, moderate cloud
2	16/05/2022	14	14	Mild, dry, still, overcast
3	18/05/2022	15	17	Humid, warm, overcast, light rain (stopped during survey)
4	08/06/2022	10	14	Humid, dry, overcast
5	16/06/2022	16	19	Warm, humid, overcast, dry
6	21/06/2022	10	14	Warm, clear, still

4.2.1.11 Hazel Dormouse Presence/Absence Survey

During May 2022, three ecologists, one of whom holds a Natural England hazel dormouse class licence (Class 1 survey licence) installed 248 nest tubes at 20m intervals in suitable habitat throughout the Site, in accordance with best practice guidance specified in the Dormouse Conservation Handbook (Bright *et al.*, 2006) and an interim guidance note from Natural England (2011). Using compartment references from the *Northern Arc Allocation Planning Application: Environmental Statement Addendum* (AECOM, 2019a), 147 tubes were deployed in Compartment C to the west of Cuckfield Road, and 101 tubes were deployed in Compartment E, to the east of Cuckfield Road. Nest tubes (wooden/plastic nest tubes 250mm long and 65mm square with a wooden tray that extends beyond the end of the tube by 55mm) were secured just below branches in all hedgerows to encourage hazel dormouse to nest within them. The location of the nest tubes are shown in Figure 2. Nest tube checks were then undertaken in May, July, September and November 2022.

Scoring Index

There is an established scoring system to determine the thoroughness of any nest-tube survey. All the monthly scores for the period over which the tubes are in place are added together (irrespective of whether the tubes are actually inspected in that month). Assumed absence should not be based on a search effort score of less than 20 (Chanin & Woods, 2003). Monthly scores are based on 50 tubes in a given survey area. As more than 100 tubes were used, scores have been doubled.

4.2.2 Methodology for Determining Construction and Operational Effects

4.2.2.1 Characterising Potential Ecological Impacts

The potential ecological effects of the Proposed Development have been identified and characterised. This took into consideration the following criteria:

- **Positive or negative** – whether the effect will result in net loss or degradation of an important ecological feature or whether it would improve or enhance it;
- **Magnitude** – the size and intensity of the effect measured in relevant terms, e.g. number of individuals lost or gained, area of habitat lost or created, the degree of change to existing conditions;
- **Extent** – the spatial scope of the effect;

- **Reversibility** – the extent to which effects were reversible either spontaneously or through active mitigation;
- **Duration** – the length of time over which the effect occurred; and
- **Timing and frequency** – consideration of the timing of events in relation to ecological change; some effects might be of greater significance if they took place at certain times of year.

Potential impacts were characterised initially in the absence of any mitigation, except where this was integral to the design of the Proposed Development. A sequential process was then applied to avoid, mitigate and compensate for any significant impacts. Any additional mitigation or compensation proposed was subsequently identified and its likely effectiveness assessed.

4.2.3 Significance Criteria

4.2.3.1 Methodology for Determining Significance of Effects

The significance of the predicted impacts on important ecological features arising from the potential impacts associated with the Proposed Development, including designed-in and additional mitigation measures, was assessed. The significance of the effects was assessed as either being negative, positive or not significant.

The CIEEM EclA guidelines Version 1.3 (2018) state that ‘A *significant effect* is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring. A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects have been lawfully permitted following EIA procedures. In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).’

The valuation of sites used established value systems (e.g. SSSIs are all of national importance) and reflected the geographical context of the valuation. The categories shown in Table 7 were applied to give geographic context.

Table 7. Examples of criteria used to evaluate important ecological features in a defined geographical context

Geographical level at which ecological feature is important	Example of criteria
International (Very high)	An internationally important site, e.g. Special Protection Area (SPA), Special Area of Conservation (SAC) or Ramsar; a regularly occurring population of an internationally important species (listed on Annex IV of the Habitats Directive)
National (High)	A nationally designated site, e.g. SSSI, or a site considered worthy of such designation; a large regularly occurring population of a nationally important species
County (Medium)	An ecological feature identified in the local BAP. A smaller area of local BAP habitat which are essential to maintain the viability of a larger whole; non-statutory designated sites; a regularly occurring, locally significant number of a nationally important species. An ecological feature identified as of priority within Section 41 of the NERC Act 2006.
District (Low)	An ecological feature that is scarce within the district or borough or which appreciably enriches the district or borough habitat resource.
Local (Very low)	A good example of a common or widespread ecological feature in the local area.
Negligible	No or very limited ecological value.

4.2.3.2 Adverse Effects

For habitat areas and species, an effect is considered to be significant if the favourable conservation status of an important ecological feature would be compromised by the project. Conservation status is defined by CIEEM (2018) as being:

- **Habitats** – ‘conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.’

- **Species** – ‘conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.’

The decision as to whether the favourable conservation status of an important ecological feature is likely to be compromised was made using professional judgement through consideration of multiple factors in relation to the predicted effects of the Proposed Development.

A similar procedure was adopted for designated sites that would be affected by the Proposed Development, except that the focus in this case was on effects on the integrity of each site, defined by ODPM Circular 06/2005 and Defra Circular 01/2005 Biodiversity and geological conservation (Office of the Deputy Prime Minister, 2005) - statutory obligations and their impact within the planning system as ‘*the coherence of ecological structure and function, across a site’s whole area, that enable it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified.*’ This assessment was made with reference to the features for which a site has been classified/notified and involved combining assessments of the effects on the conservation status of each of these features.

For non-statutory sites, such features may not have been formally defined and would need to be agreed with the designating authority (e.g. local authority or county wildlife trust).

4.2.3.3 Beneficial Effects

As per CIEEM EclA guidelines Version 1.3 (2018), a positive effect was considered significant if it results in ‘*a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. Positive impacts may also include halting or slowing an existing decline in the quality of the environment.*’

Effects could be permanent or temporary, direct or indirect, and could be cumulative. These factors were brought together to assess the magnitude of the impact on particular important ecological features and, wherever possible, the magnitude of the impact was quantified.

4.2.4 Magnitude of Potential Impacts

Professional judgement was used to assign the impacts on the important ecological features to one of four classes of magnitude (see Table 8). This approach deviates from that advocated by the CIEEM EclA guidelines Version 1.3, but it enables comparison between different impact topics.

Major or **moderate** effects are regarded as **significant**. **Minor** or **negligible** effects are considered not significant. Where significant effects occur, the scale of the effect was also considered on a geographical scale (i.e. international, national, regional, county, district or local). For example, effects on habitats within a SSSI (a feature of high/national importance) may not always be significant at a national scale, but may be significant at regional, county or district level.

Table 8. Definition of magnitude of impacts

Magnitude	Definition
High	A permanent or long-term effect on the extent or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to substantially enhance its conservation status.
Medium	A permanent or long-term effect on the extent or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial, this is likely to be sustainable but unlikely to enhance its conservation status.
Low	A permanent or long-term reversible effect on a site, habitat, species assemblage or community, population or group whose magnitude is detectable but will not threaten its integrity.
Very low	A short-term but reversible effect on the extent or size or integrity of a site, habitat, species assemblage or community, population or group that is within the normal range.

4.2.5 Significance of Potential Impacts

Impacts and effects could be permanent or temporary, direct or indirect, and could be cumulative.

For this assessment a matrix approach was used, in which ecological value/importance and magnitude of impact are cross referenced to identify a level of significance. Table 9 presents the categorisation of the significance of effects.

Table 9. Significance of impacts

Feature importance	Magnitude of impact			
	High	Medium	Low	Very Low
International and National (High)	Major	Major	Moderate	Minor
County (Medium)	Major	Moderate	Minor	Negligible
District (Low)	Moderate	Minor	Negligible	Negligible
Local (Very Low)	Negligible	Negligible	Negligible	Negligible

With reference to Table 9, in accordance with CIEEM EclA guidelines Version 1.3 (2018), a clear distinction between evidence based and value-based judgements was made so that decision-makers and other stakeholders are aware of the level of subjective evaluation that has been used.

4.2.6 Terminology

The residual effects of the Proposed Development were translated to a significance level using a scale of negligible, minor, moderate and major as outlined in Table 10. In addition, Table 10 converts these conclusions an equivalent conclusion based on the CIEEM EclA guidelines Version 1.3 (2018).

Table 10. CIEEM assessment terms for significance level

Effect significance terminology		Equivalent CIEEM assessment
Significant (Beneficial)	Major Beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate Beneficial	Beneficial effect on structure/function or conservation status at regional level.
Non-significant	Minor Beneficial	Beneficial effect on structure/function or conservation status at Site or local level.
Non-significant	Negligible	No effect on structure/function or conservation status.
Non-significant	Minor Adverse	Adverse effect on structure or conservation status at Site - local level
Significant (Adverse)	Moderate Adverse	Adverse effect on structure/function or conservation status at regional level.
	Major Adverse	Adverse effect on structure/function or conservation status at regional, national or international level

4.2.7 Cumulative Assessment

Table 11 outlines schemes that have been considered as being relevant in considering the potential for ecological cumulative effects, as they lie within 1km of the Site and have the potential to affect the Site.

Table 11. Developments within 1km of the Site

Application number	Scheme	Address	Description	Status
DM/18/5114	Brookleigh	Burgess Hill Northern Arc, Land North And North West Of Burgess Hill, Between Bedelands Nature Reserve In The East And, Goddard's Green Waste Water Treatment Works In The West	Comprehensive, phased, mixed-use development comprising approximately 3,040 dwellings, three local centres, a Centre for Community Sport, healthcare facilities, employment development comprising a 4ha dedicated business park, two primary schools and a secondary school, public open space and associated infrastructure.	Under construction
DM/19/3845	Freeks Farm	Land To The West Of Freeks Lane Freeks Lane Burgess Hill West Sussex	Approval of reserved Matters pursuant to Condition 1 of DM/18/0509 for the erection of 460 dwellings, including public open space, play areas, associated infrastructure including roads, surface water attenuation and associated demolition.	Under construction

Application number	Scheme	Address	Description	Status
DM/19/3313	Eastern Bridge and Link Road	Land East Of Isaacs Lane And Land West Of Freeks Lane Burgess Hill West Sussex	Single carriageway link road from Isaacs Lane to Freeks Farm with separate 4.5m 'Green Superhighway' and cycle/footway provision. All-modes bridge across the River Adur, together with earthworks, surface water and foul drainage infrastructure, utilities corridors, street lighting, landscaping and fencing.	Under construction
DM/19/1895 (Outline) DM/21/2627 (Reserved Matters)	Fairbridge Way development	Land At And Adjacent To The Former Sewage Treatment Works Fairbridge Way Burgess Hill West Sussex RH15 8BF	Construction of 307 residential units, car and cycle parking, internal roads, a LEMP and associated boundary treatments	Under construction
DM/21/2870	Brookleigh Phase 1B	Burgess Hill Northern Arc, Land North And North West Of Burgess Hill, Between Bedelands Nature Reserve In The East And, Goddard's Green Waste Water Treatment Works In The West	Reserved Matters Application pursuant to outline application DM/18/5114. Erection of 247 dwellings, alteration to Lowlands Farm and its conversion to form two dwellings, car parking, open space and infrastructure including an extension to Bedelands Nature Reserve	Under construction
DM/22/0239	Church & Community Facility	Land Off Maple Drive Burgess Hill West Sussex	The erection of a new Church and Community Facility including all associated external works forming car, motor cycle and cycle parking and associated hard and soft landscaping.	Approved
DM/22/2553	Brookleigh Secondary School	Burgess Hill Northern Arc, Land North And North West Of Burgess Hill, Between Bedelands Nature Reserve In The East And, Goddard's Green Waste Water Treatment Works In The West	Application for reserved matters, pursuant to outline application DM/21/3279 for the erection of a Secondary School, including specialist support centre, car parking (including Electric Vehicle charging), cycle parking, drop off area, access, multi-use games area, all weather pitch, substation, bin storage, means of enclosure and lighting, with associated landscaping and infrastructure	Approved
DM/24/0222	Brookleigh Pond 22	Burgess Hill Northern Arc, Land N And NW Of Burgess Hill, Between Bedelands Nature Reserve In The East And, Goddard's Green Waste Water Treatment Works In The West	Reserved matters application pursuant to outline application DM/21/3279 for the construction and operation of a regional SuDS pond (Pond 22) and associated drainage infrastructure to provide surface water attenuation and treatment linked to a sub catchment within drainage network 9.2 of the Northern Arc Regional Surface Water Masterplan including landscaping.	Awaiting decision
DM/24/2010	Brookleigh Sub-Phase P1.8 Foul Sewer Pumping Station	Burgess Hill Northern Arc, Land N And NW Of Burgess Hill, Between Bedelands Nature Reserve In The East And, Goddard's Green Waste Water Treatment Works In The West	Reserved Matters Application pursuant to outline application DM/21/3279, to consider access, appearance, landscaping, layout and scale for the installation of a foul pumping station on Sub-Phase P1.8, to the north of Fairbridge Way and the east of Isaacs Lane at Brookleigh.	Pending consideration

4.3 Limitations

The aim of a desk study is to help characterise the baseline context of a proposed development and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitats or species does not necessarily mean that the habitats or species do not occur in the study area. Likewise, the presence of records for particular habitats and species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development.

Where habitat boundaries coincide with physical boundaries recorded on OS maps the resolution is as determined by the scale of mapping. Elsewhere, habitat mapping is as estimated in the field and/or recorded by hand-held GPS. Where areas of habitat are given, they are approximate and should be verified by measurement on site where

required for design or construction. While indicative locations of trees are recorded this does not replace requirements for detailed specialist arboricultural survey to British Standard 5837:2012 *Trees in Relation to Design, Demolition and Construction*.

During the great crested newt population class assessment survey on 18th May 2022, storms and heavy rain was predicted overnight. Therefore, bottle trapping was not used as a method due to the risk of traps becoming dislodged or water levels rising overnight.

During the great crested newt population class assessment survey on 16th June 2022, warm temperatures were predicted overnight (minimum overnight temperature of 16°C, temperatures of 19°C at the time of torching). Therefore, bottle trapping was not used due to the risk of newt mortality.

However, in both instances bottle trapping was replaced with netting. Therefore, this is not considered to be a constraint.

During the bat static automated detector surveys in April 2022, an equipment malfunction meant that data was not recorded. Therefore, the detectors were redeployed in early May 2022 to capture Spring data.

During the bat static automated detector surveys in August 2022, a fault with the static automated detector at Location C meant data was not recorded. However, as data was recorded from this location in all other months this is not considered to be a major constraint.

Heavy rain was recorded overnight prior to the dawn bat re-entry survey of Trees 96 and 97 on 6th September 2022. However, the rain ceased 2 hours 50 minutes prior to the survey and weather conditions during the survey were suitable with bat activity recorded. Therefore, this is not considered to be a constraint.

The dawn bat activity survey of Transect 2 scheduled for 12th August 2022 was cancelled due to the presence of travellers. However, this survey was rescheduled and completed on 22nd September 2022.

The dusk bat activity survey of Transect 1 on 21st September 2022 commenced 14 minutes after sunset. However, as data was collected for this Transect throughout the active bat season this is not considered to be a major constraint.

The number of emergence surveys conducted was in line with best practice guidance at the time (Collins, 2016) that listed trees as low, moderate, or high suitability with numbers of emergence surveys dependent on this suitability. Under these guidelines, low suitability trees did not receive emergence survey, moderate suitability received two (one at dusk, one at dawn), and high suitability received three (one at dusk, one at dawn, a third at either dusk or dawn). Therefore, this report includes two surveys conducted of trees that are now listed as likely PRF-I, which would now receive only a single emergence survey under the updated guidelines (Collins, 2023). As this survey effort is increased compared to the current guidelines, and these trees will not be lost to facilitate the Proposed Development, it is not considered to be a constraint to the results of this report.

Trees 39 is scheduled to be removed. These trees were most recently identified as PRF-M, but showed no signs of an active roost when subject to emergence survey in 2024. Trees 32 and 39 are scheduled to be removed and were identified as PRF-I. These trees were most recently subject to an updated suitability inspection from the ground in September 2024 and were assessed as 'likely PRF-I'. An aerial tree inspection of this tree has not been completed, and it was not subject to emergence survey in line with the guidelines at the time of survey (Collins, 2016). An aerial tree inspection will be completed to confirm the suitability of the tree, and any requirement for further survey in the unlikely event that evidence of bats is identified will be notified to the Local Planning Authority.

The northern extent of Cuckfield Road was not safe to access for any ecological survey, due to a lack of walkable verges and high vehicle speeds. However, works in this location will be restricted to the road itself and comprise small scale works such as implementation of traffic calming measures within the carriageway. Therefore, a lack of access to this part of the road and its associated verges is not considered to be a constraint to the survey.

It should be noted that ecosystems are dynamic and constantly changing, and therefore species may move, or new species may be recorded in subsequent years. For this reason, and in accordance with current guidance, the existing survey data has a 'shelf-life' of, and should only be relied on for a period of two years from the date of survey, reduced to 12-18 months for bat data (CIEEM, 2019). However, standing advice from Natural England states that for hazel dormouse "Surveys up to 3 years old are acceptable if the habitats have not significantly

*changed*¹. After these dates, an ecologist should conduct an updated walkover survey to determine if updated surveys are required.

Surveys included in this EclA are predominantly from 2022, with an updated walkover survey completed on 12th September 2024. This updated the badger survey, as badgers are a highly mobile species, the Phase 1 habitat survey, which determined habitats were similar in their suitability (or unsuitability) for protected species, and the Ground Level Tree Assessment (GLTA) for bats, which found no new features present on trees.

The Site, and wider Brookleigh site was previously surveyed in 2019 with a suite of surveys including those for hazel dormouse, bats, reptiles, breeding and non-breeding birds, great crested newt and badger, as well as habitat surveys. The 2022, 2023 and 2024 Phase 1 habitat survey updates did not find significant changes to the habitats present. Surveys completed in 2022 did not find differences in the presence or likely absence of protected species to the 2019 data, with the exception of the presence of great crested newt in Pond 8a (which was not subject to survey in 2019), and a reduction in the number of active badger setts present. Tree P12-1 was surveyed in 2024 only, as it was not previously within the boundary of the Site. The updated Phase 1 habitat survey, GLTA and badger survey did not find changes in the Site from the 2022 surveys.

In addition, this EclA takes a precautionary approach in valuing IEFs, to ensure the assessment is based on a reasonable worst-case scenario. Therefore, the majority of ecological surveys being completed in 2022 is not considered to be a constraint to identifying the significant effects likely to arise as a consequence of the construction and/or operation of the Proposed Development.

Pre-construction checks to ensure continued absence of protected species such as hazel dormice have also been recommended within this report, as construction is not anticipated to commence until later in 2025, continuing into 2026. This is to ensure compliance with wildlife legislation as part of a precautionary working method.

4.4 Quality Assurance

The AECOM ecologists who conducted the surveys and authored this report are members, at the appropriate level, of CIEEM and follow their code of professional conduct when undertaking ecological work.

¹ <https://www.gov.uk/guidance/hazel-dormice-advice-for-making-planning-decisions>

5. Baseline Conditions

5.1 Designated Sites

5.1.1 Statutory Designations

Table 12 details the statutory nature conservation designations of sites identified by the desk study, based on the method described in Section 4.2.1.1 of this report. No internationally designated sites were identified within 10km of the Site.

There is one site with National statutory designations for nature conservation within 2km of the Site. The site is a Local Nature Reserves (LNR).

Table 12 Statutory designated sites within 2km of the Site

Designation	Reason(s) for Designation	Size (hectares)	Relationship to the Site
Bedelands Farm LNR	The Nature Reserve consists of ancient meadows, woodland, hedgerows and ponds.	35.1	0.8 km east

5.1.2 Non-Statutory Designations

Table 13 details the non-statutory nature conservation designations identified by the desk study using the method described in Section 4.2.1.1 of this report. There are six sites with non-statutory designations within 2km of the Site. All of the sites are designated as Local Wildlife Sites (LWS). One site is also designated as a Local Geological Site (LGS).

Table 13 Non-statutory designations within 2km of the Site

Designation	Reason(s) for Designation	Size (hectares)	Relationship to the Site
Bedelands LWS	The site consists of an array of habitat types such as ancient woodland, open water which progresses through reedbed to species-rich willow and alder carr, species rich meadows and pastures with species rich hedgerows. This juxtaposition of habitat types makes the site important for wildlife and much of it is Local Nature Reserve (LNR).	44.4	1.2 km east
Burgess Hill Railway Lands LWS	This site consists of a series of meadows next to a railway where common herbs are well represented with species such as yarrow (<i>Achillea millefolium</i>), bird's-foot trefoil (<i>Lotus corniculatus</i>) and sorrel (<i>Rumex acetosa</i>). Other habitats add to the interest of the site including scrub, old hedges and woodland which provide cover and feeding sites for small birds and mammals.	6.7	1.5 km south-east
Catt's Wood Complex LWS	The site consists of a number of interconnected blocks of lowland mixed deciduous woodland, much of which is also species-rich ancient woodland. The ground flora includes species such as bluebell (<i>Hyacinthoides non-scripta</i>), wood anemone (<i>Anemone nemorosa</i>) and Yellow Archangel (<i>Lamium galeobdolon</i>). The site also has many recorded notable species including Hazel Dormouse (<i>Muscardinus avellanarius</i>) and Purple Emperor (<i>Apatura iris</i>).	33.2	2.7 km north-east
Great Wood & Copyhold Hanger LWS	This site consists of an ancient, wooded gill valley with several old, abandoned water meadows. The ground flora including species like bluebell (<i>Hyacinthoides non-scripta</i>) and wood anemone (<i>Anemone nemorosa</i>) is generally species-rich and well-developed especially near the streams. The site also has a particularly good fern and bryophyte communities.	50.9	1.3 km north-east
Keymer Tile Works LWS	This site consists of a matrix of successional habitats ranging from temporary pools and bare clay through unimproved grassland to dense scrub, deciduous woodland and willow carr. It is a very varied site of particular importance for breeding amphibians such as great crested newts (<i>Triturus cristatus</i>).	20.6	2.1 km south-east

Designation	Reason(s) for Designation	Size (hectares)	Relationship to the Site
Pond Lye LWS	This site includes a pond with extensive areas of sedge swamp around the margins with species such as greater pond-sedge (<i>Carex riparia</i>) and bladder-sedge (<i>Carex vesicaria</i>). There is also a species-rich neutral grassland and a meadow with locally uncommon plants. The pond is of great ornithological importance for breeding birds including great crested grebe (<i>Podiceps cristatus</i>), water rail (<i>Rallus aquaticus</i>) and mute swan (<i>Cygnus olor</i>).	17.9	1.1 km north-west

5.1.3 Ancient Woodland

The desk study found 33 areas of ancient woodland within 1km of the Site. Nine of these are within 1km of the existing Cuckfield Road only, and are beyond 1km from the proposed Central Section and associated drainage proposals. Works at this location will be limited to in-carriageway traffic calming measures. The following areas of ancient woodland are considered relevant to this assessment, as they are within or immediately adjacent to the proposed drainage infrastructure and could be subject to pollution impacts prior to mitigation:

- Bridge Farm Shaw North: ancient semi-natural woodland present within the Site (1.0ha)
- Bridge Farm Shaw 2: ancient semi-natural woodland adjacent to the south of drainage proposals in the south of the Site (0.5ha)

A full list of ancient woodlands present within 1km of the Site is provided in Appendix N.

5.2 Habitats

5.2.1 Baseline Habitat Types

In 2022, 2023 and 2024 an updated Phase 1 habitat survey was carried out to confirm the results of the 2019 survey and to cover Cuckfield Road which was not previously surveyed.

The habitats recorded and their distributions within the Site are summarised in Table 14 below and shown in Figure 1. Associated target notes (TN) and photographs of the Site are provided in Appendix A.

Table 14. Habitats present within the Site

Habitat	Description	Area (ha) or length (m)	% of Site
Hardstanding	Cuckfield Road was present through the centre of the Site.	1.76ha	23.38%
Species-poor semi-improved grassland	Species-poor semi-improved grassland was the predominant habitat type present within fields to the west of Cuckfield Road where fields are no longer used for arable crops, and within both verges of Cuckfield Road. At the time of the updated survey in September 2024, the grassland was mown with a short sward height. Species-poor semi-improved grassland was also present in the north of the Site at the location of proposed SuDS pond and detention basin. The grass in this location had a longer sward height during the 2024 updated survey with the exception of mown walking paths. It was otherwise unchanged since the 2019 survey.	3.93ha	52.21%
Improved grassland	Improved grassland was present to the east of Cuckfield Road, dominated by perennial rye grass (<i>Lolium perenne</i>).	0.96ha	12.75%
Broadleaved parkland/scattered trees	Uniformly planted scattered broadleaved trees were recorded within amenity grassland on the golf course in the south of the Site and along the eastern verge of Cuckfield Road. Scattered trees were also present in the north of the Site, to the south-east and south-west of the proposed SuDS pond and detention basin.	0.26ha	3.45%
Cultivated/disturbed land - amenity grassland	Amenity grassland was present within Burgess Hill Golf Centre and in the verge of Cuckfield Road.	0.53ha	7.04%

Habitat	Description	Area (ha) or length (m)	% of Site
Tall ruderal vegetation	A small area of tall ruderal vegetation is present in the west of the location of the proposed SuDS pond and detention basin	0.003ha	0.04%
Intact hedge with trees – native species rich	Native species rich hedges with trees are present in a network west of Cuckfield Road.	109.46m	N/A
Intact hedge – native species rich	An intact, species-rich hedgerow was present in the north of the Site, south of the proposed SuDS pond and detention basin.	172.51m	N/A
Intact hedge – species-poor	An intact, species-poor hedgerow was present to the east of Cuckfield Road.	586.82m	N/A
Defunct hedge - species-poor hedge	A defunct, species-poor hedge is present in the south of the Site, west of Cuckfield Road.	195.85m	N/A
Defunct hedge – native species-rich	A defunct, native species-rich hedge is present along the western edge of Bridge Farm Shaw North	52.91m	N/A
Ancient woodland	Ancient woodland is present in the north of the Site (Bridge Farm Shaw North), where a proposed drainage connection will be constructed. Ancient woodland is also present outside of the Site to the south of drainage proposals in the south of the Site. At this location, an outfall will be constructed immediately north of the 15m buffer around this ancient woodland.	0.01ha	0.13%
Bracken	Bracken (<i>Pteridium aquilinum</i>) was present along the western edge of Bridge Farm Shaw North.	0.025ha	0.33%
Standing water	A pond (Pond 8) is present in the north of the Site where a SuDS pond and detention basin are proposed. A second pond (Pond 29) will have an outflow constructed for a surface water drainage pipe, with surface water discharging into the waterbody.	0.05ha	0.66%

Habitats recorded within the Site are described in detail below.

The DAFOR method has been used to define Dominant, Abundant, Frequent, Occasional and Rare species as indicated by the corresponding letter.

5.2.1.1 Hardstanding

Cuckfield Road (a single carriageway road) is present through the centre of the Site (TN11).

5.2.1.2 Species-poor semi-improved grassland

Species-poor semi-improved grassland was present in all fields within the Site to the west of Cuckfield Road. This predominantly had a short sward height at the time of the 2024 survey (TN1, TN4, Plate 5 and Plate 6) with the exception of a field in the north of the Site, where a SuDS pond and detention basin are proposed. At this location was a longer sward height with a tussocky grassland present, with the exception of mown walking paths (TN5, Plate 7). Species present throughout included dominant perennial rye grass, abundant white clover (*Trifolium repens*), and rarely recorded dandelion (*Taraxacum officinale* agg.), common fleabane (*Pulicaria dysenterica*), betony (*Stachys officinalis*), bristly ox tongue (*Helminthotheca echioides*) and bramble (*Rubus fruticosus* agg.).

Species-poor semi-improved grassland was also present within the east and west verges of Cuckfield Road. Species present included abundant perennial rye grass, frequent yarrow (*Achillea millefolium*) and common nettle (*Urtica dioica*), with occasional ragwort (*Senecio jacobaea*) and creeping thistle (*Cirsium arvense*).

5.2.1.3 Improved grassland

Improved grassland was present in the east of the Site, east of Cuckfield Road (TN13, Plate 10). This had a tall (10cm) sward height at the time of the September 2024 survey and was dominated by perennial rye grass.

5.2.1.4 Broadleaved parkland/scattered trees

Scattered semi-mature English oak (*Quercus robur*) were present within amenity grassland in Burgess Hill Golf Centre in the south of the Site (Plate 13).

Individual ash (*Fraxinus excelsior*), oak (*Quercus* sp.) and coniferous trees were present along the eastern verge of Cuckfield Road.

Hawthorn (*Crataegus monogyna*) and English oak trees were present in the north of the Site where a SuDS pond and detention basin are proposed (Plate 7).

5.2.1.5 Cultivated/disturbed land - amenity grassland

Amenity grassland was present within Burgess Hill Golf Centre (TN9, Plate 13) and in the western verge of Cuckfield Road at the Burgess Hill Golf Centre entrance (Plate 14). Species present in both locations included dominant perennial rye grass, with frequent creeping buttercup (*Ranunculus repens*) and white clover, with occasional red fescue (*Festuca rubra*).

5.2.1.6 Tall ruderal vegetation

A small area of tall ruderal vegetation is present in the west of the location of the proposed SuDS pond and detention basin, between scattered trees and species-poor semi-improved grassland. Species predominantly comprised teasel (*Dipsacus fullonum*) and common nettle.

5.2.1.7 Hedge with trees – native species rich

Native, species-rich hedgerows with trees were present within a network west of Cuckfield Road (TN2, TN7, Plate 11 and Plate 12). Species recorded included hawthorn, blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), alder (*Alnus glutinosa*), and dog rose (*Rosa canina*), all frequently recorded. Trees within the hedgerows comprised English oak.

5.2.1.8 Intact Hedge – native species rich

A native, species-rich hedge was present west of Cuckfield Road, to the south of the proposed SuDS pond and detention basin. Species present included abundant blackthorn and hawthorn, along with occasional field maple and willow (*Salix* sp.).

5.2.1.9 Intact Hedge – species poor

Species-poor hedgerows were present along the east and west verges of Cuckfield Road (TN8, TN12, Plate 15 and Plate 16). The hedgerow to the west comprised abundant hawthorn, frequent blackthorn and occasional bramble. The hedgerow to the east comprised the same species, all frequently recorded.

5.2.1.10 Defunct Hedgerows

A defunct, species-poor hedge, with no connectivity to other hedgerows, was present within the Burgess Hill Golf Centre. A defunct, species-rich hedge was present along the western edge of Bridge Farm Shaw North, with connectivity to the woodland to the north, but no connectivity to other hedgerows to the south.

5.2.1.11 Ancient woodland

Ancient woodland was present in the north of the Site, where a drainage outfall is proposed. This woodland forms part of the wider Bridge Farm North Shaw. This woodland is dominated by oak with frequent silver birch (*Betula pendula*) and occasional hornbeam (*Carpinus betulus*). Within the Site, the woodland is located on steep-sided banks either side of an access track, with a small ditch (dry at the time of survey) present along the west of the track. Wild garlic (*Alium ursinum*), dog's mercury (*Mercurialis perennis*) and moschatel (*Adoxa moschatellina*) are present, along with opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*). The woodland is not considered to be ghyll woodland as it lacks the topography, microclimate characteristics and indicator species of ghyll woodland.

The track within the woodland was overgrown with common hogweed (*Heracleum sphondylium*), bramble and common nettle at the time of the September 2024 survey (TN6, Plate 8). Bracken was present along the western bank, adjacent to the existing track at the southern extent of the woodland.

Himalayan balsam (*Impatiens glandulifera*), an invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), was present north of the Site, along the track within this ancient woodland (TN16). This is discussed further in Section 5.3.8.

5.2.1.12 Standing water

A pond was present in the north of the Site (Pond 8), adjacent to the proposed SuDS pond and detention basin. This is present within an area of trees, including hawthorn and blackthorn and is heavily shaded with no marginal vegetation, and very limited aquatic vegetation present (TN15, Plate 18).

A second pond is present to the south of the Site (Pond 29), within the Burgess Hill Golf Centre. This pond is mostly within the 15m buffer zone of ancient woodland Bridge Farm Shaw 2. However, a small section is outside of this 15m buffer zone. This is a man-made pond with some vegetation present, including soft rush (*Juncus effusus*) and flag iris (*Iris pseudacorus*) (TN10, Plate 19).

5.3 Protected and Notable Species

5.3.1 Bats

5.3.1.1 Desk Study

The desk study returned records of eight bat species within 2km of the Site within the last 10 years; *Chiroptera* bat (*Chiroptera*), *Myotis* bat (*Myotis* sp.), Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*Myotis nattereri*), pipistrelle bat species (*Pipistrellus* sp.), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*). The nearest records are common pipistrelle and soprano pipistrelle 0.6km north-east of the Site. Full desk study results are in Appendix N.

As reported in Appendix 6-7 of the *Northern Arc Allocation Planning Application: Environmental Statement Addendum* (AECOM, 2019b), during walked transect surveys in 2019, common pipistrelle, soprano pipistrelle, *Myotis* bat species, brown long-eared bat and noctule (*Nyctalus noctula*) were recorded.

Surveys in 2019 also assessed roost potential on structures within and adjacent to Site. Four trees within the Site were recorded with low suitability for supporting roosting bats. Buildings 11 and 12, located approximately 80m south of the Site were recorded as having low suitability for supporting roosting bats. Building 10 approximately 90m south of the Site was confirmed to support roosting common pipistrelle and soprano pipistrelle (AECOM, 2019b).

Two static automated detectors within habitat connected to the Site deployed in 2019 recorded common pipistrelle, soprano pipistrelle, noctule, *Myotis* bat species, brown long-eared bat, serotine (*Eptesicus serotinus*), Leisler's bat (*Nyctalus leisleri*), barbastelle (*Barbastella barbastellus*) and Nathusius' pipistrelle (*Pipistrellus nathusii*) (AECOM, 2019b).

5.3.1.2 Initial Bat Roost Suitability Assessment of Trees

Surveys completed between 2022 and 2024 identified seven trees within the Site that are suitable to support roosting bats (CS10, P12-1, AW15, 32, 39, 96 and 97). In addition, Tree 95 is adjacent to the north of the Site.

Of these, Trees CS10, 32, 95, 96 and 97 were assessed as being likely PRF-I (i.e. suitable to support individual or small numbers of bats). Trees P12-1, AW15 and 39 were assessed as being likely PRF-M (i.e. suitable to support a maternity roost).

Full details of the initial inspection can be found in Appendix E, with tree locations shown in Figure 3.

5.3.1.3 Bat Emergence Surveys

Trees 39 (Arboricultural Survey Tree Ref: H119) and P12-1 (Arboricultural Tree Survey Ref: T191) with likely PRF-M suitability were subject to emergence survey, as at the time of survey they were anticipated to be lost to facilitate the Proposed Development. Tree AW15 (Arboricultural Survey Tree Ref: T189), also with likely PRF-M suitability was not subject to emergence survey, as this tree will not be impacted by the Proposed Development.

Trees 95, 96 and 97 (Arboricultural Survey Tree Refs: T79, T74 and T90) with likely PRF-I suitability (as of the September 2024 survey) were also subject to emergence survey in 2022, as recommended by guidelines at the time of survey (in 2022, these trees were assessed as 'moderate' suitability using Collins (2016), and were therefore subject to survey).

A summary of the results of the dusk emergence and dawn re-entry surveys completed on Trees 39, 95, 96, 97 and P12-1 are presented below, with full results contained in Appendix F. No bats were recorded roosting in any of these trees (see Table 15).

Table 15. Summary of bat emergence surveys

Ecology Reference (Arboricultural Tree Tag Ref)	Tree Survey Dates	Confirmed Roost?	Notes
T39 (H119)	15 th August 2022	No	During the surveys, common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, serotine, and <i>Myotis</i> species were recorded foraging and commuting in the wider area.
	31 st August 2022		
	20 th September 2022		

T95 (T75)	16 th August 2022 30 th August 2022	No	During the surveys, common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, and serotine were recorded foraging and commuting in the wider area.
T97 (T90)	15 th August 2022 6 th September 2022	No	During the surveys, common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, and <i>Myotis</i> species were recorded foraging and commuting in the wider area
T12-1 (T191)	13 th August 2024 29 th August 2024 23 rd September 2024	No	During the surveys, common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, serotine, brown long-eared bat, and <i>Myotis</i> species were recorded foraging and commuting in the wider area.

5.3.1.4 Bat Activity Surveys and Static Automated Detector Surveys

A summary of the results of the walked transect activity surveys and static automated detector surveys are presented below. Full results of walked transect surveys are provided in Appendix G, with sonograms of species recorded are contained within Appendix H. Transect points (TP) are shown in Figure 4. The mapped survey results are shown in Figure 5 (sheets A – G). Full results of the static automated detector surveys are provided in Appendix I, with sonograms of species recorded in Appendix J.

Based on the walked transects and static automated detector surveys completed between April and October 2022 inclusive, and activity recorded during bat emergence surveys in 2022 and 2024, the Site is considered to support an assemblage of at least nine species comprising common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, serotine, Leisler's bat, brown long-eared bat, barbastelle bat and *Myotis* species, with one *Myotis* species, Daubenton's bat, identified to species level. Based on the results of advance bat technique surveys utilising mist nets and harp traps conducted in 2019 (AECOM, 2019b) it is considered likely that other *Myotis* species utilise the Site for transit with whiskered bat (*Myotis mystacinus*), Brandt's bat (*Myotis brandtii*), Natterer's bat and Bechstein's bat (*Myotis bechsteinii*) recorded in the wider Brookleigh site.

Myotis species bats were recorded at all static automated detector locations in all months with the exception of Location C in late May 2022, and Location D in August 2022. No registrations of *Myotis* species were recorded at Location C in August 2022; however, this static automated detector was not functional during this month. Total registrations at each location in each month were generally low, with the highest number of registrations recorded at Location C in September 2022 with a total of 232 registrations, followed by Location A in early May 2022 with a total of 168 registrations and Location A in late May 2022 with a total of 157 registrations. On this basis, the Site isn't considered to be of particular importance for *Myotis* species bats and is considered likely to be used for occasional transit through the Site, with some likely periods of sustained foraging. See Table 16 for further details.

Table 16. *Myotis* species registrations in each month (2022) by static automated detector location

Detector Location	Early May	Late May	June	July	August	September	October
A	168	157	8	48	45	14	46
B	30	29	10	10	33	70	38
C	11	0	7	8	N/A detector fault	232	16
D	1	3	3	1	0	29	2

Barbastelle bats were recorded in low numbers at static automated detector locations A and B only. A single barbastelle bat was recorded at Location B on 14th May 2022. Two registrations were recorded on 25th May and one on 26th May at Location A. Two possible barbastelle registrations were recorded at Location A on 22nd June

2022. Two possible barbastelle bat registrations were recorded at Location B on 20th July 2022. One possible barbastelle bat registration was recorded on 13th August 2022 and three possible registrations were recorded on 15th August 2022 at Location A. A single barbastelle bat registration was recorded at Location A on 19th October 2022. Due to the low number of registrations, it is considered likely that this species is using the Site for occasional transit, predominantly using the hedgerow where the static automated detector at Location A was situated, and less so at the hedgerow where Location B was situated (see Figure 4).

The majority of activity recorded during the walked transect surveys was of common pipistrelle, followed by soprano pipistrelle in line with the relative abundance of these species as well as the relative detectability of their calls. Based on professional judgement, activity levels of all species recorded during the walked transects were considered generally to be low across the Site itself, with activity concentrated at hedgerows and tree lines. In the wider transect route, activity was generally concentrated along hedgerows and woodland edges, particularly the northern edge of Bridge Farm Shaw, south of the proposed Central Section.

In the majority of static automated detector monitoring occasions, common pipistrelle was the most frequently recorded species. However, on eight monitoring occasions soprano pipistrelle was the most frequently recorded (Location A in early May, June and July 2022, Location B in late May, June, July and August 2022, and Location D in September 2022), at Location A in late May 2022 pipistrelle bat (common or soprano pipistrelle) was most frequently recorded, and at Location C in September 2022 *Myotis* species was most frequently recorded.

Notwithstanding their legal protection, based on the rarity categories within the Bat Mitigation Guidelines (Reason & Wray, 2023); common pipistrelle, soprano pipistrelle and brown long-eared bat are widespread in Southern England, noctule is widespread, but not abundant, and Nathusius' pipistrelle, Leisler's bat and serotine have a rarer or restricted distribution. Of the *Myotis* species, the majority are considered widespread, but not abundant with the exception of Alcahloe bat (*Myotis alcathoe*) which is considered rarer or restricted distribution but has not been recorded within the Brookleigh site previously, and Bechstein's bat which is considered to be very rare. Bechstein's bat is considered unlikely to be utilising the Site for anything other than occasional transit, but has been recorded within ancient woodland in the wider Brookleigh site. Barbastelle bat is considered to be very rare.

Table 3.3 'Assessing the importance of a bat assemblage' within the Bat Mitigation Guidelines (Reason & Wray, 2023) has been used to provide an assessment of the importance of the bat assemblage present. The Site is considered to be within the 'Southern England' geographic category.

Using a combination of both survey and desk study data for the Site, common pipistrelle, soprano pipistrelle and brown long-eared bat have been assigned a score of one, noctule has been assigned a score of two, and Nathusius' pipistrelle, Leisler's bat and serotine have been assigned a score of three. Using a reasonable worst-case scenario based on professional judgement, it is assumed that the *Myotis* registrations detected within the Site comprise whiskered bat, Brandt's bat, Natterer's bat and Daubenton's bat. These species have each been assigned a score of two. Barbastelle bat has been assigned a score of four. Therefore, in total the bat assemblage has a score of 26 which is at Regional importance. However, taking into consideration the habitats present within the Site itself, and the generally low number of individual bats recorded during surveys completed in 2022 a County (Medium) importance is considered appropriate.

5.3.2 Badger

5.3.2.1 Desk Study

No records of badger were returned from the desk study search.

During surveys conducted by AECOM in 2019, one active main badger sett was recorded [REDACTED]. Additional active outlier and annexe setts were located [REDACTED] (AECOM, 2019c). Two outlier setts (C4 and C5) were recorded [REDACTED].

An outlier sett relating to the badger clan in this area was also recorded [REDACTED] (sett C12).

