A46 Newark Bypass

TR010065/APP/6.3

6.3 Environmental Statement
Appendix 8.3 Bat Technical Report

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 6

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A46 Newark Bypass

Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT

APPENDIX 8.3 BAT TECHNICAL REPORT

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010065
Application Document Reference	TR010065/APP/6.3
Author:	A46 Newark Bypass Project Team, National Highways

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Rev 1	April 2024	DCO Application

Contents

1 Introduction

1.1 Background and scope of works

1.1.1 As part of the A46 Newark Bypass Scheme (the Scheme), bat surveys were undertaken to inform the biodiversity baseline and subsequently the impact assessment reported in Chapter 8 (Biodiversity) of the Environmental Statement (ES) **(TR010065/APP/6.1)**.

1.1.2 Chapter 2 (The Scheme) of the ES **(TR010065/APP/6.1)** provides the background and a description of the Scheme. This report provides Preliminary Roost Assessments (PRAs) for buildings, structures and trees, along with the results of subsequent dusk emergence and dawn re-entry surveys, aerial inspection surveys, bat activity (transect and static bat detectors) surveys and hibernation surveys for the Scheme.

1.1.3 The suite of bat surveys aims to identify buildings, structures and trees used by roosting bats, and the bat activity levels throughout the site.

1.1.4 This report outlines:

- Relevant legislation
- Methods used for all bat survey types
- Competencies of the ecologists involved in undertaking the bat surveys
- Deviations from, and limitations to, the surveys undertaken and any assumptions made as a result of incomplete data
- Baseline survey data
- Summary

2 Legislation

2.1.1 All bat species and their roosts are fully protected under the Conservation of Habitats and Species Regulations 2017 (as amended)[1] within additional protection under the Wildlife and Countryside Act 1981 (as amended).[2] In summary, it is an offence to intentionally or recklessly kill, injure, disturb or capture any bats or damage, destroy or obstruct access to any structure used for breeding or resting by them.

2.1.2 Seven species[3] are also listed on Section 41 of the Natural Environment and Rural Communities Act 2006[4] as species of principal importance for nature conservation.

2.1.3 Bat species listed under Annex II of the Habitats Directive (1992) must be protected under The National Sites Network and the sites managed in accordance with the ecological requirements of the species. Barbastelle *Barbastella barbastellus*, lesser horseshoe *Rhinolophus hipposideros*, greater horseshoe *Rhinolophus ferrumequinum* and Bechstein's bat *Myotis bechsteinii* are listed in Annex II of the Habitats Directive.

2.1.4 To undertake an activity which is prohibited under wildlife legislation, a protected species development licence must be obtained from Natural England, the statutory regulator in England. Under a development licence, the works can be conducted in accordance with an agreed method statement, including mitigation to maintain the favourable conservation status of the affected species, and minimise the risk of committing an offence under wildlife legislation to an acceptable level.

[1] The Conservation of Habitats and Species Regulations, 2017(as amended). Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents.

[2]Wildlife and Countryside Act, 1981 (as amended). Available at: www.legislation.gov.uk/ukpga/1981/69/contents.

[3] Barbastelle (*Barbastella barbastellus),* Bechstein's bat *(Myotis bechsteinii),* noctule *(Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat *(Plecotus auritus*), greater horseshoe bat (*Rhinolophus ferrumequinum*), lesser horseshoe bat (*Rhinolophus hipposideros*).

[4]Natural Environment and Rural Communities Act, 2006 (as amended). Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents.

3 Methodology

3.1 Desk study

3.1.1 The Nottinghamshire Biological and Geological Record Centre (NBGRC) provided records of bats within 2 kilometres of the Scheme footprint.

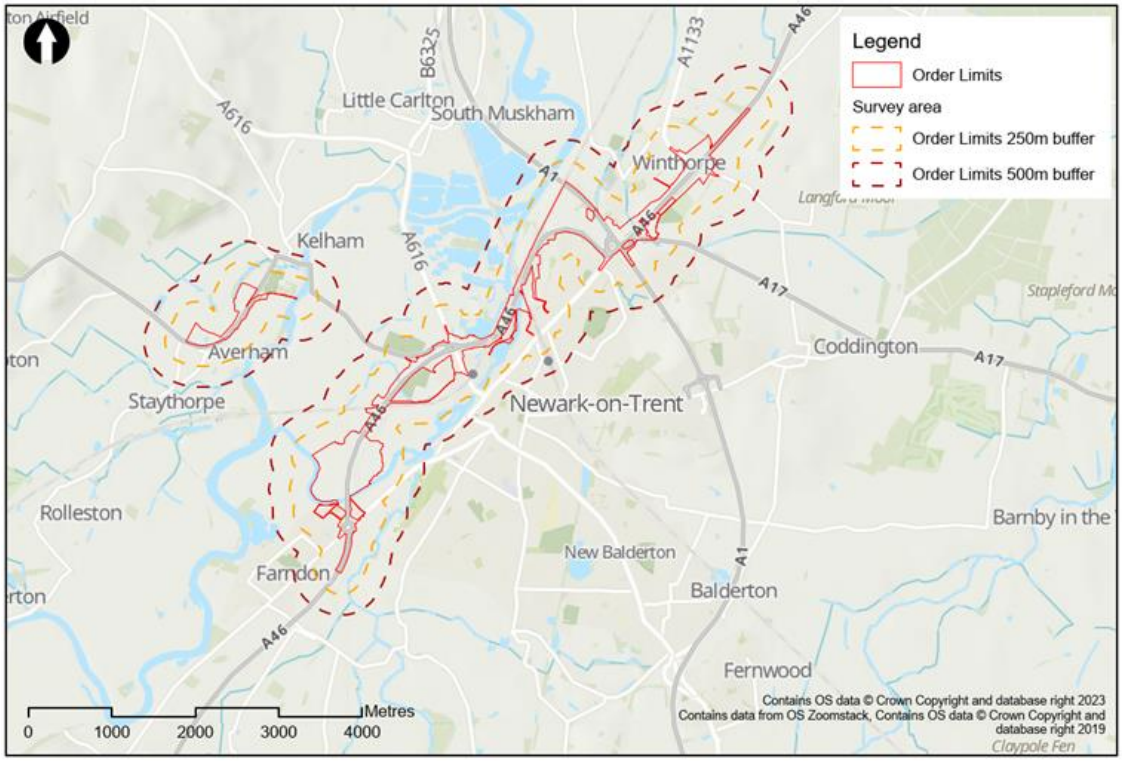
3.1.2 The records search also provided information on any protected sites that listed bat populations as wholly or partially reasons for their designation.

3.1.3 Baseline lighting (radiance) information was assessed using Visible Infrared Imaging Radiometer Suite (VIIRS) 2021 data[5] to consider the levels of lighting present in the local area.

3.2 Survey area

3.2.1 The survey area for the bat surveys included the Order Limits. Areas within 100 metres of the Order Limits (i.e. the areas within which disturbance is likely to occur during construction) were also considered with regards to potential roost sites. The survey area can be seen in Figure 3-1 below.

Figure 3-1: Survey area



[5] Jurij Stare, www.lightpollutionmap.info (accessed 03/03/2023).

3.2.2 There have been numerous design iterations resulting in changes to the Order Limits and therefore the survey area. Features recorded during surveys that are now located outside of the current survey area, are no longer within the zone of influence. These features have been omitted from this technical report and associated drawings. Original feature references have been retained, so do not appear sequentially in the results tables in the appendix.

3.3 Bat preliminary roost assessment

3.3.1 Preliminary Roost Assessments (PRA) of buildings, structures and trees were conducted between January to December 2022 and April to August 2023 in all accessible areas within a 100 metre buffer of the Order Limits, also referred to as 'the survey area'. One area of the Scheme in the Kelham and Averham Flood Compensation Area (FCA) has currently not been assessed by the use of PRA surveys due to ongoing access constraints. Access to this area of the Scheme is unlikely to be granted, and the gap in survey data for this area of the Scheme is discussed further in the limitations section (Section 3.13).

3.3.2 All trees, buildings and structures surveyed within the bat survey area were inspected for potential roost features (PRFs) with reference to the best practice guidance as set out within the Bat Conservation Trust (BCT) Good Practice Guidelines,[6] which is also referred to within this document as "BCT Guidelines."

3.3.3 Buildings, structures and trees were assessed externally using binoculars and a high-powered torch to determine if there were any suitable access points into internal spaces or any PRFs. Any internal loft voids were inspected for bats or evidence of bats, such as droppings, as well as determining any roosting features internally (where possible). From these inspections, buildings were classified according to their bat roosting suitability (negligible, low, moderate, high or confirmed) and any further surveys were recommended at this point.

3.3.4 Surveyors also recorded the suitability of the building, structure or tree for its potential to support hibernating bats over the winter. To assess the hibernation potential of identified PRFs, surveyors paid particular details to roosting features that were likely to remain at stable temperatures over the winter months, such as those deep within a building crevice or internal roof void, or within a well-insulated tree cavity that was sheltered from the elements.

3.3.5 The value of foraging and commuting habitat for bats found within the survey area was assessed by using a combination of the results of

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

the Extended Phase 1 Habitat Surveys, desk study via the use of online services such as Department for Environment Food and Rural Affairs (Defra's) MAGIC Maps,[7] and on site observations during the PRAs. Following the assessment of the foraging and commuting habitat, the survey area as an overall was given a bat suitability classification, with reference to the BCT Guidelines.

3.4 Bat activity transect

3.4.1 Bat activity transect surveys were conducted on a monthly basis, as informed by the habitat suitability within the 2022 bat survey season (April to October, inclusive) along the route of the main alignment. Due to access constraints during 2022, further surveys were undertaken at one transect between the survey window of April to July 2023 (Transect BT03).

3.4.2 Bat activity transect surveys involved a pair of surveyors walking a pre-determined transect route at dusk and/or dawn. Transect routes were devised to cover a range of suitable foraging and commuting habitats located within the survey area. Each transect was carried out by competent surveyors with acoustic bat detectors (Elekon Batlogger M), with reference to the BCT Guidelines. The direction in which the transects were walked was alternated on each visit to avoid temporal bias (for further details on the transect routes, see Appendix H.1 of this report).

3.4.3 Surveyors recorded species, numbers of bats, flight height, behaviour and direction of bat movement where possible and appropriate.

3.4.4 Details on survey dates, survey timings and weather conditions were recorded for each survey and are presented in Table D1 Appendix D of this report.

3.5 Bat activity static surveys

3.5.1 Bat static acoustic detectors (Wildlife Acoustics Song Meter 4) were deployed in strategic points along potential foraging and commuting habitats in the study area of the main alignment (for further details on static detector locations, see Appendix H.2 of this report). Each detector was left for a week and deployed once a month between April to October 2022. Due to access constraints during 2022, further deployments were made at nine locations between the survey window of April to October 2023,

[7] MAGIC maps (https://magic.defra.gov.uk/MagicMap.aspx)

3.6 Bat aerial inspection surveys

3.6.1 Bat aerial inspection surveys were conducted between January to October 2022, February to March 2023 and in August 2023 on all safe-to-climb trees that were assessed as having a 'moderate' suitability or greater for roosting bats during the PRA.

3.6.2 Methods employed during the aerial inspection surveys in trees followed guidance presented in the BCT best practice guidelines, the Bat Workers Manual[8] and Bats and Woodland Management.[9] The surveys were undertaken by a Natural England-licensed bat ecologist (with a level 2 bat licence[10], or an accredited agent under such a licence, at a minimum) with an assistant, who were both certified to climb trees with ropes. PRFs were inspected by the licensed bat ecologist using a torch and endoscope where necessary. Evidence of bats was recorded, as well as confirmation or reclassification of bat suitability rating.

3.7 Bat internal inspection surveys

3.7.1 Where buildings were identified as having roosting suitability for bats during the external building inspection, internal inspections were undertaken where possible. Internal inspections were undertaken in 2023 between April and September. No internal inspection surveys were undertaken in 2022 due to issues with internal access associated with the ongoing coronavirus pandemic.

3.7.2 All internal building inspections were undertaken by a pair of surveyors, at least one of which held a current Natural England Class 1 bat licence at a minimum.

3.7.3 Where possible and safe to do so, surveyors accessed all areas within the building, including the attic, loft spaces, cellars and any enclosed roof voids or spaces that could be accessed. High-powered torches, binoculars and endoscopes were used to assess all accessible areas, with any access constraints recorded in the survey notes and fed into the assessment of the building.

3.7.4 Evidence of any bat use (such as droppings, urine and staining) were recorded and samples were taken where it was possible to do so without disturbing any roosting bats. Where droppings or suspected droppings were found, a small sample considered to be

[8] Mitchell-Jones, A.J, & McLeish, A.P. (2004) Bat Workers' Manual. 3rd Edition. JNCC, Peterborough.

[9] Forestry Commission (2013) Guidance on managing woodlands with bats in England. Version 3 14 October 2013.

[10] Natural England Bat Level 2 Licence to disturb bats for the purpose of ecological surveying or research via the use of endoscopes, static hand-held nets and torches. Further information can be found at: www.gov.uk/government/publications/bats-survey-or-research-licence-level-2

representative of each species identified within the roost was collected and stored securely for analysis.

3.7.5 Using the results from the internal building inspections, buildings and structures were re-classified for their potential to support roosting bats.

3.8 Bat hibernation surveys

3.8.1 Bat hibernation surveys were conducted on all suitable trees, that were identified during initial PRA surveys as having hibernation roosting suitability for bats, between the months of January and February in 2023.

3.8.2 These surveys involved a detailed assessment of any present PRFs on trees within the survey area to look for and identify hibernating bats or any other evidence of hibernating bats. This methodology involved the use of torches, mirrors and endoscopes to systematically inspect the present PRFs on a tree.

3.8.3 All hibernation surveys were conducted by a suitably experienced ecologist with knowledge of bat ecology and survey methodology, and who holds a Natural England Level 2 bat licence as a minimum.

3.8.4 Hibernation surveys of structures and buildings have not been undertaken. However, further discussion with regards to structures and buildings with hibernation suitability has been provided within the results section, with reference to the PRA and internal inspection surveys undertaken on these structures and buildings to date.

3.9 Bat dusk emergence/dawn re-entry surveys of tree and structures

3.9.1 Bat dusk emergence and/or dawn re-entry surveys of trees, buildings and structures were undertaken between May to September 2022 and between May to September 2023 with reference to BCT Guidelines where appropriate and possible.[11] Surveys within the 2022 bat survey season (which runs from April to October) were conducted for features identified along the ‘main alignment’ of the Scheme, which follows the existing boundary of the A46. Future surveys were undertaken during the 2023 bat survey season on features that did not have all of their required visits completed within 2022, and on identified features within the Kelham and Averham FCA; which was added to the Scheme towards the end of the 2022 survey season.

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

3.9.2 Surveys were carried out only for trees with a roost suitability classification of high or moderate, and for buildings/structures with a classification of high, moderate or low, with reference to the BCT Guidelines.

3.9.3 Surveyors aimed to establish whether bats were roosting within the buildings, structures and trees identified within the PRA and aerial inspections (if roost suitability reclassification warranted inclusion) as requiring further survey. The surveys were carried out using full spectrum bat detectors (Elekon Batlogger M) to identify the species of bats and the behaviors observed.

3.9.4 Surveys lasted for at least 90 minutes before or after sunset but extended up to 120 minutes if bat activity was still being recorded. Dusk emergence surveys commenced at least 15 minutes prior to sunset, while dawn re-entry surveys were completed a minimum of 15 minutes after sunrise, dependent on activity. Details on survey dates, survey timings and weather conditions were recorded for each survey and are presented in Table D-2 Appendix D of this report.

3.9.5 Surveyors were placed in locations around a building, structure or tree to ensure all aspects and all PRFs could be observed. Any bats emerging or returning to the feature was recorded, including recording information on species, numbers, access points and roosting locations. The number of visits was determined by the PRAs which clarified the potential suitability of each feature to support roosting bats.

3.10 Aerial inspections of trees in place of bat dusk emergence/dawn re-entry surveys

3.10.1 Aerial inspections of trees were conducted in place of traditional dusk emergence/dawn re-entry surveys for all trees with a suitability rating of ‘moderate’ and above between May and September 2023, with reference to the BCT Guidelines, where possible and safe to do so.

3.10.2 Methods employed during the aerial inspections followed the same methodology outline in Section 3.6 above, with aerial inspection been undertaken by a Natural England-licenced bat ecologist (with a Level 2 bat licence, or an accredited agent under such a licence, at a minimum) with an assistant, who were both certified to climb trees with ropes. PRFs were inspected by the licenced bat ecologist using a torch and endoscope as appropriate. Any evidence of bats (including presence of bats) was recorded, as well as the confirmation of bat roosting suitability.

3.10.3 The timings of the aerial inspection visits were undertaken with reference to the guidance for traditional dusk emergence/dawn re-entry surveys given by the BCT Guidelines. Survey effort was undertaken with reference to the dusk emergence/dawn re-entry

methodology, all trees that were assessed as having a roosting suitability of 'moderate' or above were subject to aerial inspections between May to September 2023. Trees were subjected to the associated number of surveys for the roost suitability, with at least one survey been completed as per the traditional dusk emergence /dawn re-entry methodology. For trees with a roosting suitability of 'moderate' and above, the number of visits comprised:

- One climbed inspection and one survey completed as per the traditional dusk emergence/dawn re-entry methodology for trees with moderate roost suitability, with at least one survey undertaken between May and August, and the second completed by the end of September 2023 at the latest.
- Two climbed inspections and one survey completed as per the traditional dusk emergence/dawn re-entry methodology for trees with high roost suitability, with two surveys undertaken between May and August, and the third completed by the end of September 2023 at the latest.

3.10.4 In situations where all features on a tree could not be fully inspected or it was unsafe to climb, climbed inspections were not undertaken and bat dusk emergence and/or dawn re-entry surveys were undertaken to the same timeframe as required for traditional dusk emergence/dawn re-entry surveys in 2023, with reference to BCT good practice guidelines.

3.11 Analysis of acoustic data

3.11.1 The calls of the bats were recorded at the time of survey and later analysed using Bat Explorer (version 2.1.10.1 to 2.1.11.2) and Kaleidoscope Pro analysis software (version 5.3.8). The calls were analysed using auto-ID, before being subsequently manually checked by bat analysis ecologists. The manual analysis of bat calls was conducted for 10% of pipistrelle genus calls (common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle; excluding Nathusius' pipistrelle *Pipistrellus nathusii* for which 100% of the calls were checked), and 100% of the calls of other bat species recorded, which included Annex II species.

3.11.2 Calls of sufficient clarity and which were of an adequate length allowed the ecologist to identify the bat species (or genus in the case of *Myotis* sp.).

3.11.3 Analysed calls were subjected to secondary quality assurance (QA) checks by an experienced ecologist. This process checked between 10% and 100% of calls identified, depending on the initial ecologist's level of experience, with those less experienced in bat analysis having 100% of the analysis work checked by an experienced bat surveyor.

3.12 Deviations of methodology

3.12.1 A 100 metre survey buffer was implemented around the main alignment and Kelham and Averham FCA for bats, an approach where Natural England were in broad agreement (see Appendix A of this report for the response from Natural England).

3.12.2 Regarding bat dusk emergence/dawn re-entry surveys, the BCT Guidelines state that there should a be a range of months surveyed for a feature (tree/building/structure) across the season (April to October). Due to programming constraints and to allow for a consultation response from Natural England regarding the proposed methodologies, 2022 surveys of buildings/structures F002, F003, F009 and F016, and trees F034, F060, F065, F068, F071, F076, F080 and F130 were only able to be conducted during September 2022. However, the majority these buildings/structures and trees have subsequently been subject to further surveys during the core survey period in 2023 (May to August, inclusive). Further surveys of trees F034 and F065 were not possible due to access constraints in 2023.

3.12.3 The required number of emergence/re-entry survey visits (as recommended within the BCT Guidelines) could not be completed in their entirety in the single 2022 survey season. These additional survey visits were completed in 2023 to provide a full suite of surveys recommended for those features (subject to access).

3.12.4 For those tree features where dusk emergence and dawn re-entry surveys have not yet been completed, due to the reasons mentioned above, as well as the addition of new areas such as the Kelham and Averham FCA, aerial inspections (tree climbing) will be used as a replacement for dusk emergence and dawn re-entry surveys of trees. This approach has been agreed by Natural England, who stated it was an acceptable deviation from the standard methodology. Aerial inspections were proposed to be used in place of dusk emergence and dawn re-entry surveys for all locations. This was to reduce the number of personnel that would be required to effectively survey a potential roost and reduce the need for working at night. Using aerial inspections in place of dusk emergence and dawn re-entry surveys also allows for a more thorough survey to be undertaken on the PRFs present on the tree which may be obscured by thick vegetation, a clear line of sight from the ground or by poor lighting after sunset.

3.13 Limitations

3.13.1 Access within the area surveyed in 2022 was limited to areas of the National Highways soft-estate and third-party land where access had been agreed with the landowner. In some cases, landowner permissions to access land had not been granted and some areas of land could not be surveyed to exclude the presence of additional

features with roosting suitability for bats. All land parcels which were not surveyed in 2022 were accessed and surveyed in 2023 for the presence of additional features with roosting suitability for bats, with the exception of one parcel of land within the Kelham and Averham FCA, where land access could not be agreed.

3.13.2 Internal access was not granted for any of the buildings located within the survey area within 2022. This was in part due to the high number of private residences and the ongoing risk and safety concerns around Covid-19. During further survey efforts of the site in 2023, internal access was sought for all buildings and internal inspections were undertaken (with reference to BCT Guidelines) where access was provided and it was safe to do so. Several buildings had limited access preventing a full internal inspection of a void. Limitations included spaces too small for a surveyor to fit and the presence of structures blocking access to survey areas beyond the immediate access point (F002), upper storey inaccessible (F004, F008, F010, F016), cluttered/obscured space (F005, F008, F013), partial access only due to lack of safe access to entire internal space (F003, F009, F012) and one of the loft spaces painted shut (F023). It was not possible to internally survey the following buildings/structures, due to access refusal and/or safety concerns; F028, F037, F054 (three buildings where internal access was not granted), F034, F050, F053, F057 (four buildings where access was denied due to health and safety concerns), F061, F062, F063 and F064 (four buildings containing asbestos). For the remaining buildings/structures, a full suite of bat dusk emergence/dawn re-entry surveys have been completed, with the exception of the final survey visit for F010, F013 and F034 (due to access constraints). Whilst the lack of limited internal access to these buildings and the absence of the final emergence surveys on buildings F010, F013 and F034 are considered to be limitations, these limitation are not considered to be significant and a reasonable worst-case scenario, using professional judgement, will be applied to inform the ES Biodiversity chapter.

3.13.3 Where only partial internal inspections could be undertaken due to access constraints (F002, F004, F009, F010, F013 and F023) or no internal access was available due to the presence of asbestos (F062, F063 and F064), this would have restricted the ability to undertake comprehensive hibernation surveys for these buildings. Concerns were also highlighted with regards to security of survey equipment, if it were to be deployed within F004 and F005 (i.e. vulnerable to tampering or theft). As such, hibernation surveys, which would only have resulted in a partial dataset, were not undertaken.

3.13.4 Internal access to building F062, F063 and F064 was not possible due to the presence of asbestos, which also prevented entry to undertake hibernation surveys. Given the inability to survey these buildings for hibernating bats, a reasonable worst-case scenario,

using professional judgement, will be applied to inform the ES Biodiversity chapter.

3.13.5 Due to safety concerns (relating to anti-social behavior) and access restrictions, bat activity transect BT03 could not be surveyed between April and July 2022. In addition to this, and for the same reasons, bat activity static BT03_BS02 could also not be deployed between May and July 2022. These two features have had their visits completed during the respective months of the 2023 bat survey season and the data is included within this report. These additional surveys were limited to dawn surveys only in order to reduce the Health and Safety risk to a manageable level.

3.13.6 In 2022 bat activity static detectors were not deployed for at least five consecutive days, as per the best practice guidelines, in all months due to limitations with land access and concerns in regard to safety of the surveyors and equipment. Static detectors were, however, deployed in 2023 and the data is included with this report. The locations and months where data collection was limited in 2022 are listed below:

- BT03_BS01 – June 2022*
- BT03_BS01 – July 2022*
- BT03_BS01 – September 2022*
- BT03_BS01 – October 2022*
- BT03_BS02 – May 2022*
- BT03_BS02 – June 2022*
- BT03_BS02 – July 2022*
- BT04_BS01 – April 2022*
- BT04_BS01 – May 2022*
- BT04_BS01 – June 2022*
- BT04_BS02 – April 2022*
- BT04_BS02 – June 2022*
- BT04_BS03 – April 2022*
- BT04_BS03 – June 2022*
- BT05a_b_BS01 – April 2022*
- BT05a_b_BS03 – April 2022*
- BT05a_b_BS03 – May 2022*
- BT05a_b_BS03 - June 2022*

*Static data resurveyed in 2023 and included within this report

3.13.7 Table F-1 (Appendix F of this report) details the number of nights each static detector was deployed at each location. However, in the addition to the above, a number of statics did not record at least five days' worth of consecutive data due to technological issues such as detector malfunction. Static detectors were, however, deployed in 2023 and the data is included with this report. The locations and months where data collection was limited in 2022 are listed below:

- BT01_BS01 – September 2022*
- BT01_BS02 – June 2022
- BT01_BS02 – October 2022
- BT01_BS02 – October 2023
- BT02_BS01 – September 2022*
- BT02_BS02 – June 2022*
- BT02_BS02 – July 2022*
- BT02_BS02 – August 2022*
- BT02_BS02 – September 2022*
- BT04_BS02 – September 2022*
- BT05a_b_BS03 – September 2022*

*Static data resurveyed in 2023 and included within this report

3.13.8 Sixty-six of the 84 weeks of static detector deployments in 2022 (12 detector locations, out for one week per month between April to October) were deployed on site for at least five consecutive nights per month and were in line with the guidance laid out by the BCT. Eleven of these 66 weeks did not capture five nights worth of data due to detector malfunctions as outlined above, which leaves a total of 60 weeks' worth of data with five consecutive nights captured (71.43% of the data in total) in the 2022 bat survey season. For each of the statics above where five consecutive nights of data were not recorded, these surveys were repeated during the 2023 bat survey season (April to October) and five consecutive nights of data were recorded for each of these, with the exception of a single deployment (BT01_BS02 - October 2023) due to technical issues (96.30% of data successfully collected with reference to the BCT Guidelines).

3.13.9 Changes to the Order Limits, particularly the addition of the Kelham and Averham FCA, resulted in additional land areas which could not be surveyed in 2022 but were subject to surveys in 2023, where possible and safe to do so.

3.13.10 The habitats that were surveyed in 2022 and 2023 span across a good representation of habitats throughout the Scheme footprint and survey area and cover similar habitats to those which were not accessible. Data from the surveys that could be completed, coupled with the desk studies, are likely to capture a robust assessment on the presence of bats, species assemblage, and features that support their roosting within the total area. Where there are data gaps, the ES assessment of receptors will be guided and informed by the current data gathered throughout the survey area, desk study and anecdotal evidence and a reasonable worst-case scenario and professional judgement will be applied.

3.13.11 During the aerial inspection surveys, trees were only climbed where it was safe to do so, with trees over hazardous features such as water or rail lines/roads being excluded. Trees that were not structurally stable such as those with excessive deadwood or fungal diseases were also excluded from the tree climbing surveys. Trees that were

deemed unsafe to climb were subject to further surveys by the use of dusk emergence/dawn re-entry surveys.

3.13.12 Bat calls for *Myotis* species have typically been analysed to genus level only, due to the difficulty in identifying to species level from bat calls alone; however, where possible, calls have been analysed to species level. Some *Nyctalus* and *Pipistrellus* species were also only analysed to genus level, where definitive species identification was not possible from call analysis alone.

3.13.13 No ground-truthing of light levels (for instance using light meters to measure actual baseline information) has been carried out to date, with satellite derived radiance data only able to provide high-level information. This high-level information may only inform likelihoods of bat use of the variably illuminated areas within the Scheme footprint. Darker areas may be found within brighter areas and well-illuminated areas may be found within darker locations.

3.13.14 Access has been denied for the final emergence survey on three buildings (F010, F013 and F034). Two are located on the same parcel of land between 50 metres and 100 metres from the Order Limits (F010 and F013), both of which have confirmed roosts. Despite the absence of these final surveys, sufficient survey data has been collected to inform the assessment reported in the ES chapter.

3.13.15 Access has been refused for emergence/re-entry surveys and/or substituted aerial inspection surveys on six trees: F034 and F065 (within the Order Limits), and F173, F174, F177 and F179 (between 50 metres and 100 metres from the Order Limits). In the absence of survey data, a reasonable worst-case scenario has been applied using professional judgement to inform the assessment reported in the ES chapter.

3.13.16 A single tree (F012) was also not able to be subject to emergence/re-entry surveys, after being cut down by the landowner in the interim period between the PRA and the emergence/re-entry surveys.

3.13.17 Access restrictions have prevented any bat surveys from being completed across the large area of land south of the A617 Main Road, within the Kelham and Averham FCA survey area. Access is unlikely to be granted for this outstanding parcel. However, if future access is agreed, surveys within this parcel of land will be requested and completed pre-construction.

4 Results

4.1 Desk study

Bat species

4.1.0 A total of 825 bat records were provided by NBGRC from at least eleven bat species: barbastelle, brown long-eared, common pipistrelle, Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri*, Nathusius' pipistrelle, Natterer's bat *Myotis nattereri*, noctule, serotine *Eptesicus serotinus*, soprano pipistrelle, whiskered bat *Myotis mystacinus*, whiskered/Brandt's *Myotis mystacinus/brandtii*, unidentified *Myotis* sp., unidentified *Nyctalus* sp., unidentified *Pipistrellus* sp., and unidentified bat *Chiroptera*.

4.1.1 A summary of the records is presented in Table 4-1.

4.1.2 There are four known roosts within the Order Limits. These roosts are for brown long-eared bat (2009, unknown roost), common pipistrelle roost (2006, small numbers of day roosting bats) and unidentified pipistrelle roosts (both 2009, unknown roost and individual day roost)

Table 4-1: Summary of bat record supplied by NBGRC

Common name	Species	Number of records	Nearest record (metres away)	Type of records returned
Barbastelle*	*Barbastellus barbastella*	27	0	Field records including radio tracking information and static registrations
Brown long-eared bat	*Plecotus auritus*	93	0	Various roost records including maternity roosts; static and bat detector registrations; bat care records
Pipistrellus sp.	*Pipistrellus sp.*	86	0	Various roost records including maternity roosts; static and bat detector registrations; bat care records
Bat sp.	*Chiroptera sp*	47	0	Various roost records; static and bat detector registrations; bat care records; droppings
Common pipistrelle	*Pipistrellus pipistrellus*	255	0	Various roost records including maternity roosts; static and bat detector registrations; bat care records
Whiskered bat	*Myotis mystacinus*	4	0	Roost records; bat care and bat call registrations
Daubenton's bat	*Myotis daubentonii*	23	0	Bat call registrations
Leisler's bat	*Nyctalus leisleri*	7	0	Bat call registrations
Myotis sp.	*Myotis sp.*	39	0	Bat call registrations; droppings
Nathusius' pipistrelle	*Pipistrellus nathusii*	10	0	Bat call registrations
Natterer's bat	*Myotis nattereri*	10	86	Bat call registrations; roosts (including likely maternity)
Noctule	*Nyctalus noctula*	91	0	Bat call registrations
Nyctalus sp.	*Nyctalus sp.*	19	0	Bat call registrations
Serotine	*Eptesicus serotinus*	1	2393	Bat call registration
Soprano Pipistrelle	*Pipistrellus pygmaeus*	107	0	Various roost records; static and bat detector registrations; droppings
Whiskered/ Brandt's bat	*Myotis mystacinus/ brandtii*	5	746	Bat call registrations; roost; bat care record

*listed under Annex II of the Habitats Directive (1992)

Designated sites

4.1.3 Within 30 kilometres of the Order Limits, only one statutory designated site (Clumber Park Site of Specific Scientific Interest [SSSI], 22km to the north) includes bats as a partial reason for notification, due to its foraging resource for Natterer's bat, whiskered bat and noctule. There are no Special Areas of Conservation (SACs) designated for bats within the survey area or within 30 kilometres of the Scheme.

4.1.4 There are five Local Wildlife Sites (LWS) located within or partially within the Scheme footprint, though none include bats as a reason for their notification.

Artificial lighting

4.1.5 The brighter locations within the local landscape are found in the most urban locations: Newark, Middlebeck, Farndon and to the south-east of Staythorpe.

4.1.6 The darkest locations are found associated with the River Trent and its immediate corridor, and between Kelham and Averham.

4.2 Bat preliminary roost assessment – buildings and structures

4.2.1 A total of 39 structures were identified within the accessible survey area. Preliminary Roost Assessments identified that 26 of these 39 structures were suitable for roosting bats.

4.2.2 A full breakdown of the bat roosting suitability of the 26 identified structures within the survey area can be seen in Table B-1 Appendix B and Figure G-2 Appendix G.

4.2.3 Several bat droppings were identified on an external windowsill of one structure (F002) within the survey area. These dropping were identified from the surveys undertaken between July to August 2019 during a previous stage of works.[12] However, these droppings were not associated with any potential roosting features (PRF). Upon reassessment in February 2022, no bat droppings were identified upon this structure, and the structure was given an overall suitability rating of 'moderate'. Due to the presence of bat droppings on this structure in the past, this feature was classified as 'inconclusive' and was subject to an internal inspection and a suite of three dusk emergence/dawn re-entry surveys. No evidence of roosting bats was

[12] Atkins. (2019). HE551478-ATK-EBD-XX_A46-RP-LE-000008. A46 Newark Northern Bypass Preliminary Walkover Survey Technical Note.

observed during the internal inspection, though internal access to the loft void was limited due to the small size of the void and the presence of water tanks blocking access to areas beyond the immediate loft hatch area. An external check undertaken immediately after the internal inspection did not identify any bat droppings on this structure. Results of the dusk emergence/dawn re-entry surveys are presented within Section 4.9 'Bat emergence/re-entry surveys – buildings and structures'.

4.2.4 In addition to this structure, there were two buildings identified as providing high suitability for roosting bats (F004, F005); 14 buildings with moderate suitability for roosting bats (F003, F006, F008, F009, F013, F016, F023, F034, F050, F053, F054, F062, F063 and F064) and nine buildings with low suitability for roosting bats (F007, F010, F012, F028, F037, F057, F059, F060 and F061).

4.2.5 A total of 11 buildings and structures, that were accessible for survey, were found to have suitable features to support hibernating bats (Table 4-2).

Table 4-2: Buildings/structures with hibernation suitability

Building/Structure Reference	Description
F002	Brick house with pitched tile roof. Accommodation in roof space so limited roof void. Gaps behind barge boards on eastern gable that could give access to internal roof or wall cavities that may be suitable for hibernation.
F004	Brick and wood framed building with hipped synthetic tiled roof. Two storey section on north-west side with tile clad gable end. Multiple gaps where cladding tiles have broken which may give access into wall cavity. Larger gaps under eaves which may give potential access to enclosed internal roof void or wall cavities that could be suitable for hibernation.
F005	Derelict brick building with slate roofing. Complex of several old industrial buildings that are connected, possible enclosed internal roof void with multiple entry points through openings in the roofing tiles and entry through several smashed windows and other openings into areas of the building.
F009	Brick walled garage with false ceiling and a pitched tiled roof. Gaps at lifted tiles at eaves that may give access to an internal roof void or wall cavities that are potentially suitable for hibernation.
F010	Two-storey brick farmhouse with felt-lined pitched tile roof. Occasional lifted tile which may give access into an enclosed internal roof void suitable for hibernation.
F012	Single-storey brick walled extension to farmhouse with a pitched tiled roof. Occasional gaps under tiles at eaves and lifted tiles. Possible enclosed internal roof void suitable for hibernation.
F013	Brick out-building with an open tiled and a false ceiling with an internal roof void that would be suitable for hibernation. Frequent lifted tiles on roof and ridge and access via unglazed window.
F023	Brick built 1903 Manor House in a well-kept condition. No significant gaps or cracks within the roof or brickworks. Rear of the building dormer has some gaps on the gable. Possible that the roof has an enclosed internal void that could be suitable for hibernation.

Building/Structure Reference	Description
F062	Single-storey brick outbuilding at a disused National Highways depot. Structure with a corrugated, shallow pitched metal roof. Building boarded up with occasional access points. Gaps under edge of metal roofing on west side and north end. Structure of the pitched roof may have a roof void or access to wall cavities that may be suitable for hibernation. However, no internal inspections can be undertaken due to the presence of asbestos.
F063	Single-storey brick outbuilding at a disused National Highways depot. Structure with a pitched corrugated asbestos roof. Building boarded up with occasional access points. Gaps under roofing sheet at gable ends and at the apex of the western gable. Structure of the pitched roof may have a roof void that is suitable for hibernation. However, no internal inspections can be undertaken due to the presence of asbestos.
F064	Single-storey brick outbuilding at a disused National Highways depot. Structure with a corrugated, shallow pitched metal roof. Building boarded up with occasional access points. Several potential access points on the south side of the structure between the roof sheets and insulation. Structure of the pitched roof may have a roof void that is suitable for hibernation. However, no internal inspections can be undertaken due to the presence of asbestos.

4.3 Bat preliminary roost assessment – trees

4.3.1 A total of 113 trees were identified within the Order Limits, with 84 of these providing some roosting suitability for bats (eg low, moderate, high). A further 184 trees were surveyed within 100 metres of the Order Limits, with 145 offering some bat roost suitability (low, moderate, high, confirmed roost).

4.3.2 All trees assessed to retain roost suitability within the Order Limits and within 100 metres of the Order Limits are detailed in Table C-1 (Appendix C) and Figure G-1 Appendix G of this report, alongside details of PRFs and their bat roosting suitability classification.

4.3.3 One tree was confirmed as a bat roost (F213), with an unidentified bat observed in a trunk cavity located 1.6 metres from the ground. The bat was facing away from the cavity opening and retreated further into the cavity, preventing the surveyor from identifying the species.

4.3.4 Fifteen trees provide high roost suitability, 77 trees provide moderate roost suitability, and 137 trees provide low roost suitability. The remaining 68 trees provide negligible suitability to support roosting bats.

4.3.5 Of all trees, a total of four were assessed as also having features suitable to support hibernating bats:

- F034
- F050
- F071

- F074

4.4 Bat activity transect surveys

4.4.1 A total of six transect routes were surveyed monthly between April 2022 and October 2022, and one transect between April and July 2023, with at least one dusk survey and one dawn survey undertaken within a 24-hour period (except on transect BT03, where only dawn surveys were undertaken due to health and safety concerns).

4.4.2 A 'minimum of six bat species were recorded during the activity transect surveys – barbastelle, common pipistrelle, Leisler's bat, noctule, soprano pipistrelle, Daubenton's bat and unidentified *Myotis* sp. – along with unidentified *Nyctalus* sp., *Pipistrellus* sp. and bat species.

4.4.3 Across all transects, the highest number of bat registrations were from common pipistrelle, with the highest number of common pipistrelle registrations in transect BT04.

4.4.4 One single registration of barbastelle was recorded in transect BT01.

4.4.5 The lowest number of bat registrations from all bat species, as well as the lowest number of bat species, were recorded in transect BT03, with only four bat species recorded (common pipistrelle, Leisler's, noctule and soprano pipistrelle).

4.4.6 Transect BT04 recorded the highest number of total bat registrations. This was due to a higher number of bat registrations from common species (common pipistrelle, noctule and soprano pipistrelle) across all months.

4.4.7 Transect BT01 recorded the highest number of bat species across all transects, with six confirmed bat species (barbastelle, *Myotis* sp., Leisler's, noctule, common pipistrelle and soprano pipistrelle). As this does not include the unidentified species of *Nyctalus* and *Pipistrellus,* it is possible that there may be additional species present (ie Nathusius' pipistrelle) within this transect route's area.

4.4.8 Table 4-3 provides a summary of the total number of registrations from each bat species found on each transect, with details outlined in Appendix E. Activity levels in the form of heat maps can be seen in Appendix I. Please note that although surveyors followed the pre-determined transect routes, some data may be shown a distance away from the transect route (see Appendix I of this report) as a result of the spatial resolution of the location data recorded by the Batlogger M (which is reliant on satellite coverage and can be hindered by features such as dense vegetation/trees).

Table 4-3: The number of bat registrations each transect

Species of bat	Transect reference				
	BT01	BT02	BT03	BT04	BT05a_b
Barbastelle*	1	-	-	-	-
Daubenton's bat	-	-	-	-	1
Myotis sp.	12	7	-	13	5
Noctule	36	55	3	27	9
Leisler's bat	6	4	1	1	-
Nyctalus sp.	11	1	-	7	13
Common pipistrelle	70	99	51	186	104
Soprano pipistrelle	36	64	11	18	62
Pipistrellus sp.	1	3	-	5	8
Unidentified bat	-	1	-	-	1

*listed under Annex II of the Habitats Directive (1992)

4.5 Bat activity static surveys

4.5.1 Two static detectors were deployed monthly for transects BT01, BT02, and BT03, and three static detectors were deployed monthly for transects BT04 and BT05a_b between April 2022 and October 2023. were undertaken in 2023 (April 2023 to October 2023)Table F-1 Appendix F of this report details the number of nights for which each static detector was deployed across each transect.

4.5.2 A minimum of eight bat species were recorded by static detectors across the survey area (Table 4-4). Further records that weren't distinguished past genus level were also recorded; such as *Myotis sp.* and *Nyctalus sp.* In addition to this, several species that were not identifiable by their call alone were all assigned as *Chiroptera*.

4.5.3 As the number of static detectors and number of nights deployed for each static detector differed between transects, an average total number of bat registrations per night was calculated for each transect, which allowed for a more accurate comparison of bat registrations and bat species between transects. Table 4-5 shows the average number of bat registrations, taking into account the number of nights each static detector was deployed.

4.5.4 Common pipistrelle provided the highest percentage of bat registrations across all static detectors, except for static BT01_BS01 where noctule was the species call recorded most abundantly.

4.5.5 These results reflect the bat activity transect surveys, whereby common species (common pipistrelle, noctule and soprano pipistrelle) comprised the highest percentage of bat registrations across all static detectors.

4.5.6 Barbastelle comprised less than 1% of total bat registrations. This result is consistent with the low numbers recorded on the bat transect surveys and the geographical distribution of the species.

4.5.7 When the number of nights deployed and the number of statics deployed are taken into consideration, the highest numbers of bat registrations per night were recorded in transect BT03 followed by BT04 (Table 4-5). The lowest number of bat registrations per night were recorded in transect BT02.

Table 4-4: Total number of bat registrations from each static detector

Species	BT01-BS01		BT01-BS02		BT02-BS01		BT02-BS02		BT03-BS01		BT03-BS02		BT04-BS01		BT04-BS02		BT04-BS03		BT05a_b-BS01		BT05a_b-BS02		BT05a_b-BS03	
Barbastelle*	9	0.1%	3	0.0%	1	0.0%	0	0.0%	6	0.1%	1	0.0%	4	0.0%	1	0.0%	4	0.0%	0	0.0%	2	0.0%	1	0.0%
Serotine	9	0.1%	7	0.0%	4	0.0%	0	0.0%	6	0.1%	1	0.0%	0	0.0%	3	0.0%	16	0.1%	0	0.0%	8	0.1%	0	0.0%
Myotis sp.	261	2.5%	549	3.7%	841	9.3%	877	21.7%	245	3.5%	1270	3.3%	1354	3.3%	552	4.8%	632	5.7%	536	3.1%	314	3.0%	68	2.4%
Leisler's bat	603	5.8%	89	0.6%	48	0.5%	3	0.1%	8	0.1%	16	0.0%	0	0.0%	7	0.1%	40	0.4%	38	0.2%	46	0.4%	15	0.5%
Noctule	4069	39.3%	827	5.6%	515	5.7%	110	2.7%	165	2.4%	152	0.4%	1234	3.0%	658	5.8%	514	4.6%	241	1.4%	390	3.7%	148	5.4%
Nyctalus sp.	586	5.7%	86	0.6%	0	0.0%	14	0.3%	40	0.6%	6	0.0%	154	0.4%	7	0.1%	17	0.2%	9	0.1%	226	2.1%	27	1.0%
Nathusius' pipistrelle	3	0.0%	5	0.1%	7	0.1%	2	0.1%	2	0.0%	2	0.0%	6	0.0%	5	0.0%	22	0.2%	55	0.3%	16	0.2%	1	0.0%
Common pipistrelle	3973	38.4%	4027	27.1%	6589	72.7%	2482	61.3%	5216	75.1%	35498	93.2%	32904	81.2%	6227	54.6%	9390	84.6%	15375	89.6%	7354	69.9%	1178	64.4%
Soprano pipistrelle	592	5.7%	3870	26.1%	905	10%	455	11.2%	1192	17.2%	897	2.4%	4476	11.1%	3046	26.7%	400	3.6%	848	4.9%	1936	18.4%	689	25.0%
Brown long-eared bat	61	0.6%	9	0.1%	33	0.4%	17	0.4%	22	0.3%	40	0.1%	50	0.1%	10	0.1%	22	0.2%	7	0.0%	22	0.2%	13	0.5%
Pipistrellus sp.	181	1.7%	5360	36.1%	126	1.4%	86	2.1%	39	0.6%	218	0.6%	323	0.8%	885	7.8%	42	0.4%	54	0.3%	199	1.9%	18	0.7%
Unknown species	0	0.0%	8	0.1%	3	0.0%	2	0.0%	2	0.0%	4	0.0%	0	0.0%	1	0.0%	0	0.0%	14	0.2%	14	0.1%	1	0.0%
Total	**10478**	**-**	**14834**	**-**	**7631**	**-**	**4046**	**-**	**6943**	**-**	**38102**	**-**	**40505**	**-**	**11402**	**-**	**11100**	**-**	**17163**	**-**	**10527**	**-**	**2759**	**-**

***listed under Annex II of the Habitats Directive (1992)**

Table 4-5: Mean number of bat registrations per night in each transect using data from static detectors

	BT01		BT02		BT03		BT04		BT05	
Species	**Mean number of bat registrations**	**Percentage total of registrations**	**Mean number of bat registrations**	**Percentage total of registrations**	**Mean number of bat registrations**	**Percentage total of registrations**	**Mean number of bat registrations**	**Percentage total of registrations**	**Mean number of bat registrations**	**Percentage total of registrations**
Barbastelle*	0.2	0.05%	0.0	0.01%	0.1	0.02%	0.1	0.01%	0.0	0.01%
Serotine	0.2	0.06%	0.0	0.03%	0.1	0.02%	0.1	0.03%	0.1	0.03%
Myotis sp.	10.4	3.20%	18.1	13.10%	15.2	3.36%	15.9	4.03%	6.0	3.01%
Leisler's bat	8.9	2.73%	0.5	0.39%	0.2	0.05%	0.3	0.07%	0.6	0.33%
Noctule	62.8	19.35%	6.6	4.77%	3.2	0.70%	15.0	3.82%	5.1	2.56%
Nyctalus sp.	8.6	2.65%	0.1	0.11%	0.5	0.10%	1.1	0.28%	1.7	0.86%
Nathusius' pipistrelle	0.1	0.03%	0.1	0.07%	0.0	0.01%	0.2	0.05%	0.5	0.23%
Common pipistrelle	104.0	32.04%	95.5	69.17%	407.1	90.39%	303.3	77.01%	159.1	80.49%
Soprano pipistrelle	57.5	17.71%	14.3	10.37%	20.9	4.64%	49.5	12.57%	22.6	11.41%
Pipistrellus sp.	71.0	21.89%	2.2	1.62%	2.6		7.8	1.98%	1.8	0.89%
Brown long-eared bat	0.9	0.28%	0.5	0.38%	0.70.6	0.57%	0.5	0.13%	0.3	0.14%
Unknown species	0.0	0.00%	0.0	0.00%	0.0	0.14%	0.0	0.41%	0.1	0.05%
Total	**324.5**		**138.1**		**450.5**		**393.8**		**197.7**	

***listed under Annex II of the Habitats Directive (1992)**

4.5.8 Each static detector differed in its surrounding habitat composition and, therefore, may explain differences in bat assemblage composition (Table 4-6).

Table 4-6: Habitat type surrounding each static detector location

Transect reference	Static detector	Description
BT01	BS01	Arable
BT01	BS02	Improved Grassland
BT02	BS01	Arable
BT02	BS02	Broadleaved Plantation Woodland
BT03	BS03	Semi-Natural Broadleaved Woodland
BT03	BS01	Dense/Continuous Scrub
BT03	BS02	Tall Ruderal Herb and Fern
BT04	BS01	Broadleaved Plantation Woodland
BT04	BS02	Broadleaved Plantation Woodland
BT04	BS03	Broadleaved Plantation Woodland
BT05a/b	BS01	Broadleaved Plantation Woodland
BT05a/b	BS02	Semi-Improved Grassland
BT05a/b	BS03	Broadleaved Plantation Woodland

4.6 Bat aerial inspections

4.6.1 A total of 89 trees with bat roosting suitability were identified for aerial inspections. Seventy-nine of these trees have been surveyed by aerial inspections, with ten trees being identified as being unsafe to climb and access not being permitted for aerial inspection of a single tree (F173). Where appropriate these were reclassified in relation to their bat roosting suitability; Table C-1 (Appendix C) outlines the initial assessment for bat roosting suitability and the reviewed bat roosting suitability based on the results of the aerial inspections.

4.6.2 The aerial inspection of one tree (F123) – rated as offering high suitability in the initial Preliminary Roost Assessments (PRA) – identified a confirmed roost with a noctule roosting in the end of a split branch feature. This roost is located within 50 metres of the Order Limits. Figure G-3 in Appendix G shows the locations of all the confirmed roosts across the different methodologies used.

4.6.3 From the 79 trees, 18 trees were downgraded from moderate to negligible suitability and, therefore, require no further surveys.

4.6.4 There are 23 trees which have been downgraded from moderate to low suitability for roosting bats (F018, F022, F043, F048, F049, F051, F058, F064, F066, F073, F077, F082, F089, F147, F160, F221, F222, F240, F260, F265, F336, F338 and F364), and a further three trees which have been downgraded from high to low suitability (F047, F057 and F220).

4.6.5 There are 19 trees which remain as offering moderate roost suitability (F013, F060, F065, F068, F076, F078, F157, F171, F172, F174, F177, F179, F206, F217, F225, F231, F232, F236 and F392).

4.6.6 Two trees were downgraded from high to moderate roost suitability (F223 and F226).

4.6.7 There are seven trees which remains as offering high roost suitability (F050, F071, F214, F215, F218, F219 and F227), with a further five trees upgraded from moderate to high roost suitability (F034, F074, F080, F162, F198 and F228).

4.6.8 Ten trees were identified as being unsafe to climb (F012, F074, F159, F209, F210, F211, F261, F334, F340 and F347). Therefore, these trees were subject to dusk emergence/dawn re-entry surveys, with the exception of tree (F012) which could not be subject to emergence/re-entry surveys, after being cut down by the landowner, see Section 3.13 (Limitations).

4.6.9 Access for an aerial inspection was not granted for one tree (F173).

4.7 Bat internal inspection surveys

4.7.1 A total of 25 buildings were identified as having internal structures and voids which may possess roosting suitability bats.

4.7.2 Of these 25 buildings, 13 have been subject to an internal inspection.

4.7.3 One building confirmed as being as roost from emergence / re-entry surveys (F010) was accessed internally, but the roof void was not accessible due to the absence of a loft hatch.

4.7.4 Another building that was categorised as being an inconclusive roost (F002) due to the presence of bat dropping on an external sill from surveys undertaken in 2019 was accessed for internal inspections and was categorised as offering a moderate roosting suitability, with no evidence of bats being observed within the roof void in 2023, nor on the external areas of the building.

4.7.5 There were two buildings that were assessed as offering a high roosting suitability from the PRA surveys that remained as a high roosting suitability following the internal inspections (F004 and F005).

4.7.6 Five buildings assessed as offering a moderate roosting suitability for bats from the PRA surveys remained at a moderate roosting suitability following the internal inspections (F003, F006, F009, F016 and F023).

4.7.7 One building assessed as offering a moderate roosting suitability from the PRA surveys that were upgraded to a high roosting suitability (F008).

4.7.8 Three buildings assessed as offering a low roosting suitability from the PRA surveys remained at a low roosting suitability (F007, F012 and F059). Hibernation suitability was, however, ruled out for F012

following the internal inspection, due to the likely temperature fluctuations in the loft through the winter period as a result of residential use of the building.

4.7.9 Eight structures identified as being suitable for internal inspections could not be accessed due to internal access being refused outright (F028, F037 and F054), refused on health and safety grounds (F034, F050 and F053) and there being no or limited access to the internal structure of the roof (F010 and F013).

4.7.10 Four structures identified as being suitable for internal inspections could not be surveyed due to the presence of asbestos (F061, F062, F063 and F064).

4.8 Bat hibernation surveys

4.8.1 Four trees were identified from ground level as having suitability to support bats during the hibernation period (trees F034, F050, F071, F074). Of these, two (F050 and F071) were subject to hibernation surveys by aerial inspections in February 2023. One tree (Tree F074) was unsafe to climb due to the extent of rot and presence of barn owl and no access was provided to the fourth tree (F034). As such, these two trees were still considered to offer hibernation suitability. On climbing, the features of tree F071 could not be fully inspected due to the extent and shape of the cavity, but the feature was still considered to offer hibernation suitability. No bats were observed during the inspection of F050 but the tree was still considered to offer suitability for hibernating bats.

4.8.0 Internal inspections were undertaken on seven out of 10 buildings identified as having bat hibernation suitability during the PRA. Despite partial access, an inspection of sufficient coverage to provide a comprehensive assessment was completed on only one building (F009), with partial inspections on the remaining six buildings (F002, F004, F005, F010, F013 and F023) and no inspections undertaken on a further four buildings (F061, F062, F063 and F064) (limitations are detailed in Section 3.13 of this report).

4.8.1 Only building F009 offered sufficient access to undergo hibernation surveys, however this was deemed unnecessary as the additional survey data would not change the impact, mitigation or likely significant effects reported in the ES Biodiversity Chapter (which has been informed by completion of emergence/re-entry surveys) due to the distance of this building from the proposed works (over 50 metres)

4.8.2 Where only partial internal inspections could be undertaken (F002, F004, F005, F010, F013 and F023), this would also have impacted on the ability to undertake comprehensive hibernation surveys for these buildings. Concerns were also highlighted with regards to security of survey equipment, if it were to be deployed within F004 or F005 (i.e.,

vulnerable to tampering or theft). As such, hibernation surveys, which would only have resulted in a partial dataset, were not undertaken. Building F010 and F013 are located over 50 metres from the proposed works and F023 is located 80 metres from the proposed works.

4.8.3 Internal access to building F062, F063 and F064 was not possible due to the presence of asbestos, which also prevented entry to undertake hibernation surveys.

4.9 Bat emergence/re-entry surveys – buildings and structures

4.9.1 Following the PRA inspections, further surveys were recommended, with reference to the BCT Guidelines. All buildings/structures have been subject to emergence and/or re-entry surveys (see Table 4-7), though three buildings/structures (F010, F013 and F034) have not been subject to a full suite of surveys due to access constraints (see Section 3.3 of this report).

Table 4-7: Results of emergence/re-entry surveys on buildings and structure

Building/ Structure Reference	Building/Structure roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey (s)	Constraints	Results	Species recorded (general activity)
F002	Inconclusive (see text 4.2.3)	Dusk emergence Dusk emergence Dawn re-entry	05/09/2022 01/06/2023 29/06/2023	All visits completed	No emergence No emergence No re-entry	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp.
F003	Moderate	Dusk emergence Dawn re-entry	20/09/2022 14/06/2023	All visits completed	No emergence No re-entry	Common pipistrelle Soprano pipistrelle Noctule
F004	High	Dusk emergence Dusk emergence Dawn re-entry	09/08/2022 24/08/2022 07/06/2023	All visits completed	No emergence No emergence Re-entry of single soprano pipistrelle at 04:24 (15 minutes before sunrise)	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule
F005	High	Dusk emergence Dusk emergence Dawn re-entry (restricted access) Dawn re-entry (repeat of survey with restricted access)	10/08/2022 31/08/2022 21/06/2023 23/08/2023	All visits completed	No emergence No emergence No re-entry (though access restricted to two aspects of F005 only) No re-entry (no access restrictions)	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. *Myotis* sp. Noctule
F006	Moderate	Dawn re-entry Dusk emergence	11/08/2022 25/05/2023	All visits completed	No re-entry No re-entry	Common pipistrelle Soprano pipistrelle Noctule
F007	Low	Dusk emergence	06/06/2023	All visits completed	No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule
F008	High	Dusk emergence Dawn re-entry Dusk emergence	06/06/2023 30/06/2023 22/08/2023	All visits completed	No emergence No re-entry No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp.

Building/ Structure Reference	Building/Structure roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey (s)	Constraints	Results	Species recorded (general activity)
						Noctule *Myotis* sp.
F009	Moderate	Dusk emergence Dawn re-entry	22/09/2022 28/06/2023	All visits completed	1 x common pipistrelle emerged at 19:08 (6 minutes after sunset) from adjacent house roof (F010), not garage (F009). No re-entry	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F010	Confirmed	Dawn re-entry Dusk emergence	02/06/2023 27/06/2023	One survey incomplete. Access has been denied for a proposed third survey (dusk emergence)	No re-entry No emergence *1 common pipistrelle seen to emerge at 19:08 on 22/09/2022, during survey of F009	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp. *Pipistrellus* sp.
F012	Low	Dusk emergence	01/06/2023	All visits completed	No emergence	Common pipistrelle Noctule Brown long-eared bat *Myotis* sp. *Nyctalus* sp.
F013	Confirmed	Dawn re-entry Dusk emergence	14/06/2023 28/06/2023	One survey incomplete. Access has been denied for a proposed third survey (dusk emergence)	Re-entry by two brown long-eared bats at 03:48 (49 minutes before sunrise) No emergence	Common pipistrelle Soprano pipistrelle Noctule Brown long-eared bat
F016	Moderate	Dawn re-entry Dusk emergence	15/09/2022 06/06/2023	All visits completed	No re-entry No emergence	Common pipistrelle Soprano pipistrelle *Myotis* sp. Noctule

Building/ Structure Reference	Building/Structure roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey (s)	Constraints	Results	Species recorded (general activity)
F023	Moderate	Dawn re-entry Dusk emergence	01/06/2023 22/08/2023	All visits completed	No re-entry No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F028	Low	Dusk emergence	31/05/2023	All visits completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule
F034	Moderate	Dawn re-entry	08/06/2023	One survey incomplete. Access has been denied for the second survey (dusk emergence)	No re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp.
F037	Low	Dusk emergence	01/06/2023	All visits completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule
F050	Moderate	Dawn re-entry Dusk emergence	07/06/2023 21/06/2023	All visits completed	No re-entry No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp. Brown long-eared bat or barbastelle
F053	Moderate	Dusk emergence Dawn re-entry	07/06/2023 23/06/2023	All visits completed	No emergence No re-entry	Common pipistrelle Noctule *Myotis* sp. Soprano pipistrelle Potential Nathusius' pipistrelle
F054	Moderate	Dusk emergence Dawn re-entry	29/06/2023 22/08/2023	All visits completed	No emergence Single common pipistrelle. re-entered a crevice between hanging tiles on the northern gable of the building (at 05:08).	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule

Building/ Structure Reference	Building/Structure roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey (s)	Constraints	Results	Species recorded (general activity)
F057	Low	Dusk emergence	07/06/2023	All visits completed	3x *Pipistrellus* sp emerged from section of ivy on building (between 22:02 and 22:07)	Common pipistrelle Noctule *Pipistrellus* sp. *Nyctalus* sp. Brown long-eared bat Barbastelle
F059	Low	Dusk emergence	12/07/2023	All visits completed	No emergence	Common pipistrelle Noctule
F060	Low	Dusk emergence	12/07/2023	All visits completed	No emergence	Common pipistrelle Noctule
F061	Low	Dusk emergence	07/06/2023	All visits completed	No emergence	Common pipistrelle Soprano pipistrelle *Nyctalus* sp.
F062	Moderate	Dusk emergence Dawn re-entry	06/06/2023 22/06/2023	All visits completed	No emergence No re-entry	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp. *Pipistrellus* sp.
F063	Moderate	Dusk emergence Dawn re-entry	05/06/2023 05/07/2023	All visits completed	No emergence No re-entry	Common pipistrelle Soprano pipistrelle Noctule Brown long-eared bat
F064	Moderate	Dawn re-entry Dusk emergence	06/06/2023 22/06/2023	All visits completed	No re-entry No emergence	Common pipistrelle Noctule

4.9.2 Bat roosts have been identified in five of the buildings/structures subject to emergence/re-entry surveys.

4.9.3 A dawn survey of a building (F004) identified a single soprano pipistrelle re-entry, seen to re-enter a crevice in the barge board on the north-western facing dormer. This is considered to be a day roost. Building F004 is located within the Order Limits and proposed for demolition.

4.9.4 A survey on a building (F009) identified a roost in the adjacent building (F010). One common pipistrelle was recorded emerging from an area of lifted roof tiles on the north-western corner of the building. This is considered to be a day roost. Building F010 is approximately 60 metres outside the Order Limits.

4.9.5 A dawn survey of an outbuilding (F013) identified two brown long-eared bat re-entries. The first was observed to enter the north-east gable of the outbuilding, whilst a second bat entered the internal area of the building via an open doorway. The roosts are considered to be day roosts, located in crevices/cavities in the brick walls of the building and/or on the wall tops. Building F013 is located approximately 90 metres outside of the Order Limits.

4.9.6 A dawn survey of a building (F054) identified a single common pipistrelle re-enter a crevice between hanging tiles on the northern gable of the building. This is considered to be a day roost. Building F054 is located directly adjacent to the Order Limits.

4.9.7 A dusk survey of a barn (F057) with an extensive cover of ivy on one of its faces identified three *Pipistrellus* sp. Bats emerge from the ivy growth. The feature is considered to be a day roost. Building F057 is located approximately 80 metres outside of the Order Limits.

4.9.8 Due to the timing of the initial PRA (February 2022) and first dusk emergence survey (September 2022) of building F002, insufficient information is available to comment on whether F002 could have been used by roosting bats in 2022, though no evidence of bats or emergences were observed. Building F002 was not found to support any roosting bats during dusk emergence or dawn re-entry surveys in 2023, nor was any evidence of roosting bats noted during the internal inspection and re-survey of the external areas of this building (though noting limited access was available internally). As such, F002 was not considered an active roost in 2023. However, given previous findings of bat droppings on a windowsill of this building (in 2019) and suitable features present for roosting bats, F002 may have historically been used by roosting bats and may also in the future.

4.9.9 Figure G-3 in Appendix G shows the locations of the confirmed roosts.

4.10 Bat emergence/re-entry surveys – trees

4.10.1 Following the PRA inspections, further surveys were recommended, with reference to the BCT Guidelines. Forty-two trees have been subject to emergence and/or re-entry surveys (see Table 4-8). Six trees could not have their full suite of survey completed due to access constraints (F034, F065, F173, F174, F177 and F179), and one tree (F012) could not have its full suite of surveys completed due to the tree being cut down (see Section 3.3 of this report).

Table 4-8: Results of emergence/re-entry surveys on trees (to date – additional surveys to be completed)

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F012	High	Dawn re-entry	11/08/2022	All three surveys incomplete due to tree being cut down.	Survey attempted but could not be completed as the tree had been cut down.	NA
F013	Moderate	Dawn re-entry Bat tree climb replacement (BT3 Climb)*	12/08/2022 15/05/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule
F034	High	Dawn re-entry	01/09/2022	Two surveys incomplete. Access has been refused for the two outstanding BT3 climb surveys.	No re-entry	Unidentified bat
F050	High	Dusk emergence Dusk emergence Dawn re-entry	11/08/2022 28/09/2022 08/08/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F060	Moderate	Dusk emergence BT3 Climb	13/09/2022 15/05/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule Leisler's bat Brown long-eared bat *Myotis* sp.
F065	Moderate	Dusk emergence	15/09/2022	One survey incomplete. Access has been refused for the outstanding BT3 climb survey.	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F068	Moderate	Dusk emergence BT3 Climb	26/09/2022 15/05/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F071	High	Dusk emergence BT3 Climb BT3 Climb	27/09/2022 15/05/2023 12/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule Leisler's bat *Myotis* sp.
F074	High	BT3 Climb Dusk emergence BT3 Climb	15/05/2023 13/06/2023 10/08/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F076	Moderate	Dusk emergence BT3 Climb	14/09/2022 15/05/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Myotis* sp.
F078	Moderate	Dusk emergence Dawn re-entry	13/06/2023 24/08/2023	All surveys completed	No emergence No re-entry	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F080	High	Dusk emergence BT3 Climb BT3 Climb	22/09/2022 15/05/2023 12/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule
F123	Confirmed	Dusk emergence Dawn re-entry BT3 Climb	08/08/2022 28/09/2022 07/06/2023	All surveys completed	No emergence or re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. *Myotis* sp. Noctule
F130	Negligible (tree downgraded from moderate following BT3 Climb)	Dusk emergence BT3 Climb	09/08/2022 10/08/2023	All surveys completed, third visit not required due to tree being downgraded to negligible following BT3 climb	No emergence	Noctule Brown long-eared bat

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F157	Moderate	BT3 Climb Dawn re-entry	07/06/2023 06/07/2023	All surveys completed	No re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp.
F159	Moderate	Dawn re-entry Dawn re-entry	13/07/2023 07/09/2023	All surveys completed	No re-entry No re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule
F171	Moderate	BT3 Climb Dusk emergence	15/05/2023 14/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. *Myotis* sp. Noctule Brown long-eared bat
F172	Moderate	BT3 Climb Dusk emergence	15/05/2023 14/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule Brown long-eared bat
F198	High	BT3 Climb Dusk emergence BT3 Climb	15/05/2023 14/06/2023 10/08/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Nyctalus* sp. Brown long-eared bat
F206	Moderate	BT3 Climb Dusk emergence	15/05/2023 19/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Myotis* sp. Noctule
F209	Moderate	Dusk emergence Dawn re-entry	25/05/2023 20/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule *Nyctalus* sp. Brown long-eared bat

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F210	High	Dawn re-entry Dusk emergence Dusk emergence	25/05/2023 14/06/2023 08/08/2023	All surveys completed	At least 20 *Myotis sp.* (likely Daubenton's) bats observed swarming around F210 from 02:28 – 03:05, several bats observed entering a knot hole feature on the south-west aspect at 12-14m high. During the second survey (dusk) at least 20 *Myotis sp.* individuals (likely Daubenton's bat) were observed to emerge from the roost. Social calls were recorded the whole duration of the survey and bats visible within a feature from the ground. Bats remained in the tree after survey finished. No emergences were recorded during the third survey. Considered to be a Daubenton's bat maternity roost	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule Whiskered bat Daubenton's bat
F211	Moderate	Dusk emergence Dawn re-entry	24/05/2023 21/06/2023	All surveys completed	No emergence or re-entry	Common pipistrelle Soprano pipistrelle Noctule Brown long-eared bat
F213	Confirmed	BT3 Climb Dusk emergence BT3 Climb	15/05/2023 15/06/2023 10/08/2023	All surveys completed	No emergence	Common pipstrelle Soprano pipistrelle Noctule Brown long-eared bat *Myotis* sp.

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F214	High	BT3 Climb Dusk emergence BT3 Climb	15/05/2023 15/06/2023 10/08/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Pipistrellus* sp. *Myotis* sp.
F215	High	BT3 Climb BT3 Climb Dusk emergence	15/05/2023 12/06/2023 03/07/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule Leisler's bat *Myotis* sp.
F217	Moderate	Dawn re-entry Dusk emergence	23/08/2023 06/09/2023	All surveys completed	No re-entry No emergence	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp. *Myotis* sp.
F218	High	BT3 Climb BT3 Climb Dusk emergence	15/05/2023 12/06/2023 06/07/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule Serotine Brown long-eared bat *Myotis* sp.
F219	High	BT3 Climb BT3 Climb Dusk emergence	15/05/2023 12/06/2023 06/07/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule Serotine Brown long-eared bat *Myotis* sp.
F223	Moderate	BT3 Climb Dusk emergence	15/05/2023 21/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp. *Myotis* sp. Barbastelle

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F225	Confirmed	Dawn re-entry Dusk emergence BT3 Climb	23/08/2023 06/09/2023 22/09/2023	All surveys completed	Re-entry of single soprano pipistrelle at 05:30 No emergence	Common pipistrelle Soprano pipistrelle Noctule
F226	Moderate	BT3 Climb Dawn re-entry	15/05/2023 22/06/2023	All surveys completed	No re-entry	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp. *Myotis* sp.
F227	High	BT3 Climb BT3 Climb Dusk emergence	15/05/2023 12/06/2023 04/07/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Pipistrellus* sp. *Nyctalus* sp. *Myotis* sp.
F228	High	BT3 Climb BT3 Climb Dusk emergence	15/05/2023 12/06/2023 04/07/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F231	Moderate	BT3 Climb Dusk emergence	15/05/2023 19/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Myotis* sp.
F232	Moderate	BT3 Climb Dusk emergence	15/05/2023 19/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle Noctule *Pipistrellus* sp. *Myotis* sp.
F236	Moderate	Dusk emergence Dawn re-entry	22/08/2023 15/09/2023	All surveys completed	No emergence or re-entry	Common pipistrelle Soprano pipistrelle Noctule Brown long-eared bat *Myotis* sp. *Nyctalus* sp.

Tree reference	Tree roosting suitability	Dusk emergence or dawn re-entry survey	Date of survey(s)	Constraints	Results	Species recorded (general activity)
F261	High	Dawn re-entry Dawn re-entry Dusk emergence	26/05/2023 20/06/2023 10/08/2023	All surveys completed	No re-entry or emergence	Common pipistrelle Soprano pipistrelle Noctule *Nyctalus* sp.
F334	Moderate	Dusk emergence Dawn re-entry	24/05/2023 15/06/2023	All surveys completed	No emergence or re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule
F340	Moderate	Dusk emergence Dawn re-entry	31/05/2023 04/07/2023	All surveys completed	No emergence or re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule Barbastelle
F347	Moderate	Dawn re-entry Dawn re-entry	25/05/2023 04/07/2023	All surveys completed	No re-entry	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule
F368	Moderate	Dawn re-entry Dusk emergence	01/06/2023 23/08/2023	All surveys completed	No re-entry or emergence	Common pipistrelle Soprano pipistrelle Noctule
F392	Moderate	BT3 Climb Dusk emergence	15/05/2023 22/06/2023	All surveys completed	No emergence	Common pipistrelle Soprano pipistrelle *Pipistrellus* sp. Noctule *Myotis* sp.
*Bat tree climb replacement survey details for bat emergence/re-entry surveys detailed in Section 4.11 and Table 4-9 below.						