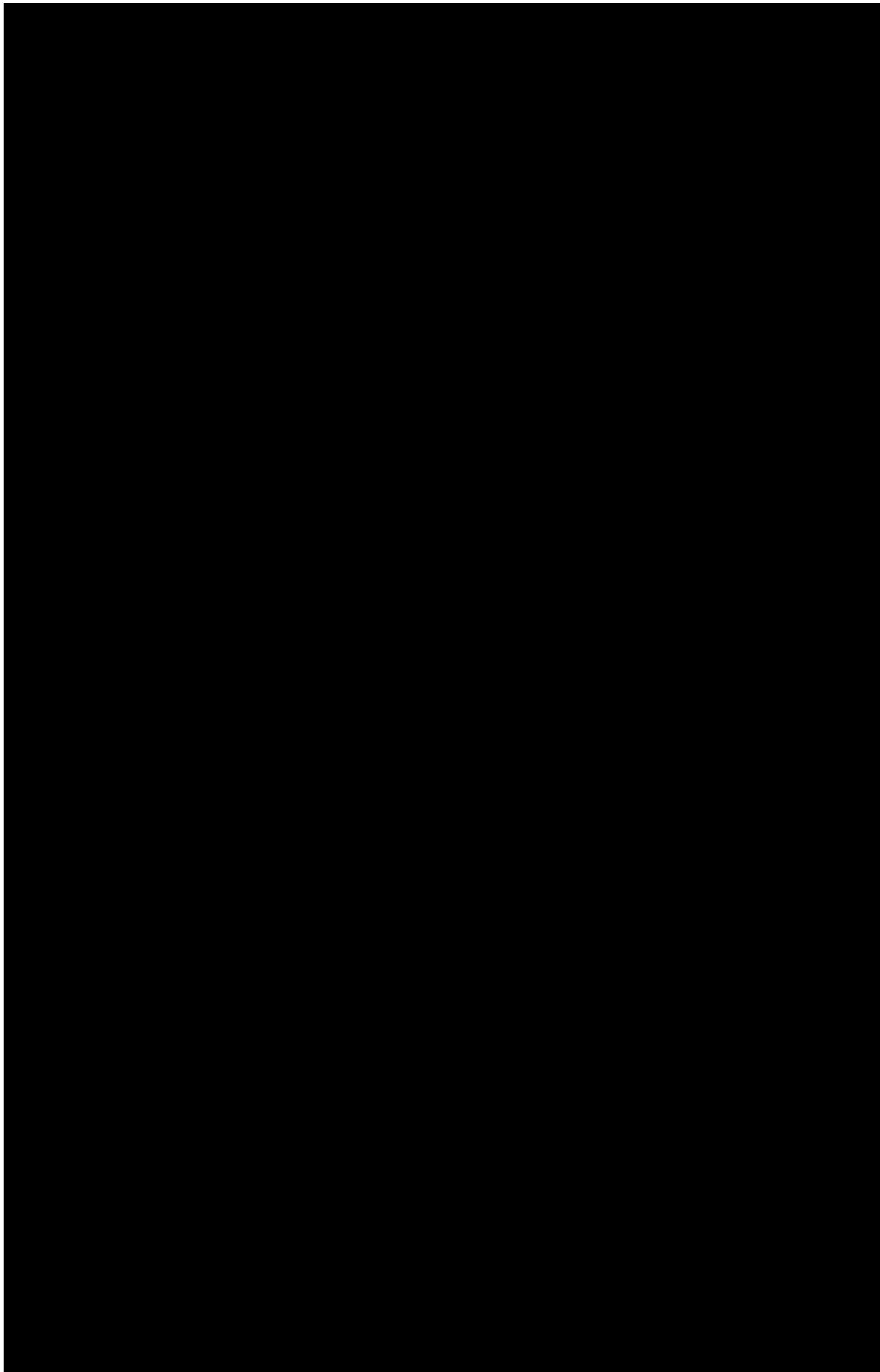
A summary of the findings of the 2019 surveys are presented in Table 17.

Table 17. Badger results

Sett ID	Sett classification	Activity
Sett C1	Main	Well-used
Sett C2	Annexe	Well-used
Sett C3	Outlier	Partially-used
Sett C4	Outlier	Disused
Sett C5	Outlier	Partially-used
Sett C6	Outlier	Partially-used
Sett C7	Subsidiary	Disused
Sett C8	Subsidiary	Well-used
Sett C9	Outlier	Partially-used
Sett C10	Outlier	Partially-used
Sett C12	Outlier	Partially-used
Sett D1	Outlier	Disused
Sett E6	Outlier	Disused
Sett E7	Outlier	Disused

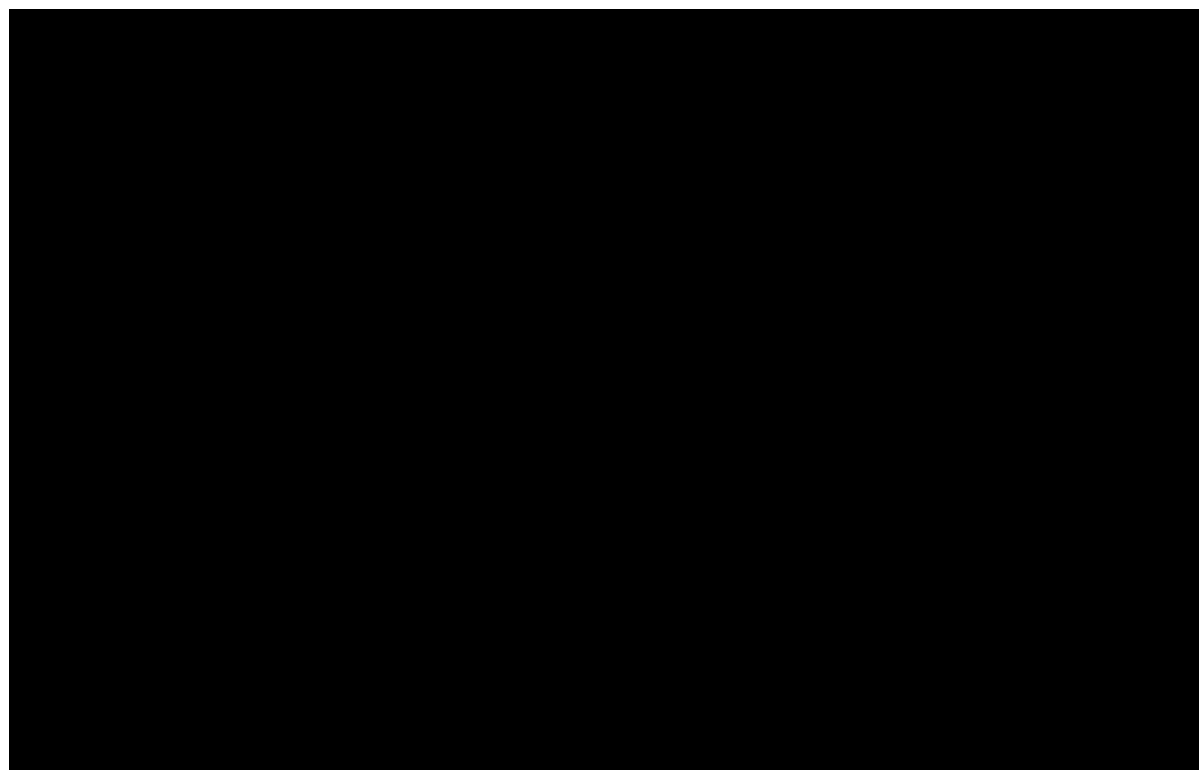
5.3.2.2 Badger Presence / Absence Survey

No new badger setts/signs were identified during the surveys completed in 2022 and 2024. All signs present during the most recent 2024 survey are detailed below. C4 and C5 were still present, [REDACTED] (Plate 1 and Plate 2). Both were found to be active in 2024. No other badger setts were recorded within 30m of the Site.



The main sett (C1) was still present in 2024, and heavily used with recently used bedding material outside some sett entrances and well-worn paths present (Plate 3). Setts C2 and C6 were also present in 2024, with sett C2 well-

used, and sett C6 partially-used. Setts C7 – C12 were not subject to survey in 2022 or 2024 due to their distance from the Site, but are assumed to remain present.



Setts D1, E6 and E7 were not present during the 2022 or 2024 surveys. All setts of relevance to the Site (including those at a suitable distance to not be directly impacted by construction, but where the Proposed Development will have severe connections between setts) are shown in Figure 6.

5.3.3 Great Crested Newt

5.3.3.1 Desk Study

The desk study returned records of great crested newts within 2km of the Site within the last 10 years. The nearest record was 0.1km north of the Site. Full desk study results are in Appendix N.

On the basis of surveys completed by AECOM in 2019, one pond within the Site boundary (Pond 8) previously supported a small population of great crested newt (AECOM, 2019d). Out of an additional 19 waterbodies within 250m of the Site, 10 returned a negative result for great crested newt, six were scoped out as they had evidently been dry for a number of years, one was not accessible with great crested newt assumed absent on the basis of surrounding waterbodies' results, one was not subject to survey in 2019, and one (Pond 30) returned a positive eDNA result, but no great crested newts were present during population class assessment surveys.

5.3.3.2 Habitat Suitability Index Assessment

A total of 18 waterbodies were subject to HSI assessment during 2022, with two additional waterbodies (Ponds 29 and 30) subject to HSI assessment in 2023. The results of the HSI assessments are summarised in Table 18 below. Full HSI assessment data are provided in Appendix K. Three waterbodies within 250m of the Application Site were not subject to HSI assessment as they had evidently been dry for a prolonged period. One waterbody within 250m of the Site (Pond 11) could not be accessed. Waterbody locations are shown in Figure 7.

Table 18 Summary of Habitat Suitability Index scores for all waterbodies surveyed

Waterbody reference	HSI score	Habitat suitability	Scoped in for eDNA survey
Drain 7	0.40	Poor	Scoped out due to presence of running water
Drain 8	0.46	Poor	Scoped in
Drain 9	DRY		Scoped out
Drain 10	0.38	Poor	Scoped out
Drain 11	DRY		Scoped out
Pond 8a	0.64	Average	Scoped in

Waterbody reference	HSI score	Habitat suitability	Scoped in for eDNA survey
Pond 8	0.77	Good	Scoped in
Pond 9	0.74	Good	Scoped in
Pond 10	0.75	Good	Scoped in
Pond 12	0.70	Good	Scoped in
Pond 13	0.68	Average	Scoped in
Pond 14	0.38	Poor	Scoped out
Pond 15	0.73	Good	Scoped in
Pond 16	0.43	Poor	Scoped out
Pond 26	0.66	Average	Scoped in
Pond 27	0.62	Below average	Scoped in
Pond 28	0.58	Below average	Scoped in
Pond 29	0.66	Average	Scoped in
Pond 30	0.69	Average	Scoped in
Pond 34	DRY		Scoped out

5.3.3.3 Great Crested Newt eDNA Survey

A total of 11 waterbodies were subject to eDNA survey in 2022, with two additional waterbodies (Ponds 29 and 30) subject to eDNA survey in 2023. Two waterbodies tested positive for great crested newt DNA, indicating presence of great crested newt: Pond 8 and Pond 8a. All other ponds returned a negative result, with great crested newt considered likely absent. This included Pond 30, which returned a positive result during surveys in 2019. This pond has been assumed to support a small population of great crested newt as a precaution.

eDNA survey results for all waterbodies surveyed are provided in Appendix L.

5.3.3.4 Great Crested Newt Population Class Assessment

Two waterbodies were subject to surveys to enable estimation of great crested newt population size in 2022. The results of these are summarised in Table 19 below. Full results from these surveys are provided in Appendix M.

Based on the peak adult count per night using a single survey method, Pond 8 had a maximum count of one adult great crested newt, and Pond 8a had a maximum count of three adult great crested newts. Great crested newt eggs were found in both Pond 8 and Pond 8a. Therefore, Pond 8 and Pond 8a are each considered to support a small breeding population of great crested newt. These ponds are located 380m apart, with short mown grassland on previously arable land between the two ponds. Therefore, these are considered likely to be two separate populations of great crested newt.

Table 19 Summary of the results of population estimate surveys

Waterbody reference	Survey visit					
	1	2	3	4	5	6
Pond 8	Bottle trapping: 1x adult female	Bottle trapping: none	Bottle trapping: none	Bottle trapping: N/A	Bottle trapping: none	Bottle trapping: N/A
	Egg searching: none	Egg searching: none	Egg searching: none	Egg searching: 2x GCN egg	Egg searching: N/A	Egg searching: N/A
	Torching: none	Torching: none	Torching: none	Torching: none	Torching: none	Torching: none
	Netting: N/A	Netting: none	Netting: none	Netting: none	Netting: N/A	Netting: none
Pond 8a	Bottle trapping: 1x adult male	Bottle trapping: 1x adult male 1x adult female	Bottle trapping: N/A	Bottle trapping: none	Bottle trapping: N/A	Bottle trapping: 1x adult male
	Egg searching: none	Egg searching: 2x GCN egg	Egg searching: N/A	Egg searching: N/A	Egg searching: N/A	Egg searching: N/A

Torching: none	Torching: 1x adult male 2x adult female	Torching: none	Torching: none	Torching: none	Torching: none
Netting: none	Netting: N/A	Netting: none	Netting: N/A	Netting: none	Netting: N/A

5.3.4 Hazel Dormouse

5.3.4.1 Desk Study

The desk study returned records of hazel dormouse within 2km of the Site within the last 10 years. The nearest record was 1km East of the Site. Full desk study results are in Appendix K.

Hazel dormouse surveys undertaken by AECOM in 2019 recorded no evidence of hazel dormice to the west of Isaacs Lane where the Site is located (AECOM, 2019e).

5.3.4.2 Hazel Dormouse Presence / Absence Survey

The findings of the hazel dormouse nest tube surveys carried out in May, July, September and November 2022 are set out in Table 20 below. Locations of the nest tubes are indicated on Figure 2. No evidence of hazel dormouse was found. Evidence of wood mouse (*Apodemus sylvaticus*) and birds' nests (mainly blue tits *Cyanistes caeruleus*) were recorded.

Table 20 Dormouse presence and absence. Date: May - November 2022

Date	Refugia number	Refugia type	Observation
May			
31/05/22	West 112	Tube	Bird Nest
July			
28/07/22	West 41	Tube	Other Mammal nest - Loose green leaves from other mouse
28/07/22	West 70	Tube	Other Mammal nest - Wood mouse nest - loose green leaves
28/07/22	West 99	Tube	Other Mammal nest - Wood mouse nest - loose green leaves
28/07/22	West 108	Tube	Bird Nest – Moss nest
28/07/22	West 112	Tube	Bird Nest
September			
29/09/22	West 74	Tube	Other Mammal nest – wood mouse
29/09/22	West 2	Tube	Other Mammal in nest - Wood mouse in nest
29/09/22	West 48	Tube	Other Mammal in nest - Wood mouse
November			
24/11/22	West 1	Tube	Other Mammal nest - Wood mouse nest
24/11/22	West 5	Tube	Other Mammal nest - Wood mouse nest
24/11/22	West 21	Tube	Other Mammal nest - Wood mouse nest
24/11/22	West 137	Tube	Other Mammal in nest - Wood mouse
24/11/22	West 122	Tube	Other Mammal nest - Wood mouse
24/11/22	East 15	Tube	Other Mammal in nest - 2 Wood mice in nest
24/11/22	East 46	Tube	Other Mammal nest - Wood mouse

5.3.5 Reptiles

5.3.5.1 Desk Study

The desk study returned records for slow worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*). Slow worm was recorded 1.1km south-west of the Site in 2019, with the closest record 0.9km south-east of the Site in 2016. Grass snake was recorded 1.3km south-west of the Site in 2016.

Surveys completed by AECOM in 2019 of species-poor semi-improved grassland in the north of the Site, west of Cuckfield Road found reptiles to be absent. Grass snake, slow worm and common lizard (*Zootoca vivipara*) were present in the wider Brookleigh site (AECOM, 2019f).

5.3.5.2 Field Survey

Habitat within the Site, confined to the longer sward height species-poor semi-improved grassland in the north of the Site, west of Cuckfield Road, was suitable to support common reptile species (grass snake, slow worm and common lizard). While hedgerows within the Site may provide connectivity to suitable reptile habitat approximately 220m south of suitable habitat in the north of the Site (approximately 50m south of the Site itself), these will be retained with small extents lost.

Due to the small extent of these areas of the Site, and the proposed future use continuing to provide suitable habitat for reptiles for the area in the north of the Site and limited loss of hedgerows in the remainder of the Site, no further survey was completed.

5.3.6 Birds

5.3.6.1 Desk Study

The desk study returned records of 32 bird species within 2km of the Site. The closest records were from 0.5km south-west of the Site for barn owl (*Tyto alba*), starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), grey wagtail (*Motacilla cinerea*), hawfinch (*Coccothraustes coccothraustes*), kestrel (*Falco tinnunculus*), hobby (*Falco subbuteo*), cuckoo (*Cuculus canorus*), stock dove (*Columba oenas*), common gull (*Larus canus*), herring gull (*Larus argentatus*), mallard (*Anas platyrhynchos*), and red kite (*Milvus milvus*).

Breeding bird surveys completed by AECOM in 2019 recorded wren (*Troglodytes troglodytes*) and moorhen (*Gallinula chloropus*) within the Site (AECOM, 2019h). At the time of the 2019 survey, these species were 'green' listed. However, under the new Birds of Conservation Concern 5 (BoCC5) released in 2021, these two species are now on the 'amber' list (Stanbury *et al.*, 2021). No other 'amber' or 'red' listed bird species territories were recorded within the Site.

Non-breeding bird surveys completed by AECOM during the 2018/2019 winter period recorded the following species on the BoCC5 'amber' list within the Site; mallard, redwing (*Turdus iliacus*), and black-headed gull (*Chroicocephalus ridibundus*). The surveys also recorded fieldfare (*Turdus pilaris*), starling and herring gull, all on the BoCC5 'red' list (AECOM, 2019g).

5.3.6.2 Field Survey

Habitats within the Site remain suitable to support breeding and non-breeding bird species. However, the Proposed Development will retain the majority of habitat used by these species; therefore, no further survey was completed.

A single barn owl was recorded commuting north to south through the Site during the bat emergence survey of Tree P12-1 on 23rd September 2024. Habitats within the Site suitable for barn owl are limited, with large amounts of suitable habitat to the north of the wider Brookleigh Site. Therefore, this species is not considered to be resident within the Site and is likely to use the Site occasionally for commuting and foraging. As a precaution it is assumed the area is used by one foraging pair.

5.3.7 Terrestrial invertebrates

5.3.7.1 Desk Study

The desk study returned records of 44 invertebrate species within 2km of the Site. This included stag beetle (*Lucanus cervus*) recorded 1.5km south-east of the Site in 2015.

Across the wider Brookleigh site, terrestrial invertebrate surveys completed in 2019 recorded a total of 272 invertebrate species, 36 of which are uncommon or otherwise unusual. Of these 36 uncommon species, 13 were recorded within survey 'compartments' which include the Site (AECOM, 2019i), but also included habitats to the north, south, east and west of the Site including semi-improved grassland, ancient woodland, broadleaved semi-natural woodland, river corridors, an orchard, and parkland with scattered mature trees.

The terrestrial invertebrate survey of the wider Brookleigh site in 2019 concluded that all species found were typical of the region. It also concluded that the golf course and arable habitats present had low insect diversity, with woodland and rough grassland supporting a higher diversity (AECOM, 2019i).

5.3.7.2 Field Survey

The Site predominantly comprised a golf course, and former arable habitats now comprising short mown species-poor semi-improved grassland and improved grassland. These are considered unlikely to support an important

assemblage of terrestrial invertebrates. The Site also supported ancient woodland, trees, hedgerows, a pond and species-poor semi-improved grassland of a taller sward height. However, these habitats are limited within the Site and are therefore considered unlikely to support important invertebrate assemblages.

5.3.8 Invasive Non-native Species

5.3.8.1 Desk Study

The desk study returned records of ten species that are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), considered to be invasive non-native species. This included Japanese knotweed (*Reynoutria japonica*), three-cornered garlic (*Allium triquetrum*), and Himalayan balsam. No records were returned from within the Site.

Japanese knotweed, three-cornered garlic and Himalayan balsam were all recorded during surveys completed by AECOM in 2019 in the wider Brookleigh site (AECOM, 2019a).

5.3.8.2 Field Survey

Himalayan balsam was recorded to the north of the Site within Bridge Farm Shaw North during the updated walkover survey in 2024, along the drainage ditch that the proposed SuDS pond will discharge into (Plate 4, TN16 in Figure 1). This comprised a stand approximately 2m x 6m in size. The Himalayan balsam was present among other ruderal species, such as common nettle.



Plate 4. Himalayan balsam north of the Site, looking west (indicated by red circles). Photo taken 12/09/2024.

5.3.9 Hedgehog

5.3.9.1 Desk Study

The desk study returned records for hedgehog (*Erinaceus europaeus*), with the closest being 0.4km south of the Site in 2017. The most recent record returned was 0.7km west of the Site in 2023.

5.3.9.2 Field Survey

Habitats within the Site are suitable to support hedgehog, including hedgerows, woodland and species-poor semi-improved grassland.

6. Evaluation

In reference to Table 7, on the basis of the desk study and field surveys undertaken, the important ecological features considered within this assessment are evaluated in Table 21 below.

Table 21. Evaluation of ecological features

Feature	Importance category	Further consideration required?	Rationale for scoping in or out of further assessment
Bedelands Farm LNR	County (Medium)	No	The nearest statutory designated site, Bedelands Farm LNR, is located approximately 0.8km from the Site. Considering the scale of potential impacts of the Proposed Development and that the LNR is upstream from the Site, no impacts on any national statutory nature conservation designations are anticipated.
Non-statutory nature conservation designations	County (Medium)	No	Bedelands LWS is the closest non-statutory designated site, approximately 1.2km east from the Site. Considering the distance of this non-statutory designated site and as all other non-statutory designated sites are beyond 1km from the Site with no river connectivity (or are upstream from the Site), no impacts on any non-statutory nature conservation designations are anticipated.
Ancient woodland	County (Medium)	Yes	Bridge Farm North Shaw is within the Site. Construction of a drainage outfall is proposed within the ancient woodland. Further consideration is required. A drainage outfall is also proposed in an online waterbody that is partially within the ancient woodland 15m buffer zone. All construction for this outfall will be outside of the ancient woodland 15m buffer zone.
Other habitats within/adjacent to the Site	County (Medium) due to hedgerow network	Yes	Loss of common and widespread habitat types (e.g. species-poor semi-improved grassland and bare ground) is anticipated. Approximately 980m of hedgerow will be lost, comprising 200m species-rich hedgerow, and 780m species-poor hedgerow. Prior to mitigation there is the potential for pollution of the River Adur during construction. Further consideration is required.
Species – bats	County (Medium)	Yes	Trees suitable to support roosting bats are present within the Site and within 10m of the Site. One tree rated as PRF-M (Ecology Ref: T39; Arb. Ref: H119). However, this tree showed no signs of current use by bats during emergence survey in 2022. In addition, and two trees rated as PRF-I (Ecology Ref: CS-10 and T32; Arb Ref: T77 and T172 respectively) will be removed Species-poor semi-improved grassland, improved grassland and hedgerows which are used by foraging and commuting bats will be partially lost. These will be replaced with a SuDS pond with a permanent level of water, and associated landscaping which will be suitable for foraging bats. However, a road will also be present. Illumination of adjacent habitats used for foraging and commuting during construction and operation could affect local bat species.
Species – great crested newt	County (Medium)	Yes	One pond within the Site, and a second pond within 250m of the Site support small populations of great crested newt. No ponds will be lost to facilitate the Proposed Development. However, terrestrial habitat will be lost including within the 'core' zone (0-50m from a pond). Within the 'core' zone, terrestrial habitat lost will be replaced by a SuDS pond with a permanent water level. In the wider area, terrestrial habitat will be replaced with a detention basin planted with a wildflower mix, and the Central Section road.
Species – badger	District (Low)	Yes	Badger setts are present [REDACTED] with a main badger sett present to the [REDACTED]. While this main badger sett will not be impacted by the Proposed Development, the Proposed Development will sever existing habitat connection between this main sett [REDACTED] and outlier setts within the same territory [REDACTED].
Species – reptiles	Local (Very low)	Yes	Reptiles were not recorded within the Site in 2019, and the majority of the Site does not support suitable reptile habitat. However, species-poor semi-improved grassland in the north of the Site, west of Cuckfield Road is suitable to support low numbers of common reptile species. Further consideration is required.
Species – breeding birds	District (Low)	Yes	Habitats provide suitable habitat for nesting birds. The breeding bird assemblage within the Site is considered likely to comprise a limited number of individuals of predominantly common species, with two 'amber' listed species present in 2019. Further consideration is required. While a

Feature	Importance category	Further consideration required?	Rationale for scoping in or out of further assessment
			single barn owl was recorded flying through the Site during a bat emergence survey in September 2024, habitats within the Site suitable for barn owl are limited, with large amounts of suitable habitat to the north of the wider Brookleigh Site. Therefore, this species is not considered to be resident within the Site and is likely to use the Site occasionally for commuting.
Species – non-breeding birds	District (Low)	Yes	Habitats provide suitable habitat for non-breeding birds. Although a limited number of species are considered likely to be present, based on data collected by AECOM in 2019 and as a precaution, this is assumed to include some birds listed as red or amber on BoCC5.
Species – terrestrial invertebrates	District (Low)	Yes	Terrestrial invertebrates throughout the Brookleigh site were considered to be of County (Medium) importance. However, the majority of notable species were associated with woodlands and unimproved grassland in the east of the wider Brookleigh site; therefore, this is considered to be an appropriate evaluation given the size of the Site, and the habitats present.
Species – hazel dormouse	N/A	No	Hazel dormice are considered to be absent.
Species – invasive non-native species	N/A	No	Himalayan balsam is present outside of, but adjacent to the Site. Mitigation is required to comply with legislation, which is included as embedded mitigation in Section 7.10. Therefore, invasive non-native species are scoped out of further assessment.
Species – hedgehog	Local (Very low)	No	Habitats are suitable to support hedgehog. Mitigation is required to comply with legislation, which is included as embedded mitigation in Section 7.4.3.4. Therefore, hedgehog are scoped out of further assessment.

7. Embedded Mitigation and Recommendations

7.1 Ancient Woodland Drainage Protocol

The Ancient Woodland Drainage Protocol (Appendix O) includes measures to prioritise during detailed design and follows the mitigation hierarchy or avoiding impacts in the first instance. These have been embedded into the design of the Proposed Development including minimising the length of drainage within the Bridge Farm Shaw North ancient woodland, using designs which allow the use of trenchless techniques, and designing headwalls to allow them to be constructed by hand.

In addition, in line with the drainage protocol, protected species surveys have been completed for badger, bats, great crested newt and hazel dormouse.

The Ancient Woodland Drainage Protocol measures to be prioritised during the installation of drainage infrastructure that are of relevance to ecology are as follows:

- Utilise trenchless techniques, such as guided auger bore;
- Site launch and receptor pits outside the ancient woodland / buffer zone / RPA where possible, or if one must be located in the ancient woodland / buffer zone / RPA this should be the smaller reception pit which will be excavated by hand;
- Avoid storing spoil, plant or materials within the ancient woodland / buffer zone / RPA;
- Reinstate any disturbed ancient woodland / buffer zones based on specialist arboricultural and ecological advice;
- Closely supervise works, including specialist arboricultural and ecological supervision as required;
- Adhere to specific species or habitat mitigation measures as appropriate, such as ceasing works before sunset and avoiding the use of artificial lighting where there is potential bat activity. An ecologist may be required during the works to undertake pre-construction checks for protected species such as nesting birds, bats and hazel dormouse and great crested newts, a Natural England badger licence and/or precautionary methods of working to be agreed in advance with the local planning authority.

The protocol also includes specific measures to protect trees. The full protocol is provided in Appendix O.

7.2 Construction Environmental Management Plan (CEMP)

As described in *Northern Arc Allocation Planning Application Environmental Statement Volume I: Chapter 6 Ecology* (AECOM, 2018a), a Construction Environmental Management Plan (CEMP) will be followed. The CEMP will be informed by the outline CEMP, located within *Volume II: Appendix 5-1* of the 2018 ES (AECOM, 2018d). The CEMP will include the clear demarcation of any retained habitats within/adjacent to the application boundary and will inform construction workers and site personnel of the importance of these habitats and their sensitivity to disturbance/ encroachment. Toolbox talks by an ecologist regarding the presence of ancient woodland, retained habitats, and protected/notable species such as badgers, bats, great crested newt, and reptiles will help communicate issues of encroachment for example, and which works can only proceed under licence and/or with an ecologist present. It is anticipated a series of conditions will prohibit/restrict the following during construction, with particular emphasis on avoiding construction encroachment into ancient woodland apart from specific permitted areas (i.e. within Bridge Farm Shaw North):

- Dumping or storing of machinery or materials within the retained habitat boundary;
- Trampling of the retained habitat; and
- Vehicular access across adjacent areas of retained habitat.

7.2.1 Pollution Incidents

During construction, fuel spillages, run off and other potential pollution incidents have the potential to impact on adjacent habitats including the ponds and watercourses. The Contractor will therefore ensure that appropriate equipment such as spill kits containing absorbent material will be available to site operatives. The Contractor will train site operatives in the use of these spill kits. All reagents and chemicals will be clearly signed and appropriately stored, contained and banded. On this basis, fuel spillage, run off and general pollution incidents will be controlled to a level that would not result in a significant effect on adjacent habitats.

7.2.2 Dust Deposition

Depending upon circumstances, dust generating activities can result in the temporary coating of vegetation up to 200m away if no control measures are implemented. However, following the adoption of industry best practice as set out within the Outline CEMP (AECOM, 2018d) to be included within the CEMP, dust deposition during the construction will be controlled. Measures will include (but not be limited to):

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site;
- Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable).

7.2.3 Construction Lighting

The CEMP will include measures that will avoid light spill during construction onto the hedgerows, trees, retained woodland habitats and Pond 8. Lighting will be designed to avoid light pollution where appropriate, as detailed within the Design Guide (AECOM, 2019j) and Lighting Assessment (AECOM, 2018c) which accompanied the outline planning application.

The Biodiversity Scheme for the wider Brookleigh development (AECOM, 2020a) includes the following measures to avoid lighting impacts on bats during construction:

- Works at night to only be permitted under exceptional circumstances;
- If security lighting is required, it will use motion-sensor lights on a short (1 minute) timer with hoods/cowls to avoid upwards light spill, and using LED technology as the wavelengths of LEDs can be controlled to avoid those most disturbing to bats; and
- Light spill onto hedgerows, trees, the pond and retained woodlands will be avoided, as well as retained and newly created grasslands.

7.2.4 Noise

Noise during construction has the potential to adversely affect wildlife within the vicinity of the proposed incursions. However, following the adoption of industry best practice as set out within the Outline CEMP (2018d) to be included within the CEMP, noise will be controlled by planning condition to a level that would not result in a significant effect on adjacent habitats. Measures will include (but not be limited to):

- Vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers, maintained in good and efficient working order and operated in such a manner as to minimise noise emissions. The Principal Contractor will ensure that all plant complies with the relevant statutory requirements;
- Machines in intermittent use will be shut down or throttled down to a minimum when not in use;
- Plant will be maintained in good working order so that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum;
- Noise emitting machinery which is required to run continuously will be housed in a suitable acoustically lined enclosure; and
- Localised remedial measures (such as acoustic barriers or netting) and boundary monitoring.

7.2.5 Protected Species

The CEMP will include measures specific to protected species, including those outlined in Section 7.2.3 with regards to construction lighting, and measures in the Biodiversity Scheme (AECOM, 2020a) and Ecology Mitigation Strategy (AECOM, 2020b) for the wider Brookleigh development.

This includes the following with regards to badgers:

- Lighting should not be directed at badger setts, hedgerows, trees or woodlands;
- Works at night will only be permitted in exceptional circumstances;
- No heavy machinery within 10m of badger setts, or excavation works within 20m of setts (without a licence);
- Chemicals to be stored securely and away from badger setts and paths;
- No fire or chemicals to be used within 20m of a sett entrance;
- Trenches to be covered at the end of each working day or include a means of escape if an animal were to fall in; and
- Activities such as noise and vibration that may agitate badgers to be limited to locations away from setts.

7.3 Ancient Woodland Buffer Zones

Embedded into the entire Brookleigh scheme through planning condition is the requirement for a 25m buffer zone around all ancient woodland, with the exception of specific areas where drainage infrastructure or footpaths have been approved within the buffer zone through a Section 73 application.

The buffer zone will comprise 15m buffer of no development (forming a 'Construction Exclusion Zone') which will be planted with broadleaved woodland, scrub and where appropriate wildflower grassland. An additional 10m buffer will comprise wildflower grassland or other soft landscaping uses, such as swales and dry detention basins. Across the Brookleigh scheme this will create a total of approximately 19.73ha of new and enhanced habitat within 25m ancient woodland buffers, of which approximately 11.84ha will comprise woodland and scrub planting within the 15m buffer.

7.4 Embedded Measures to Avoid Killing and/or Injury of Protected Species

7.4.1 Pre-construction Surveys

Construction of the Proposed Development will not commence until later in 2025, continuing into 2026. Surveys included in this EclA are predominantly from 2022, with an updated walkover survey completed on 12th September 2024 that updated the badger survey, Phase 1 habitat survey, and GLTA for bats. While the baseline reported in this EclA is considered appropriate to allow a robust assessment of impacts and resultant effects on protected and notable species, updated species surveys are recommended prior to construction as part of a precautionary working method due to the mobile nature of species, or as a particular licence requirement.

Therefore, pre-construction surveys will be completed for:

- Great crested newt, to accompany a licence application if an European Protected Species Mitigation Licence (EPSML) will be applied for (note this would not be required under the District Level Licence (DLL));
- Badgers, including specific sett monitoring to accompany a badger licence;
- Roosting bats as part of a precautionary working method; and
- Hazel dormice, should construction not commence until 2026.

For great crested newt, pre-construction surveys will confirm the continued presence of the species, and confirm the population sizes within Pond 8 and Pond 8a have not changed. These would require presence/absence survey, such as eDNA survey which can be completed between 15th April and 30th June, and population class assessment survey, which can be completed between mid-March and mid-June, with at least three of the six required visits between mid-April and mid-May.

For badgers, the pre-construction surveys should be completed no more than six months prior to the commencement of works and will aim to confirm that no new setts have been excavated that require closure under

a license to facilitate the Proposed Development. With regards to these species, the embedded measures and anticipated impacts and associated effects are not anticipated to change based on the results of pre-construction surveys.

For roosting bats, pre-construction surveys will aim to confirm the continued absence of roosting bats and PRFs within trees due to be lost to facilitate the Proposed Development (i.e. to include at a minimum those trees identified in Section 5.2 that were suitable to support roosting bats and will be lost). For hazel dormice, pre-construction surveys will aim to confirm the continued absence of this species with hedgerows and woodland within and adjacent to the Site. With regards to these species, the anticipated impacts and associated effects have the potential to change based on the results of pre-construction surveys, with appropriate mitigation required, i.e. a EPSML through Natural England in line with the Biodiversity Scheme (AECOM, 2020a) and in accordance with legislation. While the EPSML process would determine the mitigation required, an updated impact assessment report will be prepared to reflect these changes, should they occur.

A pre-construction invasive non-native species survey is also recommended to ensure Himalayan balsam present to the north of the Site has not spread from its current location.

7.4.2 Protected Species Licencing

7.4.2.1 Great crested newt

Great crested newt are afforded full protection under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017 (as amended). Under this legislation it is an offence to deliberately capture, injure, disturb or kill a great crested newt, or to deliberately take or destroy its eggs. It is also an offence to deliberately or recklessly damage, destroy or obstruct access to any structure which a great crested newt uses for shelter or protection. This protection includes both the breeding pond itself and terrestrial habitat utilised for foraging and hibernation which may be distant from the breeding pond.

The great crested newt is listed as a species of principal importance within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Potential killing, injury or disturbance impacts on great crested newt would be illegal without a licence, either through the EPSML or DLL schemes. As outlined in the Biodiversity Scheme (AECOM, 2020a) a licence through one of these routes will be applied for with appropriate mitigation outlined in the Biodiversity Scheme implemented. Due to the location of the Site in West Sussex, within the Mid Sussex District, the appropriate DLL scheme would be through NatureSpace. The Site sits partially within a red risk zone for great crested newt. Under the NatureSpace DLL, use of the scheme is permitted within red zones with the scheme using a green, amber, red and black risk rating. The Site does not sit within a black risk zone.

The Biodiversity Scheme (AECOM, 2020a) includes a 'great crested newt strategy' for the wider Brookleigh development. This includes details of receptor sites within the wider Brookleigh site. Due to the location of the Proposed Development, any individual newts found under licence will be moved to the proposed receptor site within OS1.10. A sympathetic mowing regime to enhance existing grassland within OS1.10 has been in place under the Biodiversity Scheme since 2020, with two hibernacula also constructed to ensure an appropriate carrying capacity of the receptor site for any great crested newts requiring translocation.

The great crested newt strategy within the Biodiversity Scheme (AECOM, 2020a) also includes details to be included in a great crested newt masterplan for licences within the Site, including enhancement measures for existing ponds and retained terrestrial habitat, descriptions of terrestrial habitat and new pond creation, capture and exclusion techniques for terrestrial habitat (as well as aquatic habitat, although not relevant to the Proposed Development), measures to maintain connectivity (see Section 7.5.1 of this report), and anticipated management, monitoring and maintenance requirements.

7.4.2.2 Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended). Under the above legislation it is an offence to:

- Wilfully kill, injure or ill-treat a badger;
- Cruelly ill-treat a badger, or
- Damage, destroy or obstruct access to a sett or any part thereof.

A badger sett is defined in the legislation as any structure or place which displays signs indicating current use by a badger.

Potential killing, injury or disturbance impacts on badgers would be illegal without a Natural England Licence. Setts C4 and C5 (outlier badger setts) will be lost to facilitate the Proposed Development. This will be completed under a licence from Natural England.

The setts will be monitored for a minimum of 21 days to determine activity at the sett. This could include use of footprint traps, small sticks across the sett entrance, and/or camera traps. Assuming the sett remains active, a Natural England licence will be applied for using this data, to enable sett closure between 1st July and 30th November, in line with licence requirements.

7.4.3 Precautionary Working Methods

Precautionary Working Methods will be incorporated into the CEMP, to ensure all construction staff are aware of requirements to ensure compliance with legislation.

7.4.3.1 Nesting birds

All species of wild bird in the UK are protected under Part 1 Section 1(1) of the Wildlife and Countryside Act 1981 (as amended) against intentional killing, injuring or taking, as well as taking, damaging or destroying nests in use or being built, and taking or destroying eggs. Special protection is also afforded to species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). These birds are rare, endangered, declining or vulnerable species. In addition to the protection afforded to all bird species, it is an offence to cause reckless or intentional disturbance to the specially protected Schedule 1 listed species (such as barn owl) when they are building nests.

Without appropriate controls site clearance works could result in killing and injury of nesting birds, and destruction of nests. This killing and injury would be an offence under legislation that protects birds. For this reason, wherever possible, habitat of potential value to nesting birds (including trees, hedgerows, improved grassland in the east of the Site and species-poor semi-improved grassland in the north of the Site with longer sward heights) will be removed during the period September to February inclusive when bird species are less likely to be using active nests. If this is not possible (for example, where habitat is suitable for reptiles and requires clearance during the period March to October, weather dependent, and cannot be cleared entirely within September or October), site clearance between March and August, both inclusive, will not take place until a suitably qualified ecologist has confirmed absence of nesting birds immediately prior to clearance works commencing.

7.4.3.2 Reptiles and common amphibians

All UK native reptile species are protected against intentional killing or injuring under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It should be noted that, where it is predictable that reptiles are likely to be killed or injured by an activity (such as site clearance) this could legally constitute "intentional killing or injuring", even if that was not the intention of the activity. There are four 'widespread species' of reptile in the UK: common lizard, slow worm, grass snake and adder (*Vipera berus*). All four widespread reptile species are listed as species of principal importance under Section 41 of the NERC Act 2006 (as amended), making them a material consideration during the planning process.

The two other native reptile species to the UK, sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*), are European Protected Species and as such receive full protection under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017 (as amended). However, the Site and surrounding area does not contain suitable habitat for these species.

The four common amphibians, common frog (*Rana temporaria*), common toad (*Bufo bufo*), palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*), have no legal protection other than that provided by subsection 9.5 of the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to sell them. However, general animal welfare guidelines do apply (i.e. causing an animal to suffer unnecessarily).

Site clearance works associated with the proposed SuDS pond and detention basin in the north of the Site, west of Cuckfield Road could also result in the killing and injury of common reptile species. Due to the small area of this suitable habitat within the Site, it is likely that only low numbers of reptiles are present within the Site itself, if any. Therefore, works within this area will be completed using a precautionary working method in order to prevent killing or injury of reptiles.

The precautionary working method will be undertaken during the active reptile season (generally March to October, weather dependent) when overnight temperatures are above 5°C to ensure reptiles are mobile, rather than in hibernation so they can relocate to retained areas of suitable habitat. Prior to clearance works, a suitably experienced ecologist will check areas of suitable habitat. If any reptile species are encountered, these will be moved from the Site by the ecologist to retained suitable habitat.

Suitable vegetation within these areas will then be cleared in two phases; first to a height of 150mm using hand tools. Phase 2 will commence with a suitably experienced ecologist undertaking another check for any reptiles present, following which the vegetation will be cut to ground level. During both phases, clearance will be undertaken towards suitable retained habitats (i.e. habitats will be cleared starting at the works locations, towards the retained hedgerows and ancient woodland).

The grassland must be maintained at a sward height of 50mm or below prior to works commencing to discourage reptiles from re-entering these areas.

7.4.3.3 Bats

Tree felling required to facilitate the Proposed Development will result in the loss of one tree suitable to support roosting bats PRF-M (Ecology Ref: T39; Arb. Ref: H119) and two trees that are PRF-I (Ecology Ref: CS-10 and T32; Arb Ref: T77 and T172 respectively). While these were not found to support roosting bats, there remains a residual risk of bat presence.

As outlined in Section 7.4.1, pre-construction bat surveys will be completed to ensure bats remain absent at the time of construction. This may include aerial tree inspections, with bat emergence surveys completed where aerial tree inspections are not safe to complete.

If, upon completion of the surveys, roosting bats are still considered likely absent, trees with suitability to support roosting bats will be felled using a precautionary felling method as outlined below:

- The felling contractors will be notified that the tree has been assessed for bats by way of a toolbox talk, and that although no signs of roosts have been identified, the tree is still suitable with a risk of bat presence;
- Trees will be subject to an aerial inspection of features by an ecologist who holds a Natural England WML-CL18 (Bat Survey Level 2) licence where possible;
- Where aerial inspection is not possible, trees will be soft felled (sections of the tree will be carefully lowered to the ground for inspection by an ecologist) under an ecological watching brief;
- Trees will be felled using hand tools; and
- The tree should be felled during the time bats are least likely to be present (October to March inclusive).

Should bats be discovered, clearance should stop immediately, and a EPSML should be obtained before works continue.

Tree AW15 (likely PRF-M) will be retained, but will be within 10m of the Proposed Development. To reduce the risk of impacts to any bats roosting within the tree, works within 10m of the tree will be completed using hand tools outside of the period where bats may be roosting (i.e., works at this location will be completed in early Spring (March and April) or autumn (September and October).

7.4.3.4 Hedgehog

Contractors will maintain vigilance for hedgehogs, and if found these will be carefully placed in suitable retained habitat (using gloves) or, if found over winter or injured, taken to a wildlife rescue centre.

Measures outlined in Section 7.2.5 with regards to badgers, including trenches to be covered at the end of each working day or include a means of escape if an animal were to fall in, will also benefit hedgehogs.

7.4.4 Operation of the proposed Central Section

The proposed Central Section east to west through the Site will comprise a 20mph, single carriageway road. Parking areas and central islands, along with raised tables at key junctions will facilitate traffic calming. This will reduce the risk of killing and injuring species such as badger that may cross the road while it is operational.

7.5 Retaining Connectivity

7.5.1 Badger and Amphibian Tunnels

As outlined in the Biodiversity Scheme (AECOM, 2020a), badger and amphibian tunnels have been incorporated into the design, with its location shown in *Adoptable Highway General Arrangement Sheet 2* (drawing number 60610807-ACM-CS-ZZ-DR-HW-00-0102), and a cross section of the tunnels shown in *Badger Tunnel Section* (drawing number 60610819-ACM-CS-ZZ-DR-HW-00-0753). The tunnels will be located where the road crosses Plot OS2.2, an 'Open Space' plot.

An existing hedgerow with trees is present along the western edge of this plot, linking Bridge Farm Shaw North ancient woodland in the north, and Bridge Farm Shaw in the south. Badger setts [REDACTED]. OS2.2 will also provide a habitat link for great crested newts between Pond 8 in the north, and Pond 8a in the south, as well as Pond 30 (previously recorded as supporting a small population of great crested newt). OS2.2 will also provide a habitat link to terrestrial habitat within ancient woodland buffer zones, and within OS1.11 where terrestrial habitat enhancements and new ponds are proposed within the Biodiversity Scheme (AECOM, 2020a) for the wider development.