4.10.2 A survey on a tree (F210), identified a *Myotis sp.* (likely Daubenton's bat) maternity roost. During the survey at least 20 bats (identified as likely Daubenton's bat, during post-survey analysis) were observed swarming around the tree for up to 40 minutes, with several individuals observed entering a knot hole features on the south-western aspect of the tree, around 12-14 metres high. On a second survey of this feature, 20 bats were observed emerging from the tree. In addition to this, social calls were heard from within the tree for the duration of the survey, and bats could be visibly seen within a low knot hole feature on the tree (both during and at the end of the survey). The third survey of this tree, a dusk emergence survey on 8 August 2023, did not identify any bats emerging from the tree. Intermittent *Myotis* calls were recorded between 21:19 and 22:00 but these individuals were not observed by the surveyors. Subsequently, a sample of suspected droppings was taken from the roost for Environmental DNA (eDNA) analysis[13]. The result was undetermined given failure to yield DNA material of sufficient quality/quantity from the extracted sample (see Appendix J). Tree F210 is located approximately 35 metres outside of the Order Limits.

4.10.3 The first survey of another tree (F225) identified a roost comprising a single soprano pipistrelle. This bat was observed to investigate/swarm around the tree prior to re-entering a trunk cavity located approximately 1.5m above the ground. No emergences were recorded during the second survey of this tree and during the endoscopic inspection of this tree (aerial inspection in place of dusk emergence/dawn re-entry surveys – see Section 4.11 of this report) no bats were observed. This roost is considered to be a day roost.

4.10.4 Figure G-3 in Appendix G shows the locations of the confirmed roosts.

4.11 Aerial inspections of trees in place of bat dusk emergence/dawn re-entry surveys

4.11.1 Following the PRA inspections, further surveys were recommended, in line with BCT Guidelines. As outlined in Section 3.6 and 3.10, aerial inspections of trees were conducted in place of all but one of the recommended survey visits for dusk emergence/dawn re-entry surveys on trees that were deemed safe to climb. Twenty-seven trees have had aerial inspections as replacements for dusk emergence/dawn re-entry surveys. The full results of these surveys can be seen in Table 4-9 below.

[13] Undertaken by Swift Ecology

Table 4-9: Results of aerial inspections of trees in place of bat dusk emergence/dawn re-entry surveys

Tree reference	Tree roosting suitability	Date of survey (s)	Results	Species recorded
F013	Moderate	15/05/2023	No bats recorded	NA
F060	Moderate	15/05/2023	No bats recorded	NA
F068	Moderate	15/05/2023	No bats recorded	NA
F071	High	15/05/2023	No bats recorded	NA
F071	High	12/06/2023	No bats recorded	NA
F074	High	15/05/2023	No bats recorded	NA
F074	High	10/08/2023	No bats recorded	NA
F076	Moderate	15/05/2023	No bats recorded	NA
F080	High	15/05/2023	No bats recorded	NA
F080	High	12/06/2023	No bats recorded	NA
F123	Confirmed	07/06/2023	No bat seen but droppings were present (though unable to be collected due to the narrow opening of the feature)	NA
F130	Moderate	10/08/2023	No bats recorded	NA
F157	Moderate	07/06/2023	No bats recorded	NA
F171	Moderate	15/05/2023	No bats recorded	NA
F172	Moderate	15/05/2023	No bats recorded	NA
F198	High	15/05/2023	No bats recorded	NA
F198	High	10/08/2023	No bats recorded	NA
F206	Moderate	16/05/2023	No bats recorded	NA
F213	Confirmed	15/05/2023	No bats recorded	NA
F213	Confirmed	10/08/2023	No bats recorded	NA
F214	High	15/05/2023	No bats recorded	NA
F214	High	10/08/2023	No bats recorded	NA
F215	High	15/05/2023	No bats recorded	NA
F215	High	12/06/2023	No bats recorded	NA
F218	High	15/05/2023	No bats recorded	NA
F218	High	12/06/2023	No bats recorded	NA
F219	High	15/05/2023	No bats recorded	NA
F219	High	12/06/2023	No bats recorded	NA

Tree reference	Tree roosting suitability	Date of survey (s)	Results	Species recorded
F223	Moderate	15/05/2023	No bats recorded	NA
F225	Moderate	22/09/2023	No bats recorded	NA
F226	Moderate	15/05/2023	No bats recorded	NA
F227	High	15/05/2023	No bats recorded	NA
F227	High	12/06/2023	No bats recorded	NA
F228	High	15/05/2023	No bats recorded	NA
F228	High	12/06/2023	No bats recorded	NA
F231	Moderate	15/05/2023	No bats recorded	NA
F232	Moderate	15/05/2023	No bats recorded	NA
F392	Moderate	15/05/2023	No bats recorded	NA

5 Summary

5.1.1 Bat surveys were conducted across the survey area, which includes a 100 metre buffer from the Order Limits, throughout 2022 and 2023.

5.1.2 Bat roost surveys consisted of initial inspections (Preliminary Roost Assessments (PRAs)) to assess the bat roosting suitability of buildings, structures and trees across the survey area, followed by further surveys including aerial inspections and emergence/re-entry surveys.

5.1.3 Bat activity surveys consisted of bat activity transects between April and October 2022, as well as the deployment of static detectors on each transect. Additional bat activity transect and static detector surveys have also been undertaken between April and July 2023 and April and October 2023, respectively, in areas where access was not granted in 2022, or where five consecutive nights of static detector data was not gathered in 2022.

5.1.4 Nine roosts have been confirmed (tree F123, tree F210, tree F213, tree F225 and building F004, building F010, building F013, building F054 and building F057) and one inconclusive roost (building F002) have been identified across the survey area. Tree F123 was identified as a confirmed roost during the aerial inspection survey, tree F213 was identified as confirmed roost during the PRA surveys and trees F210 and F225 were identified as confirmed roosts during dusk emergence and dawn re-entry surveys. Buildings F010 and F057 were identified as confirmed roosts during an emergence survey of each building. Buildings F004, F013 and F054 were identified as confirmed roosts on dawn re-entry surveys. Building F002 was assessed as having a ‘moderate’ roosting suitability during the PRA surveys and no evidence of bats was noted; however, the identification of bat droppings on an external sill of the building from surveys conducted in the previous stage of works in 2019 resulted in the roosting status of this building being assessed as ‘inconclusive’. An emergence survey in September 2022 did not identify any roosting bats but given the timing of this survey and the PRA (February 2022) us of F002 by roosting bats during 2022 cannot be ruled out. No evidence or presence of roosting bats was identified in F002 during 2023 surveys (internal inspection, re-survey of the external areas of the building and a dusk emergence and dawn re-entry survey); therefore, F002 was not considered an active roost during 2023. F002 may have historically be used or could be used in the future by roosting bats.

5.1.5 The PRA surveys highlighted hibernation suitability in four trees, two of which (F050 and F071) were subject to hibernation surveys by aerial inspections in February 2023 but no bats were observed. These inspection surveys confirmed hibernation suitability in all four trees.

5.1.6 The PRA surveys highlighted hibernation suitability in 10 buildings and structures across the survey area.

5.1.7 Bat activity transect surveys recorded a total of eight bat species using the survey area for commuting and foraging purposes, with transect BT04 showing the highest levels of activity, predominantly from high levels of activity of common species (common pipistrelle, noctule and soprano pipistrelle). Only a single barbastelle registration was recorded across all transect surveys within transect BT01.

5.1.8 Bat activity static surveys recorded at least eight bat species, with unidentified *Myotis sp., Nyctalus sp.* and unknown bat species also recorded using the survey area for commuting and foraging purposes. Transect BT03 showed the highest average number of bat registrations per night. Barbastelle are included within these eight species, with a total of 32 registrations recorded by all static detectors.

6 References

[1] The Conservation of Habitats and Species Regulations, 2017(as amended). Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents. Last accessed November 2023.

[2] Wildlife and Countryside Act, 1981 (as amended). Available at: www.legislation.gov.uk/ukpga/1981/69/contents. Last accessed November 2023.

[3] Barbastelle (*Barbastella barbastellus),* Bechstein's bat *(Myotis bechsteinii),* noctule *(Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat *(Plecotus auritus*), greater horseshoe bat (*Rhinolophus ferrumequinum*), lesser horseshoe bat (*Rhinolophus hipposideros*).

[4] Natural Environment and Rural Communities Act, 2006 (as amended). Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents. Last accessed November 2023.

[5] Jurij Stare, [redacted] (Last accessed November 2023).

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

[7] MAGIC maps (https://magic.defra.gov.uk/MagicMap.aspx). Last accessed November 2023.

[8] Mitchell-Jones, A.J, & McLeish, A.P. (2004) Bat Workers' Manual. 3rd Edition. JNCC, Peterborough.

[9] Forestry Commission (2013) Guidance on managing woodlands with bats in England. Version 3 14 October 2013.

[10] Natural England Bat Level 2 Licence to disturb bats for the purpose of ecological surveying or research via the use of endoscopes, static hand-held nets and torches. Further information can be found at: www.gov.uk/government/publications/bats-survey-or-research-licence-level-2. Last accessed November 2023.

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

[12] Atkins. (2019). HE551478-ATK-EBD-XX_A46-RP-LE-000008. A46 Newark Northern Bypass Preliminary Walkover Survey Technical Note.

[13] Undertaken by Swift Ecology

A. Appendix: Natural England survey methodology deviation response

Date: 07 February 2023
Our ref: **UDS A007463**
Your ref:

[redacted]

BY EMAIL ONLY

Dear [redacted]

Discretionary Advice Service (Charged Advice)
Development proposal and location: A46 Newark Bypass: Initial Survey Advice - NSIP
SPECIES: GCN and Bats

Thank you for your consultation on the above which was received on 20 October 2022.

This advice is being provided as part of Natural England's Discretionary Advice Service. Mott MacDonald on behalf of National Highways has asked Natural England to provide advice on:

- GCN survey methodology
- Bat survey methodology
- Safety concerns with a section of site near Tolney lane

This advice is provided in accordance with the Quotation and Agreement dated 26 August.

The following advice is based upon the information within :

1. [redacted]ronmental Consultant- Mott MacDonald to [redacted]with the subject 'A46 Newark Bypass: Initial Survey Advice - NSIP - UDS A007463' and dated 20/10/2022.
2. Figure entitled HE551478-MOTG-EBD-CONWI_CONW-DR-LE-00009 dated 18/10/2022.

Protected species advice

Great Crested Newt (GCN) Survey Query – Response

In our previous advice letter Natural England stated some of the criteria where it would be suitable to limit the survey area to 250m from the impacts area of the proposed scheme. Natural England also suggested that a figure of the area including the eDNA survey results would be beneficial in allowing us to better advise on the proposed survey methodology.

Thank you for submitting the figure HE551478-MOTG-EBD-CONWI_CONW-DR-LE-00009.
Natural England would agree that an accurate assessment of the ponds between 250m and 500m of the proposed scheme has been conducted. Ponds have been assessed on their suitability to support GCN based on the presence of fish, fast flowing water, size of water body and barriers to dispersal natural and manmade.
This assessment of the areas suitability to GCN is corroborated by the negative eDNA results that have come back on 13 of the 14 water bodies that have already been subject to survey as well as the biological records within the area.

Ponds that are suitable to support GCN have been surveyed using eDNA or are scheduled for survey in 2023. Additional information gathered from these surveys can then be used to further interpret the status of GCN within this area.

Kelham and Averham Floodplain Compensation Area (FCA)

Natural England are in agreement that in the area of the proposed Kelham and Averham FCA should have a different approach to the proposed survey area due to the presence of more suitable GCN habitat and confirmed / known GCN presence. The approach described in the above email from Sophie Bennett is deemed acceptable.

Bat Survey Query – Response

Tree climbing methodology:

Natural England broadly accepts the tree climbing methodology that is proposed but have additional comments / concerns.
It should be noted that there is a level of subjectivity when classifying trees as having either 'high' or 'moderate' roosting potential.
Natural England would recommend that a suitably qualified and experienced ecologist quality controls the classification process to reduce the risk of misclassification.
Alternatively, the classification system could be amended to be simpler. For example, a tree could be classified as either having 'potential' or 'no potential' to support roosting bats. In this scenario all trees with potential to support roosting bats would be subject to the same number of surveys.

It is unclear from the email if tree climbing surveys are going to be used in isolation. Tree climbing surveys have a low encounter rate and would only provide a snapshot of the bats present within the survey area.
For a scheme of this size and impact Natural England would recommend that tree climbing surveys are used in conjunction with other survey techniques to provide a broader understanding of how bats are utilising the landscape. Including techniques that can be used to identify where bats are foraging and commuting. With the proposed widening of the road identifying any crucial crossing points would be beneficia especially when it comes to planning the location of an proposed mitigation.
The use of static detectors, walked transects surveys, crossing point surveys for example could help inform on this. Natural England would expect that surveys are designed appropriately and proportionately for the impacts.

If any Annexe II species are identified during the desk studies or subsequent field surveys, this would then warrant additional surveys. These could include Advanced Level Bat Survey Techniques such as radio tracking of individuals.

Trees that cannot be climbed:

Where trees are unsafe to climb other techniques such as an elevated works platforms could be considered where possible.
Replacing tree climbing surveys with dusk / dawn surveys would be acceptable when the trees are unsafe to climb. Where dusk / dawn surveys are being used it should be noted that bats may leave and return to roost much earlier or later than sunset / sunrise– this should be taken into consideration when planning surveys.

The use of infrared and thermal imaging cameras could also be implemented to support surveyor observations on the ground; however, we are aware that this type of equipment does have limitations i.e., PRFs being obscured by branches, foliage or being too high to view and operator experience.
There is guidance on the use of these devices here: Interim-guidance-note-on-NVAs-May-2022-FINAL.pdf (bats.org.uk) here.

If it is considered appropriate supplementary or advanced survey methods should be implemented in cases where trees and individual features cannot be fully inspected and survey results are inconclusive, or confidence in a negative result is low.

Safety concerns on Tolney Lane – Response

Thank you for providing evidence that appropriate effort is being made to conduct surveys when safe to do so. My colleagues' previous comments relating a precautionary approach being taken and the use of Licensing Policy 4 are still applicable should a licence application be required.

For clarification of any points in this letter, please contact Cassandra Jackson on 07827 356 489.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is, therefore, not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours

[redacted]

Senior Adviser –Protected Species Licensing
Natural England

C [redacted]

From: [redacted]
To:
Cc:

Subject: RE: A46 Newark Bypass: Initial Survey Advice - NSIP - UDS A007463
Date: 04 May 2023 15:30:54
Attachments: image001.png

Some people who received this message don't often get email from [redacted] earn why this is important

D[redacted]

My apologies for the delay in getting back to you. Thank you for addressing Natural England's previous comments. We are pleased to see that this survey methodology is not being used in isolation and that other survey techniques have been used to make your assessments of the potential impacts to bats and their habitat.
We acknowledge that that use of night vision aids is still in its early days and appreciate that you have considered our advice but have deemed it not applicable in this instance.

Natural England have no further comments currently in relation to the proposed survey methodology.

[redacted]
Senior Adviser – HS2 Protected Species Licensing
Natural England

Mob[redacted]

www.gov.uk/natural-england

[redacted]

From [redacted]
Sent: 30 March 2023 16:24
To: [redacted]
Cc: [redacted]
Subj

Good afternoon [redacted]

Thank you for your email dated 07/02/2023 and the DAS provided in response to our questions on GCN and bat surveys. In response to the statement on bat surveys "Natural England broadly accepts the tree climbing methodology that is proposed but have additional comments / concerns", we have provided further information below to address each of the comments / concerns raised.

1. Natural England's comment: *It should be noted that there is a level of subjectivity when classifying trees as having either 'high' or 'moderate' roosting potential. Natural England would recommend that a suitably qualified and experienced ecologist quality controls the classification process to reduce the risk of misclassification. Alternatively, the classification system could be amended to be simpler. For example, a tree could be classified as either having 'potential' or 'no potential' to support roosting bats. In this scenario all trees with potential to support roosting bats would be subject to the same number of surveys.*

   Response:

   - All lead surveyors undertaking preliminary roost assessments (PRA) from the ground for this project are suitably experienced ecologists, undertaking the surveys in accordance with BCT best practice guidance (i.e. assigning 'low', 'moderate' or 'high' potential to each receptor).
   - If there is reason for doubt, a precautionary approach has been taken assigning the receptor with a higher classification for roosting suitability, until further surveys can evidence otherwise (i.e. can be 'downgraded' to lower suitability as a truer reflection of what is present, following further surveys).
   - With reference to the BCT best practice guidance, no dusk emergence / dawn re-entry surveys have been undertaken on trees identified as having a Low suitability to support roosting bats. Any trees to be removed that are identified as having Low suitability will undergo soft felling under supervision and guidance of a suitably experienced ECoW. The trees should be soft-felled and the cut sections of the tree should be retained on site for 24hrs, or checked with an endoscope prior to being removed from site.
   - The experienced lead ecologists undertaking aerial internal inspections of trees hold Natural England bat class licences allowing the appropriate use of endoscopes and torches to inspect PRF, as well as being qualified tree climbers.
   - Surveyors discuss their assessments with each other to ensure they are aligned and are not undertaken in isolation. Furthermore, quality assurance of data is undertaken at several stages of the DCO process, for example 100% of sound analysis data is QA'd and Jacobs are undertaking checks of the Environmental Statement Biodiversity chapter which has the bat report appended.
   - The majority of bat ecologists are CIEEM members and, along with Mott MacDonald ethics and values, are trusted to uphold professional integrity and technical excellence. This includes reporting to line managers the need for further training for themselves or others, and whistle blowing any false claims of competency.

2. Natural England's comment: *It is unclear from the email if tree climbing surveys are going to be used in isolation. Tree climbing surveys have a low encounter rate and would only provide a snapshot of the bats present within the survey area.*

Response:

- I can confirm one emergence or re-entry survey will have been undertaken on each tree of moderate or high potential where access has been granted and it is safe to do so.
- Remaining emergence/re-entry surveys will be replaced with tree climbing surveys. These surveys are to help identify roost type, with collection of droppings, where possible, to assist with species identification when individuals are not present at the time of survey.
- It is acknowledged that emergence / re-entry surveys also provide a snapshot in time, with additional constraints of reduced visibility in wooded areas where light levels are low and there isn't always a clear sight line of a PRF from ground level.
- Based on professional judgement and experience using a combination of emergence/re-entry surveys and tree climbing is considered to be a robust methodology to collect roost data.

3. Natural England's comment: *For a scheme of this size and impact Natural England would recommend that tree climbing surveys are used in conjunction with other survey techniques to provide a broader understanding of how bats are utilising the landscape. Including techniques that can be used to identify where bats are foraging and commuting. With the proposed widening of the road identifying any crucial crossing points would be beneficial especially when it comes to planning the location of an proposed mitigation. The use of static detectors, walked transects surveys, crossing point surveys for example could help inform on this. Natural England would expect that surveys are designed appropriately and proportionately for the impacts.*

   Response:

   - Tree climbing surveys have not been undertaken in isolation. Bat activity surveys undertaken from April 2022 to Oct 2022 (including bat transects and static detector surveys) of suitable habitats have contributed to a robust assessment of the impact of the scheme on bats. Additional bat activity surveys are due to be undertaken in 2023 (from April 2023 – July 2023) of one remaining transect which could not be surveyed during 2022 due to access restrictions.
   - Dusk emergence / dawn re-entry surveys commenced last year (2022) on each receptor of Moderate and High suitability, whilst awaiting a response from Natural England regarding the proposed replacement tree climbing surveys. Remaining surveys will be undertaken as tree climbing inspections to confirm the presence / likely absence of any bat roosts and identify the species, should they be present (either from direct observations or from eDNA resulting of droppings). Trees of Moderate suitability would effectively have survey effort of one climbed inspection and one dusk emergence / dawn re-entry survey. Trees of High suitability would effectively have survey effort of two climbed inspections and one dusk emergence / dawn re-entry survey. Any features identified on the trees that we are not able to fully inspect with an endoscope would be subject to additional dusk emergence / dawn re-entry surveys.
   - Whilst evolving technology, such as night vision aids (NVA's), is allowing for more robust data to be collected during dusk emergence / dawn re-entry surveys, it requires significant training for ecologists to efficiently use them and time to accrue this expensive resource for a scheme of this size. It is our understanding that there is due to be a stronger emphasis on using NVA's within the 4th Edition

guidelines when they are released, however, this is not covered in detail within the current guidelines. We plan on using NVA equipment during targeted surveys on this scheme during 2023 but it is not currently feasible to use these resources on every survey.

- It is understood that this methodology of tree climbing in place of dusk emergence / dawn re-entry surveys is widely used across the industry on large infrastructure schemes, as it is still possible to collect robust data to inform the impact assessment. This survey methodology will allow us to survey the majority of the trees identified as having suitability to support roosting bats prior to DCO submission with a low number of survey results likely to be submitted during the examination period.

-

4. Natural England's comment: *If any Annexe II species are identified during the desk studies or subsequent field surveys, this would then warrant additional surveys. These could include Advanced Level Bat Survey Techniques such as radio tracking of individuals.*

   Response:

   - A single barbastelle call was recorded across all walked transect activity surveys between Winthorpe Junction and the A1 carriageway, with an additional 22 recordings on eight of the 12 static detectors across the whole scheme throughout season. This is likely to have been the same individual or low numbers of bats commuting / foraging along suitable habitat. Additional dusk emergence / dawn re-entry surveys, bat activity surveys (one transect including static surveys) and tree climbing surveys are to be undertaken in 2023.
   - With reference to current survey data and the proposed works, the construction phase of the scheme is unlikely to have an impact on the Annex II barbastelle bat species. This assessment is based on the scheme being located at the top of the bats range, low numbers of passes recorded during transects, no direct impacts to Barbastelle roosts identified , and no new severance of commuting or foraging routes (dualling scheme).

Following the clarification and justification detailed above, we are seeking confirmation that Natural England are satisfied with our survey approach.

We are in the process of scheduling the remaining bat surveys and want to ensure we are in agreement on the proposed climbing methodology before the DCO is submitted this summer (2023).

Please let me know if it would be easier to discuss the above points in a meeting and I will look to arrange something asap.

Many thanks,

[redacted]

Principal Environmental and Sustainability Consultant

From: [redacted]
Sent:

To: [redacted]
Cc: [redacted]
Sub [redacted]

> [redacted]n't often get email from [redacted]
> [redacted]earn why this is important

D [redacted]

Please find enclosed your Discretionary Advice Service response to your questions on surveys in the below email dated 20/10/2022.

Please do not hesitate to let us know if you would like to set up a meeting to clarify any of the points within these letters respectively as per your contract, or if you wish to discuss next steps. Please contact [redacted]

[redacted]
Senior Adviser –Protected Species Licensing
Natural England

Mob: [redacted]

[redacted]

www.gov.uk/natural-england

[redacted]

From [redacted]
Sent: 20 October 2022 14:05
To: [redacted]
Subject: FW: A46 Newark Bypass: Initial Survey Advice

Good afternoon,

Thank you very much for your letter dated 23rd September 2022 (DAS/ A006297) containing advice related to our initial survey queries for the proposed A46 Newark Bypass. The Natural England response is attached to this email for reference. Please see below for additional information requested in relation to each. The proposed bypass area is referred to as the 'main site' and the Kelham and Averham Flood Compensation Area (FCA) is referred to as the 'Kelham site'.

Great Crested Newt (GCN) Survey Query – Response

Proposal: to only survey suitable water bodies within 250m radius of the proposed works (instead of the standard 500m) – excluding the Kelham and Averham Flood Compensation Area Site which will still be surveyed to 500m.

Further Justification:

Main scheme alignment – Proposed A46 Newark Bypass Route

We have attached a figure (HE551478-MOTG-EBD-CONWI_CONW-DR-LE-00009) that shows the suitable habitat for GCN, significant barriers to dispersal and the results of surveyed ponds up to 250m from the proposed woks that have had eDNA surveys conducted. In this figure it can be seen that there is a low amount of suitable terrestrial habitat present sporadically around the main alignment of the proposed scheme between the distances of 250m – 500m. In addition to this there are also a limited number of suitable waterbodies that are likely to support GCN between the distances of 250m – 500m.
Most of the waterbodies are unsuitable for GCN. For example, the waterbodies that are located immediately adjacent to F021 (but beyond the 250m boundary) are sizeable bodies of water and are thought to support fish, which reduces the likelihood of GCN being present. There are also a number of commercial fishing ventures in close proximity to this location. This location is also >500m from the boundaries of the main alignment site if travelling via the route that you would need to take on foot due to the River Trent, which acts as a natural barrier to dispersal. There are also several waterbodies south of these fishing lakes that are part of the Newark sugar factory. These waterbodies all contain fast-flowing outflows that filter into a local ditch system, making them unsuitable for GCN.

There are also a number of significant barriers to dispersal located along the proposed route of the main alignment site. These are predominantly shown by the solid black lines in the attached figure (HE551478-MOTG-EBD-CONWI_CONW-DR-LE-00009). These barriers to GCN dispersal include the River Trent, the A46 main road and other busy main carriage roads which support significant volumes of traffic and often kerbed edges. There is also a significant amount of unsuitable terrestrial habitat for GCN located along the route including, but not limited to, industrial estates, car parks and other hardstanding habitat.

As you will also see from the attached figure, a total of 14 waterbodies within 250m of the proposed works on the main alignment were tested in 2022 for the presence of GCN eDNA. Of these 14 waterbodies, we have received 13 Negative results for GCN and one inconclusive result (F022), which is due to be re-tested in 2023. We believe that due to the lack of GCN within these

13 waterbodies and the relatively high degree of fragmentation, due to the presence of several significant barriers to dispersal within the main alignment site, it is likely that that any waterbodies within the 250m – 500m buffer from the proposed works are also absent of populations of GCN.

The Biological Records Search (undertaken c. February 2022, updated c. June 2022) also yielded no records of GCN within 2km of the proposed main alignment site.

Kelham and Averham Floodplain Compensation Area (FCA)

The area of the proposed Kelham and Averham FCA is a more recent addition to the scheme and can be seen to the north-west of the main alignment site, north-west of the River Trent (HE551478-MOTG-EBD-CONWI_CONW-DR-LE-00009 – Page 4). Due to the recent addition of the Kelham and Averham FCA to the scheme, waterbodies within the area have to still yet to be surveyed for their suitability for GCN. However, suitable habitat for GCN have been identified both within the 0-250m buffer from the proposed works and within the 250 – 500m boundaries of the Kelham and Averham FCA due to uninterrupted extension of areas of grassland and woodland.

In addition to this, there are relatively few major barriers to dispersal that fragment the habitat within the Kelham and Averham FCA. The main barrier to dispersal that is present is the A617 road, which fragments the village of Averham from the suitable areas of habitat identified within the area of the scheme. In addition to this, all of the identified waterbodies are located north of this barrier within an area of well-connected suitable habitat. The other main barrier to dispersal is the River Trent, which runs to the south-east of the site, isolating the Kelham and Averham FCA from the rest of the main scheme alignment.

The Biological Records Search returned records of GCN having been recorded as present in a pond to the north-west of the Kelham and Averham FCA site (identified as F031).

As seen on the figure, 11 potentially suitable waterbodies have currently been identified within the 0-250m buffer area of the scheme (F025 to F035). The HSI surveys for these waterbodies will be conducted within the winter months of 2022. With eDNA surveys planned for the 2023 survey season as required.

One potentially suitable waterbody, to the north-east of F031, has also been identified within the 250m – 500m boundary. Due to the presence of the biological record, suitable areas of linear habitat, and a lack of any major barriers to dispersal, we believe that the reduction of the survey boundary to 250m is not warranted within this area of the scheme. Therefore, the additional potentially suitable waterbody which may support GCN within the 250m – 500m boundary of the Kelham and Averham FCA (north-east of F031) will also be surveyed. As for other waterbodies to be surveyed within the 0-250m buffer, the HSI surveys for this waterbody will be conducted within the winter months of 2022. With eDNA surveys planned for the 2023 survey season as required.

It should be noted that due to the spatial distance and isolation of the Kelham and Averham FCA from the main scheme alignment, creating significant barriers to dispersal, we believe that the reduction to a 250m survey boundary is still justifiable across the main alignment of the scheme

as detailed in the section above.

Bat Survey Query – Response

Proposal: to survey a 100m buffer zone around the red line boundary for bats

Thank you for confirming that a 100 metre survey buffer around the preliminary red line boundary is considered broadly proportionate. Should any additional impacts be identified during the scheme design, we will ensure that we review the suitability of the 100 metre survey buffer.

Please see below for our proposed tree climbing methodology as follows:

1. Initial tree climbing inspections of currently unsurveyed areas (Kelham and Averham Flood Compensation Area) will be undertaken during the remainder of 2022 (October – December) when trees have dropped much, if not all, of their foliage to allow for full inspection of potential roosting features (PRF). Our suitably experienced tree climbing bat ecologists will inspect all PRFs on each tree that can be safely accessed.
    - These trees will then undergo further tree climbing inspections only if there are identified PRFs, and these climbed inspections would be undertaken between May and August/September in 2023. They will be subjected to the associated number of surveys for the roost suitability, spaced at least 2 weeks apart, where possible i.e.
        - two climb inspections of trees with moderate roost suitability with one survey undertaken between May and August, completed in September 2023 at latest.
        - three climb inspections of trees with high roost suitability with two surveys undertaken between May and August, completed in September 2023 at latest.

    These timing are with reference to the timings stated in the BCT good practice guidelines for emergence and re-entry surveys. It is considered that there is greater probability of finding a variety of roosts by undertaking tree climbing inspections during this period. If tree climbing inspections proceeded prior to this, surveys could result in a false negative result as only hibernation roosts are likely to be recorded. Furthermore, these survey timings reduce risk to surveyors as flooding is prevalent throughout the survey area in winter and earlier spring, which prevented access for numerous surveys in early 2022.

    If appropriate, this tree climbing methodology will also be used to complete the remaining visits for features we started surveys for in 2022, but were unable to complete all of the required visits due to resource and programme constraints of the scheme.

2. In situations where all features on a tree cannot be fully inspected or it is unsafe to climb, bat dusk emergence and / or dawn re-entry surveys will be undertaken in 2023, with reference to BCT good practice guidelines.

Please note that the DCO is currently programmed for submission in summer 2023. We will aim to complete the proposed bat surveys as early in the survey seasons as possible, whilst ensuring that the BCT good practice guidelines are followed, in order that the data is available to feed into

the baseline and assessment work documented within the ES. Where additional data is collected beyond the DCO submission date we will ensure that this is fed into the DCO examination process and is available to inform any additional mitigation as required.

We would welcome a discussion should you have any further queries upon review of our responses.

Thanks ever so much.

Kind regards

[redacted]
Senior Environmental Consultant
[redacted]

From: [redacted]
Sent: 23 September 2022 17:11
To: [redacted]
Cc: [redacted]
: A46 Newark Bypass: Initial Survey Advice

[redacted] Learn why this is important

Please find enclosed your Discretionary Advice Service response to your questions on surveys dated 7th June.

Please do not hesitate to let us know if you would like to set up a meeting to clarify any of the points within these letters respectively as per your contract, or if you wish to discuss next steps.

Kind regards,
Natural England Wildlife Licensing Service

www.gov.uk/natural-england
To help people consider the environment Natural England offers two chargeable services
- the Discretionary Advice Service (DAS), which can provide advice on planning/licensing proposals
- the Pre-submission Screening Service (PSS) for European Protected Species mitigation licence applications.

All Natural England offices and our Mail Hub are currently closed due to the Covid-19 pandemic – please send any documents to me by email not post – see the latest news on Covid-19 at **http://www.gov.uk/coronavirus**

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B. Appendix PRA results for buildings and structures

Appendix Table B-1: Results for buildings and structures with bat roosting potential within the survey area

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F002	Residential Lodge	Brick house with pitched tiled roof in good condition. Accommodation in roof space so limited roof void. Gaps behind barge boards on eastern gable could give access to internal roof and wall cavities. Gaps under soffits. Missing mortar on chimney stack. Hole in soffit boards under tiles at apex of southern gable. Missing and damage hanging tiles on the western aspect of the building, along with gaps between the hanging tiles and the soffits.	Evidence of bat droppings found on external sill from PCF Stage 2 supplier surveys in 2019 that was not associated with a feature. No evidence of bats recorded in 2022 or 2023 update surveys. Roost classified as moderate suitability for bats but the roost status is classified as inconclusive.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F003	Residential home	Brick walled single storey residential home. Gap under fascia on north end gives access to roof void. Roof unlikely to provide suitable void for hibernation due to temperature fluctuations associated with heating this residential building. Several small openings within the mortar of the ridge tiles at gable ends. Multiple small gaps under lifted tiles at both gable ends	No evidence of bats observed. Moderate suitability for roosting bats.	
F004	Disused commercial property	Mint Leaf - former restaurant building now derelict. Brick/wood framed single storey building with hipped synthetic tiled roof. Occasional gaps under eaves and lifted flashing on NE, SE and SW sides. Two storey section on NW side with tile clad gable end. Frequent gaps where cladding tiles broken, potential wall cavity access. Larger gaps under eaves - potential access to roof	No evidence of bats observed. High suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
		void. Faces onto line of trees with good connectivity. False ceiling throughout so no visibility of internal roof voids.		
F005	Derelict building	Derelict network of several old industrial buildings that are connected. Brick walled with slate roofing. Building is generally in very poor state with missing mortar and cracks in the brickwork across all faces of the building. Several gaps along the fascia on western, eastern and northern faces which may give access in to roof void along fascia. Several smashed windows and openings in the building which give access to the internal of the structure. Anecdotal evidence that the building is lived in.	No evidence of bats observed, High suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F006	Brick arched road bridge	Bridge archways on Great North Road Missing mortar, gaps in brickwork. Single feature at north end of viaduct on east side at apex of arch. Deep crevice with moderate roosting suitability.	No evidence of bats observed. Moderate suitability for roosting bats.	
				