New planting has been incorporated along the eastern edge of this plot leading up to the Proposed Development. Once mature, this will form a bat crossing but will also aid in guiding badgers and amphibians towards the tunnel entrances. This has already been planted to allow some growth prior to the construction of the Proposed Development.

The badger tunnel will comprise a 600mm diameter concrete pipe, with entry headwalls at the northern and southern entrances. To reduce the risk of surface water flooding within the tunnel, a 0.2m high and 0.2m wide earth bund will be constructed to the south of the southern tunnel entrance (with the back of the bund offset from the tunnel entrance by approximately 5m) to divert surface water either side of the tunnel entrance. Due to its small height and offset from the tunnel entrance, this is not anticipated to prevent badgers using the tunnel.

The amphibian tunnel will comprise an ACO Climate Tunnel KT1000 or similar.

7.5.2 Bat Crossing

As outlined in the Biodiversity Scheme (AECOM, 2020a), graduated planting will be implemented either side of the Central Section to encourage bats to fly at a suitable height over the road, once operational. This will complement existing trees present within the existing hedgerow to the north and south of the Central Section. Once mature, this is likely to also benefit any barn owl flying through the Site.

A total of 40 hornbeam saplings were planted to the east and west of the hedgerow within Plot OS2.2, to the north and south of the proposed Central Section in 2021, to allow some growth prior to construction of the Proposed Development. The location of these is shown in Figure 1 at TN3, and within Sheet 3 of the *Tree Protection Plan* (drawing number 60610807-ACM-XX-XX-AB-TPP-03). A small number of these saplings will be moved from their current position to another suitable location (e.g. further north or south in the planting area) due to the need for a wider working area than anticipated at the time of planting.

In addition, while not part of the bat crossing design, two hornbeam trees will be planted within a central island where the road will sever the hedgerow at this location, as shown in *Landscape Planting Plan, Planting Schedules 2 of 8* (drawing number 60610807-ACM-CS-ZZ-DR-LA-0403).

7.6 Habitat Retention and Creation

The Proposed Development retains hedgerows where possible and will predominantly result in the loss of improved grassland of lower ecological value. Trees and Pond 8 in the north of the Site, west of Isaac's Lane will be retained.

Planting along the Central Section will comprise approximately 0.39ha of wildflower grassland, 0.11ha of wetland mix, 0.11ha of groundcover verge planting, and approximately 77 trees, as shown in *Landscape General Arrangement* (drawing number 60610807-ACM-CS-ZZ-DR-LA-0401).

The wildflower grassland will include a mix of 32 species, with a mixture of 80% grasses including crested dogstail (*Cynosurus cristatus*), red fescue, smooth-stalked meadowgrass (*Poa pratensis*), common bent (*Agrostis capillaris*) and smaller cat's-tail (*Phleum bertolonii*) and 20% wildflowers. Wildflower species will include species such as yarrow, musk mallow (*Malva moschata*), red campion, common knapweed (*Centaurea nigra*), meadow buttercup (*Ranunculus acris*), yellow rattle (*Rhinanthus minor*), hoary plantain (*Plantago media*) and salad burnet (*Poterium sanguisorba*) in the highest percentage proportions.

The wetland mix will include species listed on the Royal Horticultural Society's (RHS) '*Plants for Pollinators*' list (RHS, 2019), including clustered bellflower (*Campanula glomerata*), bugle (*Ajuga reptans*), yellow iris (*Iris pseudocorus*) and ornamental species verbena (*Verbena bonariensis* 'Lollipop'), geranium (*Geranium* 'Bob's Blunder') and giant onion (*Allium moly*).

Groundcover verge planting will include a mixture of shrubs, ornamental grasses and herbaceous species. This will include bugle, listed on the RHS '*Plants for Pollinators*' list (RHS, 2019) along with a diversity of approximately eight other species, including an ornamental bramble (*Rubus tricolor*) which will provide berries.

Tree planting will include native species such as hornbeam and small-leaved lime (*Tilia cordata*), as well as other species that will provide ecological benefit once mature by providing shelter for birds and invertebrates such as Hungarian oak (*Quercus frainetto*), ornamental elm (*Ulmus 'New Horizon'*), trident maple (*Acer buergerianum*), and tulip tree (*Liriodendron tulipifera*).

At the location of the proposed SuDS pond and detention basin, terrestrial habitat will be planted. This will comprise approximately 0.31ha of wildflower mix, and approximately 0.09ha of native shrub planting.

The wildflower mix will include species beneficial to foraging bats into the planting schedules, as well as shrub planting. In line with the Bat Conservation Trust's *Encouraging Bats: A guide for bat-friendly gardening and living guidance* (Bat Conservation Trust, 2015) and the Bat Conservation Trust's *Landscape and urban design for bats and biodiversity* (Bat Conservation Trust, 2012), this includes species such as bird's-foot trefoil, cowslip (*Primula veris*), common knapweed, yarrow, red campion (*Silene dioica*), kidney vetch (*Anthyllis vulneraria*) and wild carrot (*Daucus carota*). All of these species provide a benefit to bats by attracting adult moths. In addition, common knapweed, yarrow and wild carrot provide food plants to moth caterpillars, and wild carrot also encourages sap sucking insects.

The native shrub planting mix will include species beneficial to birds, such as holly, hawthorn and blackthorn that provide winter berries. As some planting will be within the ancient woodland buffer zone, in line with the Biodiversity Scheme (AECOM, 2020a) this will also include planting to deter cats, such as hawthorn, blackthorn and dog rose. Native shrub planting will also be planted alongside existing scrub and trees to strengthen these retained habitats and provide a graduation of planting towards the wildflower grassland.

The SuDS pond has been designed to hold water year-round, and will include marginal and aquatic planting.

Species mixes are in line with the Biodiversity Scheme (AECOM, 2020a).

The Biodiversity Net Gain assessment for the wider Brookleigh project was completed on a 'plot-by-plot' basis for the Outline Planning Application, reported within the Biodiversity Scheme (AECOM, 2020a). As the Proposed Development spans 13 of these plots, the Biodiversity Net Gain assessment for these has been updated, taking the detailed design of the Proposed Development into account. An additional plot title Cuckfield Road has been included to ensure the redline boundary is fully included, including elements of the Proposed Development that extend north of the previous boundary.

Table 22 compares the Biodiversity Net Gain assessment within the Biodiversity Scheme to updated calculations completed, taking the detailed design of the Proposed Development into account.

Table 22. Biodiversity Net Gain assessment

Plot	Habitat type	2020 Biodiversity Scheme Score	Central Section Detailed Design Updated Score	Change in units
Cuckfield Road	Area	N/A	6.08% (+0.13 units)	N/A
	Hedgerow	N/A	N/A	N/A
	River	N/A	N/A	N/A
OS1.11	Area	N/A – technical fault	35.84% (+17.90 units)	+17.90
	Hedgerow	23.05% (+0.38 units)	23.05% (+0.38 units)	0 (no change)
	River	75.58% (+5.57 units)	75.58% (+5.57 units)	0 (no change)
OS2.2	Area	180.11% (+1.33 units)	154.67% (+1.14 units)	-0.19
	Hedgerow	16.44% (+0.19 units)	16.44% (+0.19 units)	0 (no change)
	River	N/A	N/A	N/A

Plot	Habitat type	2020 Biodiversity Scheme Score	Central Section Detailed Design Updated Score	Change in units
OS2.3	Area	58.49% (+2.55 units)	53.95% (+2.36 units)	-0.19
	Hedgerow	24.12% (+0.49 units)	24.12% (+0.49 units)	0 (no change)
	River	N/A	N/A	N/A
OS4.1	Area	114.98% (+1.05 units)	81.32% (+0.74 units)	-0.31
	Hedgerow	18.31% (+0.13 units)	18.31% (+0.13 units)	0 (no change)
	River	N/A	N/A	N/A
OS4.3	Area	64.55% (+7.26 units)	64.11% (+7.21 units)	-0.04
	Hedgerow	25.14% (+0.48 units)	25.14 (+0.48 units)	0 (no change)
	River	75.58% (0.20 units)	75.58% (+0.20 units)	0 (no change)
P2.4	Area	-20.86% (-3.23 units)	-13.02% (-2.01 units)	+1.22
	Hedgerow	576.46% (+1.63 units)	125.49% (+0.35 units)	-1.28
	River	N/A	N/A	
P2.5	Area	45.72% (+3.05 units)	55.13% (+3.67 units)	+0.62
	Hedgerow	45.02% (+0.73 units)	-35.34% (-0.57 units)	-1.30
	River	N/A	N/A	N/A
P2.6	Area	65.35% (+1.96 units)	86.28% (+2.59 units)	+0.63
	Hedgerow	-50.11% (-0.25 units)	-100% (-0.50 units)	-0.25
	River	N/A	N/A	N/A
P2.7	Area	52.23% (+2.80 units)	35.33% (+1.89 units)	-0.91
	Hedgerow	146.36% (+0.66 units)	25.97% (+0.12 units)	-0.54
	River	N/A	N/A	N/A
P2.8	Area	62.09% (+5.82 units)	68.93% (+6.47 units)	+0.65
	Hedgerow	+1.45 units (no hedge in baseline, no percentage calculated)	+0.42 units (no hedge in baseline, no percentage calculated)	-1.03
	River	N/A	N/A	N/A
P3.1	Area	77.83% (+5.25 units)	74.04% (+4.99 units)	-0.26 units
	Hedgerow	120.24% (+0.77 units)	35.01% (+0.23 units)	-0.54 units

Plot	Habitat type	2020 Biodiversity Scheme Score	Central Section Detailed Design Updated Score	Change in units
	River	N/A	N/A	N/A
P3.2	Area	39.87% (+3.10 units)	60.40% (+4.69 units)	+1.59
	Hedgerow	88.10% (1.27 units)	88.10% (+1.27 units)	0 (no change)
	River	N/A	N/A	N/A
P3.4	Area	90.81% (+5.58 units)	90.81% (+5.58 units)	0 (no change)
	Hedgerow	-100% (-0.48 units)	-100% (-0.48 units)	0 (no change)
	River	N/A	N/A	N/A

7.6.1 Design of SuDS

In line with the Biodiversity Scheme (AECOM, 2020a), the SuDS pond has been designed to hold water year-round.

The SuDS pond has also been designed to include aquatic planting in line with the Great Crested Newt Conservation Handbook (Langton *et al.*, 2001) including water forget-me-not (*Myosotis scorpioides*), marsh marigold (*Caltha palustris*), yellow flag iris, water mint (*Mentha aquatica*), purple loosestrife (*Lythrum salicaria*), and water crowfoot (*Ranunculus aquatilis*). This will total approximately 0.07ha of planting, split into approximately 0.06ha of emergent planting and 0.01ha of marginal planting, as shown in *Pond 13 & 14 – Landscape General Arrangement and Planting Schedules* (drawing number 60610807-ACM-CS-ZZ-DR-LA-00-0501).

A fence will be installed around the SuDS pond, primarily for the safety of pedestrians, that will reduce disturbance impacts from the public, particularly dog walkers. The fence will include a sufficient gap at the base (approx. 150mm) to allow access for great crested newts as well as common reptile species.

Adjacent to the SuDS pond will be a smaller detention basin. This will not support water apart from during storm events.

While not a mitigation measure specific for great crested newts, this design of the proposed SuDS pond in the north of the Site, west of Isaac's Lane has the potential to provide suitable aquatic habitat for great crested newt. However, this will not form mitigation as part of any great crested newt licences.

7.7 Habitat Creation and Enhancement in the wider Brookleigh Site

The approved Outline Planning for the wider Brookleigh site is supported by an Ecological Mitigation Strategy (AECOM, 2019k) and Biodiversity Scheme (AECOM, 2020a). Measures within these documents will protect and enhance retained ancient woodland, species-rich grasslands and hedgerows. Landscaping throughout the Brookleigh site will include woodland planting, wetland creation, attenuation ponds, swales, rain gardens, hedgerows and areas of species-rich wildflower grassland. Landscaping will also include new parkland areas, orchard and allotments which will all contribute to the overall biodiversity value of the development and contribute to the overall biodiversity net gain in the long term.

7.7.1 Bats

Although no confirmed roosts will be lost within the Proposed Development, the loss of potential roosting habitat will be replaced by bat boxes, to be placed within retained ancient woodland as shown in Figure 6 of the Biodiversity Scheme (AECOM, 2020a). For the Proposed Development, as trees suitable to support roosting bats will be lost to the north of the proposed Central Section, four Schwegler 1FD bat boxes or similar will be placed within Six Acre Shaw and four boxes will be placed within Bridge Farm Shaw North, both areas of ancient woodland located to the north of the Proposed Development, within the wider Brookleigh site.

As outlined in the Biodiversity Scheme (AECOM, 2020a). The wider Brookleigh site includes creation of large areas of semi-natural greenspace, including approximately 19.73ha of woodland buffer around all retained ancient woodland. This will include woodland, scrub and wildflower grassland creation. Grassland and hedgerow creation and enhancement will also be implemented throughout the wider Brookleigh site. SuDS ponds will also be created throughout the wider Brookleigh site.

7.7.2 Badger

As outlined in the Biodiversity Scheme (AECOM, 2020a). The wider Brookleigh site includes creation of large areas of semi-natural greenspace, including approximately 19.73ha of woodland buffer around all retained ancient woodland. Three proposed areas of parkland (totalling approximately 12.45ha) will provide suitable grassland foraging habitat for badgers.

The general public will be discouraged from accessing areas near retained badger setts through the use of fencing and planting of thorny vegetation around areas of ancient woodland.

7.7.3 Great Crested Newt

A proposed great crested newt receptor site has been created within OS1.10, north and west of the Proposed Development, as outlined in the Biodiversity Scheme (AECOM, 2020a). This has been enhanced with a sympathetic cutting regime since 2020, with two hibernacula also created. Additional enhancements will include planting of a 25m ancient woodland buffer zone around existing ancient woodland within OS1.10. The buffer will include trees, scrub and wildflower grassland.

In addition, as outlined in the Biodiversity Scheme OS1.11 will be enhanced through a sympathetic mowing regime, with two ponds also created east of the River Adur.

7.7.4 Breeding Birds

As outlined in the Biodiversity Scheme (AECOM, 2020a), habitat creation and enhancement throughout the wider Brookleigh site will provide suitable habitat for breeding birds. This will include the 19.73ha of ancient woodland buffer planting (11.84ha of which will comprise woodland, shrub and grassland, with the remaining 7.89ha comprising grassland), three neighbourhood parks, and green corridors throughout the wider Brookleigh site including the Green Circle, Green Superhighway and green spokes. These corridors will plant new trees, shrubs, hedgerows and grassland.

In addition, bird boxes will be installed throughout the wider Brookleigh site. For the Proposed Development, this will include a total of ten Schwegler 1B bird boxes for small passerines installed within Bridge Farm Shaw to the south of the Proposed Development, and Bridge Farm Shaw North to the north of the Proposed Development. It is recommended that three of these boxes are installed within OS2.3, in trees that will be retained. Selection of these trees will take into account any future works anticipated within OS2.3, such as construction of a Local Equipped Area for Play (LEAP).

7.7.5 Non-breeding Birds

As outlined in the Biodiversity Scheme (AECOM, 2020a), habitat creation and enhancement throughout the wider Brookleigh site will provide suitable habitat for non-breeding birds. This will include the 19.73ha of ancient woodland buffer planting, which will include species such as hawthorn, holly and blackthorn. Grassland within the ancient woodland buffer zones will also provide suitable foraging habitat for small passerines that feed on invertebrates and seeds.

In addition, three neighbourhood parks, and green corridors will be created throughout the wider Brookleigh site including the Green Circle, Green Superhighway and green spokes. These corridors will plant new trees, shrubs, hedgerows and grassland, providing foraging and sheltering opportunities for non-breeding birds over winter.

7.8 Operational Lighting Design

No operational lighting is proposed at the SuDS pond or adjacent dry detention basin.

Operational lighting of the proposed Central Section will be required to ensure user safety, particularly pedestrians. This has been designed in line with the Biodiversity Scheme (AECOM, 2020a), Design Guide (AECOM, 2019j) and

Lighting Assessment (AECOM, 2018b) which accompanied the outline planning application. As the proposed Central Section is predominantly within the centre of open fields that are less used by foraging bats and bat flight lines, and within the wider development are unlikely to be suitable for use in the future, sensitive lighting design focuses on lighting columns that are required near to retained hedgerows. Lighting columns are required near to these locations due to the presence of pedestrian crossings.

At these locations, lighting will be in line with the Biodiversity Scheme (AECOM, 2020a), and guidance from the Bat Conservation Trust (BCT) and Institute of Lighting Professionals (ILP) (ILP and BCT, 2023), which has been updated since preparation of the Biodiversity Scheme. As outlined in *Northern Arc Avenue Scheme Road Lighting - Design Considerations* (4Way Consulting, 2024), LED luminaires will be used, with a dimmable component. This will allow a warm white spectrum (ideally <2700 Kelvin) to reduce blue light component where possible. Lighting will be directional and designed to minimise light spill.

Where required, hoods, cowls or louvres will be used to ensure light does not spill onto retained hedgerows and the badger tunnel entrances. The current lighting design includes the use of rear louvre type lamps to minimise light spill (4Way Consulting, 2024).

7.9 Hydrological Changes

An Outline Drainage Strategy was prepared as part of the Outline Planning Application (AECOM, 2018c). The Proposed Development will follow this strategy. This identified a number of drainage constraints and requirements for the wider Brookleigh site. It was determined that infiltration was unlikely to be viable at the wider Brookleigh site and thus surface water discharge, at restricted rates, to local watercourses would be the preferred method for managing surface water runoff from the Brookleigh development. The Outline Drainage Strategy set out provisions to protect the receiving watercourse from adverse flood risk, hydrology or water quality impacts as a result of the proposed drainage discharges:

- It was determined that discharge to watercourses would be restricted to the equivalent of the greenfield Q_1 rate for 1 year design events, and to the equivalent of the greenfield mean annual flood, Q_{bar} , for higher return period design events, up to and including the 100-year event +40% climate change. This is to avoid adverse flood risk impacts;
- It was identified that drainage systems are to mimic baseline drainage patterns as much as possible, with the distribution of water to the receiving watercourses from the drainage systems being closely aligned to the distribution runoff from the predevelopment land. This is to avoid adverse hydrology impacts;
- Requirements for water quality management were established, with measures including SuDS component treatment trains or proprietary systems to be employed as necessary subject to the land use of the drainage sub-catchments. This is to avoid adverse water quality impacts. While there is a risk of residual concentrations of pollutants, including suspended solids, metals and hydrocarbons, the proposed methods of water quality management are typically accepted as providing adequate reduction in pollutant concentrations for drainage of residential-type land uses to surface watercourses which are not used for drinking water abstraction.

Within the detention basin in the north of the Site, west of Isaac's Lane, two gabion basket sections will catch sediment to avoid water quality issues during storm events.

7.10 Measures to Reduce Recreational Pressure

As outlined in the Biodiversity Scheme (AECOM, 2020a), measures will be implemented to reduce the risk of recreational pressure on retained habitats, including ancient woodland.

For ancient woodland, this will include fencing the perimeter of the 15m ancient woodland 'no development' buffer zone with a permanent post and wire type fence, to prevent access from the general public where this is deemed necessary. Dedicated pedestrian routes, including the 'Green Circle' and 'Green Superhighway' will provide preferred routes, encouraging the public away from ancient woodland by providing an alternate route.

Some limited pedestrian access to ancient woodlands may be implemented in the wider Brookleigh scheme, where existing paths and informal access exist (such as Big Wood in the north-east of the wider Brookleigh site). However, this will not be implemented within Bridge Farm Shaw North within the Site as there is no existing access for the general public.

Desire lines into woodlands will be monitored by the contractor, or during operation the Mid Sussex District Council (MSDC) Park Ranger team. Remedial measures will be taken to divert these away from retained habitats as required.

In addition, three parks will be created in the wider Brookleigh site, one of which will be accessible from the proposed Central Section ('the Central Park'), with two others 'Western Park' and 'Eastern Park' accessible from the wider Northern Arc avenue. These will provide formal and informal landscaping areas, allotments, community orchards and play areas to provide accessible open space with the aim of reducing the risk of recreational pressure on retained sensitive habitats, including ancient woodland.

7.11 Removal of Invasive Non-native Species

While outside of the Site boundary, Himalayan balsam present to the north of the proposed drainage outfall in the north of the Site, west of Isaac's Lane, will be removed during construction, to ensure that water outflowing into the watercourse north of the Site does not carry Himalayan balsam seeds.

Removal will be completed during the construction of the Proposed Development, under an invasive non-native species management plan that will form part of the pre-construction documentation.

8. Potential Effects and Mitigation Measures

This section presents an initial assessment of likely construction and operational effects of the Proposed Development in relation to ecology and provides recommendations for mitigation measures and further considerations.

Although impacts are considered prior to mitigation, the assessment is based on the assumption (which is considered intrinsic to the scheme) that embedded measures in Section 7 will be implemented.

8.1 Effects of Construction

8.1.1 Temporary Impacts During Construction

8.1.1.1 Dust Deposition

Retained habitats including ancient woodland

There is the potential for dust deposition within Site and immediate surroundings during site clearance and construction, including retained ancient woodland (Bridge Farm Shaw North within the Site and Bridge Farm Shaw 2 immediately adjacent to the Site, as well as Six Acre Shaw, Bridge Farm West, Bridge Hill Farm Wood and Bridge Farm Shaw in the wider area) as well as other habitats.

However, with implementation of measures within CEMP as outlined in Section 7.2.2, such as dust suppression measures and wheel washes, this is considered unlikely to represent more than a **Very Low** adverse impact.

Acting on an ecological feature of **County (Medium) importance**, this will result in a **Negligible** effect that is **not significant**. This is unchanged from the effect reported within the 2018 ES and 2019 ES Addendum.

8.1.1.2 Pollution – Fuel Spillage, Run-off and General Pollution Incidents

Retained habitats and ancient woodland

Fuel spillages, run-off and other potential pollution incidents have the potential to impact retained habitats, including ancient woodland (Bridge Farm Shaw North within the Site and Bridge Farm Shaw 2 immediately adjacent to the Site), as well as adjacent habitats including the watercourse to the north.

However, the Contractor will ensure that appropriate controls are in place under the CEMP, as described in Section 7.2.1, and in line with the Ancient Woodland Drainage Protocol, as described in Section 7.1. The headwalls in Bridge Farm Shaw North and Pond 29, adjacent to the ancient woodland 15m buffer zone of Bridge Farm Shaw 2 will be constructed by hand to reduce the risk of machinery fuel spills.

On this basis, fuel spillage, run-off and general pollution incidents are considered unlikely to represent more than a **Very Low** adverse impact. Acting on an ecological feature of **County (Medium) importance**, this will result in a **Negligible** effect that is **not significant**. This is unchanged from the effect reported within the 2018 ES and 2019 ES Addendum.

8.1.1.3 Disturbance – Noise

Ancient woodland

Construction noise, particularly during the construction of the SuDS pond and dry detention basin has the potential to impact ancient woodland, particularly Bridge Farm Shaw North within which an outfall will be constructed.

Measures to reduce construction noise will be implemented within the CEMP, as described in Section 7.2.4. In addition, as embedded into the Proposed Development through the Ancient Woodland protocol described in Section 7.1, headwalls have been designed to allow them to be constructed by hand, and trenchless techniques will be used with the receptor pit, likely to be inside the ancient woodland, constructed by hand. A 15m zone of no development ('Construction Exclusion Zone') will be maintained around ancient woodlands, with the exception of permitted planting to create woodland and scrub habitat within the 15m buffer as outlined in Section 7.3.

Construction compound locations will be determined by the contractor; however, these will be sited in a location away (at least 30m) from ancient woodland. In addition, the construction compound will require reasonable road access. While some areas of ancient woodland are located adjacent to Cuckfield Road, the areas surrounding these are not easily accessible from Cuckfield Road itself. The next closest area of ancient woodland (Bridge Hill Farm Wood) is located approximately 130m west of Cuckfield Road.

Therefore, construction noise is considered to represent a **Very Low magnitude**, adverse impact. Acting on ecological features of **Country (Medium) importance**, this will result in a **Negligible** effect that is **not significant**. This is unchanged from the effect reported within the 2018 ES and 2019 ES Addendum.

Bats

Construction noise, particularly when in proximity to hedgerows supporting trees and during construction of the SuDS pond and dry detention basin has the potential to disturb any bats roosting within Trees CS10, P12-1, AW15, 32, 39, 96 and 97, where although the presence of roosting bats is considered unlikely on the basis of baseline surveys, a residual risk of presence remains.

As outlined in the Ancient Woodland Drainage Protocol (Section 7.1), and in line with measures embedded in the CEMP (Section 7.2.4), noise disturbance to roosting bats will be avoided in the first instance by siting works at least 10m away from trees that were found to be suitable to support roosting bats where possible. In addition, measures embedded in the CEMP include the adoption of industry best practice to control noise.

Where works are required within 10m of Tree AW15, as outlined in Section 7.4.3.3 these will be completed using hand tools outside of the period where bats may be roosting (i.e. works at this location will be completed in early spring (March and April) or autumn (September and October).

Construction compound locations will be determined by the contractor; however, these will be sited at least 20m from trees with suitability to support roosting bats.

Therefore, with the embedded mitigation measures taken into account, and due to the temporary nature of construction, construction noise is considered to represent a **Very Low magnitude** adverse impact. Acting on an ecological feature of **County (Medium) importance**, this will result in a **Negligible** adverse effect which is **not significant**.

Breeding and non-breeding birds and badgers

Construction noise has the potential to impact breeding and non-breeding birds through disturbance, leading to temporary displacement of breeding and non-breeding bird populations during construction. Construction noise also has the potential to impact badgers through disturbance, including through vibration which in extreme cases could lead to the collapse of setts.

However, measures embedded in the CEMP (described in Section 7.2.4) include the adoption of industry best practice to control noise, and the CEMP will include specific measures relating to avoidance of noise and vibration disturbance for badgers (described in Section 7.2.5).

Construction compound locations will be determined by the contractor; however, these will be sited away from woodland and hedgerows (at least 30m).

Therefore, with embedded mitigation measures taken into account, and due to the temporary (18 months total) nature of construction, construction noise is considered to represent a **Very Low magnitude**, adverse impact. Acting on an ecological feature of **District (Low) importance** for both breeding and non-breeding birds, this will result in a **Negligible** adverse effect which is **not significant**.

8.1.1.4 Disturbance – Lighting

Ancient woodland

During construction, there is the potential for disturbance of ancient woodland through lighting (Bridge Farm Shaw North within the Site, and Bridge Farm Shaw 2 immediately adjacent to the Site). However, as outlined in the Ancient Woodland Drainage Protocol (Section 7.1), and in line with measures embedded in the CEMP outlined in Section 7.2.3, lighting of retained ancient woodland during construction will be avoided.

Overall, impacts of construction site lighting on ancient woodland is assessed to be a **Very Low magnitude**, adverse impact on an ecological feature of up to **County (Medium) importance**, leading to a **Negligible** adverse effect which is **not significant**.

Bats, badgers, breeding birds and terrestrial invertebrates

During construction, there is the potential for disturbance of bats (roosting and foraging or commuting), badgers breeding birds and terrestrial invertebrates through construction lighting.

As outlined in the Ancient Woodland Drainage Protocol (Section 7.1), and in line with measures embedded in the CEMP (Section 7.2.3), lighting will be minimised onto habitat used for bat flight lines and potential roosting features during construction of the Proposed Development.

This will include avoiding the need for construction lighting in the first instance wherever possible, and controlling light levels, minimal upward light, use of glare control and use of LED technology (wavelength of LEDs can be controlled to avoid wavelengths likely to change insect behaviours) where lighting is required.

Overall, impacts of construction site lighting on bats is assessed to be a **Very Low magnitude**, adverse impact on an ecological feature of up to **County (Medium) importance**, leading to a **Negligible** effect which is **not significant**. This does not represent a change in the significance level of effects reported in the 2019 ES Addendum.

Measures to avoid lighting impacts on bats will also avoid lighting impacts on badgers, breeding birds and terrestrial invertebrates. Therefore, the impact of construction lighting on terrestrial invertebrates is assessed to be a **Very Low magnitude**, adverse impact on an ecological feature of up to **District (Low) importance**, leading to a **Negligible** adverse effect which is **not significant**.

The impact of construction lighting on badgers and breeding birds is assessed to be a **Very Low magnitude**, adverse impact on ecological features of up to **District (Low) importance**, leading to a **Negligible** adverse effect which is **not significant**.

8.1.1.5 Habitat Loss / Modification

Habitats

Temporary habitat loss will be required in the south of the Site, west of Isaac's Lane, for the construction of drainage infrastructure within Burgess Hill Golf Centre. This will be limited to up to 0.53ha of amenity grassland within the golf course, and habitat will be replaced upon completion of the Proposed Development. In this area of the Site, habitats are of **Local (Very low)** ecological value due to their short sward height and limited diversity. Construction of this drainage infrastructure is anticipated to take approximately 6 weeks.

This temporary habitat loss is assessed to be a **Very Low** magnitude, adverse impact on an ecological feature of **Local (Very low) importance**, leading to a **Negligible** adverse effect which is **not significant**.

8.1.2 Permanent Impacts During Construction

8.1.2.1 Habitat Loss / Modification

Ancient woodland

A single headwall will be constructed within Bridge Farm Shaw North ancient woodland, with pipework installed between the proposed SuDS pond and dry detention basin, and the headwall. Headwalls will be constructed at the receiving watercourse bank. Embedded measures within the Ancient Woodland drainage protocol (Section 7.1) include using construction materials such as concrete bagwork to allow hand-placement, reducing the requirement for machinery within the ancient woodland. The pipe will be installed using trenchless techniques.

Within Bridge Farm Shaw North, all works within the ancient woodland will be located within the centre of the ancient woodland, within an existing farm track and existing ditch within a valley that previously comprised heavily compacted bare ground and disturbed grassland but is now overgrown with common hogweed and common nettle. At this location, the woodland is present on embankments either side of the valley.

The Root Protection Area and canopy spread of ancient or veteran trees will be a fenced exclusion zone except for Tree AW15, where limited access is unavoidable and will be achieved using existing access routes/paths with additional ground protection measures in place and tree protection fencing installed on either side.

Habitat loss within Bridge Farm Shaw North is anticipated to be limited to 4m² combined for both the receptor pit and headwall construction. The excavation by hand of a receptor pit and construction of a headwall, and resulting habitat loss along the farm track within Bridge Farm Shaw North is not considered to be at a magnitude or location within the ancient woodland that would threaten the integrity of the ancient woodland.

Therefore, the permanent loss of a small amount of habitat within Bridge Farm Shaw North is considered to be a **Low magnitude**, adverse impact on an ecological feature of **County (Medium) importance**, resulting in a **Minor** adverse effect which is **not significant**. No ancient or veteran trees will be impacted.

This does not represent a change in the significance level of effects since the EcIA that accompanied a Section 73 application to enable incursions into ancient woodland (AECOM, 2022).

Other habitat

The Phase 1 habitat survey completed in 2022, 2023 and updated in September 2024 found the Site predominantly comprised species-poor semi-improved grassland, with hedgerows, improved grassland, and ponds.

The Proposed Development will result in the loss of approximately:

- 3.93ha species-poor semi-improved grassland;
- 0.96ha improved grassland;
- 980m hedgerow;
- Individual broadleaved trees.

As detailed in Section 7.6, habitat creation will include approximately:

- 0.70ha of wildflower mix;
- 0.11ha of wetland mix;
- 0.11ha of groundcover verge planting;
- 0.09ha of native shrub planting;
- A SuDS pond approximately 0.003ha in area;
- 77 trees

A breakdown of the units anticipated for each plot that the Proposed Development falls within is presented in Section 7.6. In total the Proposed Development will result in an anticipated increase of 19.75 area-based units, and decrease of -1.82 hedgerow units, compared to the 2020 assessment produced for the outline planning application. There is no anticipated change to river units.

The decrease in hedgerow units is attributed to the required reduction in tree planting along the Proposed Development, due to the requirements for offsets from lighting columns and junctions. The Biodiversity Net Gain assessment completed for the outline planning application in 2020 was a high-level assessment and therefore assumed a continuous line of trees along either side of the Central Section, which under Metric 2.0 falls within the hedgerow section of the metric. The tree spacing required within the detailed design of the Central Section means the tree planting proposed cannot be classed as a 'Line of Trees' habitat type within Metric 2.0, and these trees are instead considered within the area-based habitat assessment. Therefore, there has been a small reduction in the hedgerow units anticipated to be delivered.

Looking at the wider Brookleigh development as a whole, this reduction in tree line creation reduces the overall hedgerow units expected from +12.33 units (+23.30%) to +7.55 units (+14.27%). This still achieves more than 10% net gain; however, it is expected that during the detailed design of the developments to the north and south of the Proposed Development, hedgerow planting can be incorporated to enable the wider Brookleigh development to achieve closer to its expected +23% gain in hedgerow units.

The majority of habitat creation to compensate for the loss of habitat to construct the Proposed Development will be within the wider Brookleigh development. As outlined in Section 7.7 the wider Brookleigh site will include additional landscaping such as woodland planting, wetland creation, attenuation ponds, hedgerows and areas of species-rich wildflower grassland, both within housing development areas and areas of open space, including ancient woodland buffer zones, parks and habitat areas such as great crested newt receptor sites. Landscaping across the Brookleigh site will contribute to the overall biodiversity value of the development and contribute to the overall biodiversity net gain in the long term.

A drainage outfall will be constructed at Pond 29, which will receive surface water drainage. This pond is online, with hydrological connection to a watercourse and eventually the River Adur. As outlined in Section 7.9, surface water drainage has been designed to mimic baseline drainage patterns, with the distribution of water to the receiving watercourses from the drainage systems being aligned to the distribution runoff from the predevelopment land. Therefore, changes to the pond itself are not anticipated, with the exception of construction of an outfall pipe and associated headwall. Construction will not encroach into the ancient woodland 15m buffer zone of Bridge Farm Shaw 2, or the ancient woodland itself, with all construction completed from the north.

Therefore, the impact of habitat loss and modification relating to the Proposed Development is assessed to be a **Low magnitude**, adverse impact on a feature of **County (Medium) importance**, leading to a **minor** effect that is **non-significant**.

8.1.2.2 Killing, Injury and Loss of Habitat

Bats

Trees suitable to support roosting bats (P12-1, AW15, 96 and 97) will be retained with the exception of Tree 39 (PRF-M) (Arb Ref: H119), Tree CS-10 (PRF-I) (Arb Ref: T77) and Tree 32 (PRF-I) (Arb Ref: T172). No trees were confirmed to support roosting bats; however, the loss of trees will reduce the availability of suitable roosting features the Brookleigh site as a whole.

Embedded measures include avoidance of killing and injuring roosting bats through the use of pre-construction surveys (Section 7.4.1) and a precautionary working method (Section 7.4.3.3) that will reduce the risk of killing or injuring roosting bats, which are a mobile species.

To account for the loss of suitable roosting habitat, eight bat boxes will be installed within retained ancient woodland in the wider Brookleigh site (Section 7.7.1). With these embedded measures implemented, this is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature that is of **County (Medium) importance**, this is considered likely to result in a **Minor** adverse effect which is **not significant**. This does not represent a change in the significance level of effects since the 2019 ES Addendum. The embedded measures will also ensure compliance with legislation that protects roosting bats.

The Proposed Development will result in the loss of approximately 3.93ha species-poor semi-improved grassland, 0.96ha improved grassland and approximately 980m of hedgerow. However, 0.7ha wildflower grassland, and 0.09ha of native shrub planting, along with 77 planted trees and the proposed SuDS pond within the Proposed Development will provide some replacement habitat for foraging bats and bat flight lines as described in Section 7.6. However, due to its intended use as a road through the future Brookleigh development, the Proposed Development will include lighting that will reduce the suitability of created habitat along the proposed Central Section. As outlined in Section 7.8, habitat creation around the proposed SuDS pond and dry detention basin will remain unlit and will comprise approximately 0.31ha of wildflower mix, and approximately 0.09ha of native shrub planting as well as the SuDS pond itself.

The wildflower mix will include species beneficial to foraging bats into the planting schedules, as well as and shrub planting.

Embedded into the wider Brookleigh site through measures outlined in the Biodiversity Scheme (described in Section 7.7.1) are large amounts of habitat creation that will be suitable for use by foraging and commuting bats, including 19.73ha of ancient woodland buffer planting.

With these embedded measures implemented, this is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature that is of **County (Medium) importance**, this is considered likely to result in a **Minor** adverse effect which is **not significant**.

Great Crested Newt

Pond 8 within the Site and Pond 8a to the south of the Site support small populations of great crested newt. Pond 8 within the Site will be retained. However, suitable terrestrial habitat within the core zone (0-50m) of Pond 8, and intermediate zone (51-250m) of Ponds 8 and 8a will be lost to facilitate the Proposed Development. This will predominantly comprise approximately 3.6ha species-poor semi-improved grassland with a short sward height at the time of survey; however, approximately 980m hedgerows and 0.3ha species-poor semi improved grassland with a longer sward height will also be lost to facilitate the Proposed Development.

There is a risk of killing and injuring great crested newts during site clearance. To ensure compliance with legislation that protects great crested newts, site clearance will occur under either an EPSML or DLL, as outlined in Section 7.4.2.1. Under the licence, 'reasonable avoidance measures' will be implemented within the Site to protect great crested newts, as outlined in the Biodiversity Scheme and in Section 7.4.2.1. Individual newts found under licence will be moved to the proposed receptor site in OS1.10.

Within the core (0-50m) and intermediate (51-250m) of Pond 8, surrounding the proposed SuDS pond will be approximately 0.3ha of wildflower mix and approximately 0.09ha of native shrub planting as described in Section 7.6. This will provide replacement terrestrial habitat of higher quality than the species-poor semi-improved grassland lost to facilitate the development of the SuDS pond and dry detention basin. Habitat creation along the proposed Central Section is considered unsuitable for use by great crested newts utilising Pond 8 and Pond 8a,

due to its location along a road that will eventually sit within a suburban area. However, habitat creation and enhancement in the wider Brookleigh site outlined in Section 7.7.3 will provide suitable great crested newt habitat.

Great crested newt were absent from Pond 29, where a surface water drainage pipe with associated headwall will be constructed.

Pond 29, where an outfall is proposed returned a negative result for great crested newt; therefore, impacts on great crested newt are not anticipated at this pond.

Overall, with embedded measures implemented, potential killing, injury and loss of habitat is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature of **County (Medium)** importance, this is considered likely to result in a **Minor** adverse effect which is **not significant**. This is unchanged from the significance level of effects reported within the 2019 ES Addendum.

Badger

Construction of the drainage outfall associated with the proposed SuDS pond and dry detention basin will result in the loss of two outlier setts; C4 and C5. Previous surveys completed by AECOM in 2019 determined that these are used by a clan of badgers with a main sett [REDACTED] which will be retained. As described in Section 7.4.1, pre-construction surveys will be completed to ensure continued absence of any additional badger setts that could be impacted by the Proposed Development.

Any setts requiring closure will be monitored to confirm their continued use by badger. Upon completion of the monitoring period and assuming setts remain in use, setts C4 and C5 will be closed under licence (as outlined in Section 7.4.2.2).

To avoid injury of badgers, measures embedded in the CEMP outlined in Section 7.2.5 will be implemented to ensure badgers do not become trapped in excavations, and retained setts are not impacted by construction activities.

Suitable habitat for setts is not anticipated to be lost to facilitate the Proposed Development. However, foraging habitat comprising hedgerows and grassland will be lost. This will be replaced in the north of the Site, west of Isaac's Lane by wildflower grassland and a native shrub mix. Landscaping along the proposed Central Section is considered unsuitable for use by badgers, due to its location along a road that will eventually sit within a suburban area. However, habitat creation and enhancement in the wider Brookleigh site outlined in Section 7.7.2 will provide suitable badger foraging habitat.

With embedded measures implemented, potential killing, injury and loss of habitat for badgers is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature of **District (Low) importance**, this is considered to result in a **Negligible** impact that is **not significant**. The embedded measures will also ensure compliance with legislation that protects badgers.

Breeding Birds

Construction of the Proposed Development will require loss of habitat suitable to support nesting birds, including trees and hedgerow. A precautionary working method (as described in Section 7.4.3.1) will be adopted to reduce the risk of killing and injuring breeding birds, and destruction of their nests.

There will be a loss of approximately 980m of hedgerow, along with individual trees (approximately 0.26ha) within the Site. A total of 77 trees will be planted along the proposed Central Section, that although adjacent to a road will provide suitable bird nesting habitat once mature.

In addition, as outlined in Section 7.7.4 habitat creation and enhancement throughout the wider Brookleigh site will provide suitable habitat for nesting birds. This will include installation of ten bird boxes associated with the Proposed Development, within suitable habitat within the Site, and within the wider Brookleigh site.

With embedded measures implemented, potential killing, injury and loss of habitat for breeding birds is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature of **District (Low) importance**, this is considered to result in a **Negligible** impact that is **not significant**. The embedded measures will also ensure compliance with legislation that protects nesting birds.

Non-breeding birds

Construction of the Proposed Development will require loss of habitat suitable to support non-breeding birds, including grasslands, trees and hedgerows.

There will be a loss of approximately 4.9ha of grassland, approximately 980m of hedgerow, along with individual trees within the Site. Habitat creation will include a native shrub planting mix, which as described in Section 7.6 will include species beneficial to non-breeding birds, such as holly, hawthorn and blackthorn that provide winter berries. A total of 77 trees will be planted, which may provide shelter for non-breeding birds.

In addition, as outlined in Section 7.7.4 habitat creation and enhancement throughout the wider Brookleigh site will provide suitable habitat for non-breeding birds. This will include ancient woodland buffers, parklands and green corridors that will provide foraging and sheltering opportunities for non-breeding birds over winter.

With embedded measures implemented, potential loss of habitat for non-breeding birds is considered to be a **Low magnitude**, adverse impact. Acting on an ecological feature of **District (Low)** importance, this is considered to result in a **Negligible** impact that is **not significant**.

Reptiles

Species-poor semi-improved grassland in the north of the Site, west of Isaac's Lane will be lost to facilitate construction of a SuDS pond and dry detention basin, with associated drainage outfall. This habitat is assumed to support low numbers of common reptile species. Therefore, prior to mitigation there is a risk of killing and injuring individual reptiles.

A precautionary working method will be implemented as described in Section 7.4.3.2 and with these embedded measures implemented, this is considered to be a **Low magnitude**, adverse impact on a feature of **Local (Very low) importance**, resulting in a **Negligible** impact that is **not significant**. The embedded measures will also ensure compliance with legislation that protects reptiles.

Terrestrial Invertebrates

Habitats lost to facilitate the Proposed Development will include approximately 3.93ha species-poor semi-improved grassland, 0.96ha improved grassland, individual trees (totalling approximately 0.26ha) and approximately 980m hedgerows that are suitable to support terrestrial invertebrates.

Embedded mitigation, including habitat creation within the Site (Section 7.6) and habitat enhancement and creation within the wider Brookleigh site through the Biodiversity Scheme (Section 7.7) will reduce the magnitude of impacts on terrestrial invertebrates to one that is **Low magnitude**, but adverse. Acting on a feature of **District (Low) importance**, this is considered to be a **Negligible** effect that is **not significant**. This does not represent a change in the significance level of effects since the 2019 ES Addendum.