F007	Newark Cricket Club main building	Newark Cricket Club building. Main building fascia slightly away from wall on the western side. Little no other suitable features on the structure.	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F008	Derelict barn	Dilapidated outbuilding. Two- storey brick barn with pitched tiled roof in poor state of repair. Roof felt lined. No roof voids. Single storey extension to east with part corrugated iron and part tiled roof. Two small extension on the building; One with corrugated iron and one with tiled roof. Hole in wall. Access for bats or bird but open internally. Access under tiles along eaves. Crevices in brickwork on west gable Gaps under eaves of eastern barn. Potential access under tiles along eaves and under raised tiles. Suitable for occasional summer and night roosts. Open internally and exposed.	No evidence of bats observed. Moderate suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F009	Residential garage	Garage with false ceiling and pitched tiled roof. Gaps at lifted tiles at eaves on southern and northern side.	No evidence of bats observed. Moderate suitability for roosting bats.	
F010	Farmhouse	Main house. Two-storey brick construction with pitched tiled roof. Occasional lifted roof tiles but roof felt lined (according to owner).	No evidence of bats observed. Initially assessed as low suitability for roosting bats provided in PRA. Confirmed roost following emergence survey on F009.	
F012	Brick extension	Single storey extension. Brick construction with pitched, tiled roof. Occasional gaps under tiles at eaves and lifted tiles. Could provide access to internal void.	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F013	Outbuilding	Outbuilding, brick barn with open tiled roof in northern end, potentially suitable for BLE roosting. Frequent lifted tiles on roof and ridge and access via unglazed windows. False ceiling on southern end with possible accessible roof void.	No evidence of bats observed. Moderate suitability for roosting bats.	
F016	Brick Windmill	Brick windmill. Brick structure in state of disrepair with frequent superficial crevices where mortar missing. Floors present internally and may provide sheltered internal voids or crevices. Numerous unglazed windows give access to internal spaces but likely to be exposed unless internal voids are present. Appears to be well used by domestic pigeons.	No evidence of bats observed. Moderate suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F023	Manor house	Brick-built 1903 manor. Hip and valley, pan tile roof with dormers. No significant gaps or cracks seen in the roof or brickwork. Rear of building dormer has some small gaps on the gable.	No evidence of bats observed. Moderate suitability for roosting bats.	
F028	Outbuilding	Breezeblock walled farm outbuilding/barn with single sheet corrugated open pitch roof. Small extension built on to barn structure with same material and flat corrugated roof. Several small openings where the roof sites on the breeze-block wall. Also a crack within the breezeblock wall which likely gives access to the internal wall cavity. Gaps under flashing throughout the feature. Also a large open window which gives access to the interior of the structure.	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F034	Residential house	Hayloft of two storey brick building with tiled roof. Boarded up ventilation hatches on south side and gap above. Broken and lifted tiles present throughout the roofing.	No evidence of bats observed. Moderate suitability for roosting bats.	
F037	Outbuilding	Brick walled farm outbuilding with corrugated flashing and single sheeted open gable roof. Area of thick ivy growth on the west face of the building, spanning the length of the wall.	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F050	Outbuilding	Brick-walled outbuilding in school farm cottage. Slate tiled roof with several gaps under lifted roof tiles on both pitches.	No evidence of bats observed. Moderate suitability for roosting bats.	
F053	Residential house	School farm cottage main building. Brick-walled residential house with clay-tiled roof. Numerous gaps under lifted tiles on both pitches that may give access to a potential roof cavity.	No evidence of bats observed. Moderate suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F054	Bungalow	Brick walled single-storied residential property with cross hipped roof. Wooden barge board on one gable and a flat roofed PVC extension / conservatory on southwestern face. Clay tiled roof with a single chimney. Several gaps under lifted tiles and around the flashing of the hip of the roof. Also multiple gaps under tiles at the gable ends.	No evidence of bats observed. Moderate suitability for roosting bats.	
F057	Residential house	Brick walled residential barn conversion with extensive ivy growth at the rear of the barn. Large entrance at front of the structure. Several large windows and opening which make the internal of the building light and quite exposed.	No evidence of bats observed. Low suitability for roosting bats.	
F059	Static caravan	Static caravan with pitched metal room. Appears in good	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
		condition and well sealed on all sides. Wooden shuttering on rear gable slightly raised providing potential access to internal wall void.		
F060	Concrete flyover	Expansion gaps between steel and concrete sections of flyover. Likely to be wide and relatively exposed but could be used occasionally.	No evidence of bats observed. Low suitability for roosting bats.	
F061	Disused warehouse depot	Large brick warehouse building with corrugated metal sheet cladding and roof. Limited roosting opportunities under corrugations at eaves but appears sealed so no internal access for bats. No access for internal inspection due to presence of asbestos.	No evidence of bats observed. Low suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F062	Disused warehouse depot	Single storey brick building with corrugated, shallow pitched metal roof. Boarded up doors and windows - occasional gaps around edges could provide access for bats. Gaps under edge of metal roofing on west side and north end could also provide access for bats. No internal access for survey due to the presence of asbestos.	No evidence of bats observed. Moderate suitability for roosting bats.	
F063	Disused warehouse depot	Single storey brick warehouse building with pitched corrugated asbestos sheet roof. Boarded up doors and windows with small gaps at edges. Gaps under sheet at gable ends and at apex of western gable. No access for internal survey due to the presence of asbestos.	No evidence of bats observed. Moderate suitability for roosting bats.	

Feature number	Structure	Description of building	Assessment of Bat Roosting Suitability and Evidence of Bats	Photograph
F064	Disused warehouse depot	Single storey brick building with pitched metal sheet roof and boarded up windows and doors. Frequent potential access points on south side between roof sheets and insulation. Gaps in brickwork. Gaps at edges of boards. No access for internal survey due to the presence of asbestos.	No evidence of bats observed. Moderate suitability for roosting bats.	

C. Appendix: PRA and aerial inspection results for trees

Appendix Table C-1: Results of trees with bat roosting potential within the survey area

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F004	Turkey oak *Quercus cerris*	No	Low	Low	GLTA	Some rot damage and dead wood. Rot hole full of debris	
F011	Sycamore *Acer pseudoplatanus*	No	Low	Low	GLTA	Occasional small callus features and rot features with dead wood.	
F012	Horse chestnut *Aesculus hippocastanum*	No	High	High	GLTA	Rot holes and hollow branches present on north side, flaking bark throughout.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F013	Beech *Fagus sylvatica*	No	Moderate	Moderate	GLTA, TC	Large rot hole present 4m high and 2 small callus rolls present 6m high.	
F014	Beech	No	Low	Low	GLTA	7 x upward facing callus roll features on west side of trunk. Likely to be wet but need inspection.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F016	Sweet chestnut *Castanea sativa*	No	Moderate	Negligible	GLTA, TC	Several features present including a small tear out with possible cavity 3m on east facing limb; callus roll cavity on northwest side of trunk 4m high; hazard beam on west facing branch 4m high; and large callus roll on southwest facing branch 10m high. Downgraded to negligible following a tree climbing assessment due to no significant cavities being present in the identified features.	
F018	Horse chestnut	No	Moderate	Negligible	GLTA, TC	Split in trunk that forms cavity, appears damp internally. Downgraded to negligible following a tree climbing assessment due to the cavity being wet and full of mud.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F019	Beech	No	Moderate	Negligible	GLTA, TC	Two small callus rolls present on west facing branch 10m high. Split on underside of branch that is south facing, 7m high. Rot hole on trunk at 3m high. Downgraded to negligible following a tree climbing assessment due to cavities not extending inwards and one being full of water.	
F020	Beech	No	Moderate	Negligible	GLTA, TC	Small upward facing callus roll on north facing branch, 9m high. Small callus roll on west side of trunk, 9m high. Downgraded to negligible following a tree climbing assessment due to cavities being occluded and not extending inwards.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F021	Beech	No	Moderate	Negligible	GLTA, TC	Mature beech with three rot holes on the end of branches on north side, 3, 5 and 8m high. Small callus roll near end of horizontal limb on south side, 8m high. Dead limb in upper canopy with rot holes but likely open above. Downgraded to negligible following a tree climbing assessment due to cavities not being present or being occluded.	
F022	Sycamore	No	Moderate	Low	GLTA, TC	Mature sycamore with callus roll on top side of southern limb that appears to extend upwards into the branch, 10m high. Downgraded to Low following a tree climbing assessment due to cavities being open and occluded.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F023	Ash *Fraxinus excelsior*	No	Moderate	Negligible	GLTA, TC	Coppiced ash with small knot hole that extends upwards, southeast facing, 3m high. Downgraded to negligible following a tree climbing assessment due to cavity being superficial.	
F025	Sycamore	No	Low	Low	GLTA	Possible veteran sycamore with dense ivy encompassing main trunk.	
F027	Red oak *Quercus rubra*	No	Low	Low	GLTA	Mature red oak, some areas of scarring and lifted bark.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F028	Pine species *Pinus* sp.	No	Low	Low	GLTA	Mature pine with some areas of dead wood and lifted bark.	
F029	Pine species	No	Low	Low	GLTA	Mature pine with some areas of dead wood and lifted bark.	
F030	Pine species	No	Low	Low	GLTA	Mature pine with some areas of dead wood and lifted bark.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F031	Pine species	No	Low	Low	GLTA	Mature pine with some areas of dead wood and lifted bark.	
F032	Pine species	No	Low	Low	GLTA	Mature pine with some areas of dead wood and lifted bark.	
F033	Pedunculate oak *Quercus robur*	No	Low	Negligible	GLTA, TC	Possible veteran oak. No significant features, some small desiccation fissures on dead limbs throughout. Downgraded to negligible following a tree climbing assessment due to features being superficial and exposed.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F034	Pedunculate oak	No	Moderate	High	GLTA, TC	Woodpecker / desiccation hole, extends inwards into limb, southwest facing, 5.5m high. Upgraded to high following a tree climbing assessment due to cavity extending into a large wide cavity within the limb that extended upwards. Cavity has a polished entrance suggesting use by animals.	
F035	Pedunculate oak	No	Low	Low	GLTA	Possible veteran oak. Small snapped dead limb on southern side tree, 8m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F036	Sweet chestnut	No	Low	Low	GLTA	Mature sweet chestnut with some areas of insignificant lifted bark.	
F037	Ash	No	Low	Low	GLTA	Mature ash with small knot hole that looks to extend in, west facing, 4m high.	
F038	Horse chestnut	No	Low	Low	GLTA	Two small sections of lifting bark, one east facing, 8m high. The other north facing, 7m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F040	Sycamore	No	Low	Low	GLTA	Mature sycamore with section of desiccated bark, with some areas of lifting plates of bark. East facing, 6m high.	
F041	Sessile oak *Quercus petraea*	No	Low	Low	GLTA	Mature oak with dense ivy cover encompassing main trunk.	
F042	Sycamore	No	Low	Low	GLTA	Mature sycamore with dead wood, rot holes and peeling bark, all superficial with no significant features or cavities.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F043	Horse chestnut	No	Moderate	Low	GLTA, TC	Semi-mature horse chestnut with subsidence split that may extend upwards, southwest facing, 4.5m high. Knot hole that extends upwards, with another potentially conjoined knot hole above that may expose the cavity, both north facing, 2.5m high. Downgraded to Low following a tree climbing assessment due to features being occluded.	
F044	Ash	No	Low	Low	GLTA	Mature ash with a weld with limited potential, north facing, 6m high.	

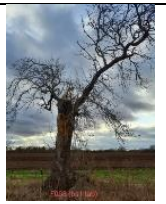
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F045	Ash	No	Low	N/A	GLTA	Mature ash with some desiccation fissures but all open upwards. Southwest facing 5.5m high.	
F046	Field maple *Acer campestre*	No	Moderate	Negligible	GLTA, TC	Mature field maple, with several features, including two calluses on branch 4m high on north side, one rot hole on large branch on south side 3m high. West facing callus roll at base of small branch off north-western limb, could lead to cavity. Appears to be staining at entrance. Downgraded to Negligible following a tree climbing assessment due to cavities being occluded.	

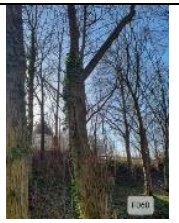
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F047	Pedunculate oak	No	High	Low	GLTA, TC	Veteran oak, very large cavity in main stem that extends upwards, but high cobwebbed, west facing, 2m high. Knott hole with suitability on eastern side, 4m high. Downgraded to Low following a tree climbing assessment due to feature being exposed and open to the sky, cobwebbed and damp.	
F048	Ash	No	Moderate	Low	GLTA, TC	Mature ash with large knot hole on western side that extends upwards into cavity of main stem, 3.5m high. Downgraded to Low following a tree climbing assessment due to cavities being occupied by bird nests and not extending upwards.	

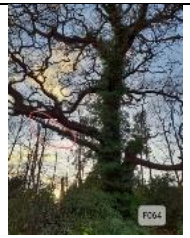
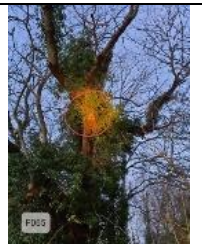
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F049	Ash	No	Moderate	Low	GLTA, TC	Mature ash with two knot holes with suitability. One southwest facing, 5m high. The other west facing, 7m high. Downgraded to Low following a tree climbing assessment due to cavities being wet.	
F050	Ash	No	High	N/A	GLTA	Mature ash with large cavity extending into the heartwood with two openings; one north facing, 3m high; the other south facing, 4m high. Small cavity on eastern side, 2m high. Tear-out / rot hole on eastern side, 5m high. Rotted branch on eastern side with suitability, 6m high. Tree unsafe to climb.	

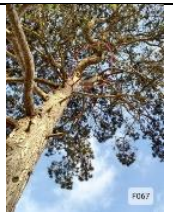
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F051	Ash	No	Moderate	Low	GLTA, TC	Mature ash with large cavity in main stem with two openings; one west facing, 3m high; the other east facing, 3.5m high. The cavity doesn't appear to extend further that the opening, but some small gaps present within. Small knot hole that extends into cavity, west facing, 2m high. Downgraded to Low following a tree climbing assessment due to the cavity being open to the sky and exposed.	
F052	Ash	No	Low	N/A	GLTA	Ash with dense ivy cover encompassing main trunk.	

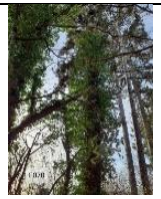
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F054	Ash	No	Low	N/A	GLTA	Mature ash with two broken limbs. Both north facing and 5m high. Cracks on limbs don't extend inwards to form a cavity or space.	
F055	Ash	No	Low	N/A	GLTA	Mature ash with snapped limb with limited potential, east facing, 3m high.	
F056	Ash	No	Low	N/A	GLTA	Mature ash with several knot holes and rot fissures. All appear to be superficial and not lead to cavities.	
F057	Pedunculate oak	No	High	Low	GLTA, TC	Large callus roll on northwest side of trunk, 5m high. Second callus roll on main limb on north-western side, 12m high. Downgraded to Low following a tree climbing assessment	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						due to cavities being exposed and occluded.	
F058	Apple *Malus x domestica*	No	Moderate	Low	GLTA, TC	Apple in old orchard with hollow trunk and limbs. Opening at the top of the trunk. Potentially sheltered cavity in horizontal limbs. Downgraded to Low following a tree climbing assessment due to cavities being occluded.	
F059	Ash	No	Low	N/A	GLTA	Mature ash with scarring on the main trunk but all superficial with no cavities. Tear-out scar on top limb with callus roll that extends inwards slightly, north facing, 5.5m high.	

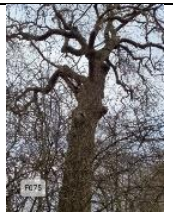
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F060	Ash	No	Moderate	Moderate	GLTA, TC	Ash with tear-out cavity that extends upwards into main stem, north facing, 3.5m high. Tree climb surveyed identified that the internal of the cavity was dry and extended upwards into the trunk.	
F061	Beech	No	Moderate	Negligible	GLTA, TC	Semi-mature beech with rot cavity that extends up into the main stem. Downgraded to Negligible following a tree climbing assessment due to cavities being superficial.	
F062	Willow species *Salix* sp.	No	Low	N/A	GLTA	Willow. with split limb that may extends inwards, northwest facing, 3m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F063	Lime species *Tilia* sp.	No	Low	N/A	GLTA	Semi-mature lime with dense ivy cover.	
F064	Pedunculate oak	No	Moderate	Low	GLTA, TC	Oak with dense ivy cover encompassing main trunk. Also, a dead limb with a section of lifted bark that is east facing, 6m high. Section of lifted bark that is west facing. Downgraded to Low following a tree climbing assessment due to cavities being superficial.	
F065	Ash	No	Moderate	Moderate	GLTA, TC	Ash with two knot holes that extend inwards into limbs. One west facing, 5.5m high. The other south facing, 6m high. Tree climbing inspection identified	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						one of the cavities as extending backwards and being sheltered.	
F066	Pine species	No	Moderate	Low	GLTA, TC	Dying pine with cavity at the base of scarred tissue on main trunk that extends upwards; north facing, 2m high. Downgraded to Low following a tree climbing assessment due evidence of cavity being occupied by birds.	
F067	Pine species	No	Low	N/A	GLTA	Mature pine with section of lifted bark, 10m high and a split limb that's south facing and 6m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F068	Sycamore	No	Moderate	Moderate	GLTA, TC	Mature sycamore with a knot hole that extends inwards into cavity, 6m high. Tree climbing inspection identified internal cavities to be extending inwards and dry.	
F069	Sycamore	No	Low	N/A	GLTA	Sycamore with dense ivy cover encompassing trunk.	
F070	Pine species	No	Low	N/A	GLTA	Pine with dense ivy cover encompassing trunk.	
F071	Sycamore	No	High	High	GLTA, TC	Mature sycamore with large tear-out cavity that extends up into the main stem, 3m high. Tree climbing inspection identified several sheltered knot	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						holes that extended upwards into the trunk.	
F072	Ash	No	Low	N/A	GLTA	Mature ash with butt rot that possibly extends upwards into main stem. Wood on main trunk also showing signs of decay.	
F073	Willow species *Salix* sp.	No	Moderate	Low	GLTA, TC	Willow sp. with a cavity that possibly extends into the main stem, 5m high. Downgraded to Low following a tree climbing assessment due to cavities being unsheltered and superficial. Also, evidence of birds occupying lower cavity.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F074	Ash	No	Moderate	High	GLTA, TC	Mature ash with large rot cavity that extends into heartwood leading to two spherical cavities. Grey squirrels inside one cavity. Two entrances to cavity; one west facing, 4m high; the other east facing 4m high. Upgraded to high following a tree climbing assessment due to cavity extending far upwards into western and southern limbs.	
F075	Ash	No	Moderate	Negligible	GLTA, TC	Mature ash with two knot holes. One knot hole that is southeast facing and 6m high. The other knot hole is southwest facing and 5m high. Butt rot also present. Downgraded to negligible following a tree climbing assessment due to	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						evidence of cavities being occupied by bees with honeycombs present within and other cavities being occluded.	
F076	Sycamore	No	Moderate	N/A	GLTA	Mature sycamore with small cavity from desiccation fissure that is north facing and 7m high. May extend inwards but cannot assess from the ground.	
F077	Ash	No	Moderate	Low	GLTA, TC	Ash with knot hole that may extend inwards into main trunk; north facing and 5m high. Downgraded to Low following a tree climbing assessment due to cavity being occupied by squirrels and relatively shallow.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F078	Willow species	No	Moderate	N/A	GLTA	Willow with south facing cavity that may extend inwards.	
F079	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ivy covered ash tree.	
F080	Pedunculate oak *Quercus robur*	No	Moderate	High	GTLA, TC	Veteran oak with large amounts of rot in trunk. Upgraded to high following a tree climbing assessment due to large rot cavity extending deep into the trunk and additional features being present that couldn't be seen from ground.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F081	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in good condition. Small callus in upper limb.	
F082	Beech *Fagus sylvatica*	No	Moderate	Low	GTLA, TC	Mature beech in good condition. Rot hole low down on the east side of trunk that offers limited shelter. Three callus rolls on west of trunk at 5, 7 and 9m high. Downgraded to Low following a tree climbing assessment due to features being occluded.	
F087	Lime species *Tilia* sp.	No	Low	N/A	GTLA	Lime tree with ivy cover encompassing trunk.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F088	Lime species *Tilia* sp.	No	Low	N/A	GTLA	Lime tree with ivy cover encompassing trunk.	
F089	Sycamore *Acer pseudoplatanus*	No	Moderate	Low	GTLA, TC	Sycamore with ivy cover around the trunk. Small callus features on northern side at 3.5m and 6m high. Downgraded to Low following a tree climbing assessment due to callus feature being superficial.	
F090	Lime species *Tilia* sp	No	Low	N/A	GTLA	Mature lime in hedgerow. Feature in split limb, northwest facing.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F091	Lime species *Tilia* sp.	No	Low	N/A	GTLA	Mature lime in hedgerow. Upward facing rot hole on east side of trunk, 2.5m high. Highly cluttered around access point.	
F096	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in hedgerow with ivy cover that may obscure features.	
F097	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in hedgerow with ivy cover that may obscure features.	
F098	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in hedgerow with ivy cover that may obscure features.	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F100	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in hedgerow with ivy cover that may obscure features.	
F101	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore in hedgerow with ivy cover that may obscure features.	
F103	Pedunculate oak *Quercus robur*	No	Low	N/A	GTLA	Mature oak with no obvious roosting features. Dense ivy cover may obscure features.	
F108	Apple *Malus* sp.	No	Low	N/A	GTLA	Apple tree with callus rot hole in trunk. Cavity open at the top, so it provides limited shelter.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F110	Apple *Malus* sp.	No	Low	N/A	GTLA	Apple tree with a cavity in main limb which provides shelter opportunities.	
F111	Pear *Pyrus communis*	No	Moderate	Negligible	GTLA, TC	Pear with a hole in the side of the trunk, 4m high. Downgraded to Negligible following a tree climbing assessment due to feature being open to the sky. Also, evidence of feature being previously occupied by birds.	
F116	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Semi mature Ash with dense ivy cove.	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F122	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore with tear out cavity on main stem.	
F123	Oak *Quercus* sp.	Yes	High	Confirmed	GTLA, TC	Veteran oaks, observed from road. Confirmed roost from bat tree climb inspection due to a noctule *Nyctalus noctula* roosting in split branch end feature.	**No photograph available.**
F130	Crack Willow *Salix fragilis*	No	Moderate	Negligible	GTLA	Rot hole next to branch stump on south side 4m high that could lead to trunk cavity. Flaking bark on upper limb on south side, 8m high.	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F135	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Small callus on branch end 5m high on south side of tree.	**No photograph available.**
F138	Willow *Salix* sp.	No	Low	N/A	GTLA	Dead branches without bark, potential for features in trunk partially obscure by willows leaves, potential access for bats.	**No photograph available.**
F141	Willow *Salix* sp.	No	Low	N/A	GTLA	Flaking bark on west facing branches, split branch upwards facing but has potential for cavity not exposed to elements, willow branches obscure a lot of the trunk.	
F143	Willow *Salix* sp.	No	Low	N/A	GTLA	Callus roll depth unknown 2m high, south facing.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F144	Willow *Salix* sp.	No	Low	N/A	GTLA	Callus roll depth unknown, no more than 2m off the ground.	
F146	Willow *Salix* sp.	No	Low	N/A	GTLA	Callus roll 0.5-1.5m from ground, cavity extent unknown.	
F147	Willow *Salix* sp.	No	Moderate	Moderate	GTLA	Callus roll depth unknown, 0.5-2m above ground.	
F148	Ash	No	Low	Low	GTLA	Numerous lifted bark, and small callus roll depth unknown on north west side 8m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F149	Willow *Salix* sp.	No	Low	N/A	GTLA	Callus fold 6m high, extension unknown, slight cluttered drop zone.	
F150	Willow *Salix* sp.	No	Low	N/A	GTLA	Callus folds depth unknown.	
F151	Willow *Salix* sp.	No	Low	N/A	GTLA	Split south facing limb, drop zone slightly cluttered.	
F152	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Trunk cavity over 40cm wide, potential to extent upwards.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F153	Willow *Salix* sp.	No	Low	N/A	GTLA	Superficial cracks along the base of trunk that are open to the sky, small tearout cavity on limb that may go in but looks to be superficial, 7 high west facing.	
F154	Willow *Salix* sp.	No	Low	N/A	GTLA	Small cavity present in upper trunk, 7.5m south facing.	
F155	Willow *Salix* sp.	No	Low	N/A	GTLA	Cavities in base of trunk low to ground and cobwebbed, 2m high, north facing. Small tearout on limb that is open to the sky, 7m high west facing.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F156	Willow *Salix* sp.	No	Low	N/A	GTLA	Small desiccation hole that may extend in, 5m high, west facing. superficial tearout, 6m high, west facing.	
F157	Ash	No	Moderate	Moderate	GTLA, TC	Mature ash with four woodpecker holes, one 5m high northeast facing, and 3 southeast facing 6m, 6.5m and 7m high. Bat tree climb assessment identified features to extend inwards and be sheltered.	
F158	Ash	No	Low	N/A	GTLA	Ash with snapped trunk, some gaps around snapped trunk, all open to the sky, 3m high, south facing.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F159	Ash	No	Moderate	N/A	GTLA	Mature ash, heartwood completely rotted with large hollow trunk open to the sky, large tearout which extends upwards 5m high, southeast facing, callus roll that looks to be superficial, 3m high, northeast facing. Tree unsafe to climb.	
F160	Ash	No	Moderate	Low	GTLA, TC	Mature ash with desiccation fissures at the top of main stem, 7m high, northeast facing. Downgraded to low following tree climb assessment due to features being shallow, exposed and superficial.	
F161	Ash	No	Low	N/A	GTLA	Mature ash, callus roll 6.5m high, northeast facing, looks to be superficial.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F162	Poplar *Populus alba*	No	Moderate	High	GTLA, TC	Poplar with three woodpecker holes, 6-7m high, west, south & southeast facing. Upgraded to high following tree climb assessment due the identification of additional desiccation features.	
F163	Willow *Salix* sp.	No	Low	N/A	GTLA	Willow with snapped limb, 4m high, northeast facing.	
F164	Ash	No	Low	N/A	GTLA	Ash with three small callous rolls, that do not seem to extend inwards into bark, 5, 5.5 & 6m high, all east facing. Hornet nest in butt rot cavity at the bottom of the tree.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F171	Pedunculate oak *Quercus robur*	No	Moderate	N/A	GTLA	Dead Pedunculate oak. Tag 1664. Holes and flaking wood and bark on west side of trunk. Splits in North side of southern stem.	
F172	Pedunculate oak *Quercus robur*	No	Moderate	N/A	GTLA	Mature pedunculate oak two woodpecker holes on east side 10m high.	
F173	Pedunculate oak *Quercus robur*	No	Moderate	Moderate	GTLA	Mature pedunculate oak on edge of bank with no tag. Hole with black staining beneath 10m high on west side. Woodpecker Hole	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						west side 14m high where trunk splits.	
F174	Norway maple *Acer platanoides*	No	High	High	GTLA	Tree tag 0081. Norway maple between lawn and agricultural field. Large bark fissure that becomes trunk hollow on south side. Could be inspected from the ground.	
F175	Ash *Fraxinus excelsior*	No	High	N/A	GTLA	Mature ash on edge of woodland. Feature is a woodpecker hole 15m high on north edge clearly visible from field. Appears to lead to large trunk cavity.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F177	Ash *Fraxinus excelsior*	No	Moderate	N/A	GTLA	Mature ash with woodpecker Hole 18m high on northwest limb.	
F178	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash tree with three woodpecker holes from 6m to 7m high on west side.	
F179	Ash *Fraxinus excelsior*	No	Moderate	N/A	GTLA	Ash tree with trunk cavity extending upwards on west side 5m high.	
F198	Sycamore *Acer pseudoplatanus*	No	Moderate	High	GTLA	Sycamore close to distinctive mature sweet chestnut with large woodpecker hole on south side 1.8m up extending into large trunk cavity upwards. Also, on	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						northeast side 6m suggesting large cavity.	
F199	Sweet chestnut *Castanea sativa*	No	Low	N/A	GTLA	Mature sweet chestnut with small cavities and fissures offering superficial shelter.	
F206	Beech *Fagus sylvatica*	No	Moderate	N/A	GTLA	Mature beech next to cemetery. Large rot hole on underside of branch on southwest side of tree, 10m high. May extend into branch cavity. Smaller callus feature on small limb a base of larger limb on west side.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F207	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Sycamore callus on west side 6m high.	
F208	Yew *Taxus baccata*	No	Low	N/A	GTLA	Yew on west side of track. Tear out at 2m high extends up but provides limited shelter and cobwebbed at time of survey.	
F209	Sycamore *Acer pseudoplatanus*	No	Moderate	N/A	GTLA	Pollarded sycamore on east side of path with hollow trunk and multiple woodpecker holes. Appears to be open at top reducing suitability but requires climbing to confirm.	
F210	Sycamore *Acer pseudoplatanus*	No	Moderate	N/A	GTLA	Two sycamore trees next to dead tree. Larger tree has rot hole at 5m and 12m high. Smaller tree has rot holes 5m, 8m and 0m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F211	Hornbeam *Carpinus betulus*	No	Moderate	N/A	GTLA	Large dead hornbeam with rot hole extending into trunk cavity on north side 14m high.	
F212	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Sycamore with several small woodpecker holes not extending into cavities.	
F213	Apple *Malus* sp.	Yes	Confirmed	Confirmed	GTLA	Confirmed roost. Bat seen 1.6m up in cavity on apple tree leading upwards. Species retreated further into the cavity before it could be identified.	

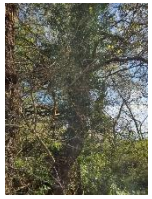
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F214	Apple *Malus* sp.	No	High	HighN/A	GTLA	Apple tree with large upwards extending cavity 1m and 2m high.	
F215	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with large upwards extending hollow trunk limb 1.8m high.	
F216	Apple *Malus* sp.	No	Low	N/A	GTLA	Apple tree with downwards sloping cavity.	**No photograph available**
F217	Apple *Malus* sp.	No	Moderate	ModerateN/A	GTLA	Apple tree with 3 holes into hollows. Some are exposed to elements.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F218	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with cracked trunk near base where hollow extends into large cavity upwards.	
F219	Apple *Malus* sp	No	High	N/A	GTLA	Apple tree with trunk cavities extending upwards into significant hollow.	
F220	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with 2 holes extending into trunk cavities upwards.	
F221	Apple *Malus* sp.	No	Moderate	N/A	GTLA	Apple tree with holes extending into cavities but not angling upwards.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F222	Apple *Malus* sp.	No	Moderate	N/A	GTLA	Small holes on apple tree into minor trunk cavity.	
F223	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with holes extending into upwards trunk cavity.	
F224	Apple *Malus* sp.	No	Low	N/A	GTLA	Small hole leading to cavity extending downwards.	
F225	Apple *Malus* sp.	No	Moderate	N/A	GTLA	Apple tree with holes extending into cavity with cobwebs suggesting limited use.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F226	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with woodpecker hole extending into upwards trunk cavity.	
F227	Apple *Malus* sp.	No	High	N/A	GTLA	Apple tree with holes extending into large trunk cavity.	
F228	Apple *Malus* sp.	No	Moderate	N/A	GTLA	Trunk cavity extending upwards into upper limb.	
F231	Poplar *Populus* sp.	No	Moderate	N/A	GTLA	Mature poplar in group of trees 10m from path. Leaning northeast. Woodpecker hole 6m high, extends into likely trunk cavity.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
						Second rot feature 10m high.	
F232	Ash *Fraxinus excelsior*	No	Moderate	N/A	GTLA	Mature ash with two rot holes and a woodpecker hole on eastern limb approximately 10m to 12m high.	
F233	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore next to path, rot hole on northwest side 10m high does not appear to extend in.	
F234	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Dead or dying sycamore with ivy cover, rot features and flaking bark but no significant cavities.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F235	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Four stem sycamore, Callus roll on east side of eastern stem 6m high. Black staining at bottom of hole. Appears to extend up but cobwebbed.	
F236	Apple *Malus* sp.	No	Moderate	N/A	GTLA	Apple tree east of gate. Rot hole on end of branch 2m high on north side. Extends in along branch at least 30cm.	
F240	Field maple *Acer campestre*	No	Moderate	N/A	GTLA	Multi stemmed field maple with rotting heart wood that has multiple desiccation cavities, and five cavities all south facing, 1.5m high.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F241	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F242	Willow *Salix* sp.	No	Low	N/A	GTLA	Knot hole, extends slightly in but not significantly, on Willow sp., approximately 6m high east facing.	
F243	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Mature multi stemmed willow sp. with vertical crack in trunk, low to ground but extends upwards. west facing, 1m high.	
F258	Ash *Fraxinus excelsior*	No	Moderate	N/A	GTLA	Multi stemmed ash tree, small crack in stem which appears to extend inwards, southeast facing, 5m high.	

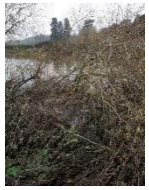
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F259	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Multi stemmed willow with snapped limb over hanging ditch, may extend inwards. Approximately 3.5m high west facing.	
F260	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Willow with multiple rot hole features. One on main stem west facing 1.5m high extends inwards. Two slightly higher up to right on branch west facing 3m high extends inwards. Three on branch extends into branch west facing 3m high.	
F261	Willow *Salix* sp.	No	High	N/A	GTLA	Mature multi stemmed willow next to ditch with Seven features Including three knot holes, one tear out cavity, two split branches and one area of lifted bark.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F262	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Multi stemmed willow over hanging dyke, with rot hole in middle of stem approximately 4.5m high south facing.	
F263	Willow *Salix* sp.	No	Low	N/A	GTLA	Willow with knot hole south facing approximately 4m high doesn't appear to extend upwards.	
F264	Willow *Salix* sp.	No	Low	N/A	GTLA	Willow over hanging dyke with rot hole over in main stem approximately 3m high south facing.	
F265	Willow *Salix* sp.	No	Moderate	N/A	GTLA	Mature willow with crack in trunk. May be exposed at top.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F322	Oak *Quercus* sp.	No	Low	N/A	GTLA	Ivy cover, no visible features but dead branches and potential rot.	
F324	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Mature ash multiple small cracks and holes, right next to busy main road A617.	
F325	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with ivy cover and knotted trunks. No cavities.	
F326	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Mature ash small holes near top 7m high and ivy cover, next to busy main road A617.	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F327	Hawthorn *Crataegus monogyna*	No	Low	N/A	GTLA	Hawthorn with extensive ivy cover offering superficial shelter.	
F328	Hawthorn *Crataegus monogyna*	No	Low	N/A	GTLA	Multiple old rotted hawthorn trees with extensive ivy cover but next to busy main road A617.	
F329	Holly *Ilex aquifolium*	No	Low	N/A	GTLA	Holly tree with small rot holes.	
F330	Unknown	No	Low	N/A	GTLA	Two large, rotted pieces of dead wood with cracks and crevices. Next to busy main road A617.	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F332	Blackthorn *Prunus spinosa*	No	Low	N/A	GTLA	Mature blackthorn with extensive ivy cover. Next to A617.	
F334	Pedunculate oak *Quercus robur*	No	Moderate	N/A	GTLA	Mature pedunculate oak with rotted limbs and multiple potential roost sites and ivy cover, couldn't inspect closely as next to A617	
F336	Pedunculate oak *Quercus robur*	No	Moderate	N/A	GTLA	Mature pedunculate oak with rotted wood, ivy cover and hole at the base with potentially significant cavity. Next to A617.	
F338	Unknown	No	Moderate	N/A	GTLA	Large rotted felled tree with cracks leading into potentially sizeable cavity and possibly some low pressure. Next to A617.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F340	Unknown	No	Moderate	N/A	GTLA	Old telephone pole with cracks leading to rotted interior.	
F342	Unknown	No	Low	N/A	GTLA	Thin telephone pole with woodpecker holes near top 5-6m high.	
F347	Unknown	No	Moderate	N/A	GTLA	Rotten tree trunk with extensive ivy. Trunk is rotten and has large upwards extending cracks.	
F349	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with cracked branch.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F350	Unknown	No	Moderate	N/A	GTLA	Standing dead wood with 2-3 rot holes.	
F351	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with rot holes that offer superficial cover.	
F352	Unknown	No	Low	N/A	GTLA	Standing dead wood with rot hole.	
F353	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with cracked branch offering superficial shelter.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F355	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F356	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F358	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F359	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F367	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F360	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F361	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F362	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F363	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with ivy encompassing trunk.	
F364	Willow sp. *Salix* sp.	No	Moderate	N/A	GTLA	Mature multi stemmed willow species with fresh snap which extends upwards east facing 2m high.	
F365	Willow sp. *Salix* sp.	No	Moderate	N/A	GTLA	Willow species knot hole 3m high which extends upwards and downwards into trunk, north facing.	
F366	Willow sp. *Salix* sp.	No	Moderate	N/A	GTLA	Mature multi stemmed willow with knot hole 8m high east facing. May extend upwards into stem.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F367	Ash *Fraxinus excelsior*	No	Moderate	N/A	GTLA	Ash tree with rot hole approximately 8m high north facing, appears to extend in from ground.	**No photograph available.**
F368	Willow sp. *Salix* sp.	No	Moderate	N/A	GTLA	Mature willow with tear out cavity, 9m high north facing, appears to extend upwards.	
F382	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Rot hole near base of crack willow.	
F383	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with cracked main stem.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F384	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow cracked branches. In the river so cannot assess properly.	
F385	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow Split branch	
F386	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with numerous small rot holes.	
F387	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Crack willow with crack at base with upward cavity.	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F388	Willow sp. *Salix* sp.	No	Low	N/A	GTLA	Cavity in trunk extending upwards.	
F389	Crack willow *Salix fragilis*	No	Low	N/A	GTLA	Rot hole at top of dead trunk.	
F391	Silver birch *Betula pendula*	No	Low	N/A	GTLA	Birch with ivy encompassing trunk.	
F392	Willow sp. *Salix sp.*	No	Moderate	N/A	GTLA	Willow species with large north facing frost crack, extends upwards into trunk, 5.5m high.	

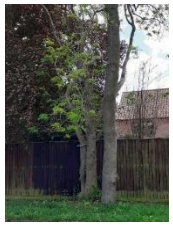
Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F393	Pedunculate oak *Quercus robur*	No	Moderate	Moderate	GTLA	Mature pedunculate oak. Feature is a rot hole under dead limb at 14m on south side.	
F395	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Mature sycamore with dense ivy cover	
F396	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Semi-mature sycamore with moderate ivy cover	
F401	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Twin stemmed sycamore with ivy cover	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F405	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Sycamore with shallow callus rolls on south side. Do not appear to extend in.	
F411	Scots pine *Pinus sylvestris*	No	Low	N/A	GTLA	Scots pine in good condition with ivy cover on trunk which could hire roosting features	
F412	Lime *Tilia* sp.	No	Low	N/A	GTLA	Semi-mature lime with dense ivy cover which could hide roost features	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F413	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Semi-mature sycamore with dense ivy cover which could hide roost features	
F414	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Semi-mature sycamore with dense ivy cover which could hide roost features	
F415	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Young sycamore with dense ivy cover which could hide roost features	**No photograph available.**

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F416	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Sycamore with dense ivy cover which could hide roost features	
F417	Lime *Tilia* sp.	No	Low	N/A	GTLA	Young lime with dense ivy cover which could hide roost features	
F418	Lime *Tilia* sp.	No	Low	N/A	GTLA	Semi-mature lime with dense ivy cover which could hide roost features	
F419	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Young sycamore with dense ivy cover which could hide roost features	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F420	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Young sycamore with dense ivy cover which could hide roost features	
F421	Lime *Tilia* sp.	No	Low	N/A	GTLA	Young lime with dense ivy cover which could hide roost features	
F422	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Young ash tree with light ivy cover which could hide roost features	
F423	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Young sycamore with dense ivy cover which could hide roost features	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F424	Sycamore *Acer pseudoplatanus*	No	Low	N/A	GTLA	Young sycamore with dense ivy cover which could hide roost features	
F425	Lime *Tilia sp.*	No	Low	N/A	GTLA	Young lime with dense ivy cover which could hide roost features	
F427	Lime *Tilia* sp.	No	Low	N/A	GTLA	Young lime tree with dense ivy cover which could hide roost features	
F448	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Ash with evidence of dieback. multi stem at breast height. 25cm DBH. Union join at 4m with potential cavity but unclear from ground level. no other features	

Tree Number	Tree Species	Evidence of bats	Assessed roosting suitability	Revised suitability following aerial inspection	Survey type	Description	Photograph
F450	Pedunculate oak *Quercus robur*	No	Low	N/A	GTLA	Pedunculate oak. multi stem at breast height. 30cm DBH. fairly dense ivy cover from base to canopy. Given semi maturity of the tree and ivy cover, assess as Low on precautionary basis.	
F460	Ash *Fraxinus excelsior*	No	Low	N/A	GTLA	Mature ash tree with callus roll on east side of trunk	

D. Appendix: Metadata for emergence/re-entry results and bat activity surveys

Appendix Table D-1: Summary of dates, times and weather data for bat transect surveys

Ref.	Visit no.	Date	Dusk/ dawn	Sunrise / sunset	Start time	End time	Start temp. (°C)	End temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
BT01	1	26/04/2022	Dusk	20:22	20:26	22:16	9	9	7	1	None	Light breeze, 90%, no rain 24hr prior to survey	NJ	CT
BT01	2	10/05/2022	Dusk	20:47	20:47	22:47	15	11	8	1	None	Overcast, warm evening	JG	EF
BT01	3	15/06/2022	Dusk	21:31	21:31	23:32	18	17	0	2	None	Warm, partially cloudy and light breeze	EF	RK
BT01	4	16/06/2022	Dawn	04:36	02:21	04:36	14	14	0	0	None	Dry and cool, clear sky	EF	RK
BT01	5	14/07/2022	Dusk	21:23	21:23	23:23	15	14	0	0	None	Warm, clear sky and no wind	RK	MF
BT01	6	17/08/2022	Dusk	20:27	20:27	22:27	18	16	6	1	None	Warm overcast evening	MF	BN
BT01	7	05/09/2022	Dusk	19:43	19:43	21:45	19	19	7	1	None	Light wind, cloudy and humid	RK	CT
BT01	8	13/10/2022	Dusk	18:12	18:12	20:13	14	10	3	2	None	N/A	CRM	RK
BT02	1	27/04/2022	Dusk	20:24	20:24	22:24	8	9	8	2	None	Overcast and dull most of the day	NJ	CT
BT02	2	11/05/2022	Dusk	20:48	20:48	22:48	12	10	0	3	None	Clear brisk evening, slight cold	JG	EF
BT02	3	28/06/2022	Dusk	21:34	21:34	23:34	18	17	3	1	None	Warm clear night	JV	MN
BT02	4	13/07/2022	Dusk	21:24	21:24	23:24	17	15	0	0	None	Warm, clear sky, no wind	RK	LA
BT02	5	14/07/2022	Dawn	04:54	02:51	04:56	13	12	0	0	None	Cool, clear sky, no wind	RK	LA
BT02	6	08/08/2022	Dusk	20:45	20:50	22:50	21	18	0	0	None	Warm clear night	JV	AW
BT02	7	06/09/2022	Dusk	19:41	19:41	21:45	19	17	7	1	None	Warm, light wind with some overcast	RK	CT

Ref.	Visit no.	Date	Dusk/ dawn	Sunrise / sunset	Start time	End time	Start temp. (°C)	End temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
BT02	8	12/10/2022	Dusk	18:15	18:15	20:15	14	12	7	2	None	Overcast, mild	CRM	RK
BT03	1	22/08/2022	Dusk	20:15	20:15	22:01	18	16	8	1	Light rain	Warm overcast, evening	JG	MF
BT03	2	22/09/2022	Dawn	06:49	04:49	06:49	10	11	2	1	None	Brisk clear evening	MN	MF
BT03	3	25/10/2022	Dawn	07:48	05:50	07:52	10	10	0	1	None	Brisk, clear, no wind	MN	CRM
BT03	4	21/04/2023	Dawn	05:52	03:46	05:52	9	9	8	1	None	Overcast	MF	CRM
BT03	5	31/05/2023	Dawn	04:44	02:45	04:50	11	11	8	2	None	Overcast, light wind and mild	SB	RM
BT03	6	07/06/2023	Dawn	04:40	02:40	04:40	11	11	7	2	None	Overcast, light wind and mild	MN	MF
BT03	7	04/07/2023	Dawn	04:44	02:44	04:44	10	10	1	2	None	Clear, light wind and mild	JS	RM
BT04	1	28/04/2022	Dusk	20:26	20:26	22:25	10	8	4	2	None	Brisk, overcast and light wind	NJ	CJ
BT04	2	12/05/2022	Dusk	20:50	20:50	22:50	13	10	8	1	None	Overcast, mild	JG	EF
BT04	3	14/06/2022	Dusk	21:31	21:31	23:31	18	14	0	0	None	No wind, warm, humid and clear sky	EF	RK
BT04	4	15/06/2022	Dawn	04:36	02:13	04:36	12	10	0	0	None	Dry and cool, clear sky	EF	RK
BT04	5	12/07/2022	Dusk	21:25	21:25	23:25	22	21	7	0	None	Overcast, warm and humid	RK	JV
BT04	6	09/08/2022	Dusk	20:42	20:42	22:57	24	17	1	2	None	Warm clear evening	NJ	AW
BT04	7	07/09/2022	Dusk	19:39	19:39	21:41	14	13	8	0	Light rain	Light rain beginning of the survey, no wind and cool	RK	JG
BT04	8	05/10/2022	Dusk	18:31	18:31	20:32	14	12	6	4	Light rain	Overcast with light rain and wind	RK	CRM
BT05a_b	1	26/04/2022	Dusk	20:22	20:22	22:22	12	10	7	1	None	Overcast and no wind	SS	GB
BT05a_b	2	16/05/2022	Dusk	20:56	20:56	23:35	20	17	3	1	None	Humid with light cloud cover	JV	NJ
BT05a_b	3	13/06/2022	Dusk	21:30	21:30	22:30	16	13	8	1	None	Overcast with light wind and no rain	JG	SA

Ref.	Visit no.	Date	Dusk/ dawn	Sunrise / sunset	Start time	End time	Start temp. (°C)	End temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
BT05a_b	4	14/06/2022	Dawn	04:38	02:38	04:38	13	10	8	1	None	Overcast with light wind and no rain	JG	SA
BT05a_b	5	13/07/2022	Dusk	21:24	21:24	23:24	19	15	1	1	None	Warm and mostly clear	JG	MF
BT05a_b	6	18/08/2022	Dusk	20:26	20:26	22:26	18	17	5	1	None	Warm and moderately overcast	MF	BN
BT05a_b	7	08/09/2022	Dusk	19:36	19:36	20:37	15	14	8	0	None	Cool, no wind, overcast but ground was wet from previous rain	RK	CT
BT05a_b	8	04/10/2022	Dusk	18:33	18:33	20:43	17	17	8	1	None	Warm and completely overcast	RK	CRM

Appendix Table D-2: Summary of dates, times and weather data for emergence surveys of trees/structures

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
F002	1	05/09/2022	Structure	Dusk	19:43	19:28	21:13	21	1	0	None	Warm with some cloud cover	BN	JV, MN, RM
F002	2	01/06/2023	Structure	Dusk	21:19	21:04	22:49	11	7	3	None	Cool, overcast and windy	JV	MF, RM
F002	3	29/06/2023	Structure	Dawn	04:40	03:10	04:55	15	3	1	None	Mild with scattered clouds and light wind	MF	RM
F003	1	20/09/2022	Structure	Dusk	19:07	18:25	20:37	16	8	1	None	Mild and completely overcast	MF	MN
F003	2	14/06/2023	Structure	Dawn	04:37	03:07	04:37	11	0	0	None	Clear and cool with no wind	JG	GA
F004	1	09/08/2022	Structure	Dusk	20:43	20:28	22:13	25	1	2	None	Warm with a breeze and light cloud cover	BN	JG, JV, PS
F004	2	24/08/2022	Structure	Dusk	20:10	19:55	21:40	23	2	0	None	Warm with cloud cover and no wind	BN	JM, NJ,

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
														PN
F004	3	07/06/2023	Structure	Dawn	04:39	03:09	04:54	11	8	1	None	Cool and overcast with light wind	GA	JD, LP
F005	1	10/08/2022	Structure	Dusk	20:41	20:25	23:11	23	0	1	None	Warm with no cloud cover	JG	JH, JV, MF, MN
F005	2	31/08/2022	Structure	Dusk	19:54	19:39	21:24	18	1	1	None	Warm with light cloud cover and wind	BN	JG, JV, NJ, PN
F005	3	21/06/2023	Structure	Dawn	04:37	03:07	04:52	15	0	2	None		MN	RM, MF, AW, GA
F005	4	23/08/2023	Structure	Dawn	05:57	04:27	06:12	14	7	1	None	Mild and overcast with a light wind	GA	CRM, BN, MF, RM
F006	1	10/08/2022	Structure	Dawn	05:35	04:05	05:35	18	0	0	None	Warm with no clouds or wind	JV	MN
F006	2	25/05/2023	Structure	Dusk	21:10	20:40	22:40	18	8	2	None	Overcast, mild and light wind	JS	AW
F007	1	06/06/2023	Structure	Dusk	21:25	21:10	22:55	12	8	2	None	Overcast, cool and light wind	GA	MF
F008	1	06/06/2023	Structure	Dusk	21:24	21:09	22:54	12	8	0	None	Overcast, cool and no wind	JG	JV, LP
F008	2	30/06/2023	Structure	Dawn	04:41	03:11	04:56	14	0	1	None	Mild with no cloud cover	JS	CJ, LP
F008	3	22/08/2023	Structure	Dusk	20:19	20:04	21:49	19	6	1	None	Warm and overcast with a light wind	GA	BA, RM
F009	1	29/09/2022	Structure	Dusk	18:48	18:33	20:18	13	1	1	None	Cool and humid with light cloud cover	MF	MN

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
F009	2	28/06/2023	Structure	Dawn	04:39	03:09	04:54	18	7	0	None	Warm and overcast with no wind	GA	RM
F010	1	02/06/2023	Structure	Dawn	04:43	03:13	04:58	11	7	3	None	Overcast, cool and windy	MF	RM
F010	2	27/06/2023	Structure	Dusk	21:34	21:19	23:04	19	8	0	None	Warm and overcast with no wind	GA	RM
F012	1	01/06/2023	Structure	Dusk	21:19	21:04	22:49	12	7	3	None	Mild, overcast and windy	JG	CR M
F013	1	14/06/2023	Structure	Dawn	04:37	03:07	04:52	10	0	1	None	Cool with light wind	MN	BN, LP
F013	2	28/06/2023	Structure	Dusk	21:34	21:19	23:04	16	8	2	None	Warm and overcast with a light wind	GA	RM, MF
F016	1	15/09/2022	Structure	Dawn	06:36	05:06	06:51	15	7	1	None	Mild with extensive cloud cover	MF	MN
F016	2	06/06/2023	Structure	Dusk	21:24	21:10	22:54	11	8	2	None	Mild and overcast with a light wind	LM	CT
F023	1	01/06/2023	Structure	Dawn	04:44	03:14	04:49	9	6	1	None	Cool and overcast with a light wind	JV	SB
F023	2	22/08/2023	Structure	Dusk	20:16	20:01	21:46	19	5	1	None	Warm and overcast with a light wind	CRM	MF
F028	1	31/05/2023	Structure	Dusk	21:18	21:03	22:48	11	8	2	None	Cool with extensive cloud cover	JV	GA, SB
F034	1	08/06/2023	Structure	Dawn	04:38	03:08	04:53	10	6	2	None	Cool and overcast with a light wind	MF	BN, JD, LP
F037	1	01/06/2023	Structure	Dusk	21:19	21:04	22:49	11	8	3	None	Cool, overcast and windy	LM	AW, SB
F050	1	07/06/2023	Structure	Dawn	04:39	03:07	04:39	11	7	0	None	Cool and overcast with no wind	JG	BN
F050	2	21/06/2023	Structure	Dusk	21:33	21:18	23:03	19	2	0	None	Warm with light cloud cover and no wind	MN	GA
F053	1	07/06/2023	Structure	Dusk	21:25	21:10	22:55	12	7	2	None	Cool and overcast with light wind	MF	JD
F053	2	23/06/2023	Structure	Dawn	04:37	03:07	04:52	17	4	2	None	Warm and moderately overcast with a light	MF	CT

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
												wind		
F054	1	29/06/2023	Structure	Dusk	21:33	21:18	23:03	18	0	2	None	Warm and clear with a light wind	JS	CJ, LP
F054	2	22/08/2023	Structure	Dawn	05:55	04:25	06:10	16	0	1	None	Mild and clear with a light wind	GA	CRM, MF
F057	1	07/06/2023	Structure	Dusk	21:25	21:10	22:55	12	7	2	None	Cool and overcast with light wind	BN	LP
F059	1	12/07/2023	Structure	Dusk	21:26	21:11	22:56	15	5	2	Light rain	Mild and overcast with light with and drizzle at survey start	CRM	BN
F060	1	12/07/2023	Structure	Dusk	21:26	21:11	22:55	15	5	2	Light rain	Mild and overcast with light with and drizzle at survey start	JV	GA
F061	1	07/06/2023	Structure	Dusk	21:25	21:10	22:55	12	8	2	None	Cool and overcast with a light wind	CRM	GA
F062	1	06/06/2023	Structure	Dusk	21:24	21:09	22:54	15	7	1	None	Mild and overcast with a light wind	SS	BN, LP
F062	2	22/06/2023	Structure	Dawn	04:38	03:08	04:53	15	2	0	None	Mild with scattered clouds and no wind	MN	MF, LP
F063	1	05/06/2023	Structure	Dusk	21:23	21:08	22:53	11	8	1	None	Cool and overcast with light wind	SS	JV, LP, MF
F063	2	05/07/2023	Structure	Dawn	04:44	03:14	04:59	15	7	2	None	Mild and overcast with light wind	JS	BN, GA, MF
F064	1	06/06/2023	Structure	Dawn	04:40	03:10	04:40	11	8	1	None	Cool and overcast with light wind	SS	JV, GA, LP
F064	2	22/06/2023	Structure	Dusk	21:33	21:18	23:03	21	2	0	None	Warm with scattered clouds and no wind	CJ	GB, CT, MF
F013	1	11/08/2022	Tree	Dawn	06:37	04:07	05:37	14	0	0	None	Mild and clear	MN	JH
F034	1	01/09/2022	Tree	Dawn	06:13	04:43	06:13	17	0	0	None	Clear and mild with	NJ	JV

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
												no wind		
F050	1	11/08/2022	Tree	Dusk	20:38	20:23	21:15	24	0	2	None	Warm and clear with light wind	MN	JH
F050	2	28/09/2022	Tree	Dusk	18:48	18:33	20:18	13	4	2	None	Cool with scattered clouds and light wind	MN	MF
F050	3	08/08/2023	Tree	Dawn	05:31	04:01	05:31	11	6	0	None	Cool and overcast with no wind	GA	SB
F060	1	13/09/2022	Tree	Dusk	19:24	19:09	20:54	16	2	1	None	Mild with light cloud cover	MN	MF
F065	1	15/09/2022	Tree	Dusk	19:19	19:04	20:49	18	8	1	None	Mild and completely overcast	MN	MF
F068	1	26/09/2022	Tree	Dusk	18:52	18:37	20:22	13	7	2	None	Overcast with a breeze	MF	MN
F071	1	27/09/2022	Tree	Dusk	18:50	18:35	20:20	12	1	1	None	Cool with light cloud cover	MF	MN
F074	1	13/06/2023	Tree	Dusk	21:30	21:15	23:00	19	0	1	None	Warm and clear with light wind	JG	GA
F076	1	14/09/2022	Tree	Dusk	19:19	19:06	20:49	18	8	1	None	Mild and completely overcast	JV	N/A
F078	1	13/06/2023	Tree	Dusk	21:30	21:15	23:00	19	2	1	None	Warm with scattered clouds and light wind	CRM	LP
F078	2	24/08/2023	Tree	Dawn	05:59	04:29	06:14	18	0	3	None	Warm, clear and windy	MF	RM
F080	1	22/09/2022	Tree	Dusk	18:54	18:39	20:24	16	8	1	Light rain	Overcast with light rain	MN	MF
F123	1	08/08/2022	Tree	Dusk	20:43	20:47	22:15	25	1	0	None	Warm with no wind and light cloud cover	BN	NJ
F123	2	28/09/2022	Tree	Dawn	06:59	05:29	07:14	7	2	2	None	Cool with some cloud cover and a breeze	MF	MN
F130	1	08/09/2022	Tree	Dusk	19:36	19:21	21:06	17	7	1	None	Mild with extensive cloud cover	MN	BN
F157	1	06/07/2023	Tree	Dawn	04:45	03:15	05:00	12	2	1	None	Cool with light cloud and wind	MF	BN
F159	1	13/07/2023	Tree	Dawn	04:52	03:22	05:07	13	6	2	None	Cool with scattered clouds and light wind	CRM	BN

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
F159	2	07/09/2023	Tree	Dawn	06:22	04:52	06:37	17	2	1	None	Mild with light cloud and wind	MN	CRM
F171	1	14/06/2023	Tree	Dusk	21:31	21:16	23:01	17	4	1	None	Warm	GA	MF
F172	1	14/06/2023	Tree	Dusk	21:31	21:16	23:01	17	4	1	None		MN	LP
F198	1	16/06/2023	Tree	Dusk	21:31	21:16	23:01	17	0	2	None		LM	BN
F206	1	19/06/2023	Tree	Dusk	21:32	21:17	23:02	22	1	0	None	Warm and still	CJ	GB
F209	1	25/05/2023	Tree	Dusk	21:10	20:55	22:40	14	8	2	None	Overcast	MN	BN
F209	2	20/06/2023	Tree	Dawn	04:36	03:06	04:51	21	7	0	None	Warm and overcast	CJ	GB
F210	1	25/05/2023	Tree	Dawn	04:51	03:05	05:06	16	0	1	None	Mild and clear	JS	AW
F210	2	14/06/2023	Tree	Dusk	21:31	21:16	23:01	18	0	0	None	Warm, clear and no wind	JS	JG
F210	3	08/08/2023	Tree	Dusk	20:45	20:30	22:15	17	2	1	None	Warm with scattered clouds and a light wind	GA	SB
F211	1	24/05/2023	Tree	Dusk	21:08	20:38	22:38	20	0	2	None	Warm and clear	JS	AW
F211	2	21/06/2023	Tree	Dawn	04:36	03:06	04:51	18	8	0	None	Warm and overcast with no wind	CJ	GA
F213	1	15/06/2023	Tree	Dusk	21:31	21:16	23:01	18	2	1	None	Warm with scattered clouds and a light wind	LM	BN
F214	1	13/06/2023	Tree	Dusk	21:30	21:15	23:00	19	0	0	None	Warm and clear with no wind	AW	BN
F215	1	03/07/2023	Tree	Dusk	21:32	21:17	23:02	15	2	1	None	Mild with scattered clouds and a light wind	LM	BN
F217	1	23/08/2023	Tree	Dawn	05:57	04:27	06:12	15	5	1	None	Mild and overcast with a light wind	JS	AW
F217	2	06/09/2023	Tree	Dusk	19:41	19:26	21:11	25	3	0	None	Warm, humid and still with scattered clouds	GA	CRM
F218	1	06/07/2023	Tree	Dusk	21:30	21:15	23:00	19	4	5	None	Warm, overcast and windy	MF	BN

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
F219	2	06/07/2023	Tree	Dusk	21:30	21:15	23:00	19	4	5	None	Warm, overcast and windy	MF	BN
F223	1	21/06/2023	Tree	Dusk	21:33	21:18	23:03	22	4	0	None	Short periods of drizzle during the day; humid but dry at start of the survey	CJ	GB
F225	1	23/08/2023	Tree	Dawn	05:57	04:27	06:12	14	0	1	None	Mild and clear with a light wind	JS	AW
F225	2	06/09/2023	Tree	Dusk	19:41	19:26	21:11	25	5	0	None	War and humid with no wind and overcast	CRM	GA
F226	1	22/06/2023	Tree	Dawn	4:36	03:06	04:51	17	8	0	None	Currently dry but it had rained during the day	CJ	GB
F227	1	04/07/2023	Tree	Dusk	21:32	21:17	23:02	14	7	1	None	Mild, overcast and a light wind	GA	CRM
F228	1	04/07/2023	Tree	Dusk	21:31	21:16	23:01	14	5	1	None	Mild, cloudy and a light wind	LM	BN
F231	1	19/06/2023	Tree	Dusk	21:35	21:20	23:05	25	2	1	None	Warm with scattered clouds and a light wind	CT	LP
F232	1	19/06/2023	Tree	Dusk	21:35	21:20	23:0-5	25	2	1	None	Warm with scattered clouds and a light wind	CT	LP
F236	1	22/08/2023	Tree	Dusk	20:15	20:00	21:45	21	6	2	None	Warm and overcast with a breeze	JS	AW
F236	2	15/09/2023	Tree	Dawn	06:36	05:05	06:51	14	4	1	None	Overcast with scattered cloud	JG	MN
F261	1	26/05/2023	Tree	Dawn	04:50	03:20	05:05	14	8	1	None	Overcast and mild	JS	AW
F261	2	20/06/2023	Tree	Dawn	21:33	21:18	23:03	17	4	2	None	Mild with scattered clouds and a light wind	CT	GB
F261	3	10/08/2023	Tree	Dusk	20:41	20:26	22:11	24	1	1	None	Warm, overcast and light wind	LM	MF
F340	1	31/05/2023	Tree	Dusk	21:18	21:03	22:48	9	8	3	None	Cool, overcast and windy	JG	RM

Ref.	Visit no.	Date	Roost type	Dusk/ dawn	Sunrise / Sunset	Start time	End time	Start temp. (°C)	Cloud cover	Wind (Beaufort)	Rain	Weather notes	Surveyors	
F340	2	04/07/2023	Tree	Dawn	04:43	03:13	04:43	11	0	2	None	Cool and clear with light wind	CRM	BN
F334	1	24/05/2023	Tree	Dusk	21.09	20.54	22.39	15	1	2	None	Mild and clear	MN	BN
F334	2	15/06/2023	Tree	Dawn	04:37	02:37	04:52	13	2	2	None	Mild with cloud developing throughout into fog by the end of the survey	JS	BN
F347	1	25/05/2023	Tree	Dawn	04:51	03:21	05:06	13	2	1	None	Mild and clear	MN	BN
F347	2	04/07/2023	Tree	Dawn	04:43	03:13	04:43	11	0	2	None	Cool and clear with light wind	BN	CRM
F368	1	01/06/2023	Tree	Dawn	04:44	03:14	04:44	10	7	3	None	Cool, overcast and windy	JG	RM
F368	2	23/08/2023	Tree	Dusk	20:14	19:59	21:44	22	7	0	None	Warm, overcast and no wind	GA	RM
F392														

E. Appendix: Survey results for bat activity transects

Appendix Table E-1: Survey results for transect BT01

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
26/04/2022	21:52	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7-8
26/04/2022	21:52	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7-8
26/04/2022	21:59	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	8-9
26/04/2022	22:02	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	9
10/05/2022	21:07	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	3	Y	8
10/05/2022	21:18	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – multiple bats flying south, social calls present	10	Y	7
10/05/2022	21:21	*Myotis sp.*	-	Not seen	Commuting	2	Y	7
10/05/2022	21:23	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	3	Y	7
10/05/2022	21:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	7
10/05/2022	21:25	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7
10/05/2022	21:26	*Nyctalus noctula*	Noctule	Not seen	Commuting	2	Y	6
10/05/2022	21:38 – 21:40	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
10/05/2022	21:42	*Myotis sp.*	-	Not seen	Commuting	1	Y	5
10/05/2022	21:46	*Myotis sp.*	-	Not seen	Commuting	2	Y	5
10/05/2022	21:47	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	8	Y	4
10/05/2022	21:49	*Myotis sp.*	-	Not seen	Commuting	1	Y	4

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
10/05/2022	21:51	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
10/05/2022	21:52	*Myotis sp.*	-	Not seen	Commuting	1	Y	4
10/05/2022	21:58	*Nyctalus leisleri*	Leisler's bat	Not seen	Unknown	1	Y	4-3
10/05/2022	21:59	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	3	Y	3
10/05/2022	22:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3
10/05/2022	22:02	*Myotis sp.*	-	Not seen	Foraging	1	Y	3
10/05/2022	22:02	*Barbastella barbastellus*	Barbastelle	Not seen	Commuting	1	Y	3
10/05/2022	22:09	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	2
10/05/2022	22:20 – 22:23	*Nyctalus noctula*	Noctule	Not seen	Commuting	2	Y	1
10/05/2022	22:35	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	1
10/05/2022	22:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	1
15/06/2022	21:57	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	2-3
15/06/2022	21:58 – 22:01	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – flew from line of trees towards residential buildings and back, 3m high. From S to N	2	Y	3
15/06/2022	22:08	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3-4
15/06/2022	22:11	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	4
15/06/2022	21:12	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4
15/06/2022	22:27	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5-6
15/06/2022	22:36	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	6-7
15/06/2022	22:39	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging – note from sound analysis; many *P.*	3	Y	7

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
					pyg and *P. pip* tracks within time period of stopping point			
15/06/2022	22:45	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	7-8
15/06/2022	23:02	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – foraging / circling around the field / in front of the treelines, 2m high	1	Y	8-9
15/06/2022	23:26	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	10 – 9
16/06/2022	02:33	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	1-2
16/06/2022	02:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	2
16/06/2022	02:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	2-3
16/06/2022	02:46	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	2	Y	2-3
16/06/2022	02:54	*Myotis sp.*	-	Not seen	Commuting	1	Y	3
16/06/2022	02:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	3-4
16/06/2022	03:04	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3-4
16/06/2022	03:17	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	5
16/06/2022	03:21 – 03:23	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – foraging over arable field / circling along the hedgerow	1	Y	5
16/06/2022	03:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5-6
16/06/2022	03:53	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
16/06/2022	04:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8-9
16/06/2022	04:07	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	9
14/07/2022	21:45	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	8
14/07/2022	21:52	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging – constant	1	Y	8-7
14/07/2022	21:57	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
14/07/2022	21:58	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – foraging / circling along the treeline, 3m high	3	Y	7
14/07/2022	21:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging – foraging / circling along the treeline, 3m high	3	Y	7
14/07/2022	22:01	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7
14/07/2022	22:04	*Myotis sp.*	-	Not seen	Foraging	1	Y	7-6
14/07/2022	22:05	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging – circling along treeline	2	Y	7-6
14/07/2022	22:06	*Nyctalus noctula*	Noctule	Seen	Commuting – flew above the arable field. West to East. 5m high	1	Y	7-6
14/07/2022	22:08	*Nyctalus noctula*	Noctule	Not seen	Foraging	2	Y	7-6
14/07/2022	22:09	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	7-6
14/07/2022	22:10	*Nyctalus noctula*	Noctule	Not seen	Foraging	2	Y	7-6
14/07/2022	22:14	*Nyctalus noctula*	Noctule	Seen	Foraging – flew from N to E, above the arable field	1	Y	6
14/07/2022	22:15 – 22:19	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	6-5
14/07/2022	22:25	*Nyctalus noctula*	Noctule	Not seen	Unknown	1	Y	5

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
14/07/2022	22:33	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	2	Y	5-4
14/07/2022	22:38	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting – flew N to W, 3m high	1	Y	4
14/07/2022	22:38 – 22:43	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
14/07/2022	22:42	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
14/07/2022	22:44	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	4-3
14/07/2022	22:53	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3
14/07/2022	22:55	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3
14/07/2022	22:57	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3-2
17/08/2022	20:45	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socialising	1	Y	2-3
17/08/2022	20:47	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting SE	1	Y	3
17/08/2022	20:49	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3
17/08/2022	20:50	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting SE	7	Y	3
17/08/2022	20:52	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting SE – SW	2	Y	3
17/08/2022	20:53	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3-4
17/08/2022	20:58	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
17/08/2022	21:23	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6-7
17/08/2022	21;28	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Other	1	Y	7
17/08/2022	21:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Possible commuting	1	Y	8

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
17/08/2022	21:53 – 21:55	*Nyctalus noctula*	Noctule	Not seen	Visible call at this time	2	Y	9-10
17/08/2022	21:58	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	10
05/09/2022	20:09	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	8
05/09/2022	20:15	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	8-7
05/09/2022	20:30	*Nyctalus noctula*	Noctule	Not seen	Commuting – faint call (16-8khz)	1	Y	6
05/09/2022	20:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-5
05/09/2022	20:34	*Nyctalus sp.*	-	Not seen	Unknown – 2 faint recordings	1	Y	6-5
05/09/2022	20:36	*Nyctalus sp.*	-	Not seen	Unknown	1	Y	6-5
05/09/2022	20:40	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	5
05/09/2022	20:48	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4
05/09/2022	21:06	*Nyctalus noctula*	Noctule	Not seen	Foraging – 3 passes	1	Y	2
05/09/2022	21:09	*Myotis sp.*	-	Seen	Commuting – flew E to W along the hedgerow, 2m high	1	Y	2
05/09/2022	21:12	*Nyctalus sp.*	-	Not seen	Foraging – 4 passes	1	Y	2-1
05/09/2022	21:13	*Nyctalus sp.*	-	Not seen	Foraging – 7 passes	1	Y	2-1
05/09/2022	21:14	*Nyctalus sp.*	-	Not seen	Foraging – 5 passes	1	Y	2-1
05/09/2022	21:15 – 21:17	*Nyctalus sp.*	-	Not seen	Foraging – 6 passes	1	Y	2-1
05/09/2022	21:16 – 21:17	*Nyctalus sp.*	-	Not seen	Foraging – 5 passes	1	Y	2-1
05/09/2022	21:17 – 21:22	*Nyctalus sp.*	-	Not seen	Foraging – 10+ passes	1	Y	1
05/09/2022	21:23 – 21:28	*Nyctalus sp.*	-	Not seen	Foraging – 10+ passes	1	Y	2-1

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
05/09/2022	21:35	*Nyctalus noctula*	Noctule	Not seen	Unknown – faint call. Not found on recordings during sound analysis QA	-	N	2-3
05/09/2022	21:38	*Nyctalus sp.*	-	Not seen	Foraging	1	Y	2-3
05/09/2022	21:38	*Myotis sp.*	-	Not seen	Commuting	1	Y	2-3
05/09/2022	21:41	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	3
05/09/2022	21:43	*Nyctalus sp.*	-	Not seen	Commuting	1	Y	3
05/09/2022	21:45	*Pipistrellus sp.*	-	Not seen	Socializing	1	Y	3
13/10/2022	18:13	*Nyctalus noctula*	Noctule	Not seen	Unknown	1	Y	1
13/10/2022	18:29	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	2-3
13/10/2022	18:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3
13/10/2022	18:44	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – 5m high heading NE. 6 passes	1	Y	4
13/10/2022	18:47	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging – 6m high heading N	1	Y	4
13/10/2022	18:48	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4-5
13/10/2022	18:50	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4-5
13/10/2022	19:06	*Nyctalus leisleri*	Leisler’s bat	Not seen	Commuting	1	Y	6-7
13/10/2022	19:12	*Nyctalus leisleri*	Leisler’s bat	Not seen	Commuting	1	Y	7
13/10/2022	19:43	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	10-9
13/10/2022	19:44	*Nyctalus leisleri*	Leisler’s bat	Not seen	Commuting	1	Y	10-9
13/10/2022	19:48	*Nyctalus leisleri*	Leisler’s bat	Not seen	Commuting	1	Y	9
13/10/2022	19:52	*Nyctalus leisleri*	Leisler’s bat	Not seen	Commuting	1	Y	8
13/10/2022	20:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7