8.1.2.3 Loss of Habitat Connectivity

Badger

Construction of the Proposed Development has the potential to result in the loss of habitat connectivity due to severance of habitat that is used by a single badger clan territory in the west of the Site. This badger clan uses setts [REDACTED]

Embedded into the design of the wider Brookleigh development is the use of 'Open Space' plots to maintain habitat connectivity. OS2.2 will provide a habitat link between setts [REDACTED] as well as linking setts to suitable foraging areas. This comprises a hedgerow, with associated adjacent grassland which will be severed by the proposed Central Section.

In order to provide continued connectivity north and south of the proposed Central Section, a badger tunnel has been embedded into the design as outlined in Section 7.5.1.

In the wider Brookleigh development proposals, a pedestrian link will also be incorporated into this open space. The future design of this pedestrian link will ensure any potential interaction between pedestrians and badgers is minimised.

With embedded measures implemented, loss of habitat connectivity is a **Low magnitude**, adverse impact on a feature of **District (Low) importance**, resulting in a **Negligible** adverse effect that is **not significant**.

Great Crested Newt

Construction of the Proposed Development has the potential to result in the loss of habitat connectivity due to severance of terrestrial habitat within the intermediate (51-250m) of Ponds 8 and 8a, potentially reducing the availability of terrestrial habitat available to great crested newts utilising these ponds.

Embedded into the design of the wider Brookleigh development is the use of 'Open Space' plots to maintain habitat connectivity. OS2.2 will provide a habitat link between terrestrial habitat in the north and south of this area of the Site, including suitable retained terrestrial habitat and newly created habitat to the north and south of the proposed Central Section. OS2.2 comprises a hedgerow, with associated adjacent grassland which will be severed by the proposed Central Section.

In order to provide continued connectivity north and south of the proposed Central Section, an amphibian tunnel has been embedded into the design as outlined in Section 7.5.1.

With embedded measures implemented, loss of habitat connectivity is a **Low magnitude**, adverse impact on a feature of **County (Medium)** importance, resulting in a **Minor** adverse effect that is **not significant**.

Bats

Construction of the Proposed Development has the potential to result in a reduction in habitat connectivity for bats, due to severance of hedgerows. However, due to the width of the proposed road (6.5m, with 3m footpath one side and 2m footpath the other) and the presence planted verges including tree planting between the road and footpaths) this is considered unlikely to have a severance effect on bat species using the hedgerows for flight lines. Nevertheless, the bat crossing and central tree planting described in Section 7.5.2 will reduce the risk of a severance impact.

Therefore, with embedded measures implemented, loss of habitat connectivity is assessed to be a **Very low magnitude**, adverse impact on a feature of **County (Medium)** importance, resulting in a **Negligible** effect that is **not significant**.

8.2 Effects of Operation

8.2.1 Permanent Impacts During Operation

8.2.1.1 Changes in Lighting

Bats, badgers and terrestrial invertebrates

Operational lighting of the proposed Central Section will be required to ensure user safety, particularly pedestrians. However, its presence will increase the lighting within the Site from the baseline situation (currently unlit), which could reduce the suitability of existing commuting routes and foraging sites for bats and badgers, reduce the suitability of potential roosting features for bats in trees, and reduce the use of the Site by terrestrial invertebrates.

As described in Section 7.8, operational lighting has been designed in line with the Biodiversity Scheme (AECOM, 2020a), Design Guide (AECOM, 2019j) and Lighting Assessment (AECOM, 2018b) which accompanied the outline planning application, as well as guidance from the Bat Conservation Trust (BCT) and Institute of Lighting Professionals (ILP) (ILP and BCT, 2023), as recommended within the Bat Mitigation Guidelines (Reason & Wray, 2023).

Lighting of the proposed Central Section is the minimum required to enable adoption of the road and has been designed in conjunction with West Sussex County Council. Sensitive lighting design has focussed on lighting columns near to retained hedgerows. While anticipated lux levels at the road edge will be between approximately 5 and 6, increased to approximately 16 directly beneath lighting columns, this will reduce to 1.5 lux a minimum of approximately 5m and a maximum of approximately 10m from the road (Lighting Reality, 2024). However, as described in Section 7.8 measures such as hoods, cowls or louvres will be implemented to ensure operational lighting does not spill onto habitats of importance for bat foraging and flight lines, as well as habitats used by badgers for commuting through the Site (including badger tunnel entrances), and for terrestrial invertebrates.

With embedded measures implemented, operational lighting will result in a **Low** magnitude, adverse impact on an ecological feature of **County (Medium)** importance (bats), resulting in a **Minor** adverse impact that is **not significant**.

For badgers and terrestrial invertebrates, this will result in a **Low** magnitude, adverse impact on features of **District (Low)** importance, resulting in a **Negligible** impact that is **not significant**. For all of these ecological features, this does not represent a change in effect since the 2019 ES Addendum.

8.2.1.2 Hydrological Changes

Ancient woodland

A drainage outfall and associated pipework is proposed within Bridge Farm Shaw North, which comprises ancient woodland.

This route has been selected as it aims to maintain the current hydrological conditions, with surface water runoff being transferred into the same watercourse that receives runoff pre-development. Alternative routes have been explored (as described in the *Northern Arc Ecological Impact Assessment Section 73 Application – Incursions to Ancient Woodland* (AECOM, 2022), but either require pumping stations, which are prohibited by West Sussex County Council and increase the risk of flooding or require surface water runoff to be transferred to an alternate location. This includes transferring runoff to alternate watercourses, or to the existing watercourse but further downstream. These would both impact hydrological conditions, by increasing the amount of water transferred to a watercourse and/or reducing or removing water transferred to a watercourse.

Leaks from pipes installed within the ancient woodland (and ancient woodland buffer zone) are considered unlikely due to the construction methods proposed. Pipes installed by trenchless techniques are stronger than normal pipes. Coupled with the absence of traffic loading within the ancient woodland and ancient woodland buffer zones, the likelihood of pipe structural failure is extremely low. Furthermore, the locking sleeve joints required for trenchless installation are less prone to displacement or root ingress.

As no hydrological changes are anticipated, and as pipes leaking is considered to be extremely unlikely but cannot be fully ruled out, potential hydrological impacts are considered to be of **Very low** magnitude. Acting on an ecological feature of **County (Medium) importance**, this is considered likely to result in a **Negligible** effect which is **not significant**.

8.2.1.3 Recreational Pressure

Retained habitat including ancient woodland

Footpaths along the proposed Central Section will not give direct access to ancient woodland or other retained habitats. Upon completion, the presence of the proposed Central Section will facilitate construction of extensive residential development in land to the north and south of the road. These will be fenced, preventing movement of the public beyond the footpaths along the proposed Central Section in the short term.

However, upon construction of the surrounding residential developments, the proposed Central Section will form part of a network of roads and footpaths, and wider residential development that could lead to increased recreational pressure of retained habitats, including ancient woodland. This could result in degradation of ground flora,

Measures embedded into the wider Brookleigh development, including within the Biodiversity Scheme (AECOM, 2020a) include measures to reduce ease of access into ancient woodland and provision of open space throughout the wider Brookleigh site will reduce the risk of increased recreational pressure on retained habitats, including ancient woodland.

Therefore, there will be a **Low** magnitude, adverse impact on an ecological feature of **County (Medium)** importance, resulting in a **Minor** adverse effect which is **not significant**. This does not represent a change in effect since the 2018 ES or 2019 ES Addendum.

8.2.1.4 Vehicle Collisions

Bats

During operation of the Proposed Development there is potential for vehicle collisions to increase bat mortality within the Site. The proposed Central Section may be used by high-sided vehicles including buses.

As embedded into the design and outlined in the Biodiversity Scheme (AECOM, 2020), a bat crossing point has been planted where the proposed Central Section severs a hedgerow used as a bat flight line. This aims to encourage bats to fly at a suitable height over the road, in conjunction with retained trees within the hedgerow. This is described in Section 7.5.2, and has already been planted to enable sapling growth in advance of construction and subsequent operation of the Proposed Development.

In addition, the proposed Central Section will have a 20mph speed limit through the Site, with additional traffic calming measures as outlined in Section 7.4.4.

With this embedded measure implemented, this is considered to be a **Low** magnitude, adverse impact on an ecological feature of **County (Medium) importance**, resulting in a **Minor** effect which is **not significant**.

Badgers

During operation of the Proposed Development there is potential for vehicle collisions to increase badger mortality within the Site.

Embedded into the design, and as outlined in the Biodiversity Scheme (AECOM, 2020) is a badger tunnel with entrances to the north and south of the proposed Central Section, as described in Section 7.5.1. This will allow a safe crossing point for badgers travelling between setts and foraging areas to the north and south of the Proposed Development, along an area of retained habitat.

In addition, as embedded into the design the proposed Central Section will have a 20mph speed limit through the Site, with parking areas, central islands, and raised tables at junctions providing traffic calming measures. This will also reduce the risk of road traffic accidents resulting in badger injury or mortality.

With these embedded measures implemented, this is considered to be a **Low** magnitude, adverse impact on an ecological feature of **Borough (Low) importance**, resulting in a **Negligible** effect which is **not significant**.

8.2.1.5 SuDS Pond Maintenance

Great crested newt

Although the SuDS pond does not provide specific great crested newt mitigation, it has been designed to hold water year-round and aquatic and marginal planting will be implemented to make the pond generally suitable for great crested newt. Therefore, there is a risk of great crested newts being present during maintenance works.

However, maintenance works within the SuDS, including any de-silting operations are considered unlikely to impact great crested newts (if present) if they are undertaken from late autumn through the winter, typically early November to late January when great crested newts are likely to be absent.

Therefore, SuDS pond maintenance is considered to be a **Very low** magnitude, adverse impact on an ecological feature of **County (Medium) importance**, resulting in a **Negligible** effect which is **not significant**.

8.3 Additional Mitigation

Although impacts are considered prior to mitigation, the assessment is based on the assumption (which is considered intrinsic to the Proposed Development) that all embedded measures in Section 7 will be implemented. This includes construction industry good practice that will be implemented using a CEMP and landscaping design. These measures will minimise potential effects related to pollution, noise, dust and lighting and avoid significant adverse effects on habitats and species.

The killing, injury and disturbance of protected species will also be avoided through implementation of the mitigation hierarchy. Where impacts cannot be avoided, best practice measures (with respect to timing of construction works and hand searches) will be used under precautionary working methods (as outlined in Section 7.4.3), or through the use of Natural England licences (as outlined in Section 7.4.2).

An operational management plan will be required to ensure that required measures are implemented during maintenance tasks. This would include a requirement for trenchless techniques to be used for pipe inspections and repairs as a priority, where these are within the ancient woodland or ancient woodland buffer zone, and for maintenance works to SuDS to be during the period early November to late January.

Following the assessment of effects on ecological receptors, and considering the implementation of the embedded measures and operational management plans, the Proposed Development is not anticipated to result in significant effects for ecological features, and will be compliant with legislation that protects these features.

9. Residual Effects

The Proposed Development is not anticipated to result in any significant residual effects.

However, minor adverse effects that are not significant are anticipated to result from the following impacts during construction:

- Permanent loss of approximately 4m² of habitat in Bridge Farm Shaw North ancient woodland;
- Loss and modification of other habitats;
- Loss of potential roosting habitat for bats;
- Loss and severance of suitable foraging and commuting habitat for bats;

- Potential killing, injury and loss of habitat for great crested newt;
- Loss of habitat connectivity for great crested newt

Minor adverse effects that are not significant are anticipated to result from the following impacts during operation:

- Changes in lighting for bats;
- Increased recreational pressure for ancient woodland and other retained habitat;
- Vehicle collisions for bats.

A summary is provided in Table 23.

Table 23. Impact Assessment Summary

Receptor	Importance of Feature	Predicted Impact	Relevant Embedded Measures	Resulting Effect (CIEEM Equivalent in Brackets)	Additional Mitigation	Residual Significant Effect?
Ancient woodland	County (Medium)	<u>Construction</u> - Dust deposition - Light & noise disturbance - Pollution events - Habitat loss / modification <u>Operation</u> - Hydrological changes - Recreational pressure	- Retention of ancient woodland with 25m buffer zone - Use of trenchless techniques and works by hand - Protection fencing around 15m buffer - Design has ensured no hydrological changes to the ancient woodland - Implementation of CEMP - Sensitive lighting design - Implementation of 'Ancient Woodland Drainage Protocol' - Provision of open space in wider Brookleigh site - Measures to reduce ease of access to retained habitat	<u>Construction</u> Minor adverse, not significant (Adverse at the Local level, not significant) <u>Operation</u> Minor adverse, not significant (Adverse at the Site level, not significant)	N/A	No
Other habitats	County (Medium)	<u>Construction</u> - Dust deposition (retained habitats) - Pollution events - Loss of habitat - Spread of Himalayan balsam <u>Operation</u> - Recreational pressure	- Implementation of CEMP - Removal of Himalayan balsam by a specialist contractor under a management plan to avoid spread of invasive species via watercourse. - Habitat creation - Provision of open space in wider Brookleigh site - Measures to reduce ease of access to retained habitat	<u>Construction</u> Minor adverse, not significant (Adverse at the Local level, not significant) <u>Operation</u> Minor adverse, not significant (Adverse at the Site level, not significant)	N/A	No
Bats	County (Medium)	<u>Construction</u> - Loss of potential roosting habitat - Killing and injury (potential) - Loss of foraging habitat and flight lines - Lighting & noise disturbance <u>Operation</u> - Changes in lighting - Vehicle collisions	- Retention of hedgerow habitats - Installation of eight bat boxes in retained woodland - Pre-construction surveys to ensure continued absence of roosting bats - Implementation of precautionary felling method - Habitat creation including SuDS may have some foraging benefit.	<u>Construction</u> Minor adverse, not significant (Adverse at the Local level, not significant) <u>Operation</u> Minor adverse, not significant (Adverse at the Local level, not significant)	N/A	No

Receptor	Importance of Feature	Predicted Impact	Relevant Embedded Measures	Resulting Effect (CIEEM Equivalent in Brackets)	Additional Mitigation	Residual Significant Effect?
			- Construction and operational lighting to be sensitively designed - Implementation of CEMP - Planting of 'bat crossing' - Traffic calming measures and 20mph speed limit			
Great crested newt	County (Medium)	<u>Construction</u> - Killing, injury - Disturbance - Loss and severance of habitat <u>Operation</u> - SuDS pond maintenance	- Implementation of District Level Licence or EPSML - Construction of amphibian tunnel under the proposed Central Section - Habitat creation and enhancement - Pre-construction surveys	<u>Construction</u> Minor adverse, not significant (Adverse at the Site level, not significant) <u>Operation</u> Negligible, not significant (No effect)	N/A	No
Badger	District (Low)	<u>Construction</u> - Killing and injury - Loss of setts - Lighting disturbance - Habitat severance <u>Operation</u> - Changes in lighting - Vehicle collisions	- Pre-construction survey for badgers to ensure continued absence of setts - Implementation of CEMP (covering of excavations) - Implementation of Natural England licence for sett closure - Construction of a badger tunnel under the proposed Central Section - Traffic calming measures and 20mph speed limit - Construction and operational lighting to be sensitively designed	<u>Construction</u> Negligible, not significant (No effect) <u>Operation</u> Negligible, not significant (No effect)	N/A	No
Reptiles	Local (Very low)	<u>Construction</u> Killing and injury	Precautionary working method	<u>Construction</u> Negligible, not significant (No effect)	N/A	No
Birds (Breeding)	Local (Very low)	<u>Construction</u> - Killing and injury, destruction of nests - Disturbance - Loss of habitat	- Timing of vegetation clearance, or pre-clearance check by an ecologist - Installation of ten bird boxes in retained woodland - Implementation of CEMP - Habitat creation	<u>Construction</u> Negligible, not significant (No effect)	N/A	No

Receptor	Importance of Feature	Predicted Impact	Relevant Embedded Measures	Resulting Effect (CIEEM Equivalent in Brackets)	Additional Mitigation	Residual Significant Effect?
Birds (Non-breeding)	District (Low)	<u>Construction</u> - Disturbance - Loss of habitat	- Implementation of CEMP - Habitat creation	<u>Construction</u> Negligible, not significant (No effect)	N/A	No
Terrestrial invertebrates	District (Low)	<u>Construction</u> - Loss of habitat - Lighting disturbance <u>Operation</u> - Changes in lighting	- Habitat creation - Implementation of CEMP - Construction and operational lighting to be sensitively designed	<u>Construction</u> Negligible, not significant (No effect) <u>Operation</u> Negligible, not significant (No effect)	N/A	No

10. Cumulative Effects Assessment

The following schemes have been considered as being relevant in considering the potential for ecological cumulative effects as they are within 1km of the Site:

- DM/18/5114 Wider Brookleigh Scheme (formerly Northern Arc);
- DM/19/3845 Freeks Farm;
- DM/19/3313 Eastern Bridge and Link Road;
- DM19/1895 Fairbridge Way Development;
- DM/21/2870 Brookleigh Scheme – Phase 1B;
- DM22/0239 Church & Community Facility on Maple Drive;
- DM/22/2553 Brookleigh Scheme – Secondary School;
- DM/24/0222 Brookleigh Scheme – Pond 22; and
- DM/24/2010 Brookleigh Scheme – Foul Sewer Pumping Station.

Further details on these schemes are provided in Section 4.2.7.

10.1 Cumulative Effects During Construction

The developments at Fairbridge Way, Freeks Farm, the Eastern Bridge and Link Road and Phase 1B of the Brookleigh Scheme have commenced but will be continuing when the construction of the Proposed Development commences. The Brookleigh Secondary School, Pond 22 and Foul Sewer Pumping Station developments may commence during construction of the Proposed Development. All of these developments are beyond the eastern extent of the Proposed Development.

There is potential for a temporary cumulative effect from noise, light and dust pollution on retained habitats within the Site, including immediately adjacent offsite habitats particularly towards the eastern extent of the Site. However, a CEMP should be in place during all proposed developments, which would reduce any temporary cumulative effect to one that is non-significant.

10.2 Cumulative Effects During Operation

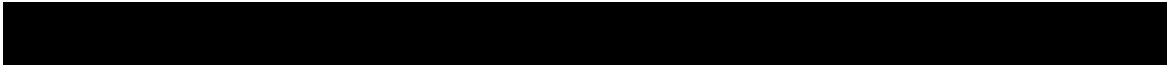
The Eastern Bridge and Link Road has the potential to result in increased mortality of badgers due to vehicle collisions, although due to its location this would be from a different badger clan. Nevertheless, the Eastern Bridge and Link Road has implemented a badger tunnel linking areas of open space, reducing any cumulative effect to one that is not significant.

11. Conclusions

Based on a combination of desk study and survey data collected to date, an assessment of the importance of ecological receptors has been made.

Habitats present within the Site include ancient woodland, species-poor semi-improved grassland, improved grassland, scattered broadleaved trees, amenity grassland, a pond (Pond 8), and hedgerows including hedgerows with trees. Hardstanding in the form of the existing Cuckfield Road is also present within the Site. Ancient woodland is an irreplaceable habitat.

With regards to protected species:

- Habitats within and adjacent to the Site are suitable for roosting bats (but no roosting bats were present during surveys);
- Habitats within and adjacent to the Site are used by foraging bats and bat flight lines, with an assemblage of at least nine species utilising the Site;
- 
- Small populations of great crested newt are present in Pond 8 within the Site, and Pond 8a outside of the Site;
- Hazel dormouse are considered absent;
- An assemblage of breeding and non-breeding birds is present;
- An assumed small population of common reptile species is present in suitable habitat in the north of the Site;
- An assemblage of terrestrial invertebrates is present;
- The Site is suitable for use by hedgehog; and
- A single stand of Himalayan balsam was recorded north of the Site, within a ditch that surface water drainage will outfall to.

The following potential impacts (prior to mitigation) have been identified:

- Disturbance, including through light and noise, as well as dust deposition and pollution of retained habitats including ancient woodland;
- Disturbance through light and noise of bats, badger, birds and terrestrial invertebrates;
- Habitat loss, including ancient woodland;
- Hydrological changes to ancient woodland soils;
- Increased recreational pressure of retained habitats;
- Killing and injury of badger, bats, nesting birds, great crested newt and reptiles during construction;
- Light disturbance of bats, badger, terrestrial invertebrates during operation;
- Severance impacts for bats, badger and great crested newt;
- Increased vehicle collisions for bat and badger;
- Spread of invasive species;

Measures embedded into the design are:

- Implementation of the Ancient Woodland Drainage Protocol including use of trenchless techniques, no storage of spoil, plant or materials within the ancient woodland or buffer zone, reinstatement of disturbed ancient woodland soils where possible, arboricultural supervision, construction by hand;
- Implementation of a CEMP including measures with regards to lighting, pollution, noise, and prevention of mammals becoming trapped in excavations;
- Implementation of ancient woodland buffer zones including a 15m 'no development' buffer and a 10m buffer of soft landscaping;
- Precautionary methods of work, with pre-construction surveys completed for mobile species as appropriate;

- Implementation of protected species licences for badger and great crested newt, with updated surveys completed as appropriate in line with licence requirements;
- Measures to retain connectivity including badger tunnel, amphibian tunnel and a 'bat crossing';
- Creation of new habitat suitable for use by badgers, bats, reptiles, birds, great crested newt and invertebrates, including SuDS design to create suitable aquatic habitat for great crested newt;
- Connected habitat creation and enhancement in the wider Brookleigh site in future;
- Sensitive operational lighting design as appropriate;
- Avoidance of hydrological changes through drainage design to mimic current conditions;
- Measures to reduce the risk of increased recreational pressure on retained habitat including ancient woodland, such as creation of accessible green space throughout the wider Brookleigh scheme and use of a Park Ranger team;
- Installation of bird and bat boxes within retained woodland in the wider Site, in line with the Biodiversity Scheme;
- Removal of Himalayan balsam from Bridge Farm Shaw North.

Taking the above potential impacts and embedded measures into account, the Proposed Development is considered to result in **Minor adverse** effects that are not significant are anticipated for ancient woodland, other habitats, bats, and great crested newt. For all other species, a **Negligible** effect that is not significant is anticipated. No cumulative effects are anticipated with other nearby schemes.

12. References

4Way Consulting (2024). *Northern Arc Avenue Road Lighting – Design Consideration*.

AECOM (2018a). *Northern Arc Allocation Planning Application Environmental Statement Volume I: Chapter 6 Ecology*

AECOM (2018b). *Northern Arc Allocation Planning Application Environmental Statement Volume I: Chapter 7 Water Resources, Flood Risk and Drainage*.

AECOM (2018c). *Northern Arc Planning Application Allocation: Lighting Assessment*.

AECOM (2018d). *Northern Arc Allocation Planning Application: Outline Construction Environmental Management Plan*

AECOM (2019a) *Northern Arc Allocation Planning Application: Environmental Statement Addendum*

AECOM (2019b) *Northern Arc Allocation Planning Application: Environmental Statement Addendum – Appendix 6-7: Bat Survey Report*

AECOM (2019c) *Northern Arc Allocation Planning Application: Environmental Statement Addendum – Appendix 6-6: Badger Survey Report*

AECOM (2019d) *Northern Arc Allocation Planning Application: Environmental Statement Addendum – Appendix 6-10: Great Crested Newt Survey Report*

AECOM (2019e) *Northern Arc Allocation Planning Application: Environmental Statement Addendum – Appendix 6-11: Hazel Dormouse Survey Report*

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Appendix A – Legislation and Policy

A.1 Wildlife Legislation

The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) ('the WCA') is the major domestic legal instrument for wildlife protection in the UK and is the primary means by which the following are implemented:

- The Convention on the Conservation of European Wildlife and Natural Habitats ('the Bern Convention'); and
- The Council Directive 79/409/EEC on the Conservation of Wild Birds ('the Bird Directive').

The main relevant provisions of the Act are the allowance for the protection of the most important habitats and species by designating Sites of Special Scientific Interest (SSSIs), a level of protection to all nesting wild birds and species and bird species under Schedule 1.

The Protection of Badgers Act 1992

Badgers (*Meles meles*) and their setts are protected under the Protection of Badgers Act 1992. In England and Wales this makes it an offence to:

- Wilfully kill, injure or take a badger (or attempt to do so);
- Cruelly ill-treat a badger;
- Dig for a badger, intentionally or recklessly damage or destroy a badger sett, or obstruct access to it; cause a dog to enter a badger sett; and
- Disturb a badger while it is occupying a sett.

The Countryside and Rights of Way Act 2000 (CRoW)

Part III of the Countryside and Rights of Way Act 2000 ('the CRoW Act') deals specifically with wildlife protection and nature conservation in England and Wales. The CRoW Act strengthened the safeguards afforded to SSSIs and adds to the protection of wild animals designated under the WCA 1981 by making it an offence to "recklessly disturb" the sheltering places of wild animals designated under Schedule 5 of the WCA.

Natural Environment and Rural Communities (NERC) Act 2006 (as amended)

Section 41 of the Natural Environment and Rural Communities Act 2006 ('the NERC Act') requires the listing of habitats and species that are of principal importance for the conservation of biodiversity, including those that have been identified as priorities within the UK Biodiversity Action Plan (UK BAP).

The NERC Act requires that the Section 41 list be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 'to have due regard' to the conservation of biodiversity when carrying out their normal functions.

The Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) transpose the requirements of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive') into domestic legislation.

The Regulations identify European Protected Species (EPS) and various habitats of importance within Europe, with important sites for these habitats/species or both being designated as Special Areas of Conservation (SAC) and important sites for birds being designated as Special Protection Areas (SPAs). Any proposed development that may have a significant effect on a SAC or SPA should be assessed in relation to the site's 'conservation objectives' (i.e. the reasons for which the site is designated).

The Regulations also implement the species protection regime set out within the Habitats Directive, providing a clear legal basis for surveillance and monitoring of European Protected Species.

The Invasive Alien Species Act. (Enforcement and Permitting) Order 2019 (as amended)

The Invasive Alien Species Regulations sets out to address the problems concerned with invasive alien species (IASs) in order to protect native biodiversity and ecosystem services and minimize and mitigate the human health

and/or economic impacts that IASs can have. It sets out rules to prevent and manage the introduction and spread of IASs through prevention, early detection and rapid eradication, and management.

The Environment Act 2021

The Environment Act 2021, published by the UK Government as the Environment Bill in October 2019 (Environment Bill, 2019), includes proposals to make biodiversity net gain (BNG) a mandatory requirement within the planning system in England. The biodiversity elements of the Act include:

- Strengthened biodiversity duty;
- Biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- Duty upon Local Authorities to consult on street tree felling;
- Strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;
- Prohibit larger UK businesses from using commodities associated with wide-scale deforestation; and
- Requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain.

A.2 National Planning Policy

At a national level, the UK Government published the National Planning Policy Framework (NPPF) in 2012. The NPPF supersedes previous national planning policy guidance (PPGs) and planning policy statements (PPSs). The NPPF summarises in a single document the Government planning policies for England, and how these are expected to be applied. The NPPF was last updated in December 2024 (Ministry of Housing, Communities and Local Government, 2024)).

Policies and objectives which are of particular relevance to biodiversity include:

- Paragraph 187 of the revised NPPF states that “Planning policies and decisions should contribute to and enhance the natural and local environment by
 - a) *protecting and enhancing valued landscapes, sites of biodiversity of geological value and soils (in a manner commensurate with their statutory status of identified quality in the development plan);*
 - b) *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
 - c) *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
 - d) *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs.”*
- Paragraph 188 states “Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries”.
- Paragraph 192, stresses the importance of ecological networks stating that “To protect and enhance biodiversity and geodiversity, plans should:
 - a) *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

- b) *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.”*
- Paragraph 193 which states that in relation to the determination of planning applications local planning authorities “*should apply the following principles:*
 - a) *if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - b) *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
 - c) *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
 - d) *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”*
- Paragraph 194 states that “The following should be given the same protection as habitats sites:
 - a) *potential Special Protection Areas and possible Special Areas of Conservation;*
 - b) *listed or proposed Ramsar sites; and*
 - c) *sites identified, or required, as compensatory measures for adverse effects on habitat sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.”*
- Paragraph 195 states that “The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site is being planned or determined”.
- Paragraph 198 states that “Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should...limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

A.3 Local Planning Policy and Guidance

Mid Sussex District Plan (March 2018)

The Mid Sussex District Plan (2018) comprises a suite of documents to guide planning and development in the district. The plan was adopted in March 2018 and will cover a plan period up until 2031.

Policy DP37 Trees, Woodland and Hedgerows states that “*The District Council will support the protection and enhancement of trees, woodland and hedgerows.... In particular, ancient woodland and aged or veteran trees will be protected. Development that will damage or lead to the loss of trees, woodland or hedgerows..., will not normally be permitted.*”

Policy DP38 Biodiversity states that “*Biodiversity will be protected and enhanced by ensuring development:... takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity.... protects existing biodiversity, so that there is no net loss of biodiversity; Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; Avoids damage to, protects and enhances the special*

characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest...; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas and Nature Improvement Areas”.

A new Mid Sussex District Plan 2021 – 2039 (Mid Sussex District Council, 2023) is currently undergoing examination. A review of draft policies has been completed, with no significant changes anticipated.

Burgess Hill Neighbourhood Plan 2015 - 2031 (2016)

The Burgess Hill Neighbourhood Plan was adopted in 2016 and aims to focus on community development and provide the framework to deliver benefits for residents, businesses and visitors. The Plan provides clarity to communities, landowners and other interested parties on how the town of Burgess Hill will improve and transform for the benefit of existing future and population.

- Policy G3: Nature Conservation and Biodiversity states that *“Existing areas of nature conservation will be retained and protected from any negative impacts likely to arise from development. The Town Council will seek appropriate improvements to the habitat network in development proposals wherever possible. There will be new designations and enhancement of existing nature conservation as follows:*
 - a. *Enhanced meadow areas will be provided in the Leyland’s Park policy area including east of Freek’s Lane/Roman Meadow and parts of Bedelands Farm Local Nature Reserve.*
 - b. *Projects that improve the interpretation and visitor facilities to Bedelands Farm Local Nature Reserve will be supported.*
 - c. *Enhancements to ponds will be supported where appropriate”.*

Biodiversity Opportunity Area

The Site is partly located within the Burgess Hill Green Crescent Biodiversity Opportunity Area (BOA) (Sussex Biodiversity Partnership), which is identified due to presence of lowland meadows, woodland, wood-pasture and parkland. The BOA also includes Bedelands Local Wildlife Site (LWS) which is outside of, but adjacent to, the eastern boundary of the Site.

Opportunities identified within the BOA include improvements to grassland and woodland management, habitat restoration, education and community engagement, and access improvements.

Sussex Biodiversity Action Plan

The Sussex Biodiversity Partnership has prepared a list of species and habitats to be included in a Biodiversity Action Plan for the county. Priority species within the Sussex Biodiversity Action Plan include:

- Birds (52 priority bird species in Sussex, from a range of habitats including farmland);
- Fish (seven priority freshwater fish species);
- Herptiles (all ten of the UK’s priority species of amphibian and reptile species, including great crested newt *Triturus cristatus*);
- Terrestrial Invertebrates (220 priority species of invertebrate in Sussex); and
- Terrestrial Mammals - 16 priority terrestrial mammal species in Sussex, including hazel dormouse (*Muscardinus avellanarius*), brown long-eared bat (*Plecotus auritus*) and brown hare (*Lepus europaeus*).

Priority habitats within the Sussex Biodiversity Action Plan are:

- Lowland farmland (which includes arable field margins, hedgerows, lowland meadows and traditional orchards);
- Wetlands (which includes eutrophic standing waters, ponds and reedbeds);
- Coastal;
- Woodland (including wood pasture and parkland); and
- Marine.

Appendix B Target Notes and Habitat Photographs

B.1 Target Notes

Target Note (TN) 1: Species-poor semi-improved grassland within former arable field. Short sward height at the time of survey, regularly mown under existing management plan. Species present included dominant perennial rye grass, abundant white clover (*Trifolium repens*), and rarely recorded dandelion (*Taraxacum officinale* agg.), common fleabane (*Pulicaria dysenterica*), betony (*Stachys officinalis*), bristly ox tongue (*Helminthotheca echioides*) and bramble (*Rubus fruticosus* agg.)

TN2: Existing gap in species-rich hedgerow with trees where the proposed Central Section will bisect the hedgerow. Gap will be widened to achieve this. Species recorded within the hedgerow included hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), alder (*Alnus glutinosa*), and dog rose (*Rosa canina*), all frequently recorded. Trees within the hedgerows comprised English oak (*Quercus robur*).

TN3: Hornbeam (*Carpinus betulus*) planted either side of the hedgerow, and to the north and south of the existing gap to provide a bat crossing for the future operational phase of the proposed Central Section.

TN4: Species-poor semi-improved grassland within former arable field. Short sward height at the time of survey, regularly mown under existing management plan. Species present included dominant perennial rye grass, abundant white clover (*Trifolium repens*), and rarely recorded dandelion (*Taraxacum officinale* agg.), and bristly ox tongue (*Helminthotheca echioides*).

TN5: Species-poor semi-improved grassland with a taller sward height and tussocks present, along with some mown pathways. Species present were the same as TN4.

TN6: Track within Bridge Farm Shaw North ancient woodland where drainage infrastructure (pipe installed using horizontal directional drilling with an outfall constructed in an existing ditch) is proposed. Overgrown at the time of survey with hogweed (*Heracleum sphondylium*), common nettle (*Urtica dioica*) and bramble (*Rubus fruticosus* agg.).

TN7: Species-rich hedgerow where the proposed Central Section will bisect the hedgerow. Species recorded were the same as TN2.

TN8: Species-poor hedgerow to be lost to facilitate the Proposed Development. Species included abundant hawthorn and blackthorn, with occasional bramble.

TN9: Burgess Hill Golf Centre with amenity grassland present. Species present included dominant perennial rye grass, with frequent creeping buttercup (*Ranunculus repens*) and white clover, with occasional red fescue (*Festuca rubra*).

TN10: Pond 29, within which an outfall for drainage infrastructure will be constructed, with Bridge Farm Shaw 2 ancient woodland present to the south.

TN11: Existing Cuckfield Road

TN12: Species-poor hedgerow to be bisected by the proposed Central Section. Species included frequent hawthorn, blackthorn and bramble.

TN13: Improved grassland with taller sward height on formerly arable land, dominated by perennial rye grass.

TN14: Location of proposed tie-in with proposed Central Section and existing Eastern Bridge and Link Road.

TN15: Pond 8, a known great crested newt (*Triturus cristatus*) breeding pond.

TN16: Himalayan balsam (*Impatiens glandulifera*) present within Bridge Farm Shaw North.

B.2 Habitat Photographs



Plate 5. Mown species-poor, semi-improved grassland in the west of the Site, looking east along the proposed route of the Central Section. Photograph taken 12/09/2024



Plate 6. Mown species-poor, semi-improved grassland towards the centre of the Site, looking west along the proposed route of the Central Section. Photograph taken 12/09/2024



Plate 7. Species-poor semi-improved grassland in the north of the Site, west of Cuckfield Road where a SuDS pond and dry detention basin are proposed, looking south. Photograph taken 11/08/2023



Plate 8. Track within Bridge Farm Shaw North ancient woodland where drainage infrastructure is proposed, overgrown with hogweed, nettle and bramble at the time of survey. Photograph taken 11/08/2023.



Plate 9. Mown species-poor, semi-improved grassland west of Cuckfield Road where the Central Section is proposed, looking west. Photograph taken 12/09/2024



Plate 10. Improved grassland in the east of the Site, east of Cuckfield Road, looking east along the proposed route of the Central Section. Photograph taken 12/09/2024



Plate 11. Native species-rich hedgerow in the centre of the Site, west of Cuckfield Road which the proposed Central Section will bisect. Looking south. Photograph taken 12/09/2024.



Plate 12. Existing gap in native species-rich hedgerow with trees where the proposed Central Section will pass through. One end of the hornbeam 'bat crossing' is shown in the right of the photograph. Looking east. Photograph taken 12/09/2024



Plate 13. Burgess Hill Golf Centre where drainage infrastructure is proposed, with Pond 29 indicated by a red circle and Bridge Farm Shaw 2 beyond in the right hand side of the photo. Looking south-east. Photograph taken 11/08/2023.



Plate 14. Existing Cuckfield Road with amenity grassland verge, looking north from the entrance to the Burgess Hill Golf Centre. Photograph taken 11/08/2023.



Plate 15. Existing Cuckfield Road, with species-poor hedge on the right hand side of the image, proposed to be lost to facilitate the Proposed Development. Looking south. Photograph taken 11/08/2023



Plate 16. Species-poor hedgerow to the east of Cuckfield Road that the proposed Central Section will bisect. Looking north-west. Photograph taken 12/09/2024



Plate 17. The existing Eastern Bridge and Link Road at the proposed tie-in location to the proposed Central Section, looking east. Photograph taken 12/09/2024



Plate 18. Pond 8 in the north of the Site, looking south-east. Photograph taken 21/04/2022



Plate 19. Pond 29 within Burgess Hill Golf Centre, looking east. Photograph taken 30/06/2023.



Plate 20. Tree 32 within Burgess Hill Golf Centre, looking north. Photograph taken 11/08/2023



Plate 21. P12-1, looking west. Photograph taken 26/02/2024



Plate 22. Tree AW15, looking north. Photograph taken 15/03/2022



Plate 23. Trees 96 and 97, looking north. Photograph taken 12/09/2024



Plate 24. Tree 39, looking south-west. Photograph taken 12/09/2024



Plate 25. Tree 95, looking south. Photograph taken 12/09/2024



Plate 26. Tree CS10, looking south. Photograph taken 11/08/2023

Appendix C Bat Roost Suitability Definitions

Table 24. Suitability of Features to Support Roosting Bats, based on Collins (2016)

Suitability to Support Roosting Bats

Confirmed	A feature within which bats are seen to be present (either live bats, or bat carcasses) or heard 'chattering' inside will be classified as a confirmed roost. In addition any feature/structure found to contain droppings during inspections will in the first instance be considered as a confirmed roost. N.B. In some cases it may be appropriate to revise this assessment following further survey (e.g. for buildings containing low numbers or old droppings and showing no evidence of use during emergence surveys).
High	A feature which, due to its size, depth, shape, orientation or other physical properties (such as ability to maintain a constant temperature, accessibility for bats) is considered to be ideal for use by bats. Potential feeding remains, urine staining or scratch marks (in the absence of droppings) within or around the feature are likely to indicate presence of a bat occupation and therefore suggest high risk that a roost is present. In the absence of such signs, assigning a feature high risk will also be informed by the surveyor's knowledge of bat ecology and preferred roost types (relative to the feature being assessed). The quality of the surrounding habitat for bats will also be considered. For example. A building within an area of woodland is more likely to be occupied by bats than one adjacent to large areas of hard standing (as the bats would use the woodland for feeding, and potentially roosting). Potential examples of high risk features are: A south facing opening on a trunk that appears to form a significant wound within the tree, with uncluttered drop zone and good connectivity to other areas of suitable habitat; or Gap below a ridge tile that provides potential point of access to a pitched roof, with marked cleaner tile below indicating potential use by bats.
Moderate	A feature which would be considered ideal for use by bats were it not for one or more key factors which limit its potential. For example, an ideal feature in sub-optimal surrounding habitat (e.g. within an area of predominately hard standing) may be considered to have moderate risk.
Low	A tree / structure containing features where use by bats cannot be ruled out but is considered unlikely based on size, depth, construction aspect, habitat location etc. For example often metal warehouse structures with suitable access/egress points will be classed as having low risk of supporting roosting bats.
Negligible	A tree / structure with negligible features, unlikely to be suitable to support roosting bat species.

Table 25. Suitability of Features to Support Roosting Bats, based on Collins (2023)

Suitability to Support Roosting Bats

None	A tree that lacks suitable features to support roosting bats
FAR	Further Assessment Required – to establish if PRFs are present in the tree
PRF-I	Potential Roost Feature (PRF) is suitable for individual bats or very small numbers of bats either due to size of lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Appendix D Badger Survey Terminology

Table 26. Standard Badger Settle Classification Terminology (Harris *et al.*, 1989)

Sett category	Description
Main	Has several entrance holes with high levels of activity, including large spoil mounds, freshly excavated earth, "well marked" paths and usually a fresh latrine present. There is often evidence of discarded bedding, which may indicate breeding.
Annex	Close to a main sett and usually clearly linked to a nearby main sett by well-worn paths. Normally active with several holes, although with some holes displaying less obvious signs of badger activity. The size of the annex sett can vary depending on the size of the local badger population.
Subsidiary	Generally less than 5 entrance holes and some distance from a main sett and without obvious linking paths. The holes can be very variable in signs of usage and are often much less consistently in use than those of main or annex, although this very much depends on the size and density of the local badger population. Subsidiary setts can also be used for breeding, often by a sub-dominant female, which is linked to the size of the local population and hierarchy.
Outlier	Usually consists of a single or double hole with varying levels of activity. Outlier setts can sometimes be used for breeding, often by a sub-dominant female, which is linked to the size of the local population and hierarchy.
Level of usage	Description
Well used	Badger holes generally clear of all vegetation, litter or debris, except where bedding has been left in the entrance. They are likely to show signs of wear at the entrance, including scratch marks along the site on entrance holes, which can also be smooth and worn, thus devoid of vegetation such as moss.
Partly used	Leaves or twigs in badger entrance hole which have not been cleared by regular use, although may be brought into regular use with relatively little clearance or new digging. Caution is to be given during autumn, as falling leaves can give an impression of only partial usage, although closer inspections can reflect a well-used entrance hole.
Disused	Badger holes show no signs of recent usage, often partly or wholly blocked and may require considerable digging to re-open.

Appendix E Bat roost suitability assessment of trees – full results

Table 27 Full bat roost suitability assessment data for trees with suitability to support roosting bats

Tree no.	Tree species	Diameter at breast height (DBH) (m)	Description of feature						Height of Cavity (m)	Direction of cavity	Uncluttered drop zone (Y/N)	Signs	Position in landscape	Roost type suitability				Recommendations/Additional Comments	
			Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls						PRF-M	PRF-I	FAR	None		
32	Oak	1.0						X	4 & 6m	South	Y	N	Golf course		X			Transitional	Callus rolls with very small gaps at edge
			X						8m	South	Y	N			X			Transitional	Split branch but with a large gap, likely unsuitable for roosting bats
39	Oak (dead)	0.5	x						3m – 10m	All	Y	N	Hedgerow	X				Transitional	IDD in 2019, more loose bark in 2022
							x		5m	East	Y	N			X			Transitional	Callus roll with very small gaps at edge.
95	Oak	0.7			x				5m	South	Y	N	Hedgerow		X			Transitional	Cavity at callus roll where dead branch meets tree, cavity approximately 2x6cm but shallow.
96	Oak	0.5			x				5m	West	Y	N	Hedgerow		X			Transitional	Woodpecker hole on branch, facing ground, top of branch is open with no crevices.
97	Oak	0.7					x		7m	North	Y	N	Hedgerow		X			Transitional	Two callus rolls, difficult to view due to proximity to Tree 96 but only very small gaps at edges present
AW15	Oak	1.1	x						All	All	Y	N	Woodland edge	X				Transitional	Lifted bark on all aspects
					X				1.4	South	Y	N		X				Transitional	Woodpecker hole

Tree no.	Tree species	Diameter at breast height (DBH) (m)	Description of feature						Height of Cavity (m)	Direction of cavity	Uncluttered drop zone (Y/N)	Signs	Position in landscape	Roost type suitability				Recommendations/Additional Comments		
			Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls						Other	PRF-M	PRF-I	FAR			None
							X		3	East	Y	N		X			Transitional	Callus roll with small gaps at edge		
P12-1	Willow sp.	0.8			X				5m	East	Mostly	N	Trees north of Pond 8	X				Transitional	Woodpecker hole, very slightly cluttered by one or two twigs. Adjacent to good foraging habitat.	
							X		5	South-east	Y	N			X			Transitional	Small knot hole just under branch.	
			X						6	South-east	Y	N		X				Transitional	Gaps created by dead branch bark, inner coming away	
			X						6	North	Y	N			X			Transitional	Hole at top of dead branch where bark has come away. Superficial and exposed.	
CS10	Oak	0.15				X			All	All	N	N	Along eastern verge of Cuckfield Road	X				Transitional	Dense ivy cover	

Appendix F Full Bat Emergence Survey Results

F.1 Tree 39

Dusk 15th August 2022

Project Name	Brookleigh Central Section		Surveyor		GG & MB
Survey Location	Tree 39		Rain (0-5)		Start 0 : End 0
Date	15/08/2022		Wind (Beaufort 0-7)		Start 1 : End 2
Start	19:52		Temperature (°C)		Start 21 : End 19
Sunset	20:22		Weather description (start)		Hot and hazy, cooling down with thunderstorms predicted.
Finish	21:52		Weather description (end)		Slightly cooled into the evening, high pressure with air feeling dense.
Cloud Cover (0-5)	Start 4 : End 4				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
20:31	Soprano Pipistrelle	1	N	Y	Foraging around tree canopy.
20:40	Noctule	2	N	Y	Two commuting high flying noctules
20:42	Noctule	1	N	Y	Foraging around open field before carrying on commute
20:48	Soprano Pipistrelle	10+	N	Y	Foraging in front of hedgerow adjacent to tree
20:52	Soprano Pipistrelle	10+	N	Y	Foraging in front of hedgerow adjacent to tree
21:01	Soprano Pipistrelle	10+	N	Y	Foraging
21:03	Soprano Pipistrelle	10+	N	Y	Foraging
21:04	Common Pipistrelle	10+	N	Y	Foraging
21:15	Serotine	1	N	Y	Commuting
21:17	Soprano Pipistrelle	1	N	Y	Foraging
21:31	Brown long-eared bat	1	N	Y	
21:32	Common Pipistrelle	1	N	Y	Very brief
21:34	Noctule	1	N	Y	
21:43	Common Pipistrelle	3	N	Y	

Dawn 31st August 2022

Project Name	Brookleigh Central Section		Surveyor		AK & DW
Survey Location	Tree 39		Rain (0-5)		Start 0 : End 0
Date	31/08/2022		Wind (Beaufort 0-7)		Start 0 : End 2
Start	04:43		Temperature (°C)		Start 18 : End 14
Sunset	06:13		Weather description (start)		Cool, clear sky, calm, no wind, dry
Finish	06:28		Weather description (end)		Cool, mostly clear skies, light breeze, dry
Cloud Cover (0-5)	Start 0 : End 1				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
04:45	Brown long-eared bat	1	N	Y	Brief pass, fast call, very quiet
04:49	Brown long-eared bat	1	N	Y	Brief pass, fast call, very quiet
05:04	Soprano Pipistrelle	1	N	Y	Brief pass
05:06	Soprano Pipistrelle	1	N	Y	Brief pass
05:11	Soprano Pipistrelle	1	N	Y	Brief pass
05:20	Common Pipistrelle	1	N	Y	Brief pass

05:22	Common Pipistrelle	1	N	Y	Brief pass
05:44	Noctule	1	N	Y	Brief pass
05:48	Noctule	1	N	Y	Commuting high above trees
05:54	Soprano Pipistrelle	1	N	Y	Circling around the tree being observed but no re-entry

Dusk 20th September 2022

Project Name	Brookleigh Central Section		Surveyor		JS & SK
Survey Location	Tree 39		Rain (0-5)		Start 0 : End 0
Date	20/09/2022		Wind (Beaufort 0-7)		Start 2 : End 1
Start	18:34		Temperature (°C)		Start 17 : End 16
Sunset	19:04		Weather description (start)		Calm, overcast and dry
Finish	20:34		Weather description (end)		Calm, overcast and dry. Wind has lessened from start of survey
Cloud Cover (0-5)	Start 4 : End 4				
Time	Species	No. of bats	Emergence (Y/N)	Recording (Y/N)	Description
19:08	Soprano Pipistrelle	1	N	Y	
19:11	Soprano Pipistrelle	1	N	Y	Very quiet, flew from southern side of tree.
19:19	Soprano Pipistrelle	1	N	Y	Emergence potential but confirmed not with the infrared camera.
19:21	Common Pipistrelle	1	N	Y	
19:32	Common Pipistrelle	1	N	Y	
19:36	Common Pipistrelle	1	N	Y	Flew north, multiple passes foraging along adjacent hedgerow.
19:41	<i>Myotis</i> species	1	N	Y	Foraging for 5 minutes. Heard not seen
19:44	Common Pipistrelle	1	N	Y	Heard not seen, brief but multiple passes foraging.
19:47	Noctule	1	N	Y	Brief but multiple passes
19:50	Common Pipistrelle	1	N	Y	Brief but multiple passes, foraging along hedgerow until the end of the survey.
19:57	Common Pipistrelle	1	N	Y	Brief but multiple passes
20:07	<i>Myotis</i> species	1	N	Y	Heard not seen
20:20	Common Pipistrelle	1	N	Y	Heard not seen
20:24	Brown long-eared bat	1	N	Y	
20:30	Brown long-eared bat	1	N	Y	
20:30	<i>Myotis</i> species	1	N	Y	
20:30	Noctule	1	N	Y	Commuting
20:32	Brown long-eared bat	1	N	Y	

F.2 Tree 95

Dawn 16th August 2022

Project Name	Brookleigh Central Section		Surveyor		RW & DW
Survey Location	Tree 95		Rain (0-5)		Start 0 : End 0
Date	16/08/2022		Wind (Beaufort 0-7)		Start 1 : End 1

Start	04:18	Temperature (°C)		Start 17 : End 17	
Sunset	05:48	Weather description (start)		Humid, mild, overcast, still	
Finish	06:03	Weather description (end)		Mild, overcast, still	
Cloud Cover (0-5)	Start 4 : End 4				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
04:24	Brown long-eared bat	1	N	Y	Heard not seen
04:26	Soprano Pipistrelle	1	N	Y	Heard not seen. Brief pass.
04:41	Noctule	1	N	Y	Foraging
04:44	Common Pipistrelle	1	N	Y	Foraging
04:47	Soprano Pipistrelle	1	N	Y	Foraging
04:47	Brown long-eared bat	1	N	Y	
04:54	Serotine	1	N	Y	
05:00	Noctule	1	N	Y	Commuting
05:07	Noctule	1	N	Y	Commuting
05:11	Soprano Pipistrelle	1	N	Y	Foraging
05:14	Soprano Pipistrelle	1	N	Y	Foraging
05:18	Noctule	1	N	Y	Commuting
05:20	Soprano Pipistrelle	1	N	Y	Commuting
05:25	Soprano Pipistrelle	1	N	Y	Commuting along hedgerow adjacent to tree.
05:27	Soprano Pipistrelle	1	N	Y	Heard not seen. Brief pass.
05:30	Soprano Pipistrelle	1	N	Y	Foraging

Dusk 30th August 2022

Project Name	Brookleigh Central Section		Surveyor		AK & DW
Survey Location	Tree 95		Rain (0-5)		Start 0 : End 0
Date	30/08/2022		Wind (Beaufort 0-7)		Start 3 : End 1
Start	19:35		Temperature (°C)		Start 23 : End 17
Sunset	19:50		Weather description (start)		Warm, dry, minimal cloud cover, light breeze
Finish	21:20		Weather description (end)		Warm, dry, minimal cloud cover, light breeze, slightly cooler than start
Cloud Cover (0-5)	Start 1 : End 0				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
20:06	Noctule	1	N	Y	Brief pass
20:09	Soprano Pipistrelle	1	N	Y	Commuting
20:11	Soprano Pipistrelle	1	N	Y	Commuting along adjacent hedgerow
20:21	Common Pipistrelle	1	N	Y	Numerous passes for a few minutes
20:25	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
20:27	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
20:29	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
20:31	Soprano Pipistrelle	1	N	Y	Brief pass, foraging along hedgerow
20:35	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
20:39	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
20:43	Soprano Pipistrelle	1	N	Y	Numerous passes, brief
20:49	Brown long-eared bat	1	N	Y	Very brief and very quiet
20:52	Noctule	1	N	Y	Commuting

20:53	Brown long-eared bat	1	N	Y	Multiple passes along hedgerow adjacent to tree
20:53	Soprano Pipistrelle	1	N	Y	Multiple passes along hedgerow
20:55	Brown long-eared bat	1	N	Y	Numerous passes foraging until the end of the survey.
20:56	Noctule	1	N	Y	Commuting
21:00	Soprano Pipistrelle	1	N	Y	Foraging along adjacent hedgerow
21:01	Common Pipistrelle	1	N	Y	Continues for 15 minutes foraging around tree.
21:16	Soprano Pipistrelle	1	N	Y	Foraging along hedgerow

F.3 Tree 96

Dusk 15th August 2022

Project Name	Brookleigh Central Section		Surveyor		DW
Survey Location	Tree 96		Rain (0-5)		Start 0 : End 0
Date	15/08/2022		Wind (Beaufort 0-7)		Start 1 : End 2
Start	19:52		Temperature (°C)		Start 21 : End 19
Sunset	20:22		Weather description (start)		Hot and hazy, cooling down with thunderstorms predicted.
Finish	21:52		Weather description (end)		Slightly cooled into the evening, high pressure with air feeling dense.
Cloud Cover (0-5)	Start 4 : End 4				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
20:32	Soprano Pipistrelle	1	N	Y	Heard not seen, brief
20:41	Noctule	2	N	Y	Commuting
20:43	Noctule	1	N	Y	Commuting
20:49	Soprano Pipistrelle	1	N	Y	Continuous for 10 minutes
20:52	Soprano Pipistrelle	1	N	Y	Commuting and then foraging along the adjacent hedgerow
21:02	Common Pipistrelle	1	N	Y	Commuting and foraging along the hedgerow. Continues for 3 minutes
21:05	Common Pipistrelle	1	N	Y	
21:09	Soprano and Common Pipistrelle	1	N	Y	Both species at the same time. Foraging along hedgerow.
21:09	Brown long-eared bat	1	N	Y	Very brief
21:10	Common Pipistrelle	1	N	Y	
21:15	Serotine	1	N	Y	Very brief
21:16	Noctule	1	N	Y	Very brief
21:17	Serotine	1	N	Y	Very brief
21:18	Soprano Pipistrelle	1	N	Y	Very brief
21:20	Brown long-eared bat	1	N	Y	Very brief
21:22	Brown long-eared bat	1	N	Y	
21:28	Brown long-eared bat	1	N	Y	
21:30	Common Pipistrelle	1	N	Y	Foraging along the hedgerow.
21:32	Brown long-eared bat	1	N	Y	
21:35	Common Pipistrelle	1	N	Y	Foraging along the hedgerow.
21:44	Common Pipistrelle	1	N	Y	Foraging along the hedgerow.

Dawn 6th September 2022

Project Name	Brookleigh Central Section		Surveyor		SK
Survey Location	Tree 96		Rain (0-5)		Start 1 : End 0
Date	06/09/2022		Wind (Beaufort 0-7)		Start 0 : End 1
Start	04:51		Temperature (°C)		Start 15 : End 16
Sunset	06:21		Weather description (start)		Significant rainfall and thunderstorms previous night. Warm and muggy morning
Finish	06:36		Weather description (end)		Foggy/misty air with chill despite warmish temp
Cloud Cover (0-5)	Start 1 : End 1				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
04:58	Brown long-eared bat	1	N	Y	
05:01	Serotine	1	N	Y	
05:06	Soprano Pipistrelle	1	N	Y	
05:12	Brown long-eared bat	1	N	Y	
05:16	Soprano Pipistrelle	1	N	Y	
05:24	Noctule	1	N	Y	
05:39	Soprano Pipistrelle	1	N	Y	
05:41	Soprano Pipistrelle	1	N	Y	
05:44	Common Pipistrelle	1	N	Y	
05:57	Noctule	1	N	Y	
05:59	Soprano Pipistrelle	1	N	Y	

F.4 Tree 97

Dusk 15th August 2022

Project Name	Brookleigh Central Section		Surveyor		RW
Survey Location	Tree 97		Rain (0-5)		Start 0 : End 0
Date	15/08/2022		Wind (Beaufort 0-7)		Start 1 : End 2
Start	19:52		Temperature (°C)		Start 21 : End 19
Sunset	20:22		Weather description (start)		Mild, humid, light breeze
Finish	21:52		Weather description (end)		Mild, slight breeze. Much cooler and less humid than start
Cloud Cover (0-5)	Start 4 : End 4				
Time	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
20:32	Soprano Pipistrelle	1	N	Y	Commuting and then foraging along the adjacent hedgerow
20:52	Common Pipistrelle	1	N	Y	Commuting and then foraging along the adjacent hedgerow
21:00	Common Pipistrelle	1	N	Y	Commuting and foraging along the hedgerow.
21:01	Common Pipistrelle	1	N	Y	Foraging
21:04	Common Pipistrelle	1	N	Y	Foraging along hedgerow.
21:08	Myotis species	1	N	Y	Commuting
21:14	Common Pipistrelle	1	N	Y	Very brief
21:15	Noctule	1	N	Y	Very brief
21:22	Myotis species	1	N	Y	Very brief

21:30	Common Pipistrelle	1	N	Y	Very quiet
21:32	Common Pipistrelle	1	N	Y	
21:35	Noctule	1	N	Y	
21:42	Common Pipistrelle	1	N	Y	
21:44	Common Pipistrelle	1	N	Y	

Dawn 6th September 2022

Project Name	Brookleigh Central Section		Surveyor		SK
Survey Location	Tree 96		Rain (0-5)		Start 1 : End 0
Date	06/09/2022		Wind (Beaufort 0-7)		Start 0 : End 1
Start	04:51		Temperature (°C)		Start 15 : End 16
Sunset	06:21		Weather description (start)		Significant rainfall and thunderstorms previous night. Warm and muggy morning
Finish	06:36		Weather description (end)		Foggy/misty air with chill despite warmish temp
Cloud Cover (0-5)	Start 1 : End 1				
Time	Species	No. of bats	Emergence (Y/N)	Recording (Y/N)	Description
04:57	Brown long-eared bat	1	N	Y	Numerous passes
05:05	Soprano Pipistrelle	1	N	Y	Foraging
05:11	<i>Myotis</i> species	1	N	Y	
05:15	Soprano Pipistrelle	1	N	Y	
05:23	Noctule	1	N	Y	Commuting
05:29	Noctule	1	N	Y	Commuting
05:39	Soprano Pipistrelle	1	N	Y	Commuting along hedgerow
05:41	Soprano Pipistrelle	1	N	Y	Commuting along hedgerow
05:59	Soprano Pipistrelle	1	N	Y	Commuting along hedgerow
06:00	Common Pipistrelle	1	N	Y	Social calls
06:22	Soprano Pipistrelle	1	N	Y	Foraging

F.5 Tree 12-1

Dusk 13th August 2024

Project Name	Brookleigh Central Section		Surveyor		JC (east, survey point 1) & TH (north, survey point 2)	
Survey Location	Tree 12-1		Rain (0-5)		Start: 0 End: 0	
Date	13/08/2024		Wind (Beaufort 0-7)		Start: 2 End: 2	
Start	20:09		Temperature (°C)		Start: 20 End: 18	
Sunset	20:24		Weather description (start)		Sunny, dry, warm with light breeze	
Finish	21:54		Weather description (end)		Clear, dry, warm with light breeze	
Cloud Cover (0-5)	Start: 0 End: 0					
Time	Survey Point	Species	No. of bats	Emergence (Y/N)	Recording (Y/N)	Description
20:28	1	Common Pipistrelle	1	N	Y	Commuting
20:31	1	Soprano Pipistrelle	1	N	Y	Commuting
20:34-20:37	2	Soprano Pipistrelle	1	N	Y	Foraging
20:35	1	Soprano Pipistrelle	1	N	Y	Commuting, foraging

20:44	2	Noctule	1	N	Y	Brief pass
20:45	1	Noctule	1	N	Y	Commuting
20:48	1	Common Pipistrelle	1	N	Y	Commuting
20:51	1	Soprano Pipistrelle	7	N	Y	Commuting
20:52	2	Soprano Pipistrelle	1	N	Y	Brief pass
20:53	2	Common Pipistrelle	1	N	Y	Brief pass
21:03	1	Brown long-eared bat	1	N	N	Seen not heard
21:04	2	Soprano Pipistrelle	1	N	Y	Commuting
21:05	2	Noctule	1	N	Y	Brief pass
21:05	1	Soprano Pipistrelle	1	N	Y	Commuting
21:07	2	Common Pipistrelle	1	N	Y	Brief pass
21:13	2	Leisler's bat	1	N	Y	Brief pass
21:14	2	Common Pipistrelle	1	N	Y	Brief pass
21:14	2	Common Pipistrelle	1	N	Y	Brief pass
21:15	2	Pipistrelle species	1	N	Y	Brief pass
21:15	2	Serotine	1	N	Y	Brief pass
21:15	2	Pipistrelle species	1	N	Y	Brief pass
21:15	1	Leisler's bat	1	N	Y	Commuting
21:16	2	Serotine	1	N	Y	Brief pass
21:16	2	Pipistrelle species	1	N	Y	Brief pass
21:17	2	Soprano Pipistrelle	1	N	Y	Foraging
21:17	2	Serotine	1	N	Y	Foraging
21:17	1	Serotine	1	N	Y	Commuting
21:17	1	Common Pipistrelle	1	N	Y	Brief pass
21:18	2	Common Pipistrelle	1	N	Y	Foraging
21:19	2	Common Pipistrelle	1	N	Y	Foraging
21:20	1	Brown long-eared bat	1	N	N	Heard not seen, brief pass
21:21	2	Common Pipistrelle	1	N	Y	Foraging
21:22	2	Common Pipistrelle	1	N	Y	Foraging
21:23	2	Common Pipistrelle	1	N	Y	Foraging
21:23	1	Common Pipistrelle	1	N	Y	Brief pass
21:24	2	Common Pipistrelle	1	N	Y	Foraging
21:26	2	Common Pipistrelle	1	N	Y	Foraging
21:27	2	Common Pipistrelle	1	N	Y	Foraging
21:27	1	Common Pipistrelle	1	N	Y	Brief pass
21:30	2	Common Pipistrelle	1	N	Y	Foraging
21:30	1	Brown long-eared bat	1	N	N	Commuting
21:31	1	Common Pipistrelle	1	N	Y	Foraging
21:32	2	Common Pipistrelle	1	N	Y	Brief pass
21:33	2	Common Pipistrelle	1	N	Y	Brief pass
21:34	2	Common Pipistrelle	1	N	Y	Brief pass
21:36	2	Soprano Pipistrelle	1	N	Y	Brief pass
21:39	2	Common Pipistrelle	1	N	Y	Brief pass
21:40	2	Common Pipistrelle	1	N	Y	Brief pass
21:40	2	Common Pipistrelle	1	N	Y	Brief pass
21:40	1	Common Pipistrelle	1	N	Y	Brief pass

21:42	2	Serotine	1	N	Y	Brief pass
21:43	2	Common Pipistrelle	1	N	Y	Brief pass
21:43	1	<i>Myotis</i> species	1	N	Y	Brief pass
21:44	1	Common Pipistrelle	1	N	Y	Brief pass
21:45	2	<i>Myotis</i> species	1	N	Y	Foraging

Dusk 13th August 2024

Project Name	Brookleigh Central Section		Surveyor		JS (east, survey point 1) & SG (north, survey point 2)	
Survey Location	Tree 12-1		Rain (0-5)		Start: 0 End: 0	
Date	29/08/2024		Wind (Beaufort 0-7)		Start: 2 End: 2	
Start	19:36		Temperature (°c)		Start: 19 End: 16	
Sunset	19:51		Weather description (start)		Calm, dry, warm and partly cloudy	
Finish	21:21		Weather description (end)		Calm	
Cloud Cover (0-5)	Start: 3 End: 3					
Time	Survey Point	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
20:29	2	Soprano Pipistrelle	1	N	Y	Heard not seen
20:30	2	Common Pipistrelle	1	N	Y	Heard not seen
20:30	1	Common Pipistrelle	1	N	Y	Heard not seen, foraging
20:35	2	Soprano Pipistrelle	1	N	Y	Heard not seen
20:35	1	Soprano Pipistrelle	1	N	Y	Heard not seen, close passes, foraging
20:36	1	Common Pipistrelle	1	N	Y	Heard not seen
20:42	2	Common Pipistrelle	1	N	Y	Heard not seen
20:42	1	Common Pipistrelle	1	N	Y	Heard not seen
20:49	2	Soprano Pipistrelle	1	N	Y	Heard not seen
20:52	2	Noctule	1	N	Y	Heard not seen
20:52	2	Common Pipistrelle	1	N	Y	Heard not seen
20:53	2	Soprano Pipistrelle	1	N	Y	Heard not seen
20:59	2	Noctule	1	N	Y	Heard not seen, included pipistrelle social calls
21:00	2	Soprano Pipistrelle	1	N	Y	Heard not seen
21:00	1	Soprano Pipistrelle	1	N	Y	Heard not seen, included social calls
21:01	2	Soprano Pipistrelle	1	N	Y	Heard not seen, included social calls
21:01	1	Soprano Pipistrelle	1	N	Y	Heard not seen
21:05	2	Common Pipistrelle	1	N	Y	Heard not seen
21:05	2	Soprano Pipistrelle	1	N	Y	Heard not seen
21:05	1	Common Pipistrelle	1	N	Y	Heard not seen, brief pass
21:05	1	Soprano Pipistrelle	1	N	Y	Heard not seen

21:07	2	Serotine	1	N	Y	Heard not seen
21:14	2	<i>Myotis</i> species	1	N	Y	Heard not seen
21:18	2	Soprano pipistrelle	1	N	Y	Heard not seen
21:18	2	Soprano pipistrelle	1	N	Y	Heard not seen, included social calls
21:18	1	Soprano Pipistrelle	1	N	Y	Heard not seen

Dusk 23rd September 2024

Project Name	Brookleigh Central Section		Surveyor		JS (east, survey point 1) & LD (north, survey point 2)	
Survey Location	Tree 12-1		Rain (0-5)		Start: 0 End: 0	
Date	23/09/2024		Wind (Beaufort 0-7)		Start: 2 End: 1	
Start	18:40		Temperature (°c)		Start: 16 End: 14	
Sunset	18:55		Weather description (start)		Recent rain, wet, cool	
Finish	20:25		Weather description (end)		Clear, mild, dry, very light breeze	
Cloud Cover (0-5)	Start: 4 End: 1					
Time	Survey Point	Species	No. of bats	Emerge (Y/N)	Recording (Y/N)	Description
19:19	2	Soprano Pipistrelle	1	N	Y	Heard not seen, commuting
19:23	1	Soprano Pipistrelle	1	N	Y	Heard not seen, brief pass
19:26	2	Soprano Pipistrelle	1	N	Y	Heard not seen, commuting
19:28	1	Soprano Pipistrelle	1	N	Y	Heard not seen, brief passes for ~20 mins
19:34	1	Common Pipistrelle	1	N	Y	Heard not seen, brief passes
19:36	2	Common Pipistrelle	1	N	Y	Heard not seen, commuting
19:37	2	Soprano Pipistrelle	1	N	Y	Heard and seen, flew past tree
19:39	2	Common and Soprano Pipistrelle	1	N	Y	Heard not seen, several passes, continuous
19:40	1	Soprano Pipistrelle	1	N	Y	Heard not seen, foraging
19:44	2	<i>Myotis</i> species	1	N	Y	Heard not seen, brief pass
19:44	2	Pipistrelle social call	1	N	Y	Heard not seen, faint, brief pass
19:49	2	Brown long-eared bat	1	N	Y	Heard not seen, very faint
19:49	2	Pipistrelle social call	1	N	Y	Heard not seen, faint
19:50	1	Common Pipistrelle	1	N	Y	Heard not seen, foraging
19:54	1	Serotine	1	N	Y	Heard not seen, brief passes

19:58	1	Soprano Pipistrelle	1	N	Y	Heard not seen, brief passes
19:59	2	Pipistrelle social call	1	N	Y	Heard not seen, faint
20:07	1	Common Pipistrelle	1	N	Y	Heard not seen, foraging
20:08	2	Serotine	1	N	Y	Heard not seen, faint
20:11	2	Brown long-eared bat	1	N	Y	Heard not seen, faint
20:16	1	Soprano Pipistrelle	1	N	Y	Heard not seen, brief pass

Appendix G Full bat activity surveys

G.1 Transect 1

Visit 1 Dusk 28th April 2022

During the April 2022 dusk activity survey, seven registrations were made of common pipistrelles, five of soprano pipistrelles and two pipistrelle bats (either common or soprano pipistrelle), as well as one registration of *Myotis* bat and two of noctule bats. The majority of the activity was recorded between transect points one and three, between areas of ancient woodland and along the corridor of the River Adur, and comprised mainly brief passes with some foraging later in the survey.

Table 28. Transect 1 dusk 28th April 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
20:30	Noctule	1	Brief Pass	Heard not seen	2-3
20:56	Soprano pipistrelle	1	Brief Pass	Heard not seen	5
20:57	Common pipistrelle	1	Brief Pass	Heard not seen	5
21:07	Common pipistrelle	1	Brief Pass	Heard not seen	6
21:16	Noctule	1	Brief Pass	Heard not seen	7
21:25	Soprano pipistrelle	1	Brief Pass	Heard not seen	1
21:26	<i>Myotis</i> species	1	Brief Pass	Heard not seen	1
21:27	Common pipistrelle	1	Brief Pass	Heard not seen	1
21:29	Common pipistrelle	1	Brief Pass	Heard not seen	1
21:31	Soprano pipistrelle	1	Brief Pass	Heard not seen	1-2
21:36	Common pipistrelle	1	Brief Pass	Heard not seen	2
21:39	Pipistrelle species	1	Foraging	Heard not seen	2
21:43	Soprano pipistrelle	1	Foraging	Heard not seen	2
21:45	Pipistrelle species	1	Foraging	Heard not seen	2
22:01	Common pipistrelle	1	Foraging	Heard not seen	4
22:11	Soprano pipistrelle	1	Brief Pass	Heard not seen	5
22:15	Common pipistrelle	1	Foraging	Heard not seen	1

Visit 2 Dusk 31st May 2022

During the May 2022 dusk activity survey, two registrations were made of common pipistrelles, five of soprano pipistrelles and five pipistrelle bats (either common or soprano pipistrelle), as well as one registration of serotine. The majority of the activity was recorded between transect points seven and one, along hedgerows and comprised mainly brief passes.

Table 29. Transect 1 dusk 31st May 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:49	Pipistrelle species	4	Foraging	Heard and seen	2-3
21:52	Serotine	1	Foraging	Heard not seen	2-3
22:25	Soprano pipistrelle	1	Brief Pass	Heard not seen	1
22:27	Pipistrelle species	1	Brief Pass	Heard not seen	1
22:28	Soprano pipistrelle	1	Brief Pass	Heard not seen	1
22:30	Soprano pipistrelle	1	Brief Pass	Heard not seen	7-1
22:31	Soprano pipistrelle	1	Brief Pass	Heard not seen	7-1
22:33	Pipistrelle species	1	Brief Pass	Heard not seen	7-1
22:34	Pipistrelle species	1	Brief Pass	Heard not seen	7-1

Time	Species	Number	Activity	Observation	Transect Point
22:36	Common pipistrelle	1	Foraging	Heard not seen	7-1
22:40	Pipistrelle species	1	Brief Pass	Heard not seen	7
22:58	Soprano pipistrelle	1	Brief Pass	Heard not seen	5
22:58	Common pipistrelle	1	Brief Pass	Heard not seen	5
23:04	Pipistrelle species	1	Brief Pass	Heard not seen	1

Visit 3 Dusk 28th June 2022

During the June 2022 dusk activity survey, 12 registrations were made of common pipistrelles, 10 of soprano pipistrelles and two noctule bats, as well as two registrations of serotine. The majority of the activity was recorded between transect points seven and three, along hedgerows and ancient woodland boundaries, and comprised commuting, brief passes and foraging.

Table 30. Transect 1 dusk 28th June 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:29	Soprano pipistrelle	1	Commuting	Heard and seen	5
21:34	Soprano pipistrelle	1	Commuting	Heard and seen	3-4
21:41	Common pipistrelle	1	Foraging	Heard and seen	3
21:52	Soprano pipistrelle	2	Foraging	Heard and seen	2-3
22:05	Common pipistrelle	1	Brief Pass	Heard and seen	2
22:07	Common pipistrelle	1	Brief Pass	Heard not seen	1-2
22:08	Soprano pipistrelle	1	Foraging	Heard not seen	1-2
22:09	Soprano pipistrelle	1	Brief Pass	Heard not seen	1
22:15	Common pipistrelle	1	Brief Pass	Heard not seen	1
22:15	Serotine	1	Brief Pass	Heard not seen	7-1
22:19	Common pipistrelle	1	Brief Pass	Heard not seen	7-1
22:22	Common pipistrelle	1	Brief Pass	Heard not seen	7-1
22:23	Common pipistrelle	1	Foraging	Heard not seen	7-1
22:31	Common pipistrelle	1	Brief Pass	Heard not seen	6
22:39	Common pipistrelle	1	Brief Pass	Heard not seen	5
22:46	Serotine	1	Brief Pass	Heard not seen	4
22:48	Soprano pipistrelle	2	Foraging	Heard not seen	4
22:50	Common pipistrelle	1	Foraging	Heard not seen	4
23:02	Noctule	1	Brief Pass	Heard not seen	2-3
23:03	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
23:05	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
23:07	Noctule	1	Brief Pass	Heard not seen	2
23:07	Soprano pipistrelle	1	Brief Pass	Heard not seen	2
23:08	Common pipistrelle	1	Foraging	Heard not seen	2
23:13	Soprano pipistrelle	1	Foraging	Heard not seen	2
23:14	Common pipistrelle	1	Foraging	Heard not seen	2

Visit 4 Dusk 19th July 2022

During the July 2022 dusk activity survey, 18 registrations were made of common pipistrelles, 15 of soprano pipistrelles and four noctule bats, as well as two registrations of serotine. High activity was recorded around the transect, particularly between survey point one and two between two areas of ancient woodland in the south of the transect. Activity recorded comprised mainly unseen commuting and some foraging.

Table 31. Transect 1 dusk 19th July 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:23	Noctule	1	Commuting	Heard not seen	3
21:24	Noctule	1	Commuting	Heard and seen	3
21:41	Soprano pipistrelle	1	Commuting	Heard and seen	5
21:43	Soprano pipistrelle	1	Commuting	Heard not seen	5-6
21:45	Noctule	1	Commuting	Heard not seen	5-6
21:48	Common pipistrelle	1	Commuting	Heard not seen	6
21:49	Soprano pipistrelle	1	Commuting	Heard and seen	6
21:53	Soprano pipistrelle	1	Commuting	Heard not seen	6-7
21:56	Common pipistrelle	1	Foraging	Heard not seen	7
22:07	Common pipistrelle	1	Commuting	Heard not seen	7-1
22:09	Soprano pipistrelle	1	Commuting	Heard not seen	7-1
22:11	Soprano pipistrelle	1	Commuting	Heard not seen	7-1
22:13	Soprano pipistrelle	1	Commuting	Heard not seen	7-1
22:18	Common pipistrelle	1	Brief Pass	Heard not seen	1
22:21	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:23	Serotine	1	Foraging	Heard and seen	1-2
22:24	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:25	Soprano pipistrelle	1	Commuting	Heard not seen	1-2
22:26	Common pipistrelle	1	Commuting	Heard not seen	2
22:26	Common pipistrelle	1	Commuting	Heard not seen	2
22:27	Serotine	1	Commuting	Heard not seen	2
22:28	Common pipistrelle	2	Commuting	Heard not seen	2
22:31	Common pipistrelle	1	Commuting	Heard not seen	2
22:35	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
22:35	Noctule	1	Commuting	Heard not seen	2-3
22:36	Soprano pipistrelle	2	Foraging	Heard not seen	2-3
22:39	Common pipistrelle	1	Commuting	Heard not seen	2-3
22:40	Common pipistrelle	1	Commuting	Heard not seen	2-3
22:42	Common pipistrelle	1	Commuting	Heard not seen	3
22:44	Soprano pipistrelle	1	Commuting	Heard not seen	3
22:45	Soprano pipistrelle	1	Commuting	Heard not seen	3
22:47	Common pipistrelle	1	Commuting	Heard not seen	3-4
22:56	Soprano pipistrelle	1	Commuting	Heard not seen	2-3
22:57	Soprano pipistrelle	1	Commuting	Heard not seen	2
22:58	Common pipistrelle	1	Commuting	Heard not seen	2
22:59	Common pipistrelle	1	Foraging	Heard not seen	1-2
23:01	Common pipistrelle	1	Foraging	Heard not seen	1-2
23:02	Soprano pipistrelle	1	Foraging	Heard not seen	1-2
23:05	Common pipistrelle	1	Foraging	Heard not seen	1-2

Visit 5 Dusk 11th August 2022

During the August 2022 dusk activity survey, seven registrations were made of common pipistrelles, eight of soprano pipistrelles and one noctule bat. The majority of the activity was recorded between transect points seven and two, along hedgerows and ancient woodland boundaries, and comprised mainly foraging.

Table 32. Transect 1 dusk 11th August 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:07	Soprano pipistrelle	2	Foraging	Heard and seen	5
21:09	Common pipistrelle	1	Foraging	Heard and seen	5
21:11	Soprano pipistrelle	1		Heard not seen	5
21:27	Soprano pipistrelle	1	Foraging	Heard and seen	2
21:30	Common pipistrelle	1	Foraging	Heard not seen	7-1
21:44	Soprano pipistrelle	1	Foraging	Heard not seen	3-4
21:46	Soprano pipistrelle	1	Foraging	Heard not seen	4
21:48	Soprano pipistrelle	1	Foraging	Heard not seen	4
21:54	Soprano pipistrelle	1	Foraging	Heard not seen	4-5
22:13	Soprano pipistrelle	1	Foraging	Heard not seen	7
22:16	Common pipistrelle	1	Foraging	Heard not seen	7-1
22:24	Noctule	1	Foraging	Heard not seen	7-1
22:24	Common pipistrelle	1	Foraging	Heard not seen	7-1
22:26	Common pipistrelle	1	Foraging	Heard not seen	1
22:28	Common Pipistrelle	1	Foraging	Heard not seen	1
22:30	Common pipistrelle	1	Foraging	Heard not seen	1

Visit 6 Dawn 12th August 2022

During the August 2022 dawn activity survey, four registrations were made of common pipistrelles and six of soprano pipistrelles. The majority of the activity was recorded between transect points seven and two, along hedgerows and ancient woodland boundaries, and comprised mainly foraging.

Table 33. Transect 1 dawn 12th August 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
03:42	Soprano pipistrelle	1		Heard not seen	1-2
03:44	Common pipistrelle	1		Heard not seen	1-2
03:56	Common pipistrelle	1		Heard not seen	7-1
04:29	Common pipistrelle	1		Heard not seen	3-4
04:39	Soprano pipistrelle	1		Heard not seen	2-3
04:40	Soprano pipistrelle	1		Heard not seen	1-2
04:49	Soprano pipistrelle	2	Foraging	Heard and seen	1-2
05:00	Soprano pipistrelle	1		Heard not seen	7-1
05:01	Common pipistrelle	1	Foraging	Heard and seen	7-1
05:02	Soprano pipistrelle	1		Heard not seen	7-1

Visit 7 Dusk 21st September 2022

During the September 2022 dusk activity survey, 11 registrations were made of common pipistrelles, six of soprano pipistrelles and one registration of a *Myotis* bat. The majority of the activity was recorded between survey points seven and five, along hedgerows and ancient woodland boundaries, and comprised mainly unseen foraging.

Table 34. Transect 1 dusk 21st September 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
19:25	Common pipistrelle	1		Heard not seen	1-2
19:31	Common pipistrelle	1		Heard not seen	7-1
19:36	Common pipistrelle	1		Heard not seen	7-1

Time	Species	Number	Activity	Observation	Transect Point
19:40	Soprano pipistrelle and common pipistrelle	1	Foraging	Heard not seen	7-1
19:43	Soprano pipistrelle	1		Heard not seen	7-1
20:08	Soprano pipistrelle	1		Heard not seen	4-5
20:11	Common Pipistrelle	1	Foraging	Heard and seen	4
20:14	Soprano pipistrelle	1	Foraging	Heard and seen	4
20:18	Common pipistrelle	1	Foraging	Heard not seen	4
20:19	Soprano pipistrelle	1	Foraging	Heard not seen	4
20:22	Common pipistrelle	1	Foraging	Heard not seen	3-4
20:34	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
20:39	<i>Myotis</i> species	1	Unknown	Heard not seen	2-3
20:46	Common pipistrelle	1	Foraging	Heard not seen	1-2
20:48	Common pipistrelle	1	Foraging	Heard not seen	1-2
20:52	Common pipistrelle	1	Foraging	Heard not seen	1
20:57	Common pipistrelle	1		Heard not seen	7-1

Visit 8 Dusk 19th October 2022

During the October 2022 dusk activity survey, bat activity recorded was limited to three foraging common pipistrelles. The activity was recorded between transect points seven and two, along hedgerows and ancient woodland boundaries.

Table 35. Transect 1 dusk 19th October 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
19:16	Common pipistrelle	1		Heard not seen	7-1
19:24	Common pipistrelle	1	Foraging	Heard not seen	7-1
19:46	Common pipistrelle	1	Foraging	Heard not seen	1

G.2 Transect 2

Visit 1 Dusk 28th April 2022

During the April 2022 dusk activity survey, 18 registrations were made of common pipistrelles, three of soprano pipistrelles and one registration of noctule. The majority of the activity was recorded between transect points five and six, along a tree line in the east of the transect and comprised foraging and commuting.

Table 36. Transect 2 dusk 28th April 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
20:39	Common pipistrelle	1	Commuting	Heard and seen	6
20:40	Common pipistrelle	2	Commuting	Heard and seen	6
20:46	Noctule	1	Commuting	Heard not seen	5
20:55	Common pipistrelle	1	Commuting	Heard and seen	4
20:57	Common pipistrelle	1	Foraging	Heard and seen	4
21:05	Common pipistrelle	1	Commuting	Heard not seen	3
21:05	Common pipistrelle	1	Foraging	Heard and seen	3
21:11	Common pipistrelle	1	Foraging	Heard and seen	2-3
21:13	Soprano pipistrelle	1	Foraging	Heard and seen	2-3
21:17	Common pipistrelle	1	Commuting	Heard not seen	2
21:23	Soprano pipistrelle	1	Commuting	Heard not seen	1-2
21:23	Common pipistrelle	1	Unknown	Heard not seen	1-2

Time	Species	Number	Activity	Observation	Transect Point
21:31	Common pipistrelle	1	Foraging	Heard not seen	1
21:39	Common pipistrelle	1	Foraging	Heard not seen	6
21:40	Common pipistrelle	1	Foraging	Heard and seen	6
21:44	Common pipistrelle	1	Commuting	Heard not seen	5-6
21:44	Common pipistrelle	1	Commuting	Heard not seen	5-6
21:45	Common pipistrelle	1	Foraging	Heard and seen	5-6
21:49	Common pipistrelle	1	Commuting	Heard and seen	5-6
21:49	Common pipistrelle	2	Commuting	Heard and seen	5-6
21:57	Soprano pipistrelle	1	Commuting	Heard and seen	5
22:05	Common pipistrelle	1	Commuting	Heard not seen	4

Visit 2 Dusk 31st May 2022

During the May 2022 dusk activity survey, nine registrations were made of common pipistrelles and two of soprano pipistrelles. The majority of the activity was recorded between transect points four and five, along tree lines in the west of the transect and comprised foraging and commuting.

Table 37. Transect 2 dusk 31st May 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:44	Common pipistrelle	1	Commuting	Heard and seen	6
21:49	Common pipistrelle	1	Foraging	Heard not seen	5-6
21:56	Common pipistrelle	1	Foraging	Heard not seen	4-5
21:58	Common pipistrelle	2	Foraging	Heard not seen	4-5
22:00	Common pipistrelle	1	Foraging	Heard not seen	4-5
22:11	Soprano pipistrelle	1	Brief Pass	Heard not seen	3
22:16	Common pipistrelle	1	Brief Pass	Heard not seen	3
22:26	Common pipistrelle	1	Brief Pass	Heard not seen	1
22:44	Common pipistrelle	2	Foraging	Heard not seen	4-5
22:46	Common pipistrelle	1	Brief Pass	Heard not seen	4-5
22:57	Soprano pipistrelle	1	Brief Pass	Heard not seen	3

Visit 3 Dusk 28th June 2022

During the June 2022 dusk activity survey, 28 registrations were made of common pipistrelles and eight of soprano pipistrelles. Activity was recorded throughout the transect, particularly between transect points one and six, along tree lines in the east of the transect. Activity mainly comprised foraging.

Table 38. Transect 2 dusk 28th June 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:28	Soprano pipistrelle	1	Commuting	Heard not seen	1
21:40	Common pipistrelle	1	Foraging	2 passes	2-3
21:41	Soprano pipistrelle	1		Foraging under tree	2-3
21:44	Common pipistrelle	1	Foraging	Soprano and common foraging around trees	2-3
21:57	Common pipistrelle	1	Foraging	Foraging up and down tree line	4-5
21:58	Soprano pipistrelle	1	Foraging	Heard not seen	4-5
22:00	Soprano pipistrelle	1	Foraging	Foraging around near treeline	4-5
22:02	Common pipistrelle	1	Foraging	Bat foraging several passes	5

Time	Species	Number	Activity	Observation	Transect Point
22:06	Common pipistrelle	1	Foraging	Foraging	5
22:08	Common pipistrelle	1	Foraging	Foraging along hedge row	5-6
22:11	Common pipistrelle	1	Foraging	Foraging around tree line	5-6
22:12	Common pipistrelle	1	Foraging	Foraging around trees	5-6
22:13	Common pipistrelle	1	Foraging	Heard not seen	5-6
22:17	Common pipistrelle	1	Foraging	Heard not seen	6
22:18	Common pipistrelle	3	Foraging	Heard not seen	6-1
22:21	Common pipistrelle	1	Foraging	Heard not seen	6-1
22:23	Soprano pipistrelle	1	null	Heard not seen	6-1
22:24	Common pipistrelle	1	Foraging	Foraging up and down several passes	6-1
22:25	Common pipistrelle	1	Foraging	Heard not seen	6-1
22:26	Common pipistrelle	1	Foraging	Heard not seen	6-1
22:29	Common pipistrelle	1	Foraging	Heard not seen	1
22:32	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:36	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:37	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:50	Common pipistrelle	1	Foraging	Heard not seen	3-4
22:53	Common pipistrelle	2	Foraging	Heard not seen	4
22:55	Common pipistrelle	1	Foraging	Heard not seen	4-5
22:58	Soprano pipistrelle	1	Foraging	Heard not seen	4-5
23:00	Common pipistrelle	1	Foraging	Heard not seen	5
23:02	Common pipistrelle	1	Foraging	Heard not seen	5-6
23:03	Soprano pipistrelle	1	Foraging	Heard not seen	5-6
23:05	Soprano pipistrelle	1	Commuting	Heard not seen	6-1
23:06	Common pipistrelle	1	Foraging	Heard not seen	6-1
23:07	Common pipistrelle	1	Foraging	Heard not seen	6-1
23:10	Common pipistrelle	1	Foraging	Heard not seen	1-2
23:12	Common pipistrelle	1	Foraging	Heard not seen	1-2

Visit 4 Dusk 19th July 2022

During the July 2022 dusk activity survey, 17 registrations were made of common pipistrelles, three of soprano pipistrelles and six registrations of noctule. Activity was recorded throughout the transect and comprised foraging and commuting.