Appendix Table E-2: Survey results for transect BT02

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
27/04/2022	21:07	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
27/04/2022	21:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6
27/04/2022	21:43	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
27/04/2022	21:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
27/04/2022	21:42	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
27/04/2022	21:43	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	8
27/04/2022	21:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
27/04/2022	21:46	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
27/04/2022	22:19-22:24	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	8
11/05/2022	21:24	*Nyctalus noctula*	Noctule	Not seen	Commuting	2	Y	6
11/05/2022	21:33	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	5	Y	6
11/05/2022		*Nyctalus noctula*	Noctule	Not seen	Commuting	1	N	5
11/05/2022	21:37:00	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5
11/05/2022	21:38:00	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5
11/05/2022	21:39:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
11/05/2022	21:40:00	*Pipistrellus pygmaeus*	Common pipistrelle	Not seen	Foraging	1	Y	5

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
11/05/2022	21:42:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
11/05/2022	21:44:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
11/05/2022	21:44:00	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5
11/05/2022	21:46:00	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5
11/05/2022	21:46:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
11/05/2022	21:50:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	5
11/05/2022	21:53:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
11/05/2022	21:54:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
11/05/2022	22:16:00	*Nyctalus noctula*	Noctule	Not seen	Foraging	2	Y	4
11/05/2022	22:21:00	*Chiroptera (Unknown)*	-	Not seen	Commuting	1	Y	2
11/05/2022	22:37:00	*Pipistrellus sp.*	-	Not seen	Commuting	1	N	1
28/06/2022	21:54:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	2-3
28/06/2022	21:56:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting-Flying NE along hedgerow approx. 4m high	1	Y	2-3
28/06/2022	21:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	3
28/06/2022	21:59	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting-Flying SW along hedgerow	1	Y	3
28/06/2022	22:00	*Nyctalus noctula*	Noctule	Not seen	Unknown	1	Y	3
28/06/2022	22:01	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3
28/06/2022	22:02	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
28/06/2022	22:05	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3-4
28/06/2022	22:08	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3-4
28/06/2022	22:11	*Nyctalus noctula*	Noctule	Not seen	Foraging-circle from woodland into field and back over woodlands.10m high	1	Y	3-4
28/06/2022	22:11	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3-4
28/06/2022	22:12	*Nyctalus noctula*	Noctule	Not seen	Foraging	2	Y	3-4
28/06/2022	22:13	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3-4
28/06/2022	22:17	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-flying parallel to hedgerow 2m high	1	Y	3-4
28/06/2022	22:18	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3-4
28/06/2022	22:23	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
28/06/2022	22:24	*Pipistrellus* sp.	-	Not seen	Foraging-flying west	1	Y	4
28/06/2022	22:30	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4-5
28/06/2022	22:31	*Nyctalus noctula*	Noctule	Not seen	Commuting-flying north over railway	1	Y	4-5
28/06/2022	22:31	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4-5
28/06/2022	22:32	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4-5
28/06/2022	22:33	*Pipistrellus* sp.	-	Not seen	Commuting	1	Y	4-5
28/06/2022	22:35	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
28/06/2022	22:36	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	5

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
28/06/2022	22:37	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	5
28/06/2022	22:37	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
28/06/2022	22:38-22:40	*Nyctalus noctula*	Noctule	Not seen	Foraging	4	Y	5
28/06/2022	22:39-22:40	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	5
28/06/2022	22:41-22:43	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	6
28/06/2022	22:41-22:43	*Nyctalus noctula*	Noctule	Not seen	Foraging	3	Y	5
28/06/2022	22:44-22:46	*Nyctalus noctula*	Noctule	Not seen	Foraging-circling over grassland 5 to 10m high throughout section	3	Y	5-6
28/06/2022	22:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-circling over grassland 5 to 10m high throughout section	1	Y	5-6
28/06/2022	22:48	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	5-6
28/06/2022	22:52	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
28/06/2022	22:52	*Myotis* sp.	-	Not seen	Commuting	1	Y	6
28/06/2022	22:57	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6-7
28/06/2022	22:59	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6-7
28/06/2022	23:07	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
28/06/2022	23:08	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
28/06/2022	23:12	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	8
28/06/2022	23:13	*Myotis* sp.	-	Not seen	Unknown	1	Y	8-9
28/06/2022	23:13	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	8-9

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
28/06/2022	23:19	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	9
28/06/2022	23:20	*Nyctalus noctula*	Noctule	Not seen	Unknown	1	Y	9
28/06/2022	23:28	*Pipstrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	9-10
28/06/2022	23:39	*Pipstrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	10
13/07/2022	22:11	*Nyctalus leisleri*	Leisler's bat	Not seen	Commuting-found from sonogram track 80-85/remember heard N.noc commuting but not able to see it fly	2	Y	5-4
13/07/2022	22:12	*Nyctalus leisleri*	Leisler's bat	Not seen	Commuting	2	Y	5-4
13/07/2022	22:15	*Nyctalus noctula*	Noctule	Not seen	Foraging – heard not seen retrieved from sound analysis from track 117-122, until 22:26. N.noc was foraging constantly during this point	2	Y	4
13/07/2022	22:17	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging-circling along the treeline, 2-3m high (from W to E and back) Track 127-128	1	Y	4
13/07/2022	22:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	From sound analysis, track 151, 156			
13/07/2022	22:25	*Nyctalus noctula*	Noctule	Not seen	From sound analysis. Track 154	1	Y	4-3
13/07/2022	22:27	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-too dark to see when on field and constant foraging until 22:30. Found from sound analysis. Track 159-168	1	Y	3

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
13/07/2022	22:23	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3-2
13/07/2022	22:27	*Nyctalus noctula*	Noctule	Not seen	N/A found from sound analysis. Track 161	1	Y	3-2
13/07/2022	22:33	*Nyctalus noctula*	Noctule	Not seen	N/A Found from sound analysis track 174	1	Y	3-2
13/07/2022	22:39	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis. Trac 189	1	Y	2
13/07/2022	22:49-22:50	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis until 22:50. Track 202-204	2	Y	1
13/07/2022	22:53	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis until 22:50. Track 211	1	Y	1
13/07/2022	23:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis. Track 232-233	1	Y	2
13/07/2022	23:05	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis. Track 241-242	1	Y	2
13/07/2022	23:21	*Nyctalus noctula*	Noctule	Not seen	N/A found from sound analysis. Track 281-282, until 23:22 track 289	2	Y	3-4
13/07/2022	23:22	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	N/A found from sound analysis. Track 283-288	3	Y	3-4
14/07/2022	02:49	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	10
14/07/2022	02:50	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	10
14/07/2022	02:51-02:53	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	4	Y	10
14/07/2022	02:53	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	3	Y	10
14/07/2022	02:54-02:56	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	10

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
14/07/2022	02:57	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	2	Y	10-9
14/07/2022	02:58-03:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	9
14/07/2022	03:04	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	9-8
14/07/2022	03:05	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-track 54	2	Y	8
14/07/2022	03:06	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
14/07/2022	03:07	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	8
14/07/2022	03:08	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-Track 60	1	Y	8
14/07/2022	03:09	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	8
14/07/2022	03:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
14/07/2022	03:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	8
14/07/2022	03:10	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	2	Y	8
14/07/2022	03:10	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging.	2	Y	8
14/07/2022	03:11	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8-7
14/07/2022	03:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging. Track 126	1	Y	6
14/07/2022	03:34	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging. Track 138	1	Y	5
14/07/2022	03:40	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging-track 158. Flew adjacent to tree (South to	1	Y	5-4

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
					north) 3m high			
14/07/2022	03:43	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4
14/07/2022	03:44	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5
14/07/2022	03:45	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging-track 181, flew adjacent to tree (South to north) 3m high	1	Y	4
14/07/2022	03:47	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4
14/07/2022	03:47	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4
14/07/2022	03:50	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4-3
14/07/2022	03:51	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-track 196, flew North to south (3m high), flew along the tree and back	1	Y	4-3
14/07/2022	03:53	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging-track 199, flew north to south (3m high), flew along the tree and back	1	Y	3
14/07/2022	03:57	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging- track 204, flew north to south (3m high) flew along the tree and back	2	Y	3
14/07/2022	03:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging-track 205, flew north to south (3m high), flew along the tree and back	2	Y	3-2
14/07/2022	04:04	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3-2

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
14/07/2022	04:27	*Nyctalus noctula*	Noctule	Not seen	Commuting-track 239, flew south to north, 10m high (above arable land)	1	Y	1
08/08/2022	21:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-(F/C) near path at canopy level, flying south	2	Y	8
08/08/2022	21:11	*Nyctalus noctula*		Not seen	Other (state in notes)	1	Y	8
08/08/2022	21:14	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging-over path	1	Y	8
08/08/2022	21:15	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	8-7
08/08/2022	21:18-21:19	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging-at canopy level in clearing	2	Y	8-7
08/08/2022	21:22	*Nyctalus noctula*	Noctule	Not seen	Other (state in notes)	1	Y	7
08/08/2022	21:25	*Nyctalus noctula*	Noctule	Not seen	Other (state in notes)	1	Y	7
08/08/2022	21:28-21:29	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging over field	2	Y	7
08/08/2022	21:29-21:30	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging over field	3	Y	7
08/08/2022	21:32-21:33	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging (F/C) brief pass	2	Y	6
08/08/2022	21:33	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	6
08/08/2022	21:34-21:35	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Other (brief pass)	2	Y	6
08/08/2022	21:36-21:37	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging (F/C) brief pass	2	Y	6
08/08/2022	21:38	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging (F/C) brief pass	1	Y	6
08/08/2022	21:38	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging (F/C) brief pass	1	Y	6

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
08/08/2022	21:40-21:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-5
08/08/2022	21:50	*Myotis sp.*	-	Not seen	Foraging	1	Y	5
08/08/2022	21:54	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging (F/S) brief pass	1	Y	5-4
08/08/2022	22:07	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging (F/S) brief pass	1	Y	4-3
08/08/2022	22:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging (F/C) very faint	1	Y	2
08/08/2022	22:28	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	2-1
08/08/2022	22:39	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging (F/C) brief pass	1	Y	1
08/08/2022	22:42	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	1-0
08/08/2022	22:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	1-0
08/08/2022	22:46	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	1-0
06/09/2022	20:15	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting (flew over NE to SW, 3 m high	1	Y	6
06/09/2022	20:18	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
06/09/2022	20:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-5
06/09/2022	20:25	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging, flew N to S, circling in front of the field	1	Y	6-5
06/09/2022	20:26	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-5
06/09/2022	20:38	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5-4
06/09/2022	20:49	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
06/09/2022	20:58	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	3
06/09/2022	21:06	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	2
06/09/2022	21:16	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	2-1
12/10/2022	18:49	*Nyctalus noctula*	Noctule	Not seen	Commuting-recording number 195. 3m eastwards	1	Y	4
12/10/2022	18:50	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting-potential emergence from tree line. Heading eastwards	1	Y	4
12/10/2022	19:22	*Nyctalus noctula*	Noctule	Not seen	Commuting recording number 385	1	Y	7
12/10/2022	19:26	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7-8
12/10/2022	19:28	*Nyctalus* sp.	-	Not seen	Unknown recording 404	1	Y	8
12/10/2022	19:30-19:31	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	2	Y	8-9
12/10/2022	19:39-19:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging- recording number 493. Foraging throughout and seen 1941	4	Y	9-10
12/10/2022	19:42-19:45	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	5	Y	10
12/10/2022	19:45	*Myotis* sp.	-	Not seen	Foraging	1	Y	10
12/10/2022	19:46-19:48	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	10-9
12/10/2022	19:47	*Myotis* sp.	-	Not seen	Foraging	1	Y	10-9
12/10/2022	19:56	*Myotis* sp.	-	Not seen	Foraging	1	Y	9-8
12/10/2022	19:57	*Myotis* sp.	-	Not seen	Foraging	1	Y	8
12/10/2022	20:11-20:12	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	2	Y	6
12/10/2022	20:15-20:16	*Pipistrellus*	Soprano pipistrelle	Not seen	Foraging	2	Y	6

Date	Time	Species	Common Name	Seen?	Description	Number	Recording	Stopping point
		pygmaeus						

Appendix Table E-3: Survey results from transect BT05a_b

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
26/04/2022	20:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting northwest on top of scrub, 1m height	1	Y	4-5
26/04/2022	20:59	*Pipistrellus* sp.	-	Seen	Foraging in ruderal field heading north.	1	Y	4-5
26/04/2022	21:01	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	4-5
26/04/2022	21:03	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging in grassland away from A46 heading N.	2	Y	4-5
26/04/2022	21:10 - 21:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Along private lane with semi mature trees.	1	Y	5
26/04/2022	21:14	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting – one seen commuting north above trees	1	Y	5
26/04/2022	21:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	5-6
26/04/2022	21:15	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	5-6
26/04/2022	21:22	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Likely foraging above scrub and tree line.	3	Y	6
26/04/2022	21:22	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Likely foraging above scrub and tree line.	1	Y	6
26/04/2022	21:27	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	6-7
26/04/2022	21:34	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging - Edge of wood, foraging likely along A46.	2	Y	7

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
26/04/2022	21:40	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Along edge of woodland.	1	Y	7-8
26/04/2022	21:42	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Along edge of woodland.	1	Y	7-8
26/04/2022	21:51	*Myotis* sp.	-	Not seen	Within woodland.	1	Y	7-8
26/04/2022	22:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging along edge of woodland.	4	Y	9
26/04/2022	22:07	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging along woodland edge.	1	Y	9-10
26/04/2022	22:07	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging along woodland edge.	1	Y	9-10
26/04/2022	22:12	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging along woodland edge.	2	Y	10
26/04/2022	22:12	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging along woodland edge.	1	Y	10
26/04/2022	22:17	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	Finish
26/04/2022	22:17	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	Finish
16/05/2022	21:28	*Nyctalus* sp.	-	Not seen	Could have been a social call	Unknown	Y	8
16/05/2022	21:29	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	Unknown	Y	8
16/05/2022	21:35	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Foraging 2.5m above ground following hedge line northwards near point 7 to point 9	Unknown	Y	8
16/05/2022	21:40	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	Unknown	Y	7
16/05/2022	21:45	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	Unknown	Y	7
16/05/2022	21:47	*Nyctalus* sp.	-	Not seen	Unknown	Unknown	Y	7

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
16/05/2022	21:47	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	Unknown	Y	7
16/05/2022	21:48	*Nyctalus* sp.	-	Not seen	Unknown	Unknown	Y	7
16/05/2022	21:49	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Flew from S to N parallel to A46, 2.5m above ground	Unknown	Y	7
16/05/2022	Unknown	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	Unknown	Y	7
16/05/2022	Unknown	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	7
16/05/2022	21:56	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	Unknown	Y	7
16/05/2022	22:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging pip 2.5m above ground N to S along A46	Unknown	Y	6
16/05/2022	22:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging pip not seen	Unknown	Y	6
16/05/2022	22:06	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging pip not seen	Unknown	Y	6
16/05/2022	22:07	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging pip not seen	Unknown	Y	6
16/05/2022	22:12	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging not seen	Unknown	Y	5
16/05/2022	22:14	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	5
16/05/2022	22:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging not seen	Unknown	Y	5
16/05/2022	22:18	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	4
16/05/2022	22:20	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging not seen	Unknown	Y	4
16/05/2022	22:21	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging not seen	Unknown	Y	4
16/05/2022	22:24	*Pipistrellus*	Common pipistrelle	Not seen	Foraging not seen	Unknown	Y	4

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pipistrellus						
13/06/2022	21:59	*Unknown*	-	Seen	Commuting northeast, not echolocating	1	Y	4
13/06/2022	22:04	*Nyctalus sp.*	-	Unknown	Unknown	Unknown	Y	4
13/06/2022	22:10	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Foraging	1	Y	4
13/06/2022	22:11	*Pipistrellus* sp.	-	Unknown	Unknown	Unknown	Y	4
13/06/2022	22:15	*Nyctalus noctula*	Noctule	Unknown	Commuting	1	Y	4
13/06/2022	22:15	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Commuting	1	Y	4
13/06/2022	22:17	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	4
13/06/2022	22:18	*Pipistrellus* sp.	-	Unknown	Unknown	Unknown	Y	4
13/06/2022	22:21	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	5
13/06/2022	22:22	*Pipistrellus* sp.	-	Unknown	Unknown	Unknown	Y	5
13/06/2022	22:24	*Pipistrellus* sp.	-	Unknown	Unknown	Unknown	Y	5
13/06/2022	22:32	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging	3	Y	6
13/06/2022	22:34	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	2	Y	6
13/06/2022	22:37	*Nyctalus noctula*	Noctule	Seen	Commuting	1	Y	6
13/06/2022	22:50	*Nyctalus noctula*	Noctule	Seen	Commuting	1	Y	7
13/06/2022	22:54	*Nyctalus noctula*	Noctule	Unknown	Unknown	Unknown	Y	8
13/06/2022	23:02	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting	1	Y	9
13/06/2022	23:08	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging	1	Y	9
13/06/2022	23:09	*Pipistrellus*	Soprano pipistrelle	Unknown	Unknown	Unknown	Y	9

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pygmaeus						
13/06/2022	23:10-23:22	*Pipistrellus pipistrellus & Pipistrellus* sp.	Common pipistrelle & Pipistrelle species	Seen	Foraging	4	Y	10
14/06/2022	02:38	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	1
14/06/2022	02:45	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	2
14/06/2022	02:52	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	Unknown	Y	2
14/06/2022	03:24	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging	1	Y	5
14/06/2022	03:24	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging	4	Y	5
14/06/2022	03:29	*Myotis* sp.	-	Unknown	Unknown	Unknown	Y	5
14/06/2022	03:37	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	2	Y	6
14/06/2022	03:37	*Myotis* sp.	-	Unknown	Unknown	Unknown	Y	6
14/06/2022	03:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting	2	Y	6
14/06/2022	03:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging	1	Y	6
14/06/2022	03:43	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	6
14/06/2022	03:47	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging	1	Y	7
14/06/2022	03:53	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	7
14/06/2022	03:54	*Nyctalus noctula*	Noctule	Seen	Commuting	1	Y	7
14/06/2022	03:54	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	7

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
14/06/2022	03:56	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	8
14/06/2022	04:01	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting	1	Y	8
13/07/2022	22:02	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Flew from the tree line to the west. Foraging within trees adjacent to road.	7	Y	6
13/07/2022	22:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
13/07/2022	22:05	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
13/07/2022	22:13	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
13/07/2022	22:14	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	6
13/07/2022	22:14	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	Unknown	Y	6
13/07/2022	22:15	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
13/07/2022	22:18	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging. Flying south to north along old road	4	Y	5
13/07/2022	22:21	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
13/07/2022	22:21	*Nyctalus sp.*	-	Unknown	Unknown	Unknown	Y	5
13/07/2022	22:21	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5
13/07/2022	22:21	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	Unknown	Y	5
13/07/2022	22:22	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5
13/07/2022	22:22	*Pipistrellus sp.*	-	Unknown	Unknown	Unknown	Y	5
13/07/2022	22:23	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
13/07/2022	22:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5
13/07/2022	22:27	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	5
13/07/2022	22:35	*Nyctalus noctula*	Noctule	Unknown	Unknown	1	Y	5
13/07/2022	22:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	4	Y	4
13/07/2022	22:39	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
13/07/2022	22:42	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	4
13/07/2022	22:43	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	4
13/07/2022	22:46	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	4
13/07/2022	22:46	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	4
13/07/2022	22:59	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3
13/07/2022	23:02	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging. Flew west to east across fields	2	Y	2
13/07/2022	23:03	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	2
13/07/2022	23:04	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	2
13/07/2022	23:12	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	1
13/07/2022	23:16	*Nyctalus noctula*	Noctule	Unknown	Unknown	1	Y	1
13/07/2022	23:20	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	1
13/07/2022	23:22	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	1

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
13/07/2022	23:22	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	1
18/08/2022	20:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting south east to north west	1	Y	2
18/08/2022	20:56	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	4-5
18/08/2022	20:56	*Nyctalus sp.*	-	Unknown	Unknown	1	Y	4-5
18/08/2022	20:57	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	4-5
18/08/2022	20:57	*Nyctalus sp.*	-	Unknown	Unknown	1	Y	4-5
18/08/2022	20:58	*Nyctalus sp.*	-	Seen	Commuting north west	2	Y	4-5
18/08/2022	21:00	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	4-5
18/08/2022	21:01	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	4-5
18/08/2022	21:02	*Nyctalus sp.*	-	Not seen	Commuting	1	Y	4-5
18/08/2022	21:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4-5
18/08/2022	21:04	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	5
18/08/2022	21:07	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	5
18/08/2022	21:08	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
18/08/2022	21:10	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	5
18/08/2022	21:12	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	3	Y	5
18/08/2022	21:16	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	5
18/08/2022	21:17	*Pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	5

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pipistrellus						
18/08/2022	21:18	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	5
18/08/2022	21:20	*Nyctalus sp.*	-	Unknown	Unknown	1	Y	6
18/08/2022	21:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6-7
08/09/2022	19:54	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging. Flew north to south over arable field towards the bridge approximately 4m high.	1	Y	9-8
08/09/2022	19:56	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	9-8
08/09/2022	19:59	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	9-8
08/09/2022	20:10	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	8-7
08/09/2022	20:14	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	7
08/09/2022	20:23	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	6
08/09/2022	20:26	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	6
08/09/2022	20:45	*Myotis daubentonii*	Daubenton's bat	Unknown	Unknown	1	Y	5-4
08/09/2022	20:48	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	5-4
08/09/2022	20:54	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	5-4
08/09/2022	20:54	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	5-4
08/09/2022	20:59	*Pipistrellus sp.*	-	Unknown	Unknown	1	Y	5-4
08/09/2022	21:05	*Pipistrellus*	Soprano pipistrelle	Not seen	Commuting	1	Y	4

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pygmaeus						
08/09/2022	21:11	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	4-3
08/09/2022	21:22	*Nyctalus sp.*	-	Unknown	Unknown	1	Y	3
08/09/2022	21:33	*Nyctalus sp.*	-	Unknown	Unknown	1	Y	3-2
08/09/2022	21:49	*Pipistrellus sp.*	-	Unknown	Unknown	1	Y	1
04/10/2022	19:21	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	4
04/10/2022	19:34	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	4-5
04/10/2022	19:46	*Myotis* sp.	-	Not seen	Commuting	1	Y	5
04/10/2022	19:47	*Pipistrellus pygmaeus*	Soprano pipistrelle	Unknown	Unknown	1	Y	5
04/10/2022	19:48	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging. Flew north west along tree line towards gate at 2m.	1	Y	5-6
04/10/2022	20:09	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	6-7
04/10/2022	20:31	*Myotis* sp.	-	Unknown	Unknown	1	Y	9
04/10/2022	20:35	*Pipistrellus pipistrellus*	Common pipistrelle	Unknown	Unknown	1	Y	9

Appendix Table E-4: Survey results for transect BT03

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
22/08/2022	20:42	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3
22/08/2022	20:52	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	3

22/08/2022	21:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
22/08/2022	21:05	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	4
22/08/2022	21:09	*Nyctalus leisleri*	Leisler's bat	Not seen	Commuting	1	Y	5
22/08/2022	21:09	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
22/08/2022	21:10	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5
22/08/2022	21:11 – 21:13	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
22/08/2022	21:17	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging north to south alongside the edge of the crop	9	Y	6
22/08/2022	21:23 – 21:25	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	Unknown	Y	6-7
22/08/2022	21:39	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	8
22/08/2022	21:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
22/09/2022	06:07	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	5
25/10/2022	No bats detected							
21/04/2023	05:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5-6
21/04/2023	05:01	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5-6
21/04/2023	05:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5-6
31/05/2023	03:01	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	Unknown	Y	6-5
31/05/2023	03:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	5
31/05/2023	03:19	*Pipistrellus*	Common	Not	Unknown	1	Y	4-10

		pipistrellus	pipistrelle	seen				
31/05/2023	03:29	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	4-10
31/05/2023	03:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	Unknown	Y	4-10
31/05/2023	03:58	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Commuting	1	Y	8
31/05/2023	04:00	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging	1	Y	8
07/06/2023	02:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	1
07/06/2023	03:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	2-3
07/06/2023	03:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3
07/06/2023	03:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4-5
07/06/2023	03:34	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
07/06/2023	03:35	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
07/06/2023	03:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
07/06/2023	03:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
07/06/2023	03:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	1	Y	5-6
07/06/2023	03:38	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5-6
07/06/2023	03:41	*Pipistrellus sp.*	-	Seen	Foraging – flying along treeline south west to north east	2	Y	5-6
07/06/2023	03:42	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – flying along treeline south west to north east	1	Y	5-6

07/06/2023	03:43	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – flying along treeline north east to south west	1	Y	6
07/06/2023	03:44	*Pipistrellus pygmaeus*	Soprano pipistrelle	Seen	Foraging – flying along treeline south west to north east	1	Y	6
07/06/2023	03:45	*Pipistrellus sp.*	-	Seen	Foraging – flying along path adjacent to field north to south	2	Y	6
07/06/2023	03:48	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging	1	Y	6
07/06/2023	03:49	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6-7
07/06/2023	03:51	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6-7
04/07/2023	03:16	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3
04/07/2023	03:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	Unknown
04/07/2023	03:46	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting – flying south along a track towards the river	1	Y	6
04/07/2023	03:55	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	Unknown
04/07/2023	03:56	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	N	7
04/07/2023	04:26	Unknown	-	Seen	Commuting	1	N	Unknown

Appendix Table E-5: Survey results for transect BT04

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
28/04/2022	21:05	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
28/04/2022	21:06	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – flew from river straight over field towards trees adjacent A46 3-4m high	1	Y	4
28/04/2022	21:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
28/04/2022	21:10	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
28/04/2022	21:11	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
28/04/2022	21:14	*Myotis* sp.	-	Not seen	Unknown	1	Y	5
28/04/2022	21:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
28/04/2022	21:16	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – flew from A46 woodland along tree line towards the river	1	Y	5
28/04/2022	21:17	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	5
28/04/2022	21:19	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
28/04/2022	21:22	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
28/04/2022	21:26	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
28/04/2022	21:28	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
28/04/2022	21:29	*Myotis* sp.	-	Not seen	Unknown	1	Y	6
28/04/2022	21:29 – 21:31	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
28/04/2022	21:32 – 21:37	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7
28/04/2022	21:47	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
28/04/2022	21:49	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	9
28/04/2022	21:53	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	9
28/04/2022	22:07	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	10
28/04/2022	22:10	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	9
28/04/2022	22:19	*Myotis* sp.	-	Not seen	Unknown	1	Y	8
28/04/2022	22:20	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	8
12/05/2022	21:17	*Myotis* sp.	-	Not seen	Commuting	3	Y	8
12/05/2022	21:19	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	8
12/05/2022	21:20	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting – flew to the east around tree line	6	Y	7
12/05/2022	21:20 – 21:26	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – 3 bats foraging under A46 flyover bridge	4	Y	7
12/05/2022	21:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socializing	1	Y	7
12/05/2022	21:27	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7
12/05/2022	21:28	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
12/05/2022	21:29	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	7
12/05/2022	21:31	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
12/05/2022	21:31	*Pipistrellus*	Common	Not seen	Commuting	1	Y	6

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pipistrellus	pipistrelle					
12/05/2022	21:33	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
12/05/2022	21:34	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6
12/05/2022	21:38	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:39 – 21:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:46	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:47 – 21:50	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:51	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Socializing	2	Y	5
12/05/2022	21:51 – 21:54	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:54	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
12/05/2022	21:55	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	5
12/05/2022	21:56	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	3	Y	5
12/05/2022	22:05 – 22:07	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	3	Y	3
12/05/2022	22:08	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Foraging	2	Y	3
12/05/2022	22:08-22:11	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – close to bridge	3	Y	3
12/05/2022	22:12 – 22:18	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – multiple bats foraging over river	22	Y	2
12/05/2022	22:16	*Myotis* sp.	-	Not seen	Commuting	1	Y	2
12/05/2022	22:17 – 22:20	*Pipistrellus*	Common	Not seen	Commuting	4	Y	2

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pipistrellus	pipistrelle					
12/05/2022	22:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	10	Y	1
12/05/2022	22:23 – 22:24	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:25	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socializing	2	Y	1
12/05/2022	22:26 – 22:27	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:26	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:27	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	2	Y	1
12/05/2022	22:27	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Socializing	2	Y	1
12/05/2022	22:28 – 22:30	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	10	Y	1
12/05/2022	22:31	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socializing	1	Y	1
12/05/2022	22:31 – 22:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	3	Y	1
12/05/2022	22:37	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:38	*Myotis* sp.	-	Not seen	Commuting	1	Y	1
12/05/2022	22:38	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:40	*Myotis* sp.	-	Not seen	Commuting	1	Y	1
12/05/2022	22:42 – 22:45	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	1
12/05/2022	22:44 – 22:47	*Myotis* sp.		Not seen	Commuting	2	Y	1
12/05/2022	22:47 – 22:49	*Pipistrellus*	Common	Not seen	Commuting	1	Y	1

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
		pipistrellus	pipistrelle					
14/06/2022	21:51 – 21:59	*Nyctalus* sp.	-	Not seen	Unknown	1	Y	2-4
14/06/2022	22:10 – 22:16	*Nyctalus* sp.	-	Not seen	Unknown	1	Y	4-5
14/06/2022	22:15	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4-5
14/06/2022	22:17	*Nyctalus noctula*	Noctule	Seen	Commuting – flew 2m high S-N parallel to the river / over grassland	1	Y	4-5
14/06/2022	22:18	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	4-5
14/06/2022	22:21	*Nyctalus* sp.	-	Not seen	Unknown	1	Y	5
14/06/2022	22:22	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	5
14/06/2022	22:25	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	5-6
14/06/2022	22:29 – 22:30	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6
14/06/2022	22:37	*Nyctalus* sp.	-	Not seen	Unknown	1	Y	6-7
14/06/2022	22:39	*Nyctalus noctula*	Noctule	Not seen	Unknown	1	Y	6-7
14/06/2022	22:40	*Nyctalus noctula*	Noctule	Not seen	Unknown – short call	1	Y	7
14/06/2022	22:40 – 22:46	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging – circling under the bridge	1	Y	7
14/06/2022	22:47 – 22:48	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	7-8
14/06/2022	22:52	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	8
14/06/2022	22:58	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	8-9
14/06/2022	23:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	9

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
14/06/2022	23:13	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	10
14/06/2022	23:23	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	9
15/06/2022	20:18	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	1
15/06/2022	02:19 – 02:22	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - Flew W to E (towards small woodland/Stop 1), 2m high and foraging/circling around lock, until 2:21.	2	Y	1-2
15/06/2022	02:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	2
15/06/2022	02:37	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting - Flew N to S, 2m high, towards bridge and along the shrubs.	1	Y	3
15/06/2022	02:39	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3-4
15/06/2022	02:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4
15/06/2022	02:47	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4
15/06/2022	03:17	*Pipistrellus sp.*	-	Seen	Commuting - Did not hear echolocation but could see possible Pip sp. From size of the bat and flight. Flew E-W, 2-3m high, towards A46 bridge.	1	Y	7
15/06/2022	03:28	*Pipistrellus sp.*	-	Seen	Foraging - Did not hear echolocation but could see possible Pip sp. From size of the bat and flight. Circling along the treelines, 2m high	1	Y	8

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
15/06/2022	03:44	*Pipistrellus sp.*	-	Seen	Commuting - Did not hear echolocation but could see possible Pip sp. From size of the bat and flight. Flew towards railway, 2m high, E to W.	1	Y	9-10
15/06/2022	03:47	*Pipistrellus sp.*	-	Seen	Commuting - Did not hear echolocation but could see possible Pip sp. From size of the bat and flight. Flew W to E (from railway towards treeline), 3m high	2	Y	9-10
15/06/2022	03:50	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Commuting - Flew W to E (from railway towards treeline), 3m high	1	Y	9-10
12/07/2022	21:42	*Nyctalus noctula*	Noctule	Seen	Foraging - Flew east to west and back, above the line of trees towards railway lines, 10m high	1	Y	9
12/07/2022	21:51	*Nyctalus noctula*	Noctule	Seen	Foraging - One N.noc flew east towards treelines and the other N.noc circling adjacent to railway line. Both were flying 10m high.	2	Y	8
12/07/2022	21:54	*Nyctalus noctula*	Noctule	Seen	Foraging - 3 N.noc flew towards railway (east to west) and back to the field (west to east). 2 N.noc flew (west to east) towards treelines. All flew 10m high	5	Y	8
12/07/2022	22:00	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
12/07/2022	22:02	*Nyctalus noctula*	Noctule	Seen	Commuting - Flew adjacent to the bridge (south to north), 5m high.	1	Y	7
12/07/2022	22:06	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7-6
12/07/2022	22:07	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	7-6
12/07/2022	22:10	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7-6
12/07/2022	22:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7-6
12/07/2022	22:19	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6
12/07/2022	22:21	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
12/07/2022	22:21	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	6
12/07/2022	22:23	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
12/07/2022	22:30	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	5
12/07/2022	22:30	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - circling along treelines (flew west to east). 2m high	1	Y	5
12/07/2022	22:40	*Nyctalus noctula*	Noctule	Seen	Foraging - circling adjacent to the path (flew north to south). 2m high.	1	Y	5-4
12/07/2022	22:46	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4
12/07/2022	22:47	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4
12/07/2022	22:49	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4-3
12/07/2022	22:54	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
12/07/2022	23:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	3-2
12/07/2022	23:11	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	2
12/07/2022	23:21	*Myotis sp.*	-	Not seen	Foraging	1	Y	1
09/08/2022	21:16	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	4
09/08/2022	21:22	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - 3m high, north of disused bridge, E to W and back, looping under and back round. 2 Continued until 21:24	2	Y	4
09/08/2022	21:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socialising	1	Y	4
09/08/2022	21:27	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - E to W along tree line adjacent disused railway. Northwards along hedgerow and then west into field	2	Y	5
09/08/2022	21:31	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5
09/08/2022	21:34	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - 2.5m along A46 (north to south) treeline.	3	Y	5
09/08/2022	21:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	2	Y	6
09/08/2022	21:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	6
09/08/2022	21:43	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6
09/08/2022	21:44	*Pipistrellus pipistrellus*	Common pipistrelle	Seen	Foraging - Northwards, 2.5m high.	1	Y	6

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
09/08/2022	21:49	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7
09/08/2022	21:51	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
09/08/2022	21:56	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	7
09/08/2022	21:57	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
09/08/2022	22:08	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
09/08/2022	22:18	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Commuting	1	Y	9
09/08/2022	22:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	10
09/08/2022	22:31	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	10
09/08/2022	22:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	10
09/08/2022	22:38	*Myotis sp.*	-	Not seen	Foraging	1	Y	10
09/08/2022	22:41	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	9
07/09/2022	20:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
07/09/2022	20:15	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7
07/09/2022	20:16 – 20:18	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
07/09/2022	20:19	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7
07/09/2022	20:22 – 20:24	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7-6
07/09/2022	20:29 – 20:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	6

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
07/09/2022	20:34	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	6-5
07/09/2022	20:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	5
07/09/2022	20:53	*Nyctalus sp.*	-	Not seen	Commuting	1	Y	4
07/09/2022	20:55	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	4-3
07/09/2022	20:59	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3
07/09/2022	21:00	*Nyctalus noctula*	Noctule	Not seen	Commuting	1	Y	2
07/09/2022	21:01	*Nyctalus sp.*	-	Not seen	Commuting	1	Y	3
07/09/2022	21:04	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	3
07/09/2022	21:04	*Nyctalus sp.*	-	Not seen	Commuting	1	Y	3
07/09/2022	21:08 – 21:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socialising	1	Y	3-2
07/09/2022	21:14 - 21:17	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	1
07/09/2022	21:27	*Nyctalus leisleri*	Leisler's bat	Not seen	Commuting	1	Y	1-2
07/09/2022	21:27	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	1-2
07/09/2022	21:30	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	2
07/09/2022	21:31	*Pipistrellus pygmaeus*	Soprano pipistrelle	Not seen	Unknown	1	Y	2
07/09/2022	21:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	2
07/09/2022	21:36	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Unknown	1	Y	2
05/10/2022	19:19	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4-5

Date	Time	Species	Common name	Seen?	Description	Number	Recording	Stopping point
05/10/2022	19:20	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	4-5
05/10/2022	19:28	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5-6
05/10/2022	19:32	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5-6
05/10/2022	19:37	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	5-6
05/10/2022	19:44	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Socialising	1	Y	6-7
05/10/2022	19:46	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-7
05/10/2022	19:50	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	6-7
05/10/2022	20:02	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Foraging	1	Y	7
05/10/2022	20:03	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	7-8
05/10/2022	20:09	*Pipistrellus pipistrellus*	Common pipistrelle	Not seen	Commuting	1	Y	8
05/10/2022	20:28	*Nyctalus noctula*	Noctule	Not seen	Foraging	1	Y	10

F. Appendix Survey results for static detectors

Appendix Table F-1: Nights of deployment of static detectors per month in 2022 and 2023

Transect	Static Detector	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Total
BT01	BS01	6	7	8	2	6	0*	8	-	-	-	-	-	6	-	**43**
BT01	BS02	6	7	1*	7	8	6	0*	-	-	-	-	-	-	0*	**35**
BT02	BS01	6	6	9	7	8	0*	8	-	-	-	-	-	7	-	**51**
BT02	BS02	6	6	0*	0*	4	0*	8	-	-	7	5	6	6	-	**48**
BT03	BS01	6	6	-	-	7	-	-	-	-	6	7	-	4	8	**44**
BT03	BS02	7	-	-	-	7	11	8	-	10	6	7	-	-	-	**56**
BT04	BS01	-	-	-	8	7	5	8	8	10	7	-	-	-	-	**53**
BT04	BS02	-	9	-	8	7	9	9	6	-	7	-	-	-	-	**55**
BT04	BS03	-	9	-	8	7	5	8	8	-	7	-	-	-	-	**52**
BT05a_b	BS01	-	9	5	6	6	7	8	8	-	-	-	-	-	-	**49**
BT05a_b	BS02	6	11	9	6	6	5	8	-	-	-	-	-	-	-	**51**
BT05a_b	BS03	-	-	*	6	7	*	8	8	10	7	-	-	8	-	**54**
*Deployed for at least five consecutive nights but did not record for at least five consecutive nights, due to technological issues.																

Appendix Table F-2: Bats recorded by static detector per month in 2022 and 2023

Detector BT01 BS01

Species	Common name	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Oct 22	Sep 23
Barbastella barbastellus	Barbastelle	1	-	-	-	7	1	-
Eptesicus serotinus	Serotine	1	8	-	-	-	-	6
Myotis sp.	-	17	20	42	15	135	26	-
Nyctalus leisleri	Leisler's bat	2	5	58	24	514	-	-
Nyctalus noctula	Noctule	9	177	464	147	3233	39	-
Nyctalus sp.	-	2	73	18	6	456	31	-
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	2	-	1	-	-
Pipistrellus pipistrellus	Common pipistrelle	287	401	1988	724	450	175	58
Pipistrellus pygmaeus	Soprano pipistrelle	14	40	349	110	74	12	14
Pipistrellus sp.	-	-	-	32	7	-	17	-
Plecotus auritus	Brown long-eared bat	-	3	-	-	51	7	-
Unknown species	-	-	-	-	-	-	-	-

Detector BT01 BS02

Species	Common name	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 23
Barbastella barbastellus	Barbastelle	-	-	-	1	1	1	-
Eptesicus serotinus	Serotine	-	-	-	-	6	1	-
Myotis sp.	-	12	156	2	330	31	18	-
Nyctalus leisleri	Leisler's bat	2	3	-	7	41	36	-
Nyctalus noctula	Noctule	7	78	4	112	71	557	-
Nyctalus sp.	-	-	39	-	46	1	-	-
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	-	3	-	2	-
Pipistrellus pipistrellus	Common pipistrelle	78	1787	24	1444	436	258	-
Pipistrellus pygmaeus	Soprano pipistrelle	157	946	313	2402	2	50	-
Pipistrellus sp.	-	8	55	1	62	-	5234	-
Plecotus auritus	Brown long-eared bat	-	-	-	5	1	3	-
Unknown species	-	-	-	-	-	2	6	-

Detector BT02 BS01

Species	Common name	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Oct 22	Sep 23
Barbastella barbastellus	Barbastelle	-	-	-	-	1	-	-
Eptesicus serotinus	Serotine	-	1	2	-	1	-	-
Myotis sp.	-	4	17	153	116	239	69	53
Nyctalus leisleri	Leisler's bat	-	3	17	10	12		
Nyctalus noctula	Noctule	5	28	176	128	75	8	76
Nyctalus sp.	-	-	-	-	-	-	-	-
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	1	-	3	-	1
Pipistrellus pipistrellus	Common pipistrelle	99	955	1208	1197	1531	214	546
Pipistrellus pygmaeus	Soprano pipistrelle	7	63	103	130	199	66	309
Pipistrellus sp.	-	-	20	28	14	34	-	2
Plecotus auritus	Brown long-eared bat	-	-	-	-	23		8
Unknown species	-	-	-	1	-	-	2	-

Detector BT02 BS02

Species	Common name	Apr 22	May 22	Oct 22	Jun 23	Jul 23	Aug 23	Sep 23
Barbastella barbastellus	Barbastelle	-	-	-	-	-	-	-
Eptesicus serotinus	Serotine	-	-	-	-	-	-	-
Myotis sp.	-	-	29	713	5	21	24	14
Nyctalus leisleri	Leisler's bat	-	3	-	-	-	-	-
Nyctalus noctula	Noctule	11	12	1	12	34	18	22
Nyctalus sp.	-	-	-	-	-	1	3	10
Pipistrellus nathusii	Nathusius' pipistrelle	-	1	-	-	-	1	-
Pipistrellus pipistrellus	Common pipistrelle	328	336	139	56	726	276	310
Pipistrellus pygmaeus	Soprano pipistrelle	17	20	112	9	172	84	123
Pipistrellus sp.	-	-	-	-	14	12	-	57
Plecotus auritus	Brown long-eared bat	-	-	-	-	2	11	3
Unknown species	-	-	-	1	-	-	-	-

Detector BT03 BS01

Species	Common name	Apr 22	May 22	Aug 22	Jun 23	Jul 23	Sep 23	Oct 23
Barbastella barbastellus	Barbastelle	-	1	1	-	-	2	2
Eptesicus serotinus	Serotine	-	3	2	2	1	-	-
Myotis sp.	-	21	57	23	6	3	18	110
Nyctalus leisleri	Leisler's bat	2	5	-	2	-	-	-
Nyctalus noctula	Noctule	21	39	25	14	54	8	2
Nyctalus sp.	-	13	-	2	11	2	6	6
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	-	-	-	-	2
Pipistrellus pipistrellus	Common pipistrelle	269	1227	971	924	582	564	479
Pipistrellus pygmaeus	Soprano pipistrelle	102	81	234	231	281	130	100
Pipistrellus sp.	-	1	3	-	15	9	5	6
Plecotus auritus	Brown long-eared bat	1	-	10	2	-	6	2
Unknown species	-	-	-	1	-	-	-	-

Detector BT03 BS02

Species	Common name	Apr 22	Aug 22	Sep 22	Oct 22	May 23	Jun 23	Jul 23
Barbastella barbastellus	Barbastelle	-	1	-	-	-	-	-
Eptesicus serotinus	Serotine	-	-	-	-	-	-	-
Myotis sp.	-	563	115	375	14	107	76	19
Nyctalus leisleri	Leisler's bat	1	8	7	-	-	-	-
Nyctalus noctula	Noctule	-	104	2	6	5	15	20
Nyctalus sp.	-	-	-	-	1	3	2	-
Pipistrellus nathusii	Nathusius' pipistrelle	2	-	-	-	-	1	-
Pipistrellus pipistrellus	Common pipistrelle	3660	11545	10861	152	3068	2327	3882
Pipistrellus pygmaeus	Soprano pipistrelle	400	192	38	93	54	90	26
Pipistrellus sp.	-	82	129	-	-	3	-	4
Plecotus auritus	Brown long-eared bat	-	35	-	1	-	2	1
Unknown species	-	4	-	-	-	-	-	-

Detector BT04 BS01

Species	Common name	Jul 22	Aug 22	Sep 22	Oct 22	Apr 23	May 23	Jun 23
Barbastella barbastellus	Barbastelle	-	1	1	-	-	-	-
Eptesicus serotinus	Serotine	-	-	-	-	-	-	-
Myotis sp.	-	85	27	13	497	30	17	8
Nyctalus leisleri	Leisler's bat	-	-	-	-	-	-	-
Nyctalus noctula	Noctule	521	27	28	-	8	33	-
Nyctalus sp.	-	33	6	9	-	-	12	34
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	2	1	-	-	-
Pipistrellus pipistrellus	Common pipistrelle	1538	596	406	1907	3452	7382	1119
Pipistrellus pygmaeus	Soprano pipistrelle	112	29	23	16	1825	197	37
Pipistrellus sp.	-	-	23	11	5	89	9	26
Plecotus auritus	Brown long-eared bat	2	10	12	-	-	1	-
Unknown species	-	-	-	-	-	-	-	-

Detector BT04 BS02

Species	Common name	May 22	Jul 22	Aug 22	Oct 22	Apr23	Jun 23	Sep 23
Barbastella barbastellus	Barbastelle	-	-	-	-	-	-	1
Eptesicus serotinus	Serotine	-	2	-	1	-	-	-
Myotis sp.	-	95	177	44	26	4	35	151
Nyctalus leisleri	Leisler's bat	-	6	-	1	-	-	-
Nyctalus noctula	Noctule	228	367	20	4	1	22	14
Nyctalus sp.	-	4	-	1	-	-	-	2
Pipistrellus nathusii	Nathusius' pipistrelle	-	-	-	1	-	-	4
Pipistrellus pipistrellus	Common pipistrelle	761	3531	589	167	119	587	464
Pipistrellus pygmaeus	Soprano pipistrelle	338	358	705	6	118	371	1147
Pipistrellus sp.	-	-	40	613	4	-	15	213
Plecotus auritus	Brown long-eared bat	7	-	-	-	-	-	3
Unknown species	-	-	1	1	-	-	-	-

Detector BT04 BS03

Species	Common name	May 22	Jul 22	Aug 22	Sep 22	Oct 22	Apr 23	Jun 23
Barbastella barbastellus	Barbastelle				2	1		
Eptesicus serotinus	Serotine		16					
Myotis sp.	-	118	78	50	38	130	28	29
Nyctalus leisleri	Leisler's bat	3	12	13	10	1		
Nyctalus noctula	Noctule	98	308	12	17	1	19	39
Nyctalus sp.	-	15					1	
Pipistrellus nathusii	Nathusius' pipistrelle			2	2	8		
Pipistrellus pipistrellus	Common pipistrelle	707	2050	1045	1604	342	480	728
Pipistrellus pygmaeus	Soprano pipistrelle	125	60	46	43	8	28	13
Pipistrellus sp.	-	7		6			1	27
Plecotus auritus	Brown long-eared bat	7		2	1	8		1
Unknown species	-							

Detector BT05a_b BS01

Species	Common name	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Apr 23
Barbastella barbastellus	Barbastelle							
Eptesicus serotinus	Serotine							
Myotis sp.	-	66	51	54	109	62	113	81
Nyctalus leisleri	Leisler's bat	7	8	3	7	12		1
Nyctalus noctula	Noctule	108	50	39	7	30	7	
Nyctalus sp.	-		7	1			1	
Pipistrellus nathusii	Nathusius' pipistrelle	36		1	8	10		
Pipistrellus pipistrellus	Common pipistrelle	1332	347	378	8107	3791	678	740
Pipistrellus pygmaeus	Soprano pipistrelle	405	29	51	25	66	21	251
Pipistrellus sp.	-		5	2	13	26		8
Plecotus auritus	Brown long-eared bat		1		3	3		
Unknown species	-			1			13	

Detector BT05a_b BS02

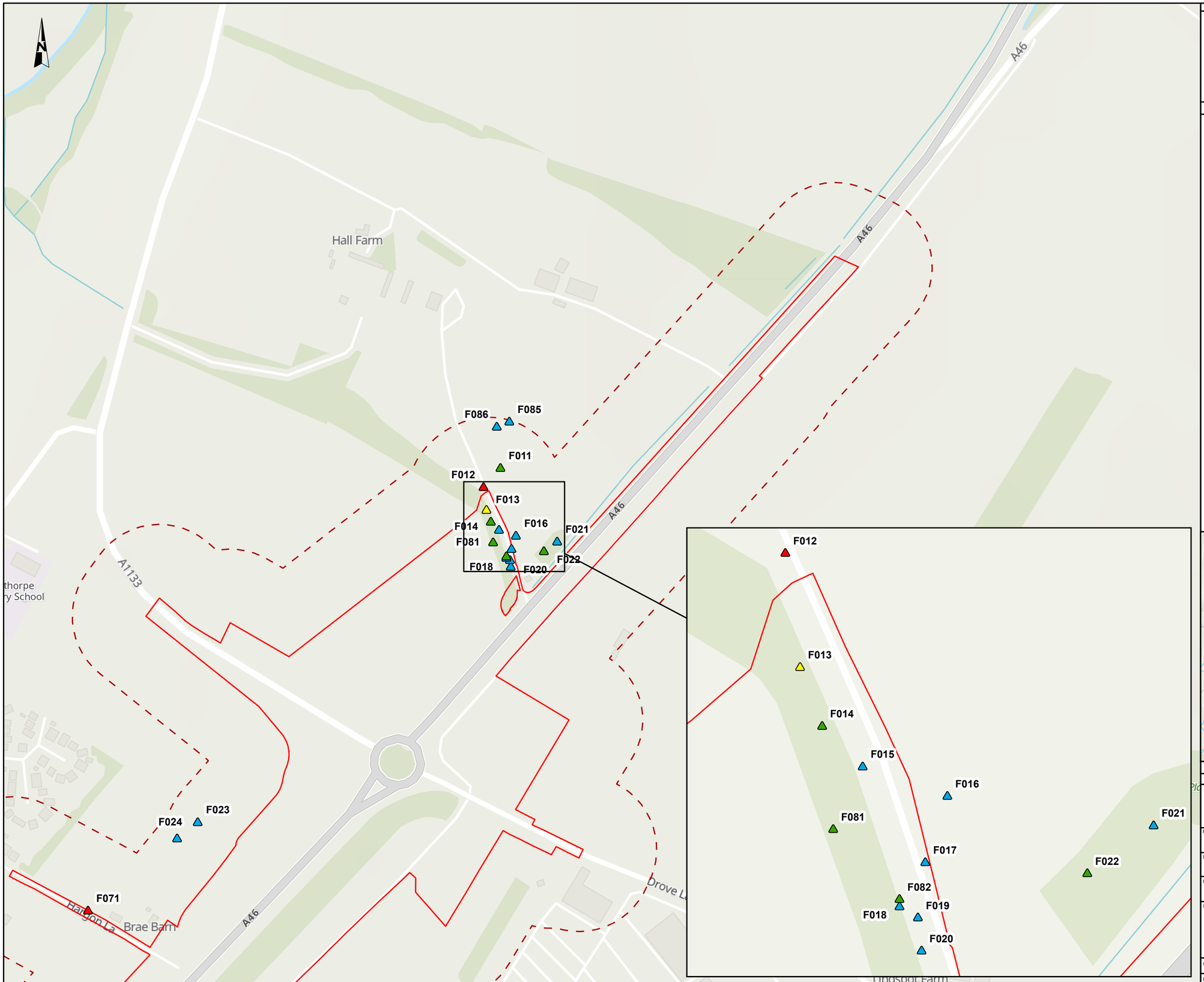
Species	Common name	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22
Barbastella barbastellus	Barbastelle		1					
Eptesicus serotinus	Serotine	2	2					
Myotis sp.	-	5	17	46	16	18	16	39
Nyctalus leisleri	Leisler's bat	7	16					
Nyctalus noctula	Noctule	22	50	100	23			
Nyctalus sp.	-			75	10	18	9	
Pipistrellus nathusii	Nathusius' pipistrelle		8					
Pipistrellus pipistrellus	Common pipistrelle	108	3317	1218	564	740	511	219
Pipistrellus pygmaeus	Soprano pipistrelle	25	75	307	177	140	108	136
Pipistrellus sp.	-			20	37	31	5	7
Plecotus auritus	Brown long-eared bat		1	5	5			
Unknown species	-	3	4			4	2	

Detector BT05a_b BS03

Species	Common name	Jul 22	Aug 22	Oct 22	Apr 23	May 23	Jun 23	Sep 23
Barbastella barbastellus	Barbastelle		1					
Eptesicus serotinus	Serotine							
Myotis sp.	-	11	4	4	3	23	7	16
Nyctalus leisleri	Leisler's bat		4			11		
Nyctalus noctula	Noctule	62	7	2		29	32	16
Nyctalus sp.	-	3				5	16	3
Pipistrellus nathusii	Nathusius' pipistrelle		1					
Pipistrellus pipistrellus	Common pipistrelle	278	334	48	27	146	282	661
Pipistrellus pygmaeus	Soprano pipistrelle	212	27	49	21	101	152	127
Pipistrellus sp.	-		1	1		7	8	1
Plecotus auritus	Brown long-eared bat		1	4		3	2	4
Unknown species	-		4				1	

G. Appendix: Location of buildings, trees and structures

Appendix Figure G-1: Preliminary Roost Assessment (PRA) results for trees



NOTES

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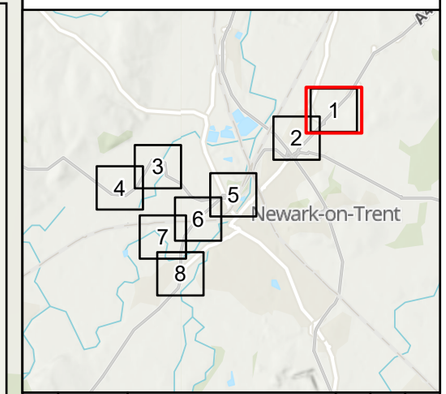
KEY TO SYMBOLS

Order Limits

Order Limits 100m buffer

Tree: suitability for roosting bat

- High
- Low
- Moderate
- Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT
national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 1 of 8

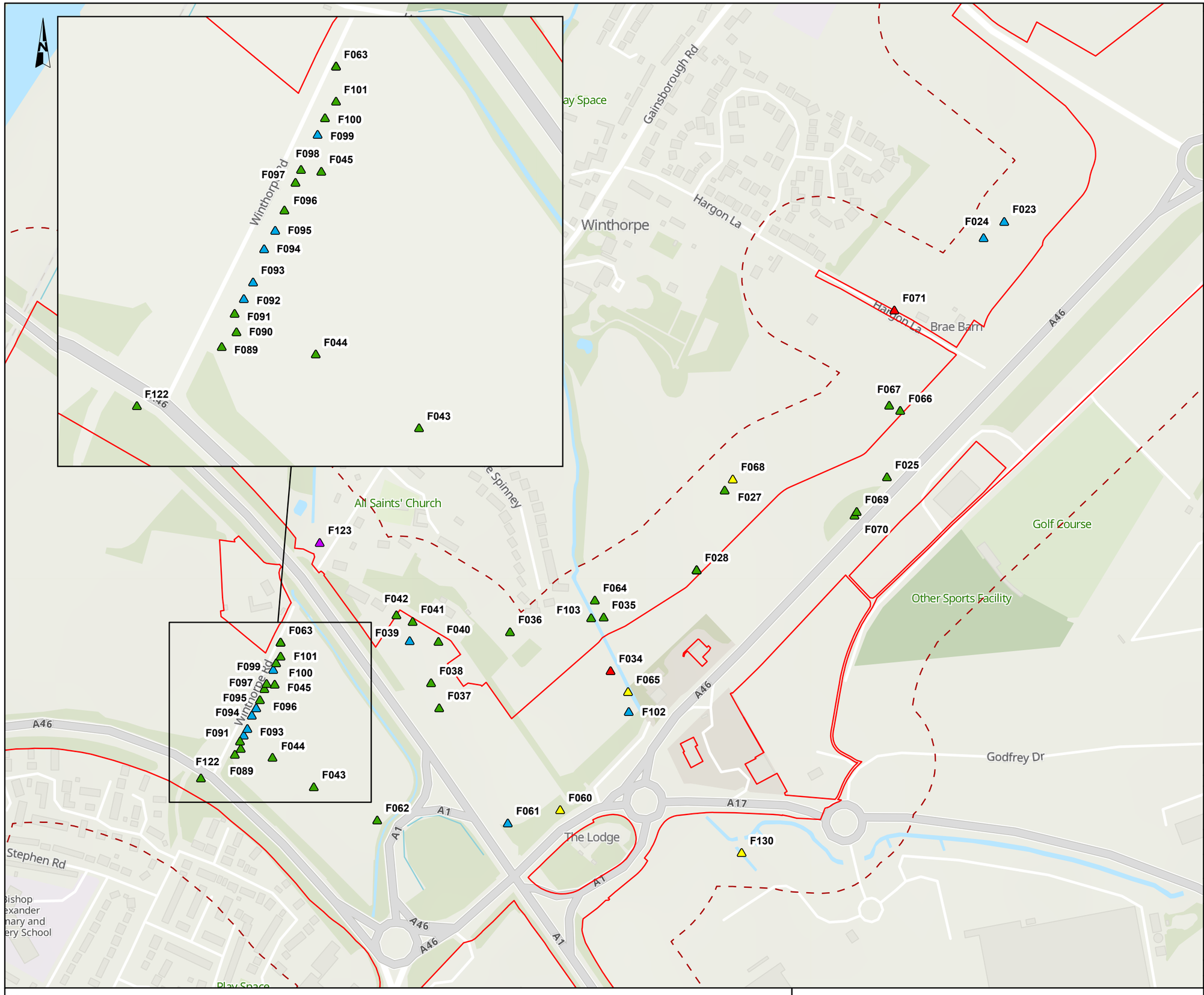
ORIGINAL SIZE A3 SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW DR LE 00051

PROJECT REF NO. HE551478

REVISION C01

0 100 200 Metres



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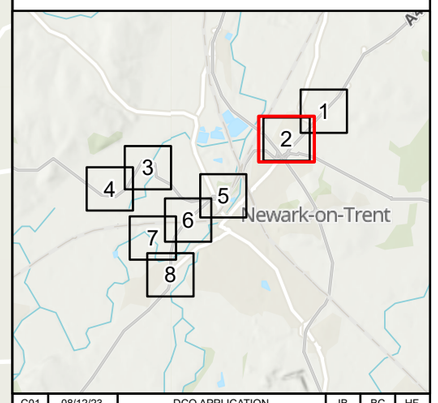
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Tree: suitability for roosting bat

- Confirmed
- High
- Low
- Moderate
- Negligible



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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 2 of 8

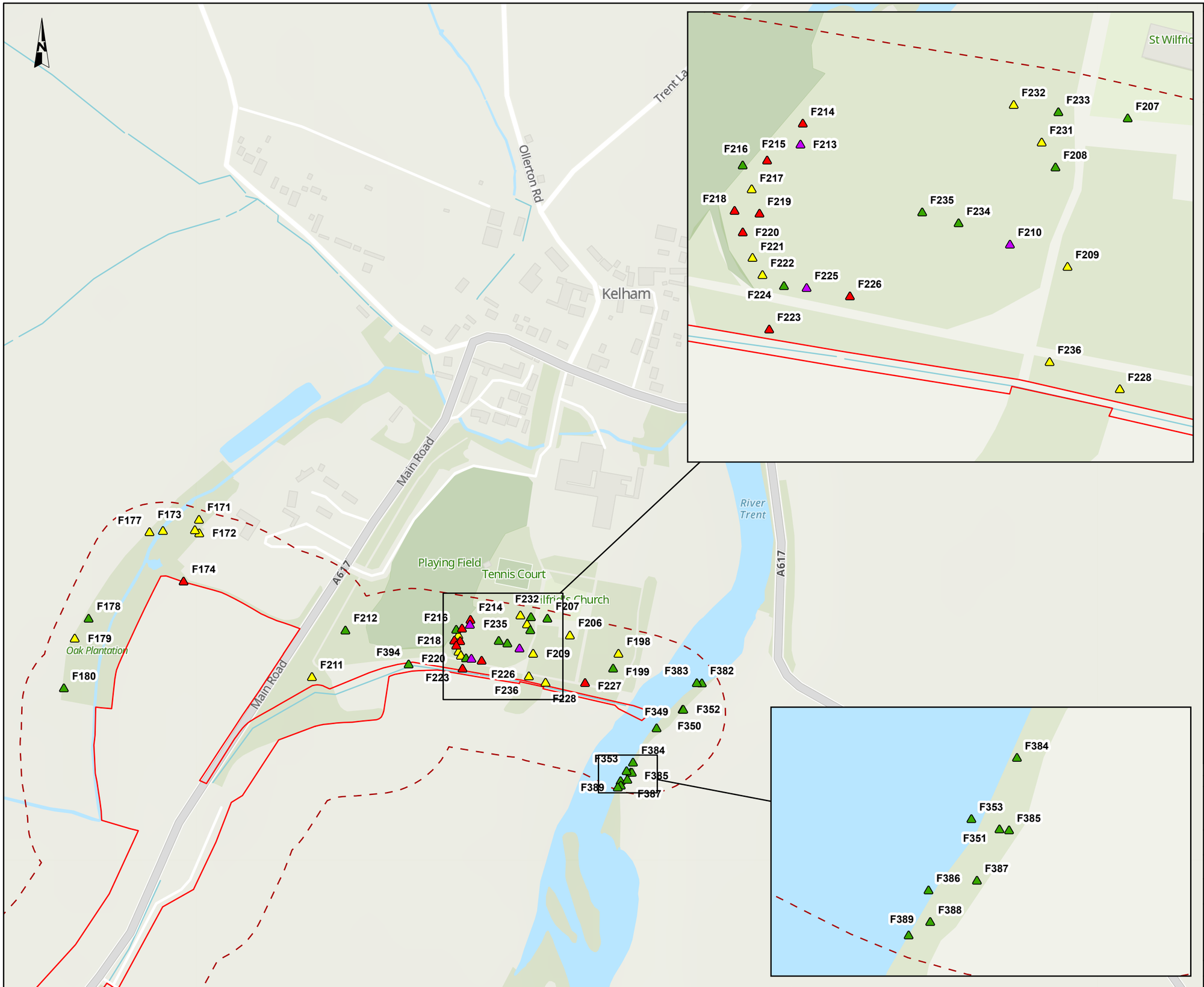
ORIGINAL SIZE A3
SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00052
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO.
HE551478

REVISION
C01

0 100 200 Metres



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KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Tree: suitability for roosting bat

- Confirmed
- High
- Low
- Moderate

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

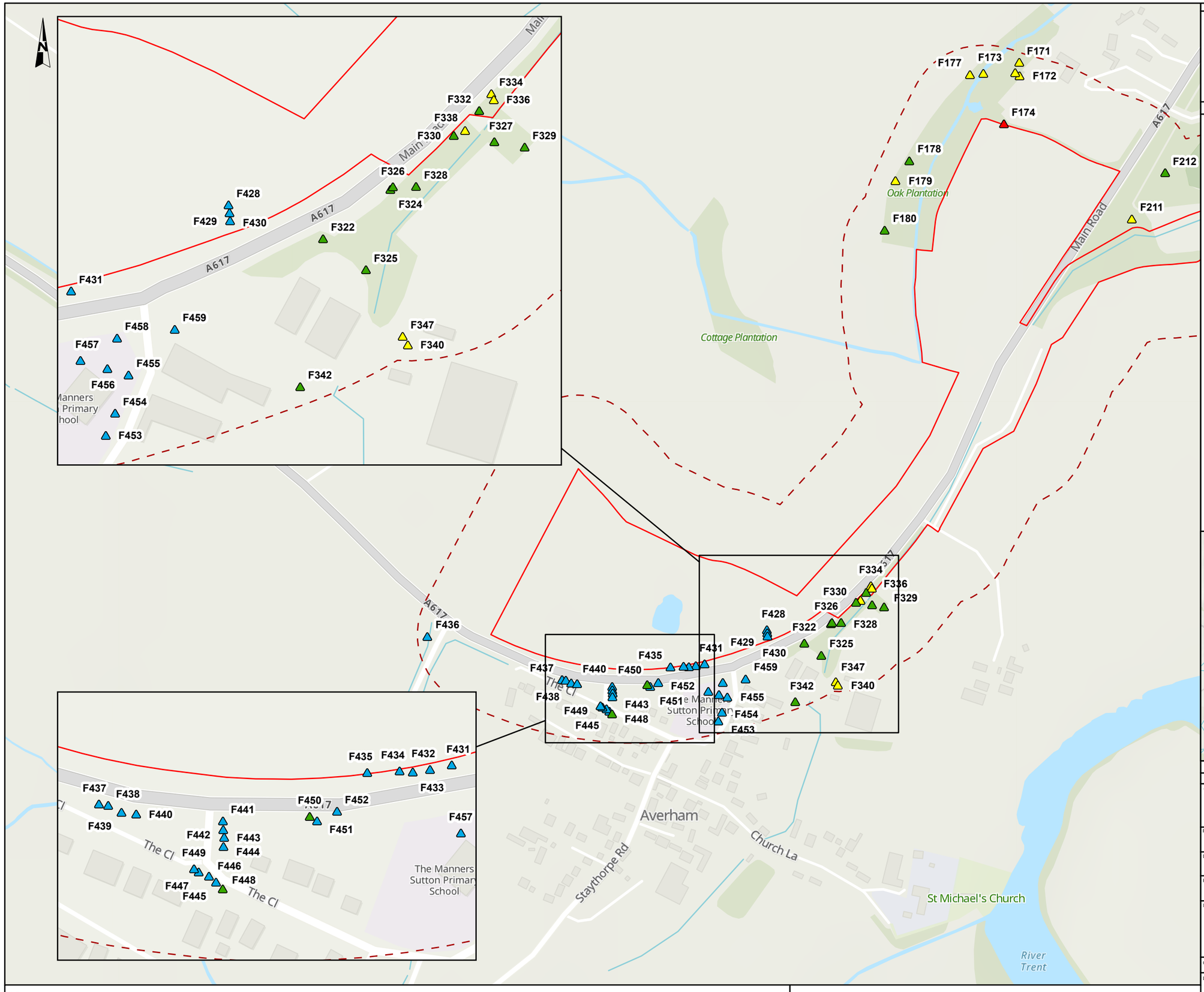
DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 3 of 8

ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW DR LE 00055

PROJECT REF NO. HE551478
REVISION C01

0 100 200 Metres



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KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Tree: suitability for roosting bat

- High
- Low
- Moderate
- Negligible

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
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DEVELOPMENT CONSENT ORDER NUMBER
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PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 4 of 8

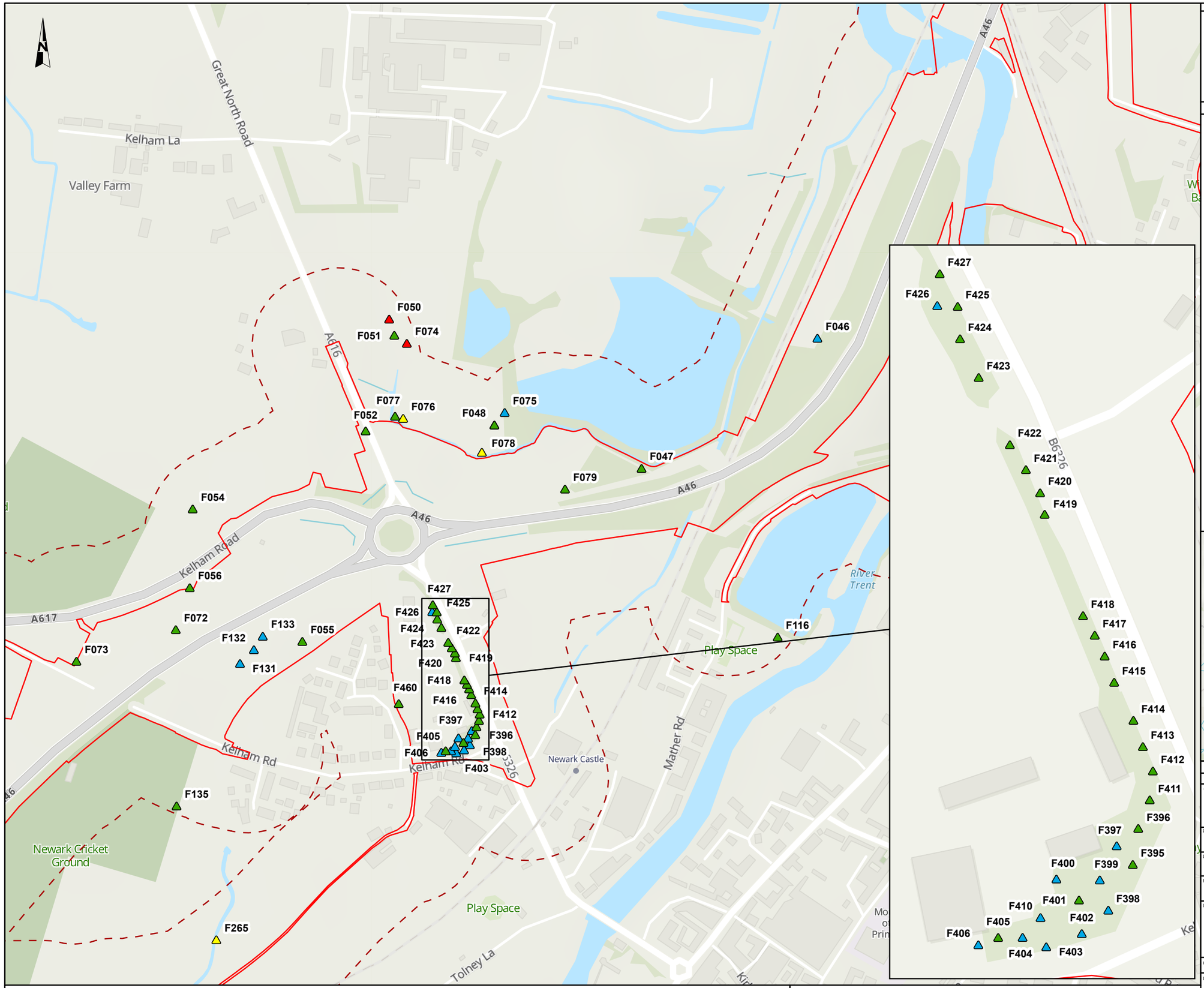
ORIGINAL SIZE A3
SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00057
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO.
HE551478