Table 39. Transect 2 dusk 19th July 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
21:27	Noctule	1	Commuting	Heard not seen	6-1
21:30	Common pipistrelle	1	Foraging	Foraging at field margin	1
21:40	Soprano pipistrelle	1	Foraging	Foraging in hedge row	2-3
21:42	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
21:42	Common pipistrelle	1	Foraging	Foraging under tree	2-3
21:50	Common pipistrelle	1	Foraging	Heard not seen	4
21:56	Common pipistrelle	1	Foraging	Foraging in field corner	4-5
22:01	Noctule	1	Commuting	Heard not seen	6
22:08	Common pipistrelle	1	Commuting	Heard not seen	6-1

Time	Species	Number	Activity	Observation	Transect Point
22:09	Common pipistrelle	1	Commuting	Heard and seen	1
22:11	Common pipistrelle	1	Commuting	Heard and seen	1
22:13	Soprano pipistrelle	1	Commuting	Heard not seen	1-2
22:15	Common pipistrelle	1	Foraging	Heard not seen	1-2
22:20	Common pipistrelle	1	Commuting	Heard not seen	3
22:26	Common pipistrelle	1	Foraging	Heard not seen	4-5
22:27	Noctule	1	Commuting	Heard not seen	4-5
22:29	Common pipistrelle	1	Foraging	Heard not seen	4-5
22:32	Common pipistrelle	1	Commuting	Heard not seen	4-5
22:39	Common pipistrelle	1	Foraging	Heard not seen	6
22:41	Common pipistrelle	1	Foraging	Heard not seen	6
22:44	Noctule	1	Foraging	Heard not seen	6-1
22:47	Common pipistrelle	1	Foraging	Heard not seen	1
22:48	Common Pipistrelle	1	Foraging	Heard not seen	1
22:50	Noctule	1	Commuting	Heard not seen	1-2
22:53	Noctule	1	Commuting	Heard not seen	1-2
22:59	Common pipistrelle	1	Foraging	Heard not seen	3

Visit 5 Dusk 11th August 2022

During the August 2022 dusk activity survey, 14 registrations were made of common pipistrelles, seven of soprano pipistrelles and two registrations of noctule, as well as one registration of *Myotis* bat. Activity was recorded across the transect, particularly between transect points two and three along tree lines towards the north of the transect. Activity recorded comprised mainly commuting.

Table 40. Transect 2 dusk 11th August 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
20:49	Noctule	1	Commuting	Heard and seen	2
20:56	Common pipistrelle	1	Commuting	Heard not seen	2-3
20:59	Common pipistrelle	1	Commuting	Heard not seen	2-3
21:02	Common pipistrelle	1	Commuting	Heard and seen	2-3
21:22	Soprano pipistrelle	1	Commuting	Heard not seen	5-6
21:23	Soprano pipistrelle	1	Foraging	Heard and seen	5-6
21:32	Common pipistrelle	1	Commuting	Heard not seen	4-5
21:42	Common pipistrelle	1	Commuting	Heard not seen	2-3
21:44	Soprano pipistrelle	1	Commuting	Heard not seen	2-3
21:48	Common pipistrelle	1	Commuting	Heard not seen	2-3
21:49	Soprano pipistrelle	1	Commuting	Heard not seen	2-3
21:55	Soprano pipistrelle	1	Commuting	Heard not seen	1
21:57	<i>Myotis</i> species	1	Commuting	Heard not seen	1
21:58	Common pipistrelle	1	Commuting	Heard not seen	1
21:59	Soprano pipistrelle	1	Commuting	Heard not seen	6-1
22:02	Common pipistrelle	1	Commuting	Heard not seen	6-1
22:04	Soprano pipistrelle	1	Commuting	Heard not seen	6-1
22:05	Common Pipistrelle	1		Heard not seen	6-1
22:05	Common pipistrelle	1	Commuting	Heard not seen	6-1
22:09	Common pipistrelle	1	Commuting	Heard not seen	5-6
22:16	Common pipistrelle	1	Commuting	Heard not seen	4-5
22:20	Common pipistrelle	1	Commuting	Heard not seen	4-5

Time	Species	Number	Activity	Observation	Transect Point
22:23	Common pipistrelle	1	Commuting	Heard not seen	4
22:27	Noctule	1	Social Calls	Heard not seen	3-4

Visit 6 Dusk 21st September 2022

During the September 2022 dusk activity survey, 22 registrations were made of common pipistrelles and 10 of soprano pipistrelles, as well as one registration of *Myotis* bat. High activity was recorded throughout the transect, particularly between transect points one and three, along hedgerows and tree lines towards the north of the transect. Activity recorded comprised mainly foraging with some commuting activity recorded.

Table 41. Transect 2 dusk 21st September 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
19:09	Common pipistrelle	1	Commuting	Heard and seen	6-1
19:17	Common pipistrelle	1	Foraging	Heard not seen	1-2
19:24	Soprano pipistrelle	1	Foraging	Heard not seen	2-3
19:26	Soprano Pipistrelle	1	Foraging	Heard not seen	2-3
19:26	Soprano Pipistrelle	3	Foraging	Foraging around tree	2-3
19:34	Common pipistrelle	1	Foraging	Heard not seen	4
19:35	Soprano pipistrelle	1	Foraging	Heard and seen	4
19:39	Common pipistrelle	1	Foraging	Heard not seen	4-5
19:39	Soprano pipistrelle	2	Foraging	Heard and seen	4-5
19:41	Common pipistrelle	1	Foraging	Heard and seen	4-5
19:43	Common pipistrelle	1	Foraging	Heard not seen	4-5
19:44	Soprano pipistrelle	1	Foraging	Heard and seen	4-5
19:45	Common Pipistrelle	1	Foraging	Heard not seen	4-5
19:47	Common pipistrelle	1	Foraging	Foraging at field margin	6-1
19:49	Soprano pipistrelle	1	Foraging	Heard not seen	5-6
19:53	Common pipistrelle	1	Foraging	Heard not seen	5-6
19:56	Common pipistrelle	1	Foraging	Heard not seen	6-1
20:06	Common pipistrelle	1	Foraging	Heard not seen	1
20:09	Soprano pipistrelle	1	Foraging	Heard not seen	1-2
20:11	Common pipistrelle	1		Heard not seen	1-2
20:13	Common pipistrelle	1	Foraging	Heard not seen	1-2
20:14	Common pipistrelle	1	Foraging	Heard not seen	1-2
20:15	Common pipistrelle	1	Foraging	Heard not seen	2
20:17	Common pipistrelle	1	Foraging	Heard not seen	2
20:19	Common pipistrelle	1	Foraging	Heard not seen	2-3
20:24	Soprano pipistrelle	1	Foraging	Heard not seen	3
20:32	Common pipistrelle	1	Foraging	Heard not seen	4
20:33	<i>Myotis</i> species	1	Foraging	Heard not seen	4-5
20:39	Common pipistrelle	1	Foraging	Heard not seen	5
20:45	Common pipistrelle	1	Foraging	Heard and seen	6-1
20:47	Common pipistrelle	1	Foraging	Heard not seen	6-1
20:53	Common pipistrelle	1	Foraging	Heard not seen	1
21:02	Soprano pipistrelle	1	Foraging	Heard not seen	2-3

Visit 7 Dawn 22nd September 2022

During the September 2022 dawn activity survey, bat activity recorded was limited to two brown long-eared bats recorded commuting. Activity recorded was located between transect points two and three, along a tree line towards the north of the transect.

Table 42. Transect 2 dawn 22nd September 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
4:51	Brown long-eared bat	1	Commuting	Heard and seen	2-3
5:38	Brown long-eared bat	1	Commuting	Heard and seen	2

Visit 8 Dusk 19th October 2022

During the October 2022 dusk activity survey, nine registrations were made of common pipistrelles and three of soprano pipistrelles. The majority of the activity was recorded between transect points four and six, along tree lines towards the south of the transect and comprised mainly foraging with some brief passes.

Table 43. Transect 2 dusk 19th October 2022 - walked transect results

Time	Species	Number	Activity	Observation	Transect Point
18:04	Soprano pipistrelle	2	Foraging	Heard and seen	5-6
18:10	Common pipistrelle	1	Foraging	Up and down tree line	6
18:36	Common pipistrelle	1	Brief Pass	Along hedge	4
18:44	Soprano pipistrelle	1	Foraging	Heard not seen	5-6
18:44	Common pipistrelle	1	Foraging	Heard not seen	5-6
18:47	Common pipistrelle	2	Foraging	Heard not seen	6
18:59	Soprano pipistrelle	1	Brief Pass	Heard not seen	1-2
19:23	Common pipistrelle	1	Social Calls	Heard not seen	5
19:25	Common pipistrelle	1	Brief Pass	Heard not seen	5
19:26	Common pipistrelle	1	Foraging	Heard not seen	5-6
19:31	Common pipistrelle	1	Brief Pass	Heard not seen	6
19:32	Common pipistrelle	1	Foraging	Heard not seen	6

Appendix H Bat activity sonograms

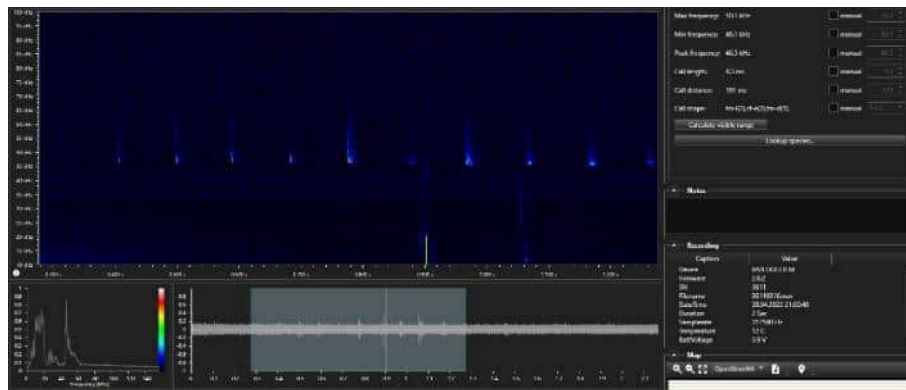


Plate 27. Common pipistrelle recorded at 20:57 during the dusk activity transect 1 on 28th April 2022

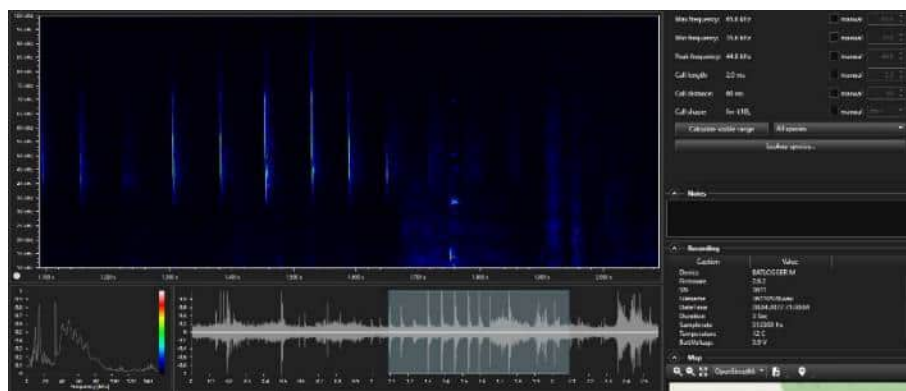


Plate 28. Myotis recorded at 21:26 during the dusk activity transect 1 on 28th April 2022

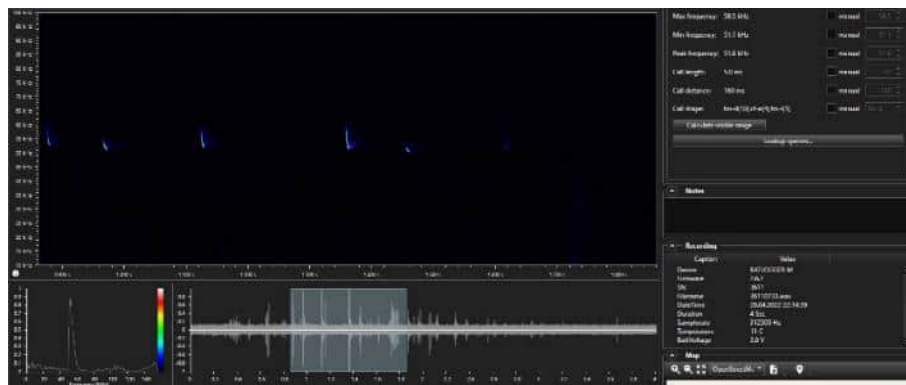


Plate 29. Soprano pipistrelle recorded at 22:11 during the dusk activity transect 1 on 28th April 2022

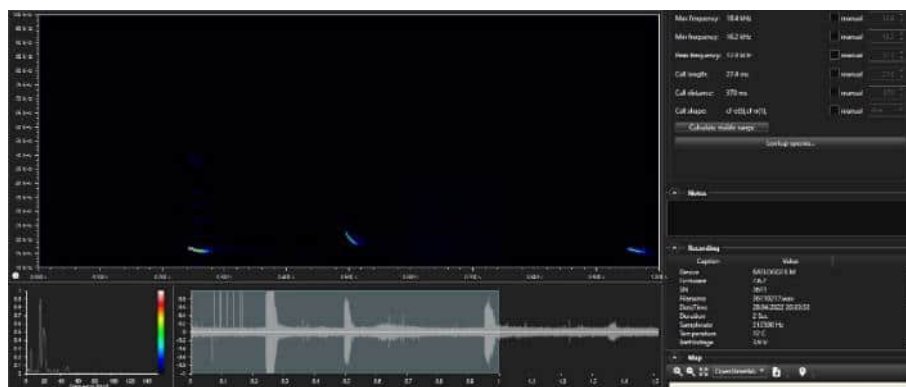


Plate 30. *Noctule pipistrelle* recorded at 20:30 during the dusk activity transect 1 on 28th April 2022

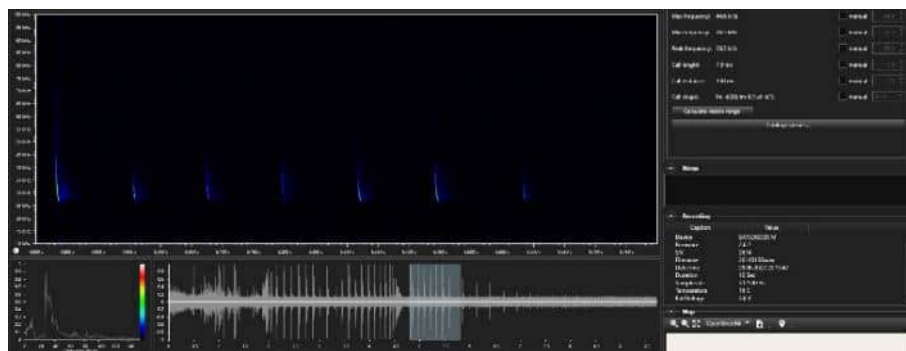


Plate 31. Serotine recorded at 22:15 during the dusk activity transect 1 on 28th June 2022

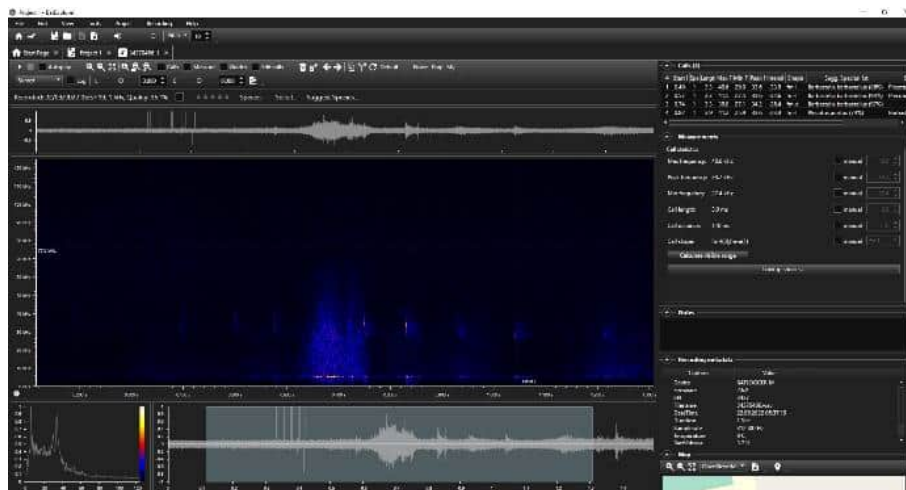


Plate 32. Brown long eared recorded at 05:37 during the dawn activity transect 2 on 22nd September 2022

Appendix I Full automated detector survey results

I.1 Transect 1

May (1)

Location A

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, noctule and a *Myotis*² bat species. Also recorded were pipistrelle species (either common or soprano pipistrelle)³, *Myotis* species or brown long-eared bat⁴, noctule or Leisler's bat⁵ and noctule, Leisler's bat or serotine⁶. The detector recorded for five nights of the five deployed, during which registrations⁷ of bat echolocation were made on all five nights. Soprano pipistrelle was the most frequently recorded with a total of 2059 registrations and a peak of 662 registrations during a single night on 12th May 2022.

Table 44 Location A – Automated detector results 12th – 16th May 2022

Date (Night Commencing)	Observation									
	<i>Myotis</i> species	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle Social Call	Serotine	<i>Myotis</i> species or long-eared bat	Noctule or Leisler's bat	Noctule	Noctule, Leisler's bat or Serotine
12/05/2022	77	134	662	480	-	3	1	1	-	1
13/05/2022	25	104	281	119	-	1	-	-	1	-
14/05/2022	13	224	331	97	1	-	-	-	-	-
15/05/2022	29	544	447	220	-	1	-	-	-	-
16/05/2022	24	236	338	331	-	2	-	-	-	-
Total	168	1242	2059	1247	1	7	1	1	1	1

Location B

At least seven confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, brown long-eared bat, serotine, noctule, barbastelle and *Myotis* species. Also recorded were pipistrelle species (either common or soprano pipistrelle), and either noctule, Leisler's bat or serotine. The detector recorded for five nights of the five deployed, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 792 registrations and a peak of 243 registrations during a single night on 15th May 2022. A single barbastelle registration was recorded on 14th May 2022.

² *Myotis* bat calls can be very similar; therefore, have been classified as *Myotis* species unless call characteristics or observations of the bat and behaviour have been recorded to enable species level identification.

³ Common pipistrelle and soprano pipistrelle can be difficult to separate using a zero-crossing file when calls recorded are towards the lower end of the soprano pipistrelle peak frequency and higher end of the common pipistrelle peak frequency. As such any pipistrelle bat with a peak frequency between 49kHz and 51kHz has been classified as pipistrelle bat.

⁴ *Myotis* and brown long-eared bat calls can be very similar, making them difficult to identify accurately when only part of the call is present. Therefore, unless the species could be clearly distinguished these have been grouped together.

⁵ Leisler's and noctule bats can be difficult to identify accurately when calls are recorded towards the lower end of the Leisler's peak frequency and higher end of the noctule peak frequency, therefore unless the species could be clearly distinguished have been grouped together.

⁶ Leisler's, noctule and serotine bat can be difficult to identify accurately if only part of the call is present towards the lower end of the serotine and Leisler's bat frequency and upper end of the noctule peak frequency, therefore unless the species could be clearly distinguished these have been grouped together.

⁷ A registration has been classed as a single bat within a zero-crossing file.

Table 45 Location B – Automated detector results 12th – 16th May 2022

Date (Night Commencing)	Observation									
	Serotine	Barbastelle	Brown long-eared bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle social call	Myotis species	Noctule	Noctule, Leisler's bat or Serotine
12/05/2022	-	-	2	151	68	13	1	6	1	-
13/05/2022	-	-	-	71	33	5	-	3	2	-
14/05/2022	1	1	-	164	60	4	2	13	-	1
15/05/2022	-	-	-	243	441	18	22	3	-	-
16/05/2022	-	-	2	163	142	7	2	5	1	-
Total	1	1	4	792	744	47	27	30	4	1

Location C

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule and *Myotis* species. Also were recorded were pipistrelle species (either common or soprano pipistrelle), pipistrelle species (either common or Nathusius' pipistrelle⁸), and either noctule, Leisler's bat or serotine. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 233 registrations and a peak of 74 registrations during a single night on 15th May 2022.

Table 46 Location C – Automated detector results 12th – 16th May 2022

Date (Night Commencing)	Observation							
	Myotis species	Noctule	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle species (common or Nathusius')	Brown long-eared bat	Noctule, Leisler's bat or serotine
12/05/2022	1	1	65	12	9	-	-	-
13/05/2022	4	-	22	6	5	-	-	-
14/05/2022	1	2	40	25	5	1	1	-
15/05/2022	1	-	74	16	1	-	-	1
16/05/2022	4	-	32	18	3	-	-	-
Total	11	3	233	77	23	1	1	1

May (2)**Location A**

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, barbastelle, noctule and *Myotis* species. Also recorded was pipistrelle species (common or soprano pipistrelle). The detector recorded for six nights, during which registrations of bat echolocation were made on all six nights. Pipistrelle species (common or soprano pipistrelle) was the most frequently recorded with a total of 2084 registrations and a peak of 1113 registrations during a single night on 26th May 2022. Three barbastelle registrations were recorded in total; two on 25th May 2022 and one on 26th May 2022.

⁸ Common pipistrelle and Nathusius' pipistrelle can be difficult to separate using a zero-crossing file when calls recorded are towards the lower end of the common pipistrelle peak frequency and higher end of the Nathusius' pipistrelle peak frequency. As such any pipistrelle bat with a peak frequency between 40khz and 41khz has been classified as pipistrelle bat.

Table 47 Location A – Automated detector results 25th – 28th May 2022

Date (Night Commencing)	Observation							
	Serotine	<i>Myotis</i> species	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle social call	Barbastelle	Noctule
25/05/2022	2	45	280	340	459	4	2	-
26/05/2022	3	49	755	414	1113	-	1	-
27/05/2022	4	43	154	436	289	1	-	-
28/05/2022	-	7	165	152	145	-	-	-
29/05/2022	-	8	12	49	23	-	-	1
30/05/2022	-	5	71	72	55	-	-	-
Total	9	157	1437	1463	2084	5	3	1

Location B

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, Leisler's bat, noctule and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), pipistrelle species (common or Nathusius' pipistrelle), noctule or Leisler's bat, and either *Myotis* species or brown long-eared bat. The detector recorded for six nights, during which registrations of bat echolocation were made on all six nights. Soprano pipistrelle was the most frequently recorded with a total of 2304 registrations and a peak of 1264 registrations during a single night on 26th May 2022.

Table 48 Location B – Automated detector results 25th – 28th May 2022

Date (Night Commencing)	Observation										
	Serotine	Leisler's bat	Noctule or Leisler's bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle species (common or Nathusius')	Pipistrelle social call	<i>Myotis</i> species	Noctule	<i>Myotis</i> species or long-eared bat
25/05/2022	1	1	1	114	367	3	-	-	-	-	-
26/05/2022	-	1	-	475	1264	13	1	5	11	-	-
27/05/2022	-	-	-	172	298	1	-	-	13	-	1
28/05/2022	1	-	-	123	264	10	1	-	3	-	-
29/05/2022	-	-	-	16	23	3	-	-	1	-	-
30/05/2022	-	-	-	36	88	6	-	-	1	1	-
Total	2	2	1	936	2304	36	2	5	29	1	1

Location C

Three confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle and serotine. Also recorded were pipistrelle species (common or soprano pipistrelle) and either noctule, Leisler's bat or serotine. The detector recorded for six nights, during which registrations of bat echolocation were made on four nights. Common pipistrelle was the most frequently recorded with a total of 206 registrations and a peak of 73 registrations during a single night on 28th May 2022.

Table 49 Location C – Automated detector results 25th – 28th May 2022

Date (Night Commencing)	Observation				
	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Serotine	Noctule, Leisler's bat or Serotine
25/05/2022	64	10	10	-	-
26/05/2022	52	11	-	-	-
27/05/2022	17	17	13	1	1
28/05/2022	73	8	1	-	-
Total	206	46	24	1	1

June

Location A

At least four confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle) and two registrations of a possible barbastelle⁹. The detector recorded for six nights, during which registrations of bat echolocation were made on three nights. Soprano pipistrelle was the most frequently recorded with a total of 1035 registrations and a peak of 520 registrations during a single night on 24th June 2022. Two possible barbastelle registrations were recorded on 22nd June 2022.

Table 50 Location A – Automated detector results 22nd – 24th June 2022

Date (Night Commencing)	Observation					
	<i>Myotis</i> species	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or Soprano)	Possible barbastelle	Serotine
22/06/2022	1	199	220	106	2	-
23/06/2022	2	246	295	209	-	-
24/06/2022	5	206	520	442	-	1
Total	8	651	1035	757	2	1

Location B

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, noctule, Leisler's bat and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), either *Myotis* species or brown long-eared bat and either noctule, Leisler's bat or serotine. The detector recorded for six nights, during which registrations of bat echolocation were made on three nights. Soprano pipistrelle was the most frequently recorded with a total of 1808 registration and a peak of 721 registrations during a single night on 23rd June 2022.

⁹ Barbastelle calls can be difficult to identify accurately if only part of the call is present. Therefore, unless the species could be clearly identified 'possible barbastelle' has been used.

Table 51 Location B – Automated detector results 22nd – 24th June 2022

Date (Night Commencing)	Observation									
	Serotine	<i>Myotis</i> species	Noctule, Leisler's bat or Serotine	Noctule	Leisler's bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or Soprano)	Pipistrelle social call	<i>Myotis</i> species or Long-eared bat
22/06/2022	10	2	2	1	-	89	578	12	1	-
23/06/2022	8	3	-	-	1	122	721	16	-	-
24/06/2022	-	5	1	-	-	211	509	18	-	3
Total	18	10	3	1	1	422	1808	46	1	3

Location C

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, noctule and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle) and either noctule, Leisler's bat or serotine. The detector recorded for six nights, during which registrations of bat echolocation were made on five nights. Common pipistrelle was the most frequently recorded with a total of 118 registrations and a peak of 55 registrations during a single night on 23rd June 2022.

Table 52 Location C – Automated detector results 22nd – 24th June 2022

Date (Night Commencing)	Observation						
	Serotine	<i>Myotis</i> species	Noctule, Leisler's bat or Serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or Soprano)	Noctule
22/06/2022	1	2	1	31	24	16	-
23/06/2022	-	2	1	55	25	24	2
24/06/2022	-	2	-	6	20	22	-
25/06/2022	-	-	1	15	7	5	-
26/06/2022	-	1	-	11	4	5	-
Total	1	7	3	118	80	72	2

July**Location A**

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, Leisler's bat, noctule, serotine and *Myotis* species. Also recorded was pipistrelle species (common or soprano pipistrelle). The detector recorded for six nights, during which registrations of bat echolocation were made on all six nights. Soprano pipistrelle was the most frequently recorded with a total of 1489 registrations and a peak of 531 registrations during a single night on 20th July 2022.

Table 53 Location A – Automated detector results 19th-24th July 2022

Date (Night Commencing)	Observation							
	Myotis species	Leisler's bat	Noctule	Serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species	Pipistrelle Social call
19/07/2022	23	3	3	-	244	450	285	2
20/07/2022	11	3	4	-	270	531	21	-
21/07/2022	-	-	-	-	50	86	16	-
22/07/2022	3	-	1	1	39	76	1	-
23/07/2022	2	1	1	-	56	164	61	-
24/07/2022	9	4	3	1	333	410	224	-
Total	48	11	12	2	992	1489	608	2

Location B

At least seven confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's bat, brown long-eared bat and *Myotis* species. Also recorded were two registrations of possible barbastelle. The detector recorded for six nights, during which registrations of bat echolocation were made on three nights. Soprano pipistrelle was the most frequently recorded with a total of 651 registrations and a peak of 353 registrations during a single night on 19th July 2022. Two possible barbastelle registrations were made on 20th July 2022.

Table 54 Location B – Automated detector results 19th-24th July 2022

Date (Night Commencing)	Observation								
	Myotis species	Leisler's bat	Noctule	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Pipistrelle social call	Brown long-eared bat	Possible Barbastelle
19/07/2022	5	11	3	208	353	-	2	-	-
20/07/2022	4	16	1	81	206	2	1	2	2
21/07/2022	1	2	2	92	92	-	-	1	-
Total	10	29	6	381	651	2	3	3	2

Location C

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, brown long-eared bat and *Myotis* species. Also recorded was pipistrelle species (common or soprano pipistrelle). The detector recorded for six nights, during which registrations of bat echolocation were made on all six nights. Common pipistrelle was the most frequently recorded with a total of 206 registrations and a peak of 104 registrations during a single night on 20th July 2022.

Table 55 Location C – Automated detector results 19th-24th July 2022

Date (Night Commencing)	Observation						
	Myotis species	Leisler's bat	Noctule	Common pipistrelle	Soprano pipistrelle	Pipistrelle species	Brown long-eared bat
19/07/2022	1	3	11	34	37	-	1
20/07/2022	3	3	2	104	56	-	2
21/07/2022	1	2	1	32	24	-	1
22/07/2022	2	1	4	11	8	-	-
23/07/2022	-	2	2	36	16	-	2
24/07/2022	1	5	2	43	20	1	1
Total	8	16	22	206	161	1	7

August

Location A

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, and *Myotis* species. Also recorded were four registrations of possible barbastelle. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 609 registrations and a peak of 247 registrations during a single night on 13th August 2022. A total of four possible barbastelle registrations were recorded; one on 13th August 2022 and three on 15th August 2022.

Table 56 Location A – Automated detector results 11th-15th August 2022

Date (Night Commencing)	Observation						
	<i>Myotis</i> species	Noctule	Common pipistrelle	Soprano pipistrelle	Pipistrelle social call	Leisler's bat	Possible barbastelle
11/08/2022	1	2	64	118	-	-	-
12/08/2022	16	3	67	115	-	1	-
13/08/2022	4	-	247	167	-	-	1
14/08/2022	12	10	120	81	-	3	-
15/08/2022	12	3	111	122	4	8	3
Total	45	18	609	603	4	12	4

Location B

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, brown long-eared bat and *Myotis* species. Also recorded was pipistrelle species (common or soprano pipistrelle). The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Soprano pipistrelle was the most frequently recorded with a total of 365 registrations and a peak of 136 registrations during a single night on 15th August 2022.

Table 57 Location B – Automated detector results 11th-15th August 2022

Date (Night Commencing)	Observation							
	<i>Myotis</i> species	Noctule	Common pipistrelle	Soprano pipistrelle	Pipistrelle species	Pipistrelle social call	Leisler's bat	Brown long-eared bat
11/08/2022	3	2	24	47	-	-	3	1
12/08/2022	9	10	35	47	-	1	2	4
13/08/2022	5	10	78	68	-	2	10	-
14/08/2022	7	12	60	67	-	-	5	4
15/08/2022	9	9	80	136	1	16	20	1
Total	33	43	277	365	1	19	40	10

Location C

Due to a fault with the static automated detector at Location C, no recordings were made.

September

Location A

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, *Myotis* species and Daubenton's bat. The detector recorded for eight nights, during which registrations of bat echolocation were made on all eight nights. Common pipistrelle was the most frequently recorded with a total of 49 registrations and a peak of 15 registrations during a single night on 28th September 2022.

Table 58 Location A – Automated detector results 21st-27th September 2022

Date (Night Commencing)	Observation					
	<i>Myotis</i> species	Noctule	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Daubenton's bat
21/09/2022	2	1	9	5	2	-
22/09/2022	2	1	3	4	1	-
23/09/2022	1	-	14	8	-	-
24/09/2022	4	-	2	4	1	-
25/09/2022	1	2	3	7	1	-
26/09/2022	1	1	2	-	2	-
27/09/2022	1	-	1	-	-	1
28/09/2022	2	-	15	13	-	-
Total	14	5	49	41	7	1

Location B

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, brown long-eared bat and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle) and either *Myotis* species or brown long-eared bat. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 165 registrations and a peak of 56 registrations during a single night on 23rd September 2022.

Table 59 Location B – Automated detector results 21st-27th September 2022

Date (Night Commencing) Observation

	<i>Myotis</i> species	<i>Myotis</i> species or long-eared bat	Common pipistrelle	Nathusius' pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or soprano)	Pipistrelle social call	Brown long-eared bat	Noctule	Other Social call
21/09/2022	14	6	28	1	20	2	3	3	-	-
22/09/2022	8	-	38	-	44	1	2	4	4	-
23/09/2022	24	2	56	-	37	2	7	2	-	1
24/09/2022	19	-	34	-	19	1	1	-	-	-
25/09/2022	5	-	9	-	11	1	-	-	-	-
Total	70	8	165	1	131	7	13	9	4	1

Location C

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, *Myotis* species and Leisler's bat. The detector recorded for four nights, during which

registrations of bat echolocation were made on all eight nights. *Myotis* species was the most frequently recorded with a total of 232 registrations and a peak of 114 registrations during a single night on 22nd September 2022.

Table 60 Location C – Automated detector results 21st-27th September 2022

Date (Night Commencing)	Observation						
	<i>Myotis</i> species	Noctule	Leisler's bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle social call	Brown long-eared bat
21/09/2022	47	1	-	13	74	-	4
22/09/2022	114	-	1	30	7	-	10
23/09/2022	43	3	-	102	102	3	4
24/09/2022	28	1	-	17	22	-	3
Total	232	5	1	162	205	3	21

October

Location A

At least seven confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, barbastelle, noctule, brown long-eared bat, Leisler's bat and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle) and either *Myotis* species or brown long-eared bat. The detector recorded for four nights, during which registrations of bat echolocation were made on all four nights. Common pipistrelle was the most frequently recorded with a total of 293 registrations and a peak of 141 registrations during a single night on 19th October 2022. A single barbastelle registration was recorded on 19th October 2022.

Table 61 Location A – Automated detector results 19th-23rd October 2022

Date (Night Commencing) Observation

	<i>Myotis</i> species	<i>Myotis</i> species or long-eared bat	Noctule	Leisler's bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle social call	Brown long-eared bat	Barbastelle
19/10/2022	24	1	-	1	141	13	-	1	-	1
20/10/2022	14	1	2	-	4	1	-	-	3	-
21/10/2022	3	-	-	-	124	6	-	-	-	-
22/10/2022	5	-	-	-	24	6	5	-	1	-
Total	46	2	2	1	293	26	5	1	4	1

Location B

At least eight confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, barbastelle, noctule, brown long-eared bat, Leisler's bat, serotine and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), either noctule, Leisler's bat or serotine and either *Myotis* species or brown long-eared bat. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 168 registrations and a peak of 53 registrations during a single night on 23rd October 2022.

Table 62 Location B – Automated detector results 19th-23rd October 2022**Date (Night Commencing) Observation**

	<i>Myotis</i> species	<i>Myotis</i> species or long-eared bat	Noctule	Leisler's bat	Serotine	Noctule, Leisler's bat or serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Brown long-eared bat	Barbastelle
19/10/2022	14	-	-	-	1	2	38	82	1	2	
20/10/2022	7	1	-	-	-	-	2	4	-	1	1
21/10/2022	1	-	-	1	-	-	40	17	-	-	-
22/10/2022	16	-	1	-	-	1	35	18	2	-	1
23/10/2022	-	-	-	-	-	-	53	18	-	-	-
Total	38	1	1	1	1	3	168	139	3	3	2

Location C

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, Nathusius' pipistrelle and *Myotis* species. Also recorded were either noctule, Leisler's bat or serotine and pipistrelle social calls. The detector recorded for four nights, during which registrations of bat echolocation were made on all four nights. Common pipistrelle was the most frequently recorded with a total of 32 registrations and a peak of 14 registrations during a single night on 20th October 2022.

Table 63 Location C – Automated detector results 19th-23rd October 2022

Date (Night Commencing)	Observation						
	<i>Myotis</i> species	Noctule	Noctule, Leisler's bat or serotine	Common pipistrelle	Nathusius' pipistrelle	Soprano pipistrelle	Pipistrelle social call
19/10/2022	11	-	1	12	-	6	-
20/10/2022	3	3	-	14	1	3	-
21/10/2022	1	-	-	2	-	-	-
22/10/2022	1	1	-	4	1	2	1
Total	16	4	1	32	2	11	1

I.2 Transect 2**May (1)****Location D**

At least four confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle) and either noctule, Leisler's bat or serotine. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 83 registrations and a peak of 28 registrations during a single night on 15th May 2022.

Table 64 Location D – Automated detector results 12th – 16th May 2022

Date (Night Commencing)	Observation					
	Noctule	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Noctule, Leisler's bat or Serotine	<i>Myotis</i> species
12/05/2022	1	8	4	2	-	-
13/05/2022	-	11	6	1	-	-
14/05/2022	-	19	5	1	-	-
15/05/2022	-	28	9	1	1	-
16/05/2022	1	17	5	2	-	1
Total	2	83	29	7	1	1

May (2)

Location D

At least four confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, brown long-eared bat and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), pipistrelle species (common or Nathusius' pipistrelle) and either *Myotis* species or brown long-eared bat. The detector recorded for six nights, during which registrations of bat echolocation were made on four nights. Common pipistrelle was the most frequently recorded with a total of 96 registrations and a peak of 57 registrations during a single night on 26th May 2022.

Table 65 Location D – Automated detector results 25th – 28th May 2022

Date (Night Commencing)	Observation						
	<i>Myotis</i> species or long-eared bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle species (common or Nathusius')	Brown long-eared bat	<i>Myotis</i> species
25/05/2022	1	16	1	-	-	1	-
26/05/2022	-	57	1	1	1	-	-
27/05/2022	-	15	3	1	-	-	1
28/05/2022	-	8	-	1	-	-	2
Total	1	96	5	3	1	1	3

June

Location D

At least four confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), pipistrelle species (common or Nathusius' pipistrelle) and either *Myotis* or brown long-eared bat. The detector recorded for six nights, during which registrations of bat echolocation were made on four nights. Common pipistrelle was the most frequently recorded with a total of 55 registrations and a peak of 23 registrations during a single night on 23rd June 2022.

Table 66 Location D – Automated detector results 22nd – 24th June 2022

Date (Night Commencing)	Observation						
	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or Soprano)	Pipistrelle species (common or Nathusius')	<i>Myotis</i> species	<i>Myotis</i> or Long-eared bat	Noctule
22/06/2022	20	1	5	1	-	-	-

Date (Night Commencing)	Observation						
	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (Common or Soprano)	Pipistrelle species (common or Nathusius')	Myotis species	Myotis or Long-eared bat	Noctule
23/06/2022	23	4	4	-	2	1	1
24/06/2022	7	5	2	-	1	-	-
25/06/2022	5	1	2	-	-	-	-
Total	55	11	13	1	3	1	1

July

Location D

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, serotine and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), either noctule or Leisler's bat and either *Myotis* species or brown long-eared bat. The detector recorded for six nights, during which registrations of bat echolocation were made on all six nights. Common pipistrelle was the most frequently recorded with a total of 124 registrations and a peak of 41 registrations during a single night on 21st July 2022.

Table 67 Location D – Automated detector results 19th-24th July 2022

Date (Night Commencing)	Observation								
	Noctule	Leisler's bat	Noctule or Leisler's bat	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Serotine	Myotis species	Myotis species or long-eared bat
19/07/2022	8	-	-	22	8	-	-	-	-
20/07/2022	3	-	1	25	10	3	-	-	-
21/07/2022	1	-	-	41	1	1	1	-	-
22/07/2022	2	-	-	17	2	-	1	1	1
23/07/2022	1	1	-	19	10	-	-	-	-
24/07/2022	-	-	-	-	-	1	-	-	-
Total	15	1	1	124	31	5	2	1	1

August

Location D

At least five confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, serotine and Leisler's bat. Also recorded were pipistrelle species (common or soprano pipistrelle), either noctule or Leisler's bat, either noctule, Leisler's bat or serotine, and either *Myotis* species or brown long-eared bat. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 125 registrations and a peak of 39 registrations during a single night on 13th August 2022.

Table 68 Location D – Automated detector results 11th-15th August 2022

Date (Night Commencing)	Observation								
	Serotine	Noctule	Leisler's bat	Noctule or Leisler's bat	Noctule, Leisler's bat or serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Myotis species or long-eared bat
11/08/2022	1	4	1	-	1	24	7	-	-
12/08/2022	-	1	-	1	-	39	2	-	1

Date (Night Commencing)	Observation								
	Serotine	Noctule	Leisler's bat	Noctule or Leisler's bat	Noctule, Leisler's bat or serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Myotis species or long-eared bat
13/08/2022	-	4	1	-	2	27	8	1	-
14/08/2022	-	7	-	-	2	19	5	1	-
15/08/2022	3	6	-	-	2	16	4	-	-
Total	4	22	2	1	7	125	26	2	1

September

Location D

At least six confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, serotine, noctule, brown long-eared bat and *Myotis* species. Also recorded were pipistrelle species (common or soprano pipistrelle), either noctule, Leisler's bat or serotine and either *Myotis* species or brown long-eared bat. Pipistrelle social calls were also recorded. The detector recorded for seven nights, during which registrations of bat echolocation were made on all seven nights. Soprano pipistrelle was the most frequently recorded with a total of 268 registrations and a peak of 89 registrations during a single night on 24th September 2022.

Table 69 Location D – Automated detector results 21st-27th September 2022

Date (Night Commencing) Observation

	Myotis species	Myotis species or long-eared bat	Noctule	Serotine	Noctule, Leisler's bat or serotine	Common pipistrelle	Soprano pipistrelle	Pipistrelle species (common or soprano)	Pipistrelle social call	Brown long-eared bat	Other social call
21/09/2022	9	5	1	-	-	2	12	1	2	1	4
22/09/2022	6	5	2	-	-	3	29	-	-	-	-
23/09/2022	4	1	1	1	2	9	81	1	6	1	2
24/09/2022	5	-	-	-	-	-	89	-	-	2	-
25/09/2022	4	1	2	-	-	-	47	-	-	1	1
26/09/2022	1	-	-	-	-	-	3	-	-	1	-
27/09/2022	-	-	-	-	-	3	7	-	-	1	-
Total	29	12	6	1	2	17	268	2	8	7	7

October

Location D

At least four confirmed bat species were recorded, comprising common pipistrelle, soprano pipistrelle, noctule, and *Myotis* species. The detector recorded for five nights, during which registrations of bat echolocation were made on all five nights. Common pipistrelle was the most frequently recorded with a total of 19 registrations and a peak of 14 registrations during a single night on 20th October 2022.

Table 70 Location D – Automated detector results 19th-23rd October 2022

Date (Night Commencing)	Observation			
	Myotis species	Noctule	Common pipistrelle	Soprano pipistrelle
19/10/2022	1	1	1	-
20/10/2022	-	-	14	2

Date (Night Commencing)	Observation			
	Myotis species	Noctule	Common pipistrelle	Soprano pipistrelle
21/10/2022	-	-	1	-
22/10/2022	1	2	2	1
23/10/2022	-	-	1	1
Total	2	3	19	4

Param	Value	Unit
Mass	0.0001	kg
h	0.001	m
Rz	0.0001	m
h0	0.0001	m
h1	0.0001	m
h2	0.0001	m
h3	0.0001	m
h4	0.0001	m
h5	0.0001	m
h6	0.0001	m
h7	0.0001	m
h8	0.0001	m
h9	0.0001	m
h10	0.0001	m
h11	0.0001	m
h12	0.0001	m
h13	0.0001	m
h14	0.0001	m
h15	0.0001	m
h16	0.0001	m
h17	0.0001	m
h18	0.0001	m
h19	0.0001	m
h20	0.0001	m
h21	0.0001	m
h22	0.0001	m
h23	0.0001	m
h24	0.0001	m
h25	0.0001	m
h26	0.0001	m
h27	0.0001	m
h28	0.0001	m
h29	0.0001	m
h30	0.0001	m
h31	0.0001	m
h32	0.0001	m
h33	0.0001	m
h34	0.0001	m
h35	0.0001	m
h36	0.0001	m
h37	0.0001	m
h38	0.0001	m
h39	0.0001	m
h40	0.0001	m
h41	0.0001	m
h42	0.0001	m
h43	0.0001	m
h44	0.0001	m
h45	0.0001	m
h46	0.0001	m
h47	0.0001	m
h48	0.0001	m
h49	0.0001	m
h50	0.0001	m
h51	0.0001	m
h52	0.0001	m
h53	0.0001	m
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h55	0.0001	m
h56	0.0001	m
h57	0.0001	m
h58	0.0001	m
h59	0.0001	m
h60	0.0001	m
h61	0.0001	m
h62	0.0001	m
h63	0.0001	m
h64	0.0001	m
h65	0.0001	m
h66	0.0001	m
h67	0.0001	m
h68	0.0001	m
h69	0.0001	m
h70	0.0001	m
h71	0.0001	m
h72	0.0001	m
h73	0.0001	m
h74	0.0001	m
h75	0.0001	m
h76	0.0001	m
h77	0.0001	m
h78	0.0001	m
h79	0.0001	m
h80	0.0001	m
h81	0.0001	m
h82	0.0001	m
h83	0.0001	m
h84	0.0001	m
h85	0.0001	m
h86	0.0001	m
h87	0.0001	m
h88	0.0001	m
h89	0.0001	m
h90	0.0001	m
h91	0.0001	m
h92	0.0001	m
h93	0.0001	m
h94	0.0001	m
h95	0.0001	m
h96	0.0001	m
h97	0.0001	m
h98	0.0001	m
h99	0.0001	m
h100	0.0001	m
h101	0.0001	m
h102	0.0001	m
h103	0.0001	m
h104	0.0001	m
h105	0.0001	m
h106	0.0001	m
h107	0.0001	m
h108	0.0001	m
h109	0.0001	m
h110	0.0001	m
h111	0.0001	m
h112	0.0001	m
h1		

Peak	Retention Time (min)	Area	Concentration (%)
1	1.12	1.12	1.12

Prepared for: Homes England

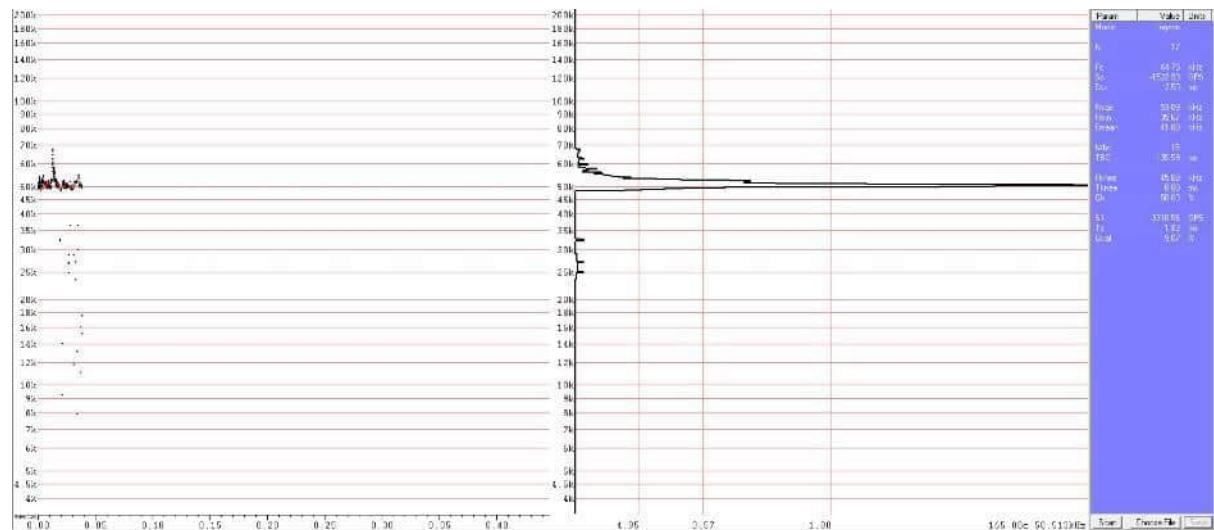


Plate 36. *Pipistrelle* species recorded at 01:33 on 13th May 2022 at Location C, F6 compression

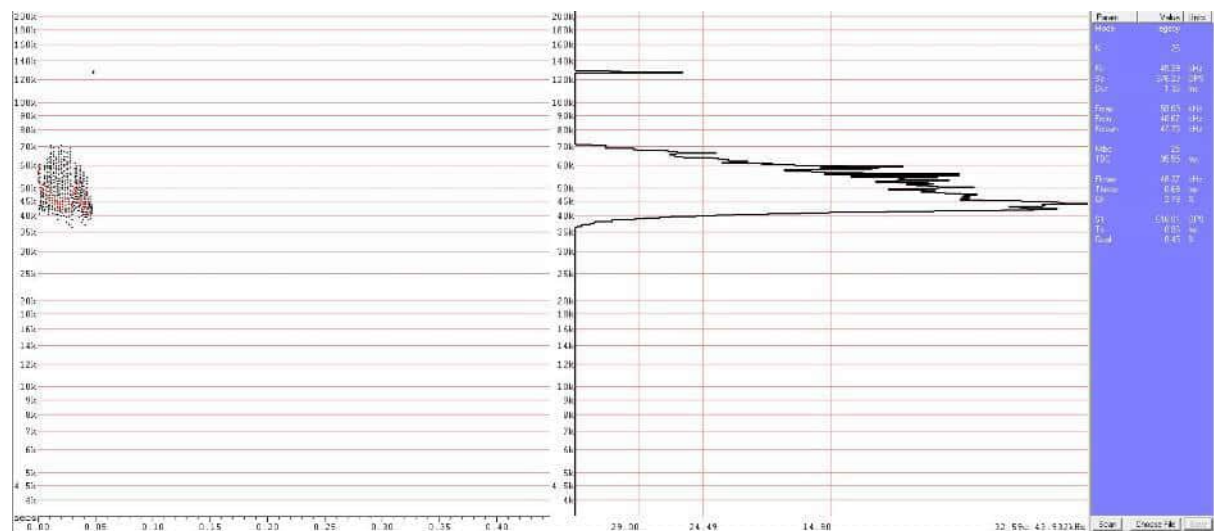


Plate 37. *Myotis* species recorded at 04:16 on 14th May 2022 at Location C, F6 compression

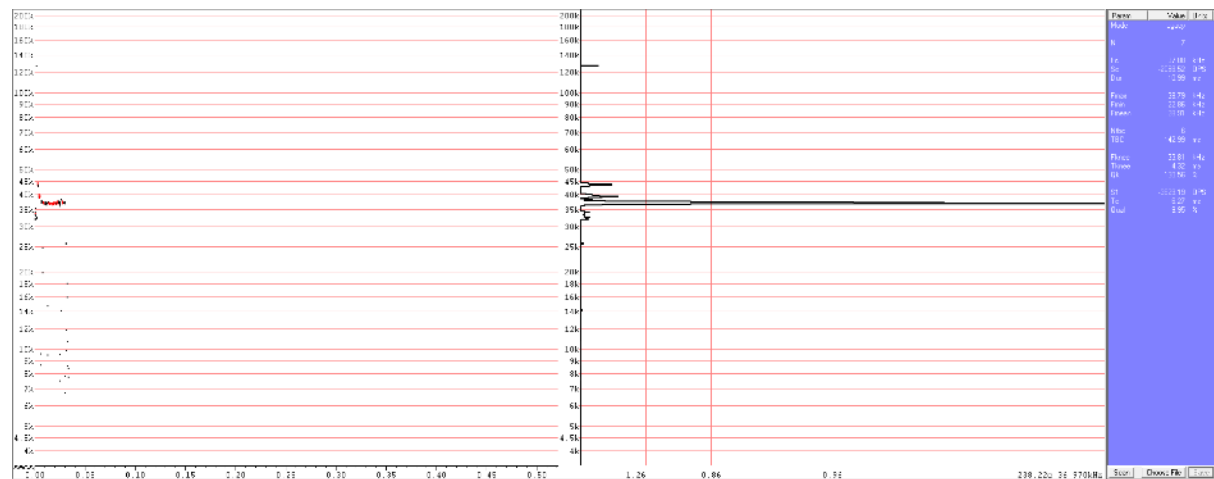


Plate 38. Nathusius' pipistrelle recorded at 00:18 on 15th May 2022 at Location C, F6 compression

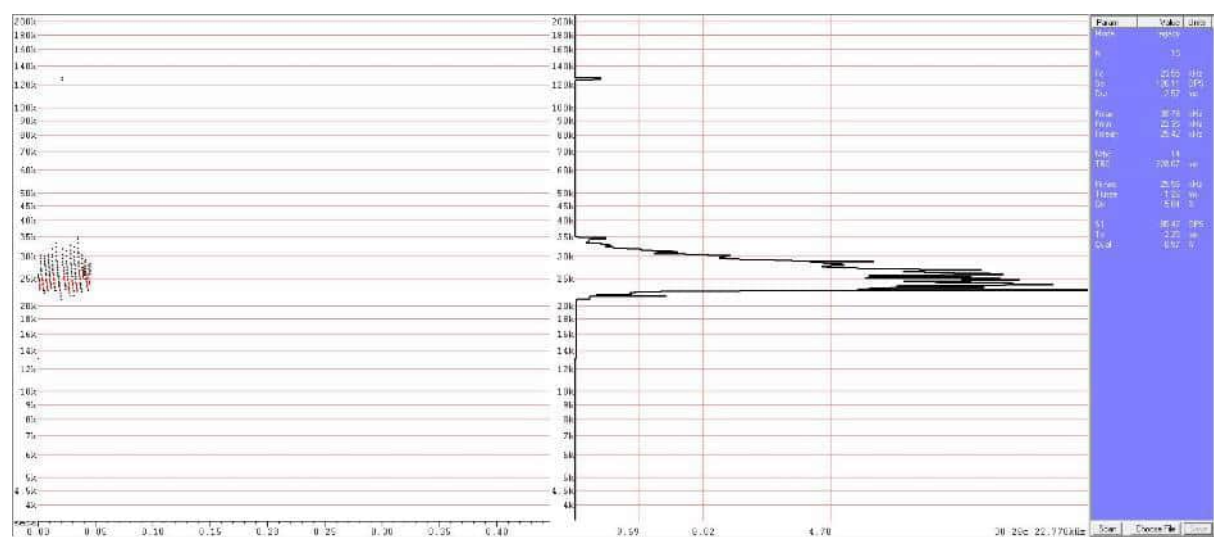


Plate 39. Brown long-eared bat recorded at 00:31 on 15th May 2022 at Location C, F6 compression

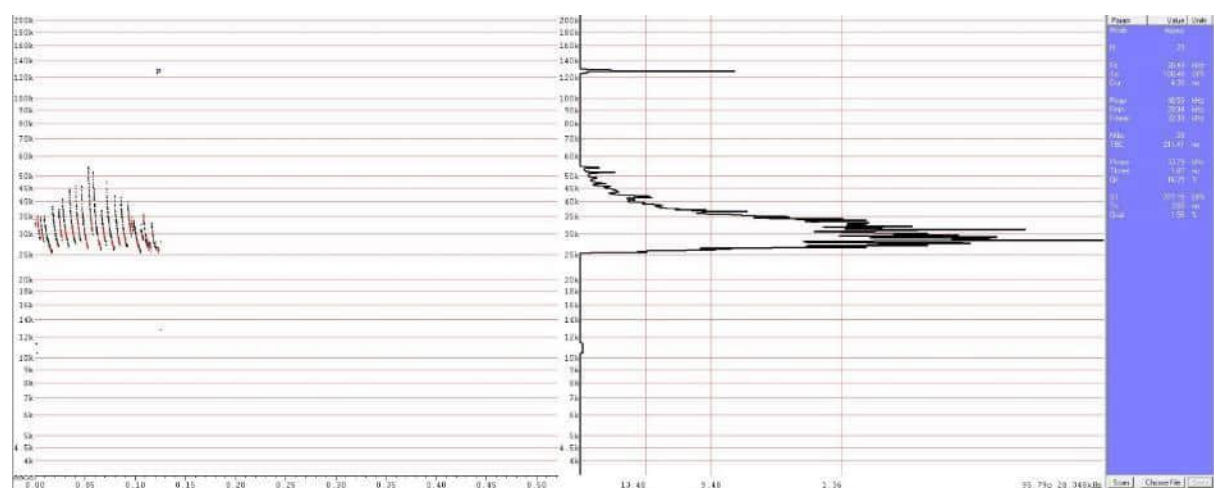


Plate 40. Serotine recorded at 22:32 on 22nd June 2022 at Location B, F6 compression

Appendix K Full Great Crested Newt HSI Assessment Data

Table 71. Full HSI Assessment Data

HSI criteria/ score definition

		Drain 7	Drain 8	Drain 10	Drain 11	Pond 8	Pond 9	Pond 10	Pond 8a	Pond 12
SI - Location	Ponds are scored according to their geographic location: A = optimal (north, central and southern England); B = marginal; C = unsuitable	A - 1	A - 1	A - 1	DRY	A - 1	A - 1	A - 1	A - 1	A - 1
SI2 - Pond area	Calculated based on pond area	2m ² – 0.05	3.5m ² – 0.05	<1m ² – 0.05		519m ² – 1	1170m ² – 0.9	548m ² – 1	56m ² – 0.1	797m ² – 0.9
SI3 - Pond drying	Never dries = 0.9; Rarely dries 1.0; sometimes dries = 0.5; dries annually 0.1	Dries annually – 0.1	Sometimes dries – 0.5	Dries annually – 0.1		Never dries – 0.9	Never dries – 0.9	Never dries – 0.9	Never dries – 0.9	Rarely Dries - 1
SI4 - Water quality	Good = 1.0; Moderate = 0.67; Poor 0.33; Bad = 0.01	Poor - 0.33	Poor – 0.33	Poor – 0.33		Moderate – 0.67	Poor – 0.33	Poor – 0.33	Moderate – 0.67	Moderate – 0.67
SI4 - Shade	Calculated as a percentage; shading in excess of 60% progressively reduces pond value for great crested newt	100% – 0.2	100% - 0.2	100% - 0.2		90% - 0.4	30% - 1	60% - 1	80% - 0.6	100% - 0.2
SI6 - Fowl	Absent = 1; Minor = 0.67; Major = 0.01	Absent - 1	Absent -1	Absent - 1		Absent - 1	Minor – 0.67	Absent - 1	Absent - 1	Absent - 1
SI7 - Fish	Absent = 1; Possible = 0.67; Minor = 0.33; Major = 0.01	Absent - 1	Absent -1	Absent - 1		Absent - 1	Absent -1	Absent - 1	Absent -1	Absent - 1
SI8 - Ponds	Number of ponds occurring within 1km of survey pond, divided by Pi (3.14). Exclude ponds where major barriers such as roads exist	3.2 -0.95	3.2 – 0.95	6 – 1		7 -1	7 -1	7 -1	6 -1	8 -1
SI9 - Terrestrial habitat	Good = 1; Moderate = 0.67; Poor 0.33; Bad = 0.01	Good - 1	Good – excellent -1	Moderate – 0.67		Good - 1	Moderate – 0.67	Moderate – 0.67	Moderate – 0.67	Good – 0.67
SI10 - Macrophytes	Estimated percentage value of macrophyte cover (sum of emergent, floating, submerged plants reaching the surface except duckweed)	0% - 0.3	0% - 0.3	0% - 0.3		0% - 0.3	10% - 0.4	0% - 0.3	20% - 0.5	5% - 0.35
HSI score		0.40 - Poor	0.46 - Poor	0.38 - Poor	N/A	0.77 - Good	0.74 – Good	0.75 - Good	0.64 - Average	0.70 – Good

HSI criteria/ score definition

		Pond 13	Pond 14	Pond 15	Pond 16	Pond 26	Pond 27	Pond 28	Pond 29	Pond 30	Pond 34
SI - Location	Ponds are scored according to their geographic location: A = optimal (north, central and southern England); B = marginal; C = unsuitable	A - 1	A - 1	A - 1	A - 1	A - 1	A - 1	A - 1	A - 1	A - 1	DRY
SI2 - Pond area	Calculated based on pond area	2375m ² – factor omitted	5m ² – 0.05	600m ² – 1	N/A – 0.05	510m ² – 1	128m ² – 0.2	40m ² – 0.05	100m ² – 0.2	450m ² – 0.9	
SI3 - Pond drying	Never dries = 0.9; Rarely dries 1.0; sometimes dries = 0.5; dries annually 0.1	Rarely Dries - 1	Dries annually – 0.1	Sometimes Dries – 0.5	Dries annually – 0.1	Dries annually – 0.1	Never dries – 0.9	Never dries – 0.9	Never dries – 0.9	Rarely Dries - 1	
SI4 - Water quality	Good = 1.0; Moderate = 0.67; Poor 0.33; Bad = 0.01	Moderate - 0.67	Poor – 0.33	Moderate - 0.67	Poor – 0.33	Moderate - 0.67	Moderate - 0.67	Moderate - 0.67	Poor – 0.33	Poor – 0.33	
SI4 - Shade	Calculated as a percentage; shading in excess of 60% progressively reduces pond value for great crested newt	100% - 0.2	100% - 0.2	90% - 0.4	80% - 0.6	20% - 1	0% - 1	15% - 1	50% - 1	85% - 0.5	
SI6 - Fowl	Absent = 1; Minor = 0.67; Major = 0.01	Absent - 1	Absent -1	Absent - 1	Absent - 1	Absent - 1	Minor – 0.67	Minor – 0.67	Absent - 1	Minor – 0.67	
SI7 - Fish	Absent = 1; Possible = 0.67; Minor = 0.33; Major = 0.01	Absent - 1	Absent -1	Absent - 1	Absent - 1	Absent -1	Absent - 1	Absent -1	Absent - 1	Possible – 0.67	
SI8 - Ponds	Number of ponds occurring within 1km of survey pond, divided by Pi (3.14). Exclude ponds where major barriers such as roads exist	8 -1	8 -1	6 -1	7 -1	6 -1	6 -1	6 -1	6 – 1	6 – 1	
SI9 - Terrestrial habitat	Good = 1; Moderate = 0.67; Poor 0.33; Bad = 0.01	Good – 0.67	Moderate - 0.67	Moderate - 0.67	Moderate - 0.67	Moderate - 0.67	Poor – 0.33	Moderate - 0.67	Moderate - 0.67	Good – 0.67	
SI10 - Macrophytes	Estimated percentage value of macrophyte cover (sum of emergent, floating, submerged plants reaching the surface except duckweed)	5% - 0.35	0% 0.3	30% - 0.6	0% - 0.3	5% - 0.35	0% - 0.3	10% - 0.4	10% - 0.4	25% - 0.55	
HSI score		0.68 – Average	0.38 - Poor	0.73 Good	0.43 - Poor	0.66 – Average	0.62 – Average	0.58 – Below average	0.66 – Average	0.69 - Average	N/A

Appendix L Great Crested Newt eDNA Survey Results

The full eDNA results from Sure Screen Scientific are shown below.



Folio No: E12980
 Report No: 1
 Purchase Order: 1520551
 Client: AECOM INFRASTRUCTURE
 AND ENVIRONMENT
 Contact: Rosie Walton, Amelia Kent

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 26/04/2022
 Date Reported: 28/04/2022
 Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2426	Burgess Hill/Northern Arc Pond 13	TQ30439 21173	Pass	Pass	Pass	Negative	0
2429	Burgess Hill/Northern Arc Pond 8	TQ2993 2085	Pass	Pass	Pass	Positive	5
2430	Burgess Hill/Northern Arc Pond 10	TQ3011 2115	Pass	Pass	Pass	Negative	0
2431	Burgess Hill/Northern Arc Pond 26	TQ30711 20553	Pass	Pass	Pass	Negative	0
2435	Burgess Hill/Northern Arc Pond 15	TQ30601 20683	Pass	Pass	Pass	Negative	0



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
 UK Tel: +44 (0)1332 292003 Email: scientific@suresscreen.com
 Company Registration No. 08950940



2436	Burgess Hill/Northern Arc Pond 12	TQ30441 21167	Pass	Pass	Pass	Negative	0
2438	Burgess Hill Pond 28	TQ30313 20504	Pass	Pass	Pass	Negative	0
2439	Burgess Hill/Northern Arc Pond 9	TQ3005 2113	Pass	Pass	Pass	Negative	0
2440	Burgess Hill/Northern Arc unnamed pond	TQ3040 2080	Pass	Pass	Pass	Positive	2
2443	Burgess Hill Pond 27	TQ30361 20554	Pass	Pass	Pass	Negative	0
2444	Burgess Hill Drain 8	TQ29322 20819	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth

Approved by: Esther Strafford

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5,' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS



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SIC:	Sample Integrity Check [Pass/Fail] When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
DC:	Degradation Check [Pass/Fail] Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
IC:	Inhibition Check [Pass/Fail] The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
Result:	Presence of GCN eDNA [Positive/Negative/Inconclusive] Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location. Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence. Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.



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Folio No: E18933
Report No: 1
Purchase Order: 1603716
Client: AECOM INFRASTRUCTURE
AND ENVIRONMENT
Contact: Rosie Walton

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (*TRITURUS CRISTATUS*)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 19/07/2023
Date Reported: 21/07/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
6907	Pond 30 Brookleigh	TQ30152 20434	Pass	Pass	Pass	Negative	0
6912	Pond 29 Brookleigh	TQ30275 20499	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Lauryn Jewkes

Approved by: Chris Troth



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Company Registration No. 08950940



METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC:	Sample Integrity Check [Pass/Fail] When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
DC:	Degradation Check [Pass/Fail] Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
IC:	Inhibition Check [Pass/Fail] The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
Result:	Presence of GCN eDNA [Positive/Negative/Inconclusive] Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location. Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence. Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.



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Appendix M Population estimate survey results

M.1 Pond 8

Table 72 Population estimate survey results for Pond 8

Survey visit (date)	Survey method			
	Bottle trapping	Egg searching	Torching	Netting
1 (27/04/2022)	1x Adult female great crested newt	No great crested newt eggs found	1x adult female smooth newt 1x adult common frog	N/A
2 (12/05/2022)	None	None	None	None
3 (16/05/2022)	1x Adult female smooth newt	N/A	1x Adult female smooth newt	None
4 (18/05/2022)	N/A (storms predicted overnight, concerns for bottles becoming dislodged)	2x great crested newt egg	2x adult female smooth newt 2x adult common frog	None
5 (08/06/2022)	None	N/A (eggs found previously)	None	N/A
6 (16/06/2022)	N/A (too warm for bottles)	N/A (eggs found previously)	1x Adult female smooth newt	None

M.2 Pond 8a

Table 73 Population estimate survey results for Pond 8a

Survey visit (date)	Survey method			
	Bottle trapping	Egg searching	Torching	Netting
1 (12/05/2022)	1x Adult male great crested newt	None	1x Adult female smooth newt	None
2 (16/05/2022)	1x Adult male great crested newt 1x Adult female great crested newt 2x Adult male smooth newt 1x Adult female smooth newt	2x great crested newt eggs found	1x Adult male great crested newt 2x Adult female great crested newt 7x Adult female smooth newt	N/A
3 (18/05/2022)	N/A (storms predicted overnight, concerns for bottles becoming dislodged)	N/A (eggs found previously)	1x Adult male great crested newt 1x Adult male smooth newt 2x Adult female smooth newt	None
4 (08/06/2022)	None	N/A (eggs found previously)	None	N/A
5 (16/06/2022)	N/A (too warm for bottles)	N/A (eggs found previously)	None	None
6 (21/06/2022)	1x Adult male great crested newt	N/A (eggs found previously)	3x Adult female smooth newt 1x juvenile common frog	N/A

Appendix N Desk Study Data

N.1 Ancient Woodland

Ancient woodlands within 1km of the Site are:

- Bridge Farm Shaw North: ancient semi-natural woodland present within the Site (1.0ha)
- Bridge Farm Shaw 2: ancient semi-natural woodland adjacent to the south of drainage proposals in the south of the Site (0.5ha)
- Six Acre Wood South: ancient semi-natural woodland adjacent to the east of the existing Cuckfield Road (0.3ha)
- Pains Flat Wood: ancient semi-natural woodland, adjacent to the east of the existing Cuckfield Road (0.4ha)
- Kilnfield Pit: ancient semi-natural woodland, adjacent to the west of the existing Cuckfield Road (1.1ha)
- Bellowsnose Wood: ancient semi-natural woodland, adjacent to the west of the existing Cuckfield Road (1.7ha)
- Harvesthill Wood: ancient semi-natural woodland, adjacent to the east of the existing Cuckfield Road (0.6ha)
- Bridge Hall Farm Wood: ancient semi-natural woodland 0.05km north (1.9ha)
- Six Acre Shaw: ancient semi-natural woodland 0.07km north (1.0ha)
- Harvesthill Shaw: ancient semi-natural woodland, 0.08km east of the existing Cuckfield Road (1.7ha)
- Bridge Farm Shaw West: ancient semi-natural woodland 0.1km north (0.2ha)
- Six Acre Wood: ancient semi-natural woodland 0.1km east (2.9ha)
- Bridge Farm Shaw: ancient semi-natural woodland 0.1km south (1.1ha)
- Bridge Farm Shaw: ancient replanted woodland, 0.1km south (0.4ha)
- Jane Murray Way Shaw: ancient semi-natural woodland 0.1km south-west (2.0ha)
- Hook Place Shaw: ancient semi-natural woodland 0.2km east (0.4ha)
- The Shaw 2: ancient semi-natural woodland 0.2km north-west (0.4 ha)
- Sussex Way Shaw 2: ancient semi-natural woodland 0.2km south (0.4 ha)
- Rushpit Wood: ancient semi-natural woodland, 0.2km west of the existing Cuckfield Road (2.2ha)
- The Shaw: ancient semi-natural woodland 0.3km north-west (0.5 ha)
- Moonhill Shaw: ancient semi-natural woodland, 0.3km east of the existing Cuckfield Road (0.7ha)
- Kiln Wood ancient semi-natural woodland, 0.3km north-west of the existing Cuckfield Road (3.2ha)
- Great Wood: ancient semi-natural woodland 0.6km north-west of the existing Cuckfield Road (1.1ha)
- Lye Pond Shaw: ancient semi-natural woodland, 0.6km west of the existing Cuckfield Road (0.9ha)
- Ten Acre Gill: ancient semi-natural woodland 0.7km north-east (1.4 ha)
- Hookhouse West ancient semi-natural woodland, 0.7km east of the existing Cuckfield Road (0.4ha)
- Big Wood: ancient semi-natural woodland 0.8km north-east (11.3ha)
- Watford Wood: ancient semi-natural woodland 0.8km south-east (1.9 ha)
- Dunstalls Wood ancient semi-natural woodland and ancient replanted woodland, 0.8km north-west of the existing Cuckfield Road (4.0ha semi-natural, 1.2ha replanted)
- Pook Ryde Shaw ancient semi-natural woodland, 0.8km north-east of the existing Cuckfield Road (0.4ha)
- Leigh Mill Wood: ancient semi-natural woodland, 0.9km north-west (1.1ha)
- Great Wood: ancient replanted woodland, 0.9km east of the existing Cuckfield Road (4.8ha)

- Parson's Withes: ancient semi-natural woodland, 0.9km south-west (1.7ha)

N.2 Protected and Notable Species

Table 74. Desk study records of protected and notable species

Species	Common Name	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present within Site?	Present in wider zone of influence?	Distance (km) and bearing of most recent record	Date of most recent record	Distance (km) and bearing of the nearest record	Date of the nearest record
Amphibians										
<i>Bufo bufo</i>	Common Toad	✓	✓	X	X	✓	2.1km SE	2021	0.6km SW	2015
<i>Lissotriton vulgaris</i>	Smooth Newt	✓	✓	X	✓	✓	Within Site	2022	Within Site	2022
<i>Rana temporaria</i>	Common Frog	✓	✓	✓	X	✓	0.9km S	2016	0.9km S	2016
<i>Triturus cristatus</i>	Great Crested Newt	✓	✓	✓	X	✓	0.1km N	2022	0.1km N	2022
Fish - Bony										
<i>Anguilla anguilla</i>	European Eel	X	✓	✓	X	✓	1.8km NW	2014	1.8km NW	2014
Fungi										
<i>Geoglossum fallax</i>	Deceptive Earthtongue	X	X	X	X	✓	1.4km SE	2014	1.4km SE	2014
<i>Hygrocybe insipida</i>	Spangle Waxcap	X	X	X	X	✓	1.4km SE	2014	1.4km SE	2014
<i>Hygrocybe quieta</i>	Oily Waxcap	X	X	X	X	✓	1.4km SE	2014	1.4km SE	2014
<i>Podoscypha multizonata</i>	Zoned Rosette	X	X	X	X	✓	1km NE	2016	1km NE	2016
Higher Plants – Flowering Plants										
<i>Anacamptis morio</i>	Green-winged Orchid	X	X	✓	X	✓	0.2km SW	2016	0.2km SW	2016
<i>Buxus sempervirens</i>	Box	X	X	✓	X	✓	0.4km W	2016	0.4km W	2016
<i>Carex vesicaria</i>	Bladder-sedge	X	X	✓	X	✓	1.2km NW	2022	1.2km NW	2022
<i>Erica cinerea</i>	Bell Heather	X	X	✓	X	✓	0.4km W	2016	0.4km W	2016
<i>Euphrasia nemorosa</i>	Common Eyebright	X	X	✓	X	✓	1.3km E	2019	0.4km W	2016
<i>Filago vulgaris</i>	Common Cudweed	X	X	✓	X	✓	1.6km SE	2014	1.6km SE	2014
<i>Fragaria vesca</i>	Wild Strawberry	X	X	✓	X	✓	0.4km S	2017	0.4km S	2017
<i>Genista tinctoria</i>	Dyer's Greenweed	X	X	✓	X	✓	1.4km NE	2022	1.3km E	2019
<i>Hyacinthoides non-scripta</i>	Bluebell	✓	X	X	X	✓	0.6km SE	2023	0.4km W	2016
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	X	X	✓	X	✓	0.4km W	2016	0.4km W	2016
<i>Lathyrus linifolius</i>	Bitter-vetch	X	X	✓	X	✓	0.9km S	2018	0.9km S	2018
<i>Melampyrum pratense</i>	Common Cow-wheat	X	X	✓	X	✓	1.3km E	2018	1.3km E	2018
<i>Ononis spinosa</i>	Spiny Restharrow	X	X	✓	X	✓	1.3km E	2019	1.3km E	2019
<i>Oxalis acetosella</i>	Wood-sorrel	X	X	✓	X	✓	1.1km NE	2022	1.1km NE	2022
<i>Potentilla erecta</i>	Tormentil	X	X	✓	X	✓	1.3km E	2019	0.4km W	2016
<i>Ranunculus flammula</i>	Lesser Spearwort	X	X	✓	X	✓	1.2km NW	2022	0.4km W	2016
<i>Silene flos-cuculi</i>	Ragged-Robin	X	X	✓	X	✓	1.1km NE	2022	1.1km NE	2022
<i>Succisa pratensis</i>	Devil's-bit Scabious	X	X	✓	X	✓	1.3km NW	2022	1.3km NW	2022
<i>Veronica officinalis</i>	Heath Speedwell	X	X	✓	X	✓	1.3km NE	2022	0.4km W	2016
Invertebrates - Beetles										

<i>Lucanus cervus</i>	Stag Beetle	✓	✓	✓	X	✓	1.5km SE	2015	1.5km SE	2015
Invertebrates - Butterflies										
<i>Apatura iris</i>	Purple Emperor	✓	X	✓	X	✓	1.8km SW	2014	1.8km SW	2014
<i>Coenonympha pamphilus</i>	Small Heath	X	✓	✓	X	✓	1.9km SW	2023	1km SE	2020
<i>Erynnis tages</i>	Dingy Skipper	X	✓	✓	X	✓	0.5km SW	2023	0.5km SW	2023
<i>Limenitis camilla</i>	White Admiral	X	✓	✓	X	✓	1.8km NW	2020	1.2km N	2019
<i>Pyrgus malvae</i>	Grizzled Skipper	X	✓	✓	X	✓	1.1km NW	2014	1.1km NW	2014
<i>Thecla betulae</i>	Brown Hairstreak	✓	✓	✓	X	✓	1.5km NE	2023	1.3km E	2016
Invertebrates – Dragonflies & Damselflies										
<i>Sympetrum striolatum</i>	Common darter	X	X	✓	X	✓	1.7km E	2018	1.1km SW	2017
Invertebrates – Grasshoppers & Crickets										
<i>Conocephalus fuscus</i>	Long-winged Cone-head	X	X	X	X	✓	1.7km SW	2022	1.7km SW	2022
<i>Roeseliana roeselii</i>	Roesel's Bush-cricket	X	X	X	X	✓	1.5km NE	2018	1.3km E	2016
Invertebrates - Moths										
<i>Acronicta rumicis</i>	Knot Grass	X	✓	X	X	✓	1.1km SW	2020	1.1km	2020
<i>Aporophyla lutulenta</i>	Deep-brown Dart	X	✓	X	X	✓	1.6km SE	2023	1.6km SE	2023
<i>Atethmia centrargo</i>	Centre-barred Sallow	X	✓	X	X	✓	1.1km SW	2019	1.1km SW	2019
<i>Chiasmia clathrata</i>	Latticed Heath	X	✓	X	X	✓	1.1km SW	2019	1.1km SW	2019
<i>Chloroclysta siterata</i>	Red-green Carpet	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Cirrhia icteritia</i>	Sallow	X	✓	X	X	✓	1.1km SW	2019	1.1km SW	2019
<i>Cleorodes lichenaria</i>	Brussels Lace	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Crambus pratella</i>	Scarce Grass-veneer	X	X	✓	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Crambus silvella</i>	Wood Grass-veneer	X	X	✓	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Ecliptopera silaceata</i>	Small Phoenix	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Eilema sororcula</i>	Orange Footman	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Ennomos fuscantaria</i>	Dusky Thorn	X	✓	X	X	✓	1.1km SW	2019	1.1km SW	2019
<i>Eupithecia pusillata</i>	Juniper Pug	X	X	X	X	✓	1.2km SW	2020	1.2km SW	2020
<i>Evergestis pallidata</i>	Chequered Pearl	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Furcula bicuspis</i>	Alder Kitten	X	X	X	X	✓	1.1km SW	2022	1.1km SW	2022
<i>Hecatera dysodea</i>	Small Ranunculus	X	X	✓	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Hypomecis roboraria</i>	Great Oak Beauty	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Leucania comma</i>	Shoulder-striped Wainscot	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Litoligia literosa</i>	Rosy Minor	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Lycia hirtaria</i>	Brindled Beauty	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Malacosoma neustria</i>	Lackey	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Meganola albula</i>	Kent Black Arches	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Mythimna pallens</i>	Common Wainscot	X	X	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Pareulype berberata</i>	Barberry Carpet	✓	✓	✓	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	X	✓	X	X	✓	1.1km NW	2022	1.1km NW	2022

<i>Spilosoma lubricipeda</i>	White Ermine	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Spilosoma lutea</i>	Buff Ermine	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
<i>Tholera decimalis</i>	Feathered Gothic						1.1km SW	2019	1.1km SW	2019
<i>Timandra comae</i>	Blood-vein	X	✓	X	X	✓	1.2km SE	2023	1.2km SE	2023
<i>Tyria jacobaeae</i>	Cinnabar	X	✓	X	X	✓	1.5km SW	2022	1.1km SW	2020
<i>Watsonalla binaria</i>	Oak Hook-tip	X	✓	X	X	✓	1.1km SW	2020	1.1km SW	2020
Invertebrates – Spiders										
<i>Argiope bruennichi</i>	Wasp Spider	X	X	X	X	✓	1.3km NE	2015	1.3km NE	2015
Invertebrates – True Bugs										
<i>Peribalus strictus</i>	Vernal Shieldbug	X	X	✓	X	✓	1.1km E	2015	1.1km E	2015
Invertebrates – True Flies										
<i>Volucella zonaria</i>	Hornet Hoverfly	X	X	X	X	✓	1km SW	2022	1km SW	2022
Lower Plants – Mosses										
<i>Syntrichia papillosa</i>	Marble Screw-moss	X	X	X	X	✓	1.4km SE	2017	1.4km SE	2017
Mammals - Terrestrial (excl. bats)										
<i>Erinaceus europaeus</i>	West European Hedgehog	X	✓	✓	X	✓	0.7km W	2023	0.4km S	2017
<i>Muscardinus avellanarius</i>	Hazel Dormouse	✓	✓	✓	X	✓	1.5km E	2021	1km E	2015
<i>Oryctolagus cuniculus</i>	European Rabbit	X	X	✓	X	✓	1.5km SW	2022	0.4km SE	2015
Reptiles										
<i>Anguis fragilis</i>	Slow-worm	✓	✓	X	X	✓	1.1km SW	2019	0.9km SE	2016
<i>Natrix helvetica</i>	Grass Snake	✓	✓	X	X	✓	1.3km SW	2016	1.3km SW	2016
Mammals – Terrestrial (bats)										
<i>Chiroptera</i>	Bat	✓	✓	✓	X	✓	1.6km SE	2021	1.1km NW	2020
<i>Myotis</i>	Myotis Bat	✓	✓	✓	X	✓	1.7km NW	2019	1.7km NW	2019
<i>Myotis daubentonii</i>	Daubenton's Bat	✓	X	✓	X	✓	1.1km NW	2020	1.1km NW	2020
<i>Myotis nattereri</i>	Natterer's Bat	✓	✓	✓	X	✓	0.9km NW	2020	0.9km NW	2020
<i>Pipistrellus</i>	Pipistrelle Bat	✓	✓	X	X	✓	1.7km NW	2019	1.7km NW	2019
	species									
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	✓	✓	X	X	✓	0.9km NW	2022	0.6km NE	2018
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	✓	✓	X	X	✓	1.7km NW	2019	0.6km NE	2018
<i>Plecotus auritus</i>	Brown Long-eared Bat	✓	✓	X	X	✓	1km NW	2017	1km NW	2017
Birds										
<i>Milvus milvus</i>	Red Kite	✓	X	✓	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Anas platyrhynchos</i>	Mallard	X	X	X	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Apus apus</i>	Swift	X	X	X	X	✓	1.6km SE	2019	1.6km SE	2019
<i>Larus argentatus</i>	Herring Gull	X	✓	X	X	✓	0.5km SW	2020	0.5km SW	2020
<i>Larus canus</i>	Common Gull	X	X	X	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Egretta garzetta</i>	Little Egret	X	X	✓	X	✓	1.6km SW	2014	1.6km SW	2014
<i>Columba oenas</i>	Stock Dove	X	X	X	X	✓	0.5km SW	2021	0.5km SW	2021
<i>Cuculus canorus</i>	Cuckoo	X	✓	X	X	✓	0.6km SE	2019	0.5km SW	2016
<i>Falco subbuteo</i>	Hobby	✓	X	X	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Falco tinnunculus</i>	Kestrel	X	X	X	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Alauda arvensis</i>	Skylark	X	✓	X	X	✓	1.6km SE	2015	1.6km SE	2015
<i>Emberiza citrinella</i>	Yellowhammer	X	✓	X	X	✓	1.4km SE	2020	1.4km SE	2020
<i>Emberiza schoeniclus</i>	Reed Bunting	X	✓	X	X	✓	2km SW	2020	2km SW	2020
<i>Coccothraustes coccothraustes</i>	Hawfinch	X	✓	X	X	✓	0.5km SW	2020	0.5km SW	2020
<i>Linaria cannabina</i>	Linnet	X	✓	X	X	✓	0.6km SE	2017	0.6km SE	2017

<i>Pyrrhula pyrrhula</i>	Bullfinch	X	✓	X	X	✓	0.6km SE	2018	0.6km SE	2018
<i>Delichon urbicum</i>	House Martin	X	X	X	X	✓	0.6km SE	2018	0.6km SE	2018
<i>Hirundo rustica</i>	Swallow	X	X	X	X	✓	0.6km SE	2018	0.6km SE	2018
<i>Motacilla cinerea</i>	Grey Wagtail	X	X	X	X	✓	0.5km SW	2022	0.5km SW	2022
<i>Luscinia megarhynchos</i>	Nightingale	X	X	X	X	✓	0.6km SE	2022	0.6km SE	2022
<i>Muscicapa striata</i>	Spotted Flycatcher	X	✓	✓	X	✓	1.9km NW	2020	1.9km NW	2020
<i>Poecile palustris</i>	Marsh Tit	X	✓	X	X	✓	0.6km SE	2019	0.6km SE	2019
<i>Passer domesticus</i>	House Sparrow	X	✓	X	X	✓	0.5km SW	2020	0.5km SW	2020
<i>Phylloscopus trochilus</i>	Willow Warbler	X	X	X	X	✓	0.6km SE	2016	0.6km SE	2016
<i>Prunella modularis</i>	Dunnock	X	✓	X	X	✓	0.6km SE	2020	0.6km SE	2020
<i>Regulus ignicapilla</i>	Firecrest	X	X	X	X	✓	1.6km NE	2022	1.6km NE	2022
<i>Sturnus vulgaris</i>	Starling	X	✓	X	X	✓	0.5km SW	2020	0.5km SW	2020
<i>Turdus philomelos</i>	Song Thrush	X	✓	X	X	✓	0.6km SE	2018	0.6km SE	2018
<i>Turdus viscivorus</i>	Mistle Thrush	X	X	X	X	✓	1.4km SE	2020	0.6km SE	2018
<i>Picus viridis</i>	Green Woodpecker	X	X	X	X	✓	1.4km SE	2020	0.6km SE	2018
<i>Strix aluco</i>	Tawny Owl	X	X	X	X	✓	1.2km NW	2021	0.5km SW	2019
<i>Tyto alba</i>	Barn Owl	✓	X	X	X	✓	1.4km W	2022	0.5km SW	2021
Invasive non-native species										
<i>Aix galericulata</i>	Mandarin Duck	X	X	✓	X	✓	0.5km SW	2020	0.5km SW	2020
<i>Branta canadensis</i>	Canada Goose	X	X	✓	X	✓	1.7km SW	2022	0.5km SW	2020
<i>Allium triquetrum</i>	Three-cornered Garlic	X	X	✓	X	✓	0.6km SE	2023	0.6km SE	2023
<i>Cotoneaster horizontalis</i>	Wall Cotoneaster	X	X	✓	X	✓	0.5km SW	2016	1.4km SW	2014
<i>Fallopia japonica</i>	Japanese Knotweed	X	X	✓	X	✓	0.7km SE	2023	0.7km SE	2023
<i>Hyacinthoides non-scripta</i> x <i>hispanica</i> = <i>H. x massartiana</i>	Bluebell	X	X	X	X	✓	0.6km SE	2023	1km SW	2018
<i>Impatiens glandulifera</i>	Himalayan Balsam	X	X	✓	X	✓	0.5km SW	2016	0.5km SW	2016
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	X	X	✓	X	✓	1.3km SE	2022	1.3km SE	2022
<i>Petasites fragrans</i>	Winter Heliotrope	X	X	X	X	✓	1.5km SE	2022	1.5km SE	2022
<i>Prunus laurocerasus</i>	Cherry Laurel	X	X	X	X	✓	1.3km SE	2022	0.5km SW	2016
<i>Rhododendron ponticum</i>	A Flowering Plant	X	X	✓	X	✓	1.6km E	2022	0.5km SW	2016
<i>Harmonia axyridis</i>	Harlequin Ladybird	X	X	X	X	✓	1.6km SW	2022	0.6km SW	2018
<i>Harmonia axyridis form succinea</i>	A Beetle	X	X	✓	X	✓	1.9km SW	2022	1.9km SW	2022
<i>Lilioceris lillii</i>	Lily Beetle	X	X	✓	X	✓	0.9km SE	2022	0.9km SE	2022
<i>Cameraria ohridella</i>	Horse-Chestnut Leaf-miner	X	X	X	X	✓	1.3km SW	2019	1.3km SW	2019
<i>Neovison vison</i>	American Mink	X	X	✓	X	✓	1.5km NW	2021	1.5km NW	2021
<i>Sciurus carolinensis</i>	Eastern Grey Squirrel	X	X	✓	X	✓	1.8km NE	2021	1.8km NE	2021

Key to symbols: ✓ = yes, ? = possibly see Supporting Comments for further rationale

Legally protected species are those listed under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended); and, Schedules 2 and 4 of The Conservation of Habitat & Species Regulations 2017 (as amended).

Species of Principal Importance as those listed under Section 41 of the NERC Act 2006. Planning Authorities have a legal duty under Section 40 of the same Act to consider such species when determining planning applications.

Other notable species include native species of conservation concern listed in the LBAP (except species that are also of Principal Importance), those that are Nationally Rare, Scarce or Red Data List, and non-native controlled weed species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) or the Sussex Invasive Non-native Species list

Coarse resolution records are not included to reduce discrepancies in data.

Appendix O Ancient Woodland Drainage Protocol

Project name:
Northern Arc, Burgess Hill**Project ref:**
60610807**From:**
Andy Jennings, AECOM**Date:**
01 September 2021**To: Louise Yandell, Natalie James**
(Mid Sussex District Council)**CC: Lisa Palframan, Nicholas Milner, Rob**
Morley (Homes England)

Memo

Subject: Ancient Woodlands Drainage Protocol

Introduction

The Northern Arc proposed development includes the provision of a total of 81.92 ha of strategic green infrastructure. Trees and woodland are a distinctive feature of the existing landscape, and the proposed green infrastructure includes 14.55 ha of retained ancient woodland plus 38.11 ha of natural and semi-natural greenspace including ancient woodland buffers. Ancient woodland buffer zones comprise a proximal 15m buffer zone and a distal 10m buffer zone.

Much of the retained ancient woodland is found in association with watercourses. Woodland shaws, comprising wooded valleys hosting minor watercourses, include Six Acre Shaw, Bridge Farm Shaw (North), Bridge Farm Shaw (2) and Hook Place Shaw. Other areas of ancient woodland are found within the river corridors of the River Adur, Worlds End Stream and Copyhold Stream, including Watford Wood, Big Wood, Jane Murray Way Shaw and Bridge Farm Shaw.

The surface water drainage strategy for the Northern Arc adheres to the principle that runoff from the development should follow greenfield runoff patterns as closely as possible. This means that drainage network discharge points are required at all watercourses which currently receive runoff from the site, to maintain baseline flow conditions and prevent watercourses either drying up or becoming overloaded locally.

As many of the watercourses are juxtaposed with ancient woodland, this brings the proposed drainage networks into conflict with ancient woodland or ancient woodland 15m buffer zones in several places. The following sites of conflict have been identified:

- Drainage Network 4.2 outfall drain and Six Acre Shaw;
- Drainage Network 4.3 outfall drain and Six Acre Shaw;
- Drainage Network 4.8 outfall drain and Bridge Farm Shaw (North);
- Drainage Network 10.1 outfall drain and Watford Wood;
- Regional SuDS Basin P16 and Sussex Way Shaw.

The purpose of this protocol is to set out the steps to be taken to mitigate the impact of drainage conflicts with ancient woodland or ancient woodland buffer zones.

Proposed Drainage Protocol

The protocol includes a number of measures encompassing drainage design, installation techniques and environmental mitigation measures. The most appropriate measures should be identified and implemented on a site-specific basis.

Outfall Drains & Headwalls

Many of the conflicts identified involve outfall drains, because it is the outfall drains which must reach the watercourses located within or close to ancient woodlands or ancient woodland buffer zones.

Outfall drain routes, pipe depths and diameters are currently understood from the Regional Surface Water Drainage Masterplan (RSWDM). Drainage designs defined in the RSWDM were outlined based on sometimes limited topographical or environmental survey information. There is scope in all cases for outfall drain designs to be developed and optimised during detailed design.

Indicative design dimensions of each of the conflicting outfall drains identified, based on the RSWDM, are summarised in the following table. All dimensions are approximate.

Network Outfall	Length Affected	Pipe Diameter	Pipe Depth to Invert
Network 4.2	13m	150mm	0.5m – 0.7m
Network 4.3	28m	225mm	1.4m – 2.4m
Network 4.8	56m	300mm	0.4m – 3.3m
Network 10.1	22m	150mm	1.1m – 1.3m

A typical headwall structure for the range of outfall pipe diameters may be approximately 1500mm wide and extend back from the crest of the watercourse bank by up to approximately 1000mm.

Detailed design and planning of outfall drains and headwalls must prioritise the following measures:

1. Avoid conflict with ancient woodlands, ancient woodland 15m buffer zones and the Root Protection Area (RPA) of individual trees of value (if greater than the 15m ancient woodland buffer zone) where possible;
2. Carry out detailed tree and ecological surveys to ensure that current site constraints are understood in detail. This may include surveys for badger, bats, great crested newt, and hazel dormouse. The distribution of protected and/or notable species and habitats across the Northern Arc based on surveys undertaken by AECOM in 2019 can be found within the Biodiversity Scheme¹. However, updated surveys will be required;
3. Minimise lengths of drainage within ancient woodlands, ancient woodland 15m buffer zones and the RPA of individual trees of value (if greater than 15m ancient woodland buffer zone);
4. Design routes to avoid conflict with ecological features such as badger setts. Where this is not possible, the retention of main badger setts must be prioritised over annexe, subsidiary or outlier setts;
5. Design routes to avoid conflict with individual trees RPAs and to avoid tree removal;
6. If tree removal is unavoidable, remove trees of lower quality in preference to trees of higher quality, and trees with a negligible suitability to support roosting bats in preference to trees with suitability to support roosting bats, or supporting a confirmed bat roost;
7. Minimise lengths of drainage runs within Root Protection Areas;
8. Minimise lengths of drainage runs within scrub habitat;
9. Avoid drainage designs which would preclude the use of trenchless techniques, such as drains with slack gradients which may be jeopardised by trenchless installation tolerances, or drains crossing through Root Protection Areas at shallow depths where trenchless installation could be obstructed by dense roots;
10. Select pipeline materials to facilitate the most sensitive installation method, for example vitrified clay jacking pipes where installation is to be by guided auger bore, or lightweight plastic pipes where installation must be by hand-dig;

¹ AECOM (2020). *Northern Arc Allocation: Biodiversity Scheme*.

11. Design headwalls to enable them to be constructed with the minimum use of heavy plant, for example use concrete bagwork to facilitate hand-placement;
12. Design outfalls to avoid the need for components requiring regular maintenance, such as flap valves or grilles, where possible. Flow control devices should be located upstream, outside the ancient woodland and 15m buffer zones.

Installation of drainage must prioritise the following measures where suitable:

13. Utilise trenchless techniques, such as guided auger bore;
14. Site both launch and reception pits for pipes installed by trenchless techniques outside the ancient woodland / buffer zones / RPAs where possible, if one or the other must be located in the ancient woodland / buffer zone / RPA it should preferably be the typically smaller reception pit and will be excavated by hand under the supervision of an arboriculturist;
15. Where excavation is unavoidable, extents of excavation should be minimised and utilise hand-dig or vacuum excavation techniques. Excavation within an RPA must be supervised by an arboriculturist;
16. Within excavations, tree roots greater than 25mm diameter should be preserved and not disturbed wherever possible, similarly to utility service crossings, whereas clumps of finer roots should be retained and not damaged where feasible;
17. Where severing roots is unavoidable, this should be carried out using a clean, sharp tool under the supervision of an arboriculturist;
18. Protect exposed tree roots in excavations by wrapping with hessian sacking, or similar;
19. Backfill in proximity to tree roots with excavated parent soil (to match the original soil profile) wherever possible and where not possible with appropriate inert, non toxic soil and using the minimum possible compaction;
20. Avoid storing spoil, plant or materials within ancient woodland / buffer zones / RPAs;
21. Minimise mechanical plant operations within ancient woodland / buffer zones, where unavoidable utilise the lightest possible plant, with rubber rather than steel tracks and with ground protection boards or matting on a compressible layer to spread the load over a wider area (in accordance with ground protection measures as set out in section 6.2.3 of BS5837:2012 *Trees in relation to design, demolition and construction - Recommendations*);
22. The potential requirement for tree pruning or removal of smaller trees/scrub to facilitate access for the works is to be reviewed via a site walkover by an arboriculturist in advance of commencement. Where pruning is not feasible, provide physical protection to tree trunks and branches where there would otherwise be a risk of inadvertent impact from plant or vehicles;
23. Reinstatement any disturbed ancient woodland / buffer zones based on specialist arboricultural and ecological advice;
24. Closely supervise the works, including specialist arboricultural and ecological supervision when needed;
25. Adhere to industry best practice, including *Street Works UK Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* and BS 5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations*;
26. Adhere to specific species or habitat mitigation measures as appropriate, such as ceasing works before sunset and avoiding the use of artificial lighting when there is potential bat activity. An ecologist may be required during the works to undertake pre-construction checks for protected species such as nesting birds, bats and hazel dormouse. Works may require European Protected Species Mitigation Licences (EPSMLs) for bats, hazel dormouse and great crested newts, a Natural England badger licence and/or precautionary methods of working to be agreed in advance with the local planning authority.

Regional Basin P16

Regional Basin P16 is a proposed dry detention basin of around 70m x 20m in plan area with an estimated attenuation capacity of approximately 571m³. The southern corner of P16 overlaps with the ancient woodland 15m buffer zone over a length of approximately 30m.

The position of P16 is constrained by a steep bank and retained trees to the north, and the River Adur to the south.

Whilst P16 overlaps with the ancient woodland 15m buffer zone associated with Sussex Way Shaw, it is noted that Sussex Way Shaw itself is on the opposite bank of the River Adur to P16. This could limit the potential for physical impact on the ancient woodland as the river presents a physical barrier.

Avoidable Conflicts

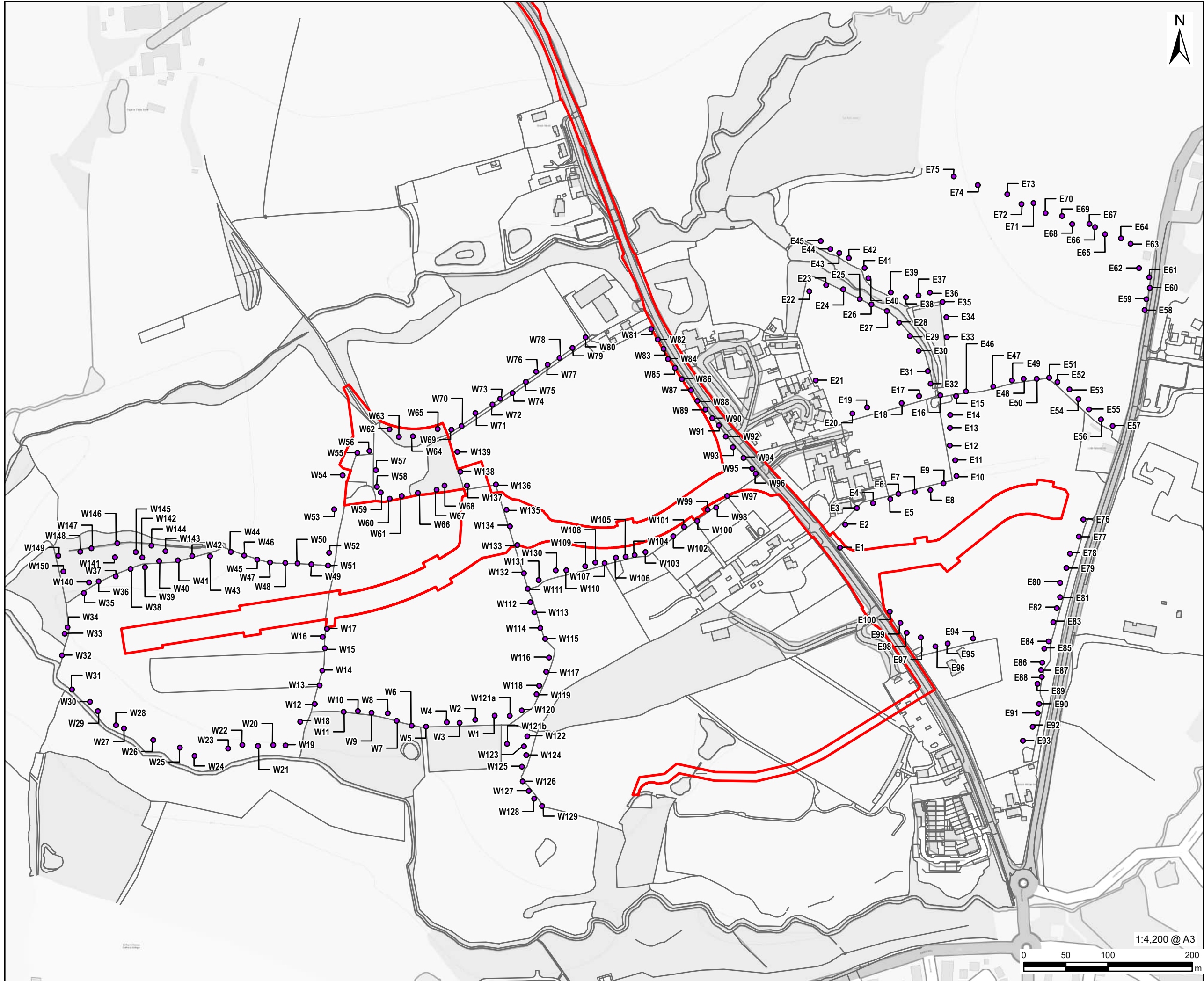
For the conflicts identified in the preceding sections, opportunities to fully avoid conflict with the ancient woodland and 15m buffer zones were investigated but found not to be viable. Therefore, it is considered that some conflict is inevitable at these locations and remains to be mitigated through implementation of the protocol.

However, several other potential conflicts were initially identified, but are deemed feasible to resolve through detailed design and development of the RSWDM. These locations are summarised in the following table.

Location	Opportunities to Avoid Conflict
Network 4.4 outfall	The receiving watercourse currently extends outside the ancient woodland 15m buffer zone beneath the proposed tertiary road alignment and through Plot P4.1. Part of the existing watercourse is to be retained through into the tertiary road corridor and / or Plot P4.1, so that the outfall can be connected there to avoid conflict with the buffer zone. The watercourse could be culverted through the tertiary road corridor and / or Plot P4.1 to minimise the impact of its retention.
Network 4.5 outfall	
Network 5.2 outfall	The proposed drainage alignment is to be adjusted to avoid the conflict identified.
Network 7.1 outfall	The proposed drainage was intended to serve Plot P3.5 West. This Plot is no longer to be developed, therefore the drainage can be eliminated.
Network 5.6 secondary road drainage	The proposed drainage was intended to serve the secondary road connection. The secondary road is now to terminate further south, eliminating the need for drainage through the ancient woodland 15m buffer zone.
Regional Basin P15	The basin is to be relocated slightly further east to avoid the ancient woodland 15m buffer zone.
Regional Swale S19	The swale is to be relocated slightly further east to avoid the ancient woodland 15m buffer zone.

Filename: \\na.aecomnet.com\1\is\EMEA\London-UK\ON06\Legacy\UK\ON06\PFPS\W001\WP4\Urban Planning\Jobs\60578790_BURGESS HILL\2-PROJECT WORK\6-GIS\6.1\Layout\January 2025\Figure2_HazelDormouseTubeLocations.mxd

Revision: 0 Drawn: LL Checked: AD Approved: JS Date: 2025-02-10



AECOM

PROJECT

Brookleigh

CLIENT

Homes England

CONSULTANT

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2, Leman Street
London, E1 8FA
United Kingdom
T +44-0207-645-2000

LEGEND

- Site Boundary
- Dormouse Tube Location

NOTES

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ISSUE PURPOSE

DRAFT

PROJECT NUMBER

60610807

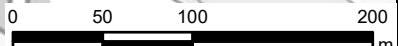
FIGURE TITLE

Hazel Dormouse Tube Locations

FIGURE NUMBER

Figure 2

1:4,200 @ A3





Brookleigh

Homes England

Aldgate Tower
2, Lemn Street
London, E1 8FA
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T +44-0207-645-2000

LEGEND

-  Site Boundary (To Cuckfield Road)
 Site Boundary (To Cuckfield Road) - 10m Buffer

Tree Suitability to Support Roosting Bats

- PRF-I
- PRF-M

NOTES

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ISSUE PURPOSE

DRAFT

PROJECT NUMBER

60610807

FIGURE TITLE

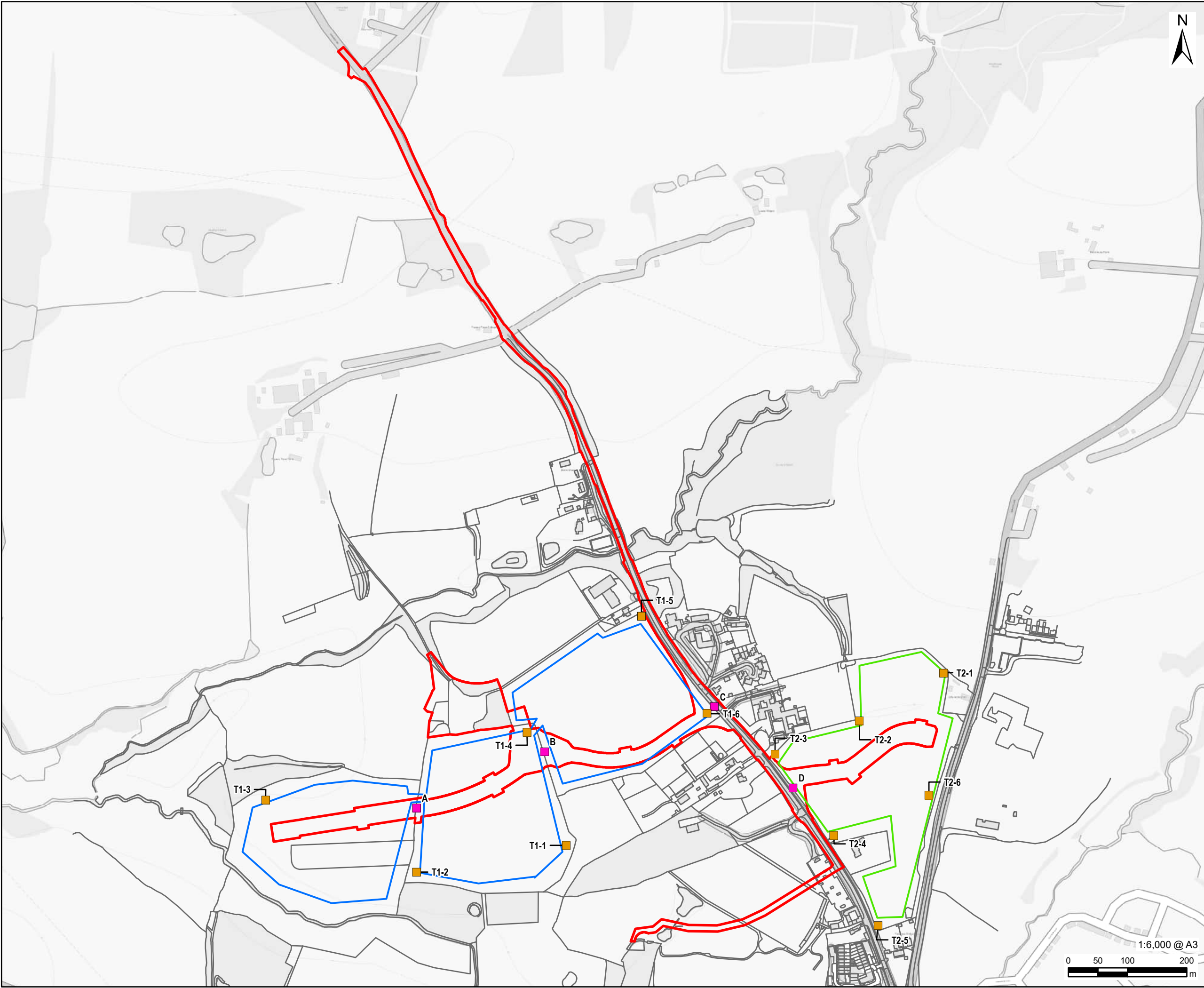
Bat Roost Suitability - Trees

FIGURE NUMBER

Figure 3

1:3,500 @ A3





AECOM

PROJECT

Brookleigh

CLIENT

Homes England

CONSULTANT

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2, Leman Street
London, E1 8FA
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LEGEND

- Site Boundary
- Bat Transect Point
- Static Automated Detector Location

Bat Transect Route

- Transect 1 (Western)
- Transect 2 (Eastern)

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ISSUE PURPOSE

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FIGURE TITLE

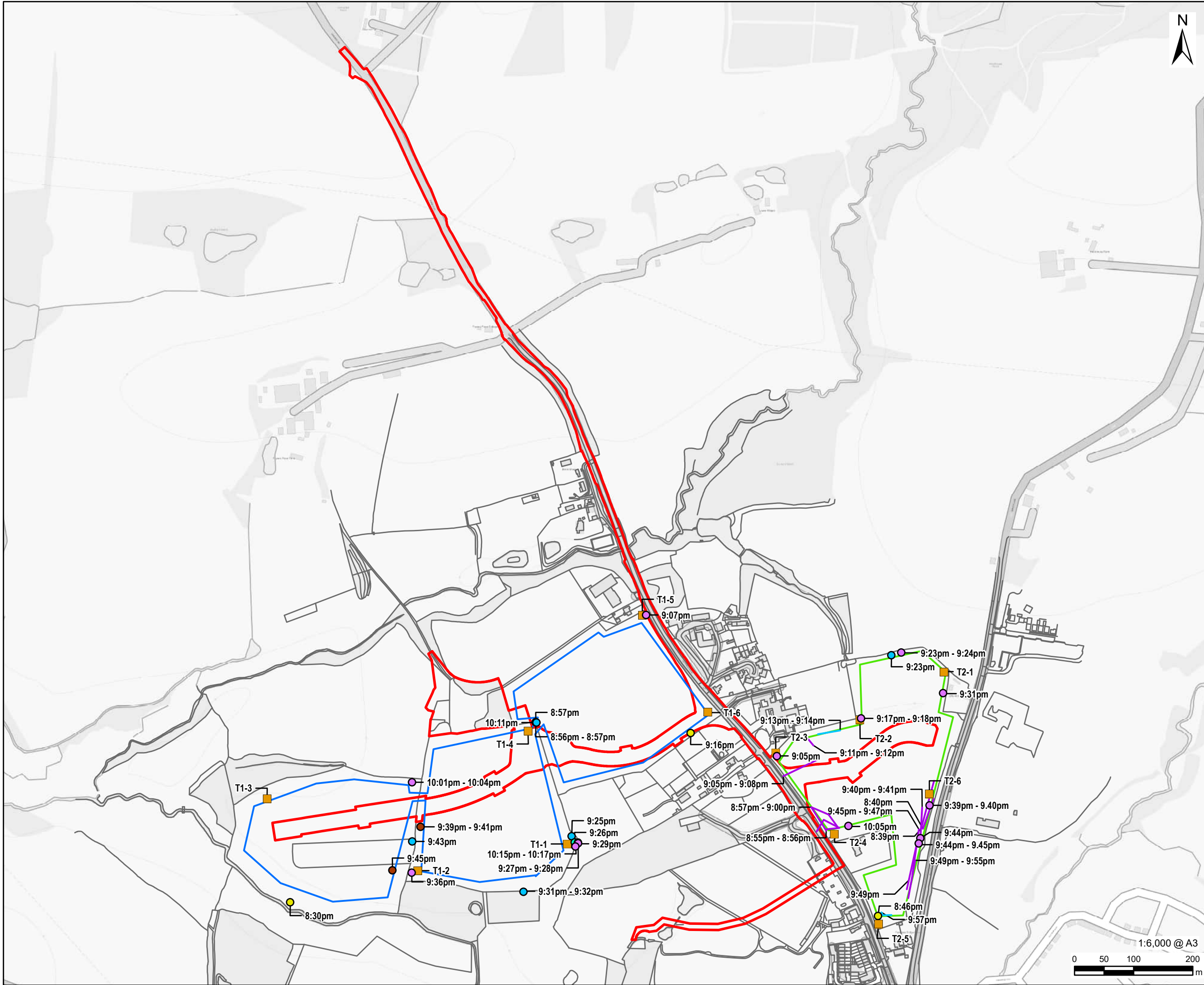
Walked Bat Transect Route and Static
Automated Detector Locations

FIGURE NUMBER

Figure 4

Filename: \\na.aecomnet.com\\fils\\EMEA\\London-UK\\LON06\\Legacy\\UK\\LON06\\PFSW001\\WP4\\Urban Planning\\Jobs\\60578790_BURGESS HILL\\2-PROJECT WORK\\6-GIS\\6.1\\Layout\\January 2025\\Figure5_WalkedBatTransectResults_Visit1.mxd

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LEGEND

- Site Boundary
- Bat Transect Point
- Bat Activity (Visit 1) Species**
 - Common pipistrelle
 - Myotis
 - Noctule
 - Soprano pipistrelle
 - Pipistrelle species
- Bat Flight Line**
 - Common pipistrelle
 - Soprano pipistrelle
- Bat Transect Route**
 - Transect 1 (Western)
 - Transect 2 (Eastern)

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FIGURE TITLE

Walked Bat Transect Results - April
(Visit 1)

FIGURE NUMBER

Figure 5A



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LEGEND

 Site Boundary

■ Bat Transect Point

Bat Activity (Visit 2) Species

- Common pipistrelle

- Serotine

- Soprano pipistrelle

- Pipistrelle species

Bat Flight Line

— Common pipistrelle

— Pipistrelle species

Bat Transect Route

— Transect 1 (Western)

— Transect 2 (Eastern)

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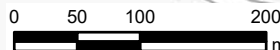
FIGURE TITLE

Walked Bat Transect Results - May (Visit 2)

FIGURE NUMBER

Figure 5B

1:6,000 @ A3





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LEGEND

 Site Boundary

■ Bat Transect Point

Bat Activity (Visit 3) Species

- Common pipistrelle

- Noctule

- Serotine

- Soprano pipistrelle

Bat Flight Line

— Common pipistrelle

— Soprano pipistrelle

Bat Transect Route

— Transect 1 (Western)

— Transect 2 (Eastern)

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FIGURE TITLE

Walked Bat Transect Results - June (Visit 3)

FIGURE NUMBER

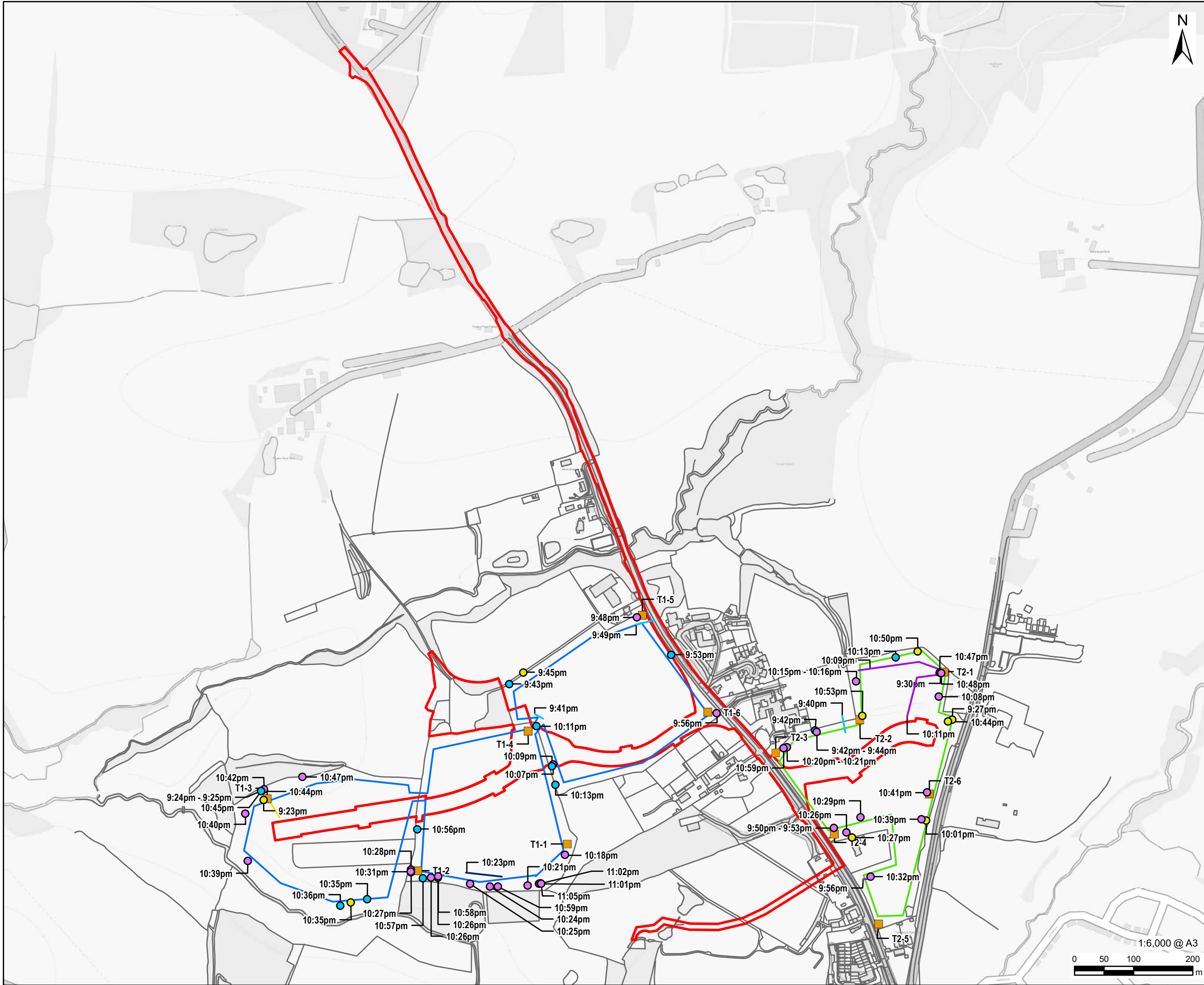
Figure 5C

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LEGEND

- Site Boundary
- Bat Transect Point
- Bat Activity (Visit 4) Species**
 - Common pipistrelle
 - Noctule
 - Serotine
 - Soprano pipistrelle
- Bat Flight Line**
 - Common pipistrelle
 - Noctule
 - Serotine
 - Soprano pipistrelle
- Bat Transect Route**
 - Transect 1 (Western)
 - Transect 2 (Eastern)

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FIGURE TITLE

Walked Bat Transect Results - July
(Visit 4)

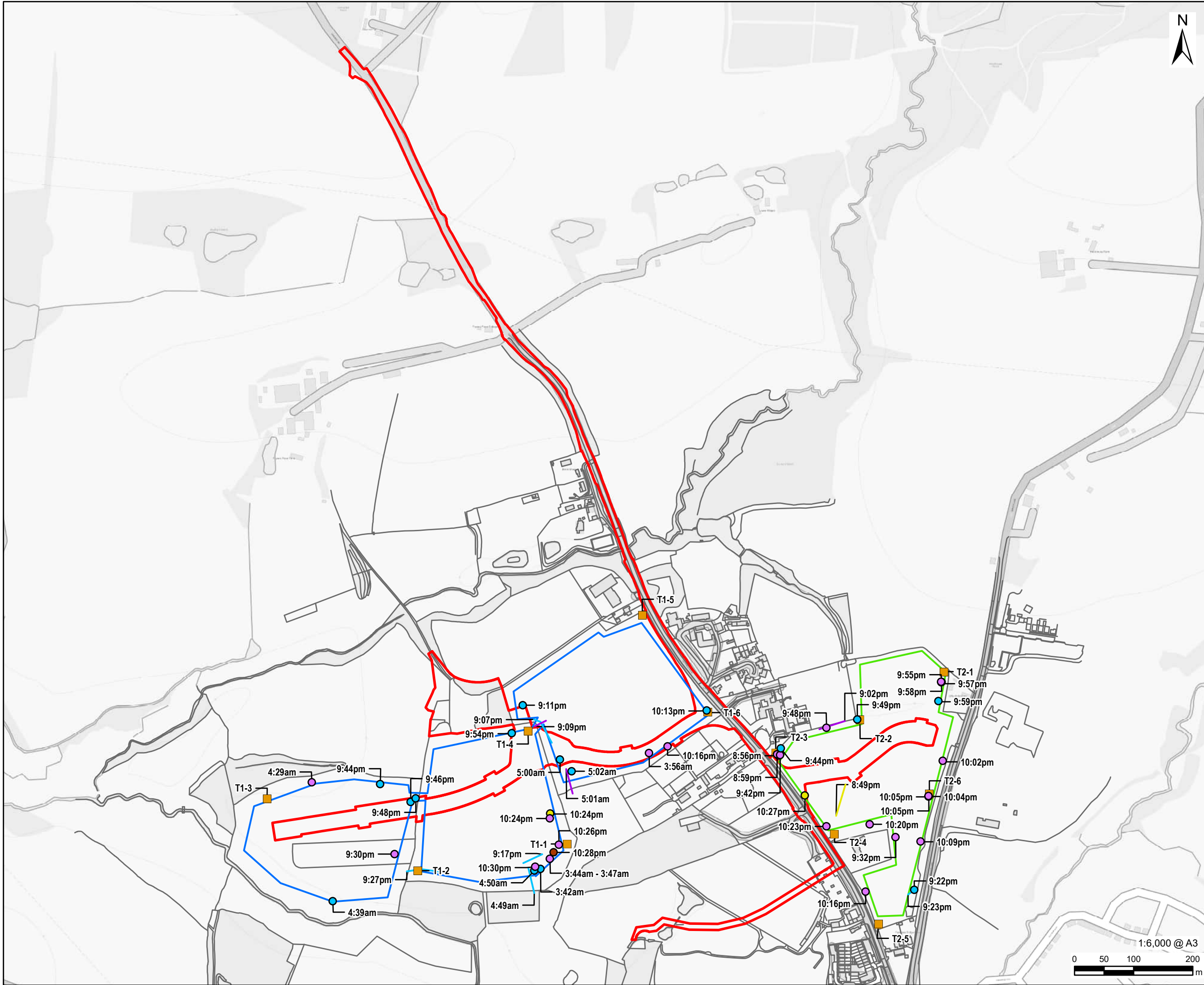
FIGURE NUMBER

Figure 5D

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LEGEND

- Site Boundary
- Bat Transect Point

Bat Activity (Visit 5 & 6) Species

- Common pipistrelle
- Myotis
- Noctule
- Soprano pipistrelle
- Pipistrelle species

Bat Flight Line

- Common pipistrelle
- Noctule
- Soprano pipistrelle

Bat Transect Route

- Transect 1 (Western)
- Transect 2 (Eastern)

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FIGURE TITLE

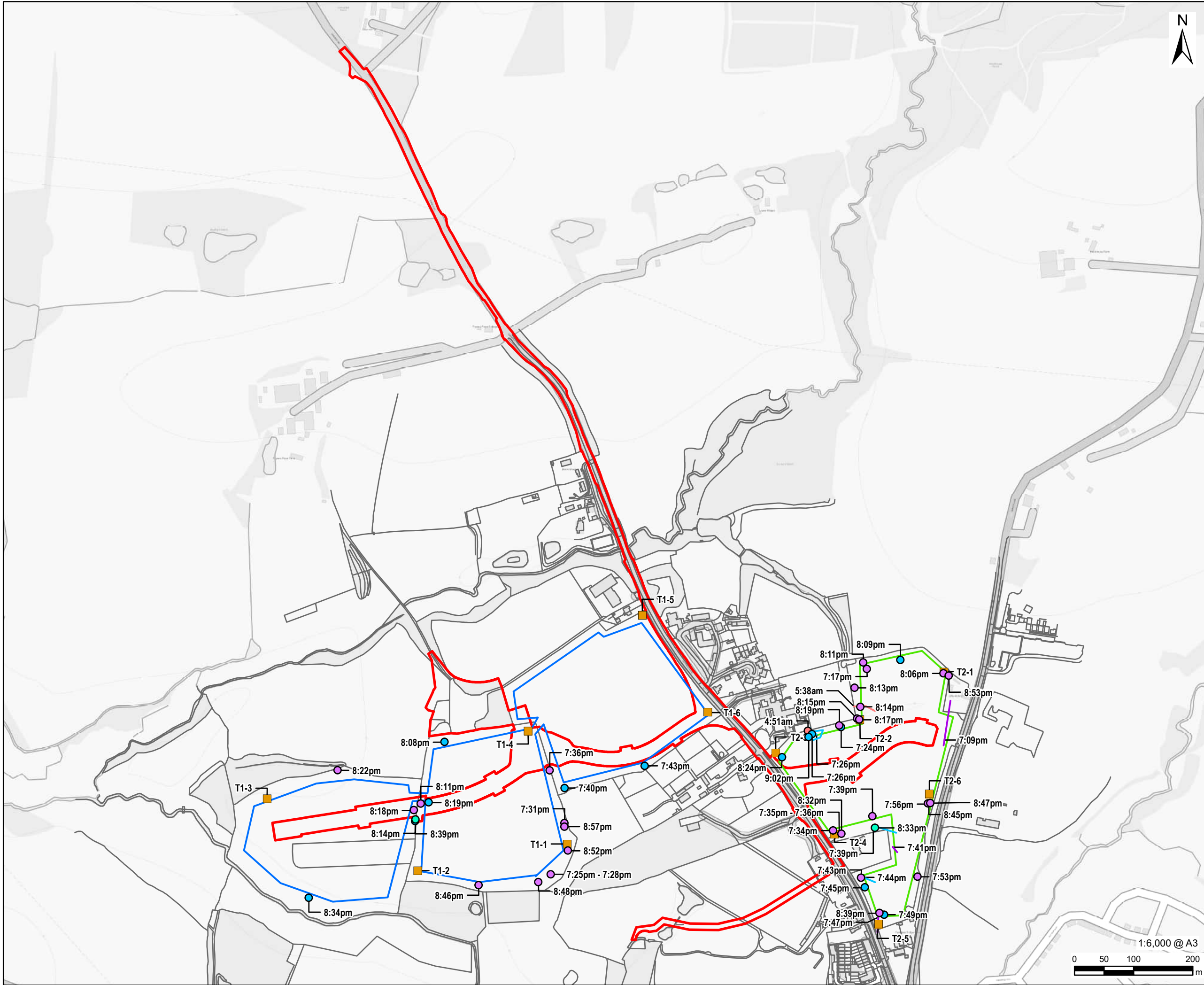
Walked Bat Transect Results - August
(Visit 5 & 6)

FIGURE NUMBER

Figure 5E

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LEGEND

- Site Boundary
- Bat Transect Point
- Bat Activity (Visit 7 & 8)**
- Species**
- Common pipistrelle
- Myotis
- Soprano pipistrelle
- Brown long-eared
- Bat Flight Line**
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- Bat Transect Route**
- Transect 1 (Western)
- Transect 2 (Eastern)

NOTES

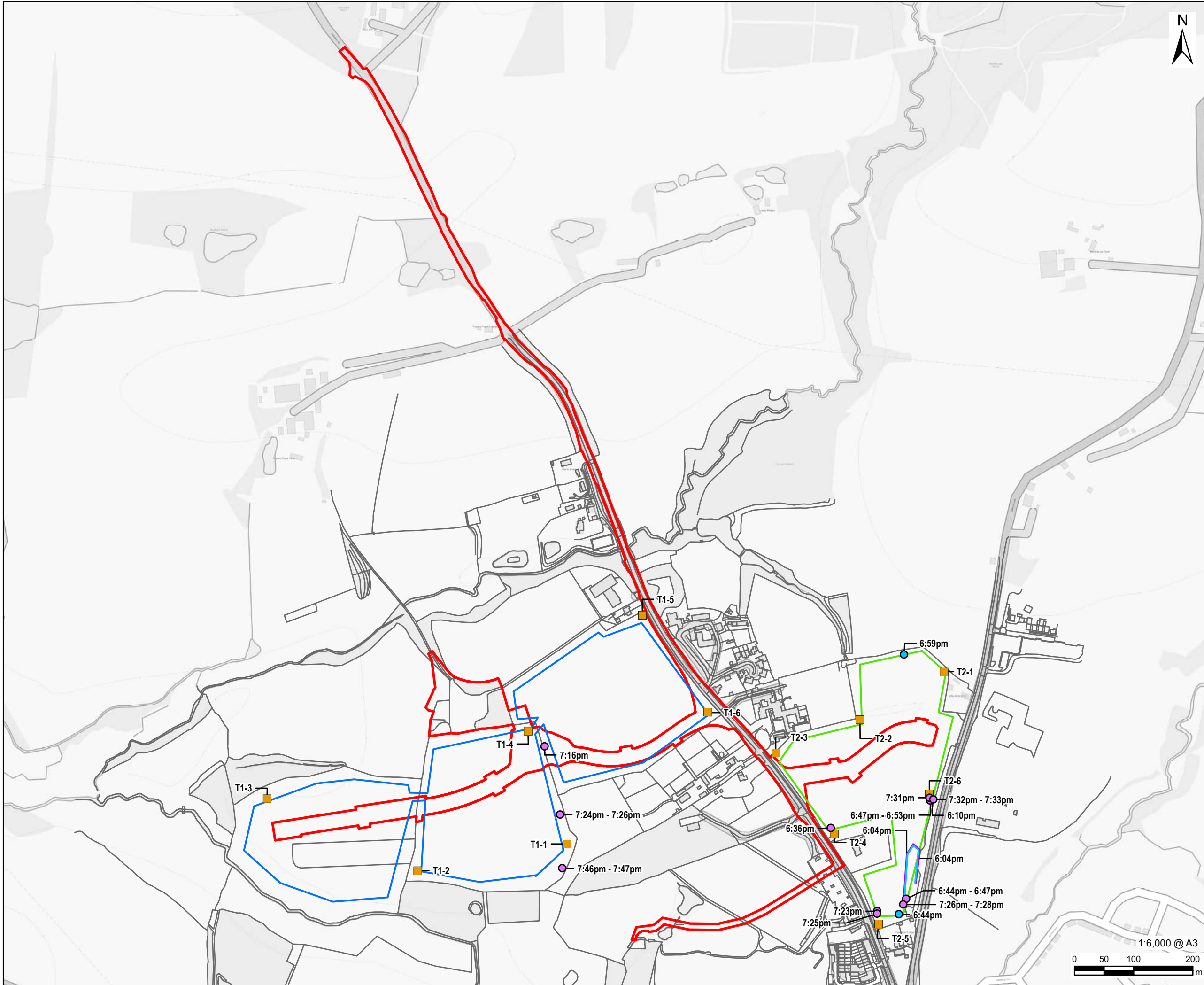
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FIGURE TITLE
Walked Bat Transect Results -
September (Visit 7 & 8)

FIGURE NUMBER
Figure 5F





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LEGEND

-  Site Boundary (To Cuckfield Road)
-  Site Boundary (To Cuckfield Road) - 250m Buffer
-  GCN Absent
-  GCN Positive (2019), Negative (2023)
-  GCN Positive (2022) Small Population
-  Scoped Out
-  Status Unknown, GCN assumed absent

Drain GCN Status

- GCN Absent
— Scoped Out

NOTES

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FIGURE TITLE

Pond Locations

FIGURE NUMBER

Figure 7

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