REVISION
C01

0 100 200 Metres



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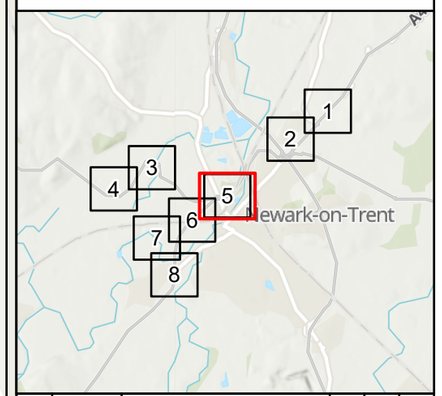
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Tree: suitability for roosting bat

- High
- Low
- Moderate
- Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

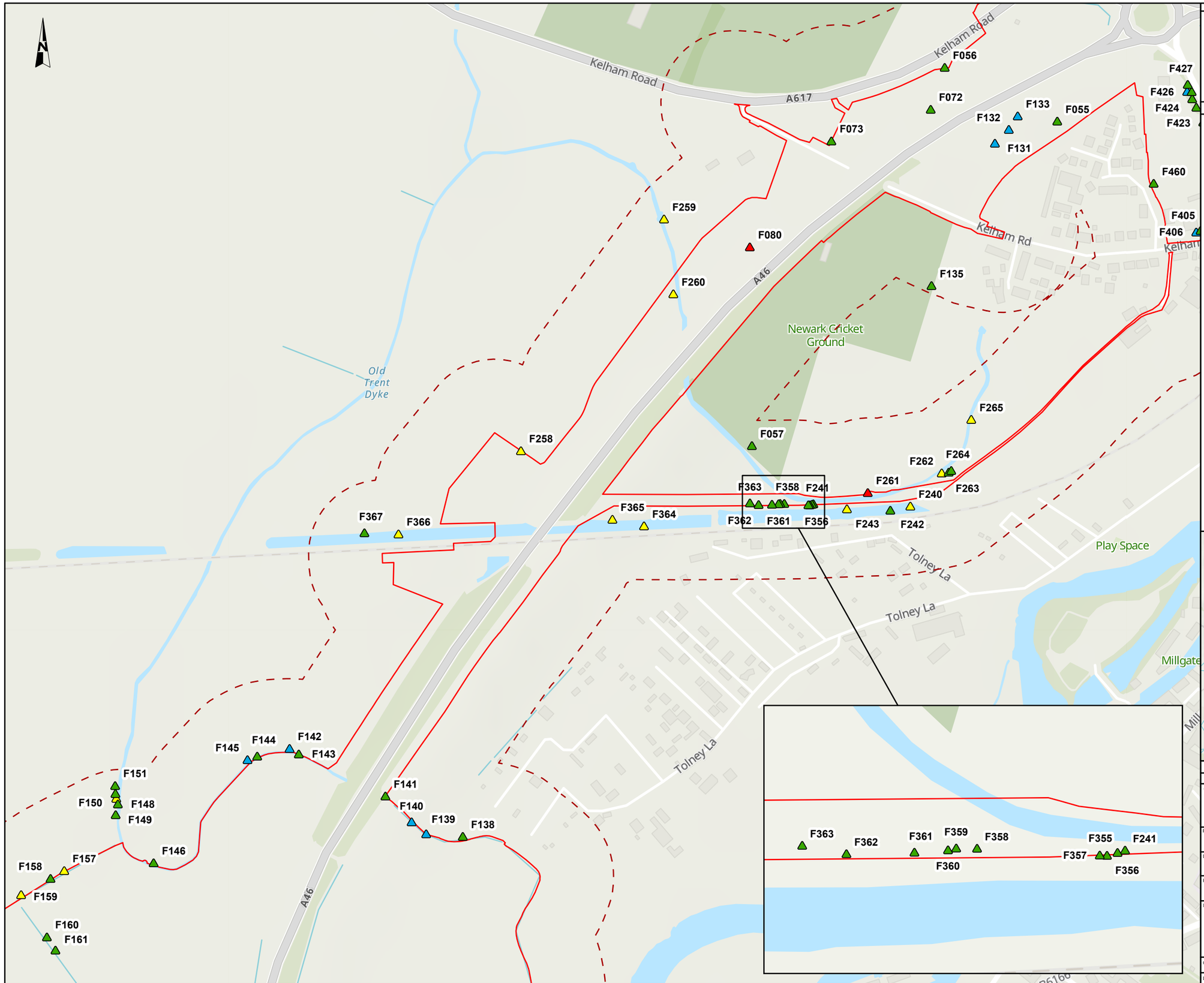
DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 5 of 8

ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW DR LE 00058

PROJECT REF NO. HE551478
REVISION C01

0 100 200 Metres



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Contains data from OS Zoomstack

KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Tree: suitability for roosting bat

- High
- Low
- Moderate
- Negligible

0 100 200 Metres

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

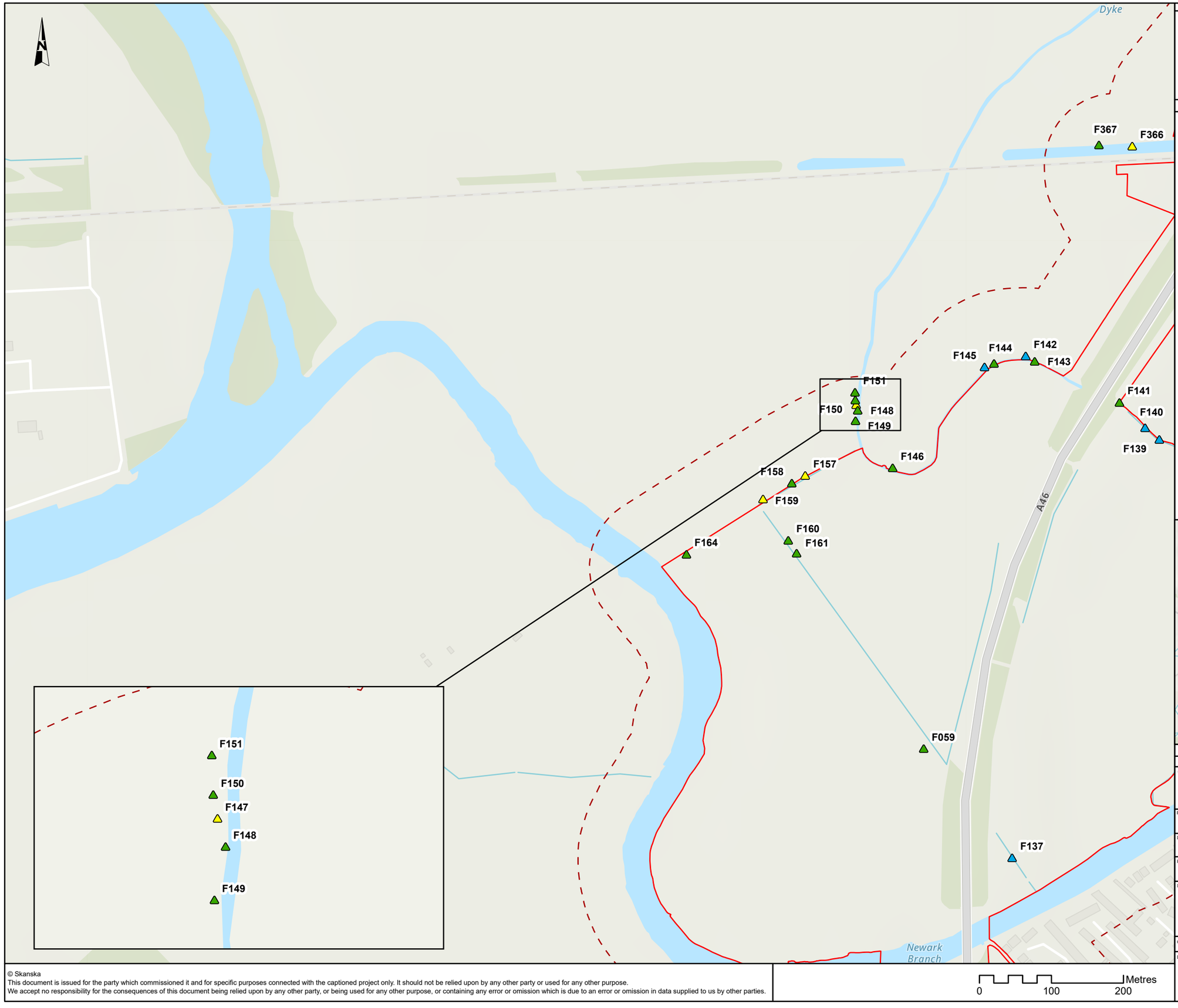
PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE: Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 6 of 8

ORIGINAL SIZE: A3 SCALE: 1:5,000

DRAWING NUMBER HE PIN	ORIGINATOR	VOLUME	PROJECT REF NO.
HE551478	SKAG	EBD	HE551478
CONWI_CONW LOCATION	DR TYPE	LE ROLE	00059 NUMBER

REVISION: C01



NOTES

Source
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Service Layer Credits
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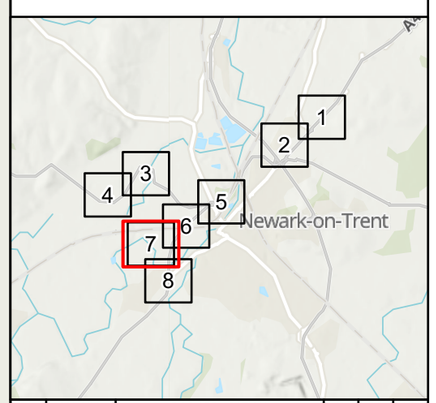
KEY TO SYMBOLS

Order Limits

Order Limits 100m buffer

Tree: suitability for roosting bat

- Low
- Moderate
- Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT

national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

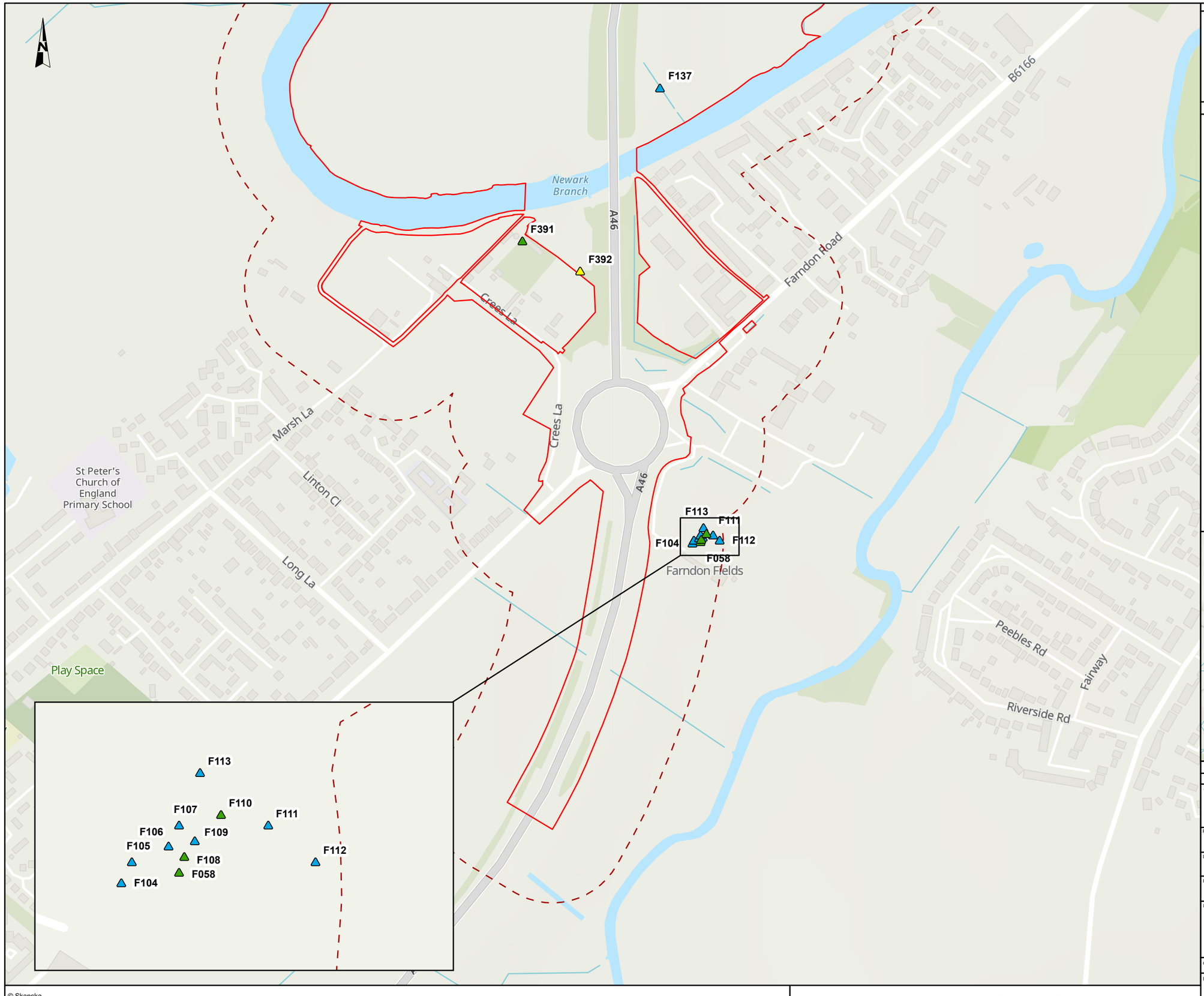
DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 7 of 8

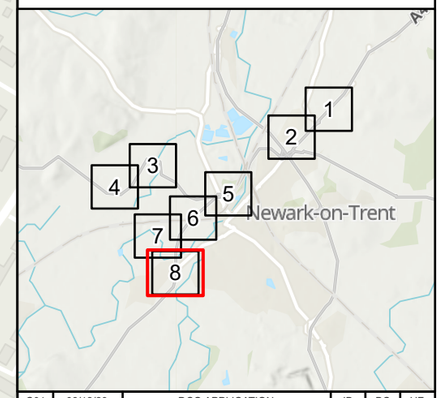
ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER HE PIN	ORIGINATOR	VOLUME	PROJECT REF NO.
HE551478	SKAG	EBD	HE551478
CONWI_CONW LOCATION	DR | TYPE	LE | ROLE	00061 | NUMBER

REVISION C01

0 100 200 Metres





NOTES

Source
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Service Layer Credits
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KEY TO SYMBOLS

Order Limits
Order Limits 100m buffer

Tree: suitability for roosting bat

- Low
- Moderate
- Negligible

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G1
Preliminary Roost Assessment (PRA) Results for Trees
Sheet: 8 of 8

ORIGINAL SIZE A3
SCALE 1:5,000

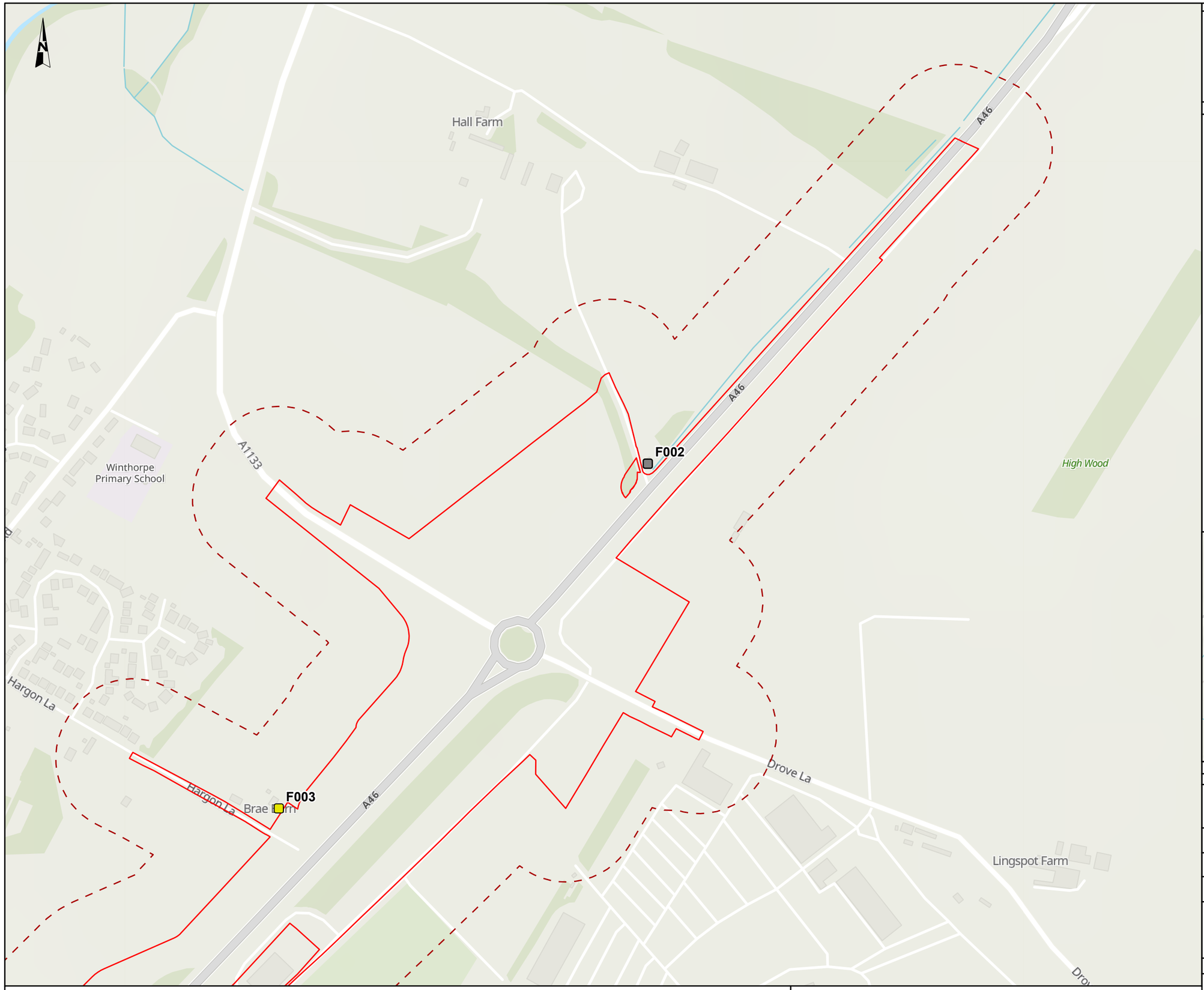
DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00062
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO.
HE551478

REVISION
C01

0 100 200 Metres

Appendix Figure G-2: Preliminary Roost Assessment (PRA) results for buildings



NOTES

Source
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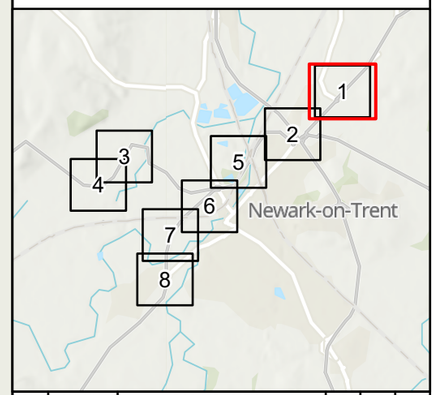
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Stucture/building: suitability for roosting bat

- Moderate
- Inconclusive



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT
national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 1 of 8

ORIGINAL SIZE A3 SCALE 1:5,000

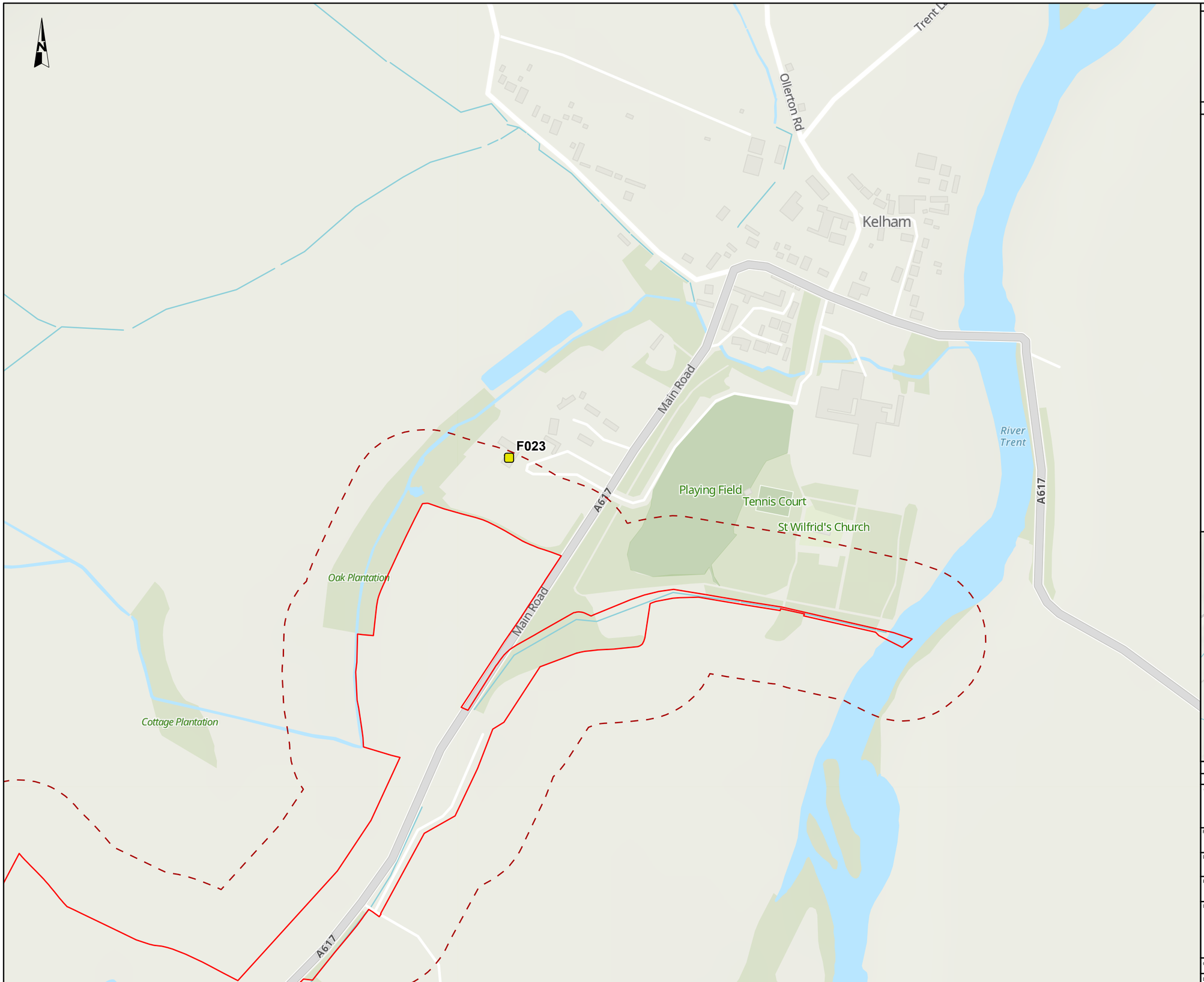
DRAWING NUMBER

HE PIN	ORIGINATOR	VOLUME	LOCATION	TYPE	ROLE	NUMBER
HE551478	SKAG	EBD	CONWI_CONW	DR	LE	00040

PROJECT REF NO. HE551478

REVISION C01

0 100 200 Metres



NOTES

Source
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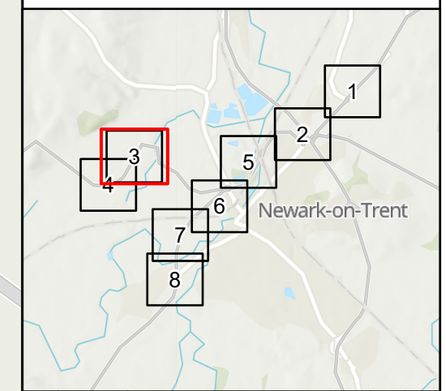
KEY TO SYMBOLS

Order Limits

Order Limits 100m buffer

Stucture/building: suitability for roosting bat

Moderate



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT

national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 3 of 8

ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00041
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO. HE551478

REVISION C01

0 100 200 Metres

0 100 200 Metres

NOTES

Source
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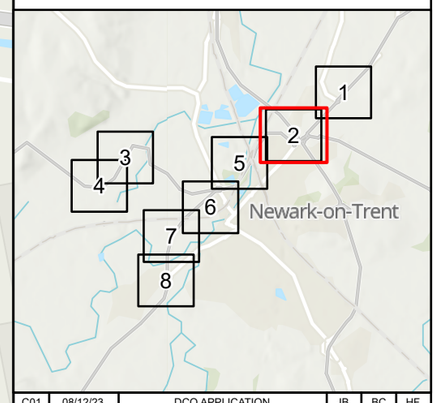
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Stucture/building: suitability for roosting bat

- Confirmed
- Moderate



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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PURPOSE OF ISSUE
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DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

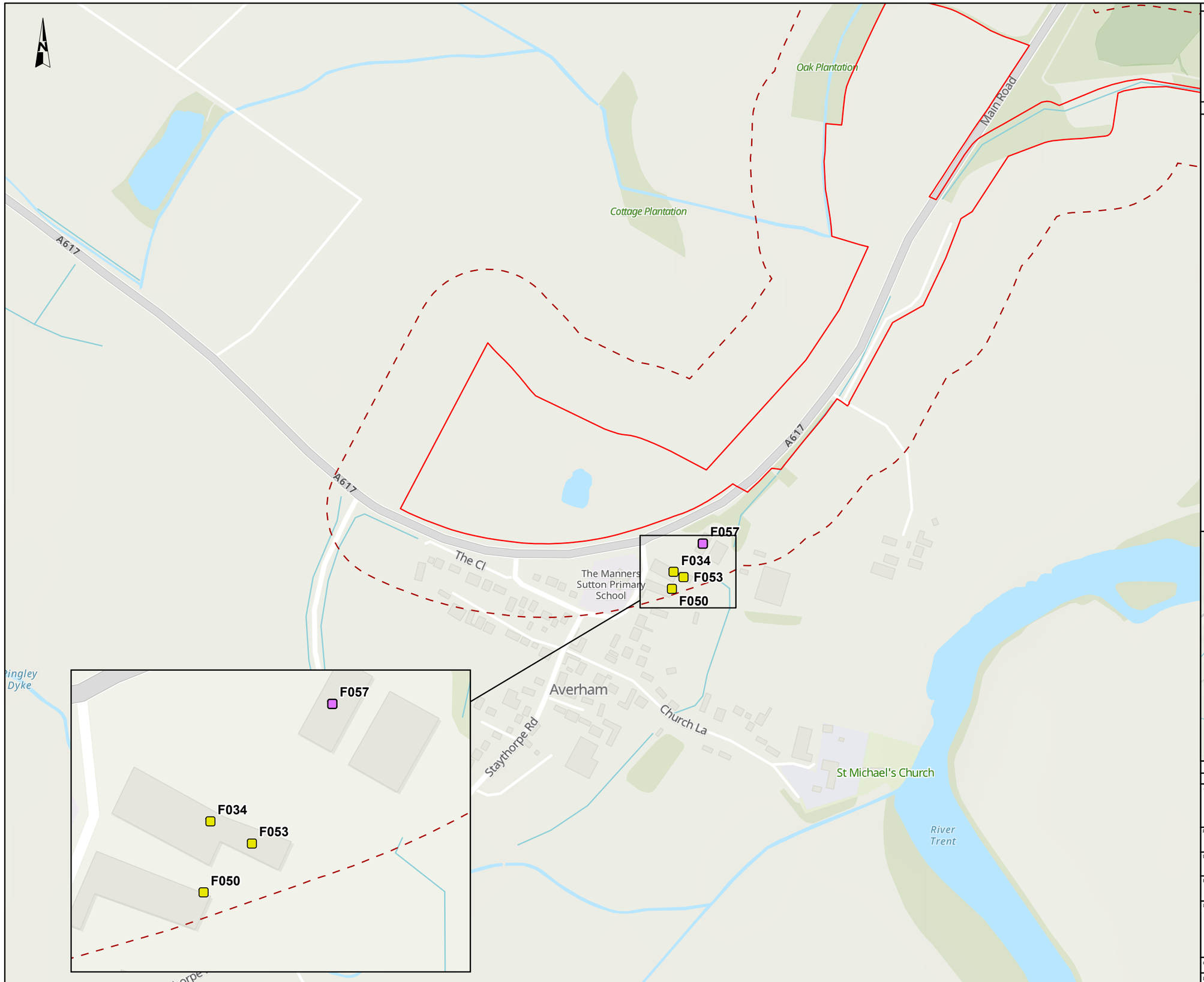
DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 2 of 8

ORIGINAL SIZE A3
SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00042
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO.
HE551478

REVISION
C01



NOTES

Source
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KEY TO SYMBOLS

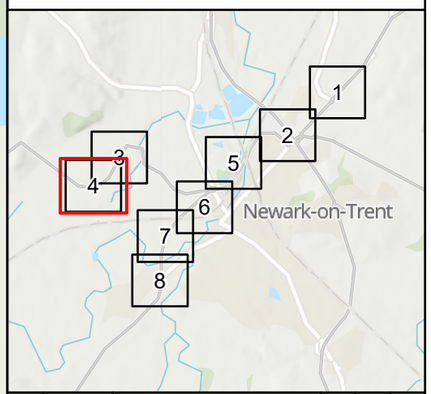
Order Limits

Order Limits 100m buffer

Stucture/building: suitability for roosting bat

Confirmed

Moderate



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 4 of 8

ORIGINAL SIZE A3
SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME | LOCATION | TYPE | ROLE | NUMBER
HE551478 SKAG EBD CONWI_CONW DR LE 00043

PROJECT REF NO. HE551478
REVISION C01

0 100 200 Metres

NOTES

Source
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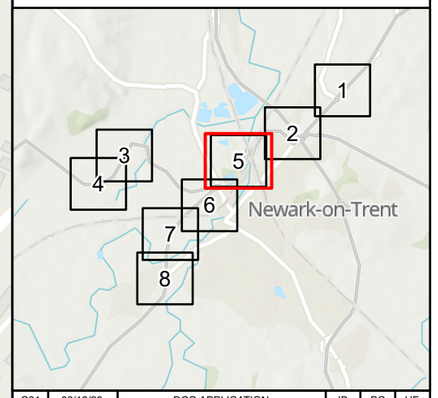
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Stucture/building: suitability for roosting bat

- High
- Low
- Moderate
- Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

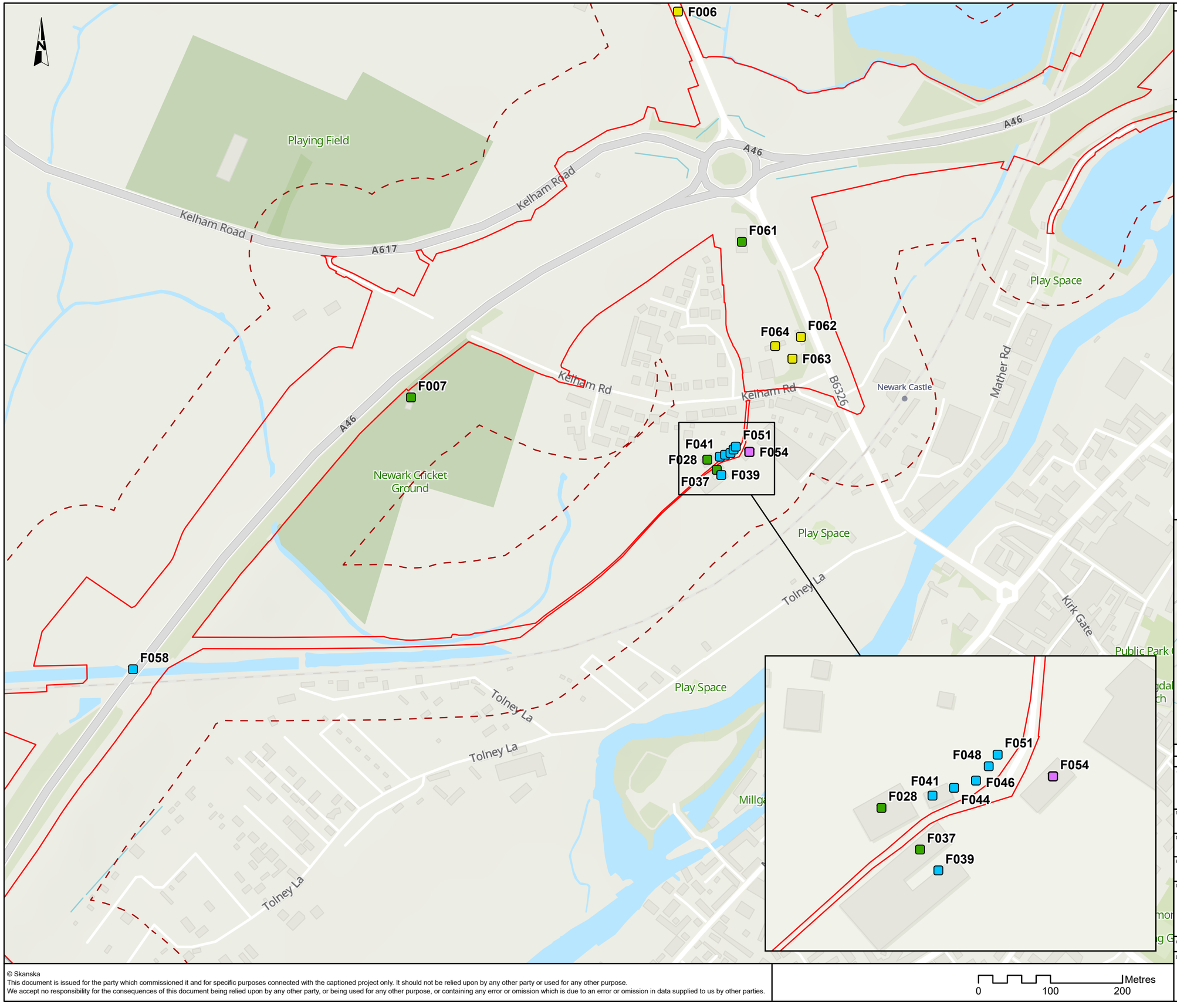
DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 5 of 8

ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW DR LE 00044

PROJECT REF NO. HE551478
REVISION C01

0 100 200 Metres



NOTES

Source
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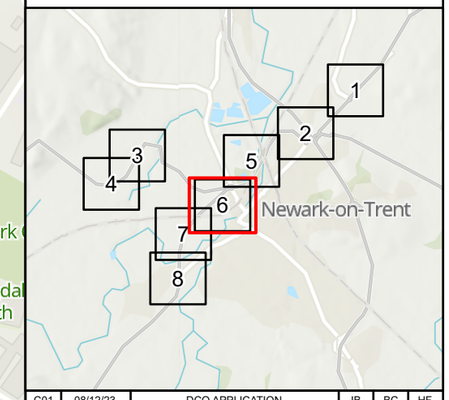
KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Stucture/building: suitability for roosting bat

- Confirmed
- Low
- Moderate
- Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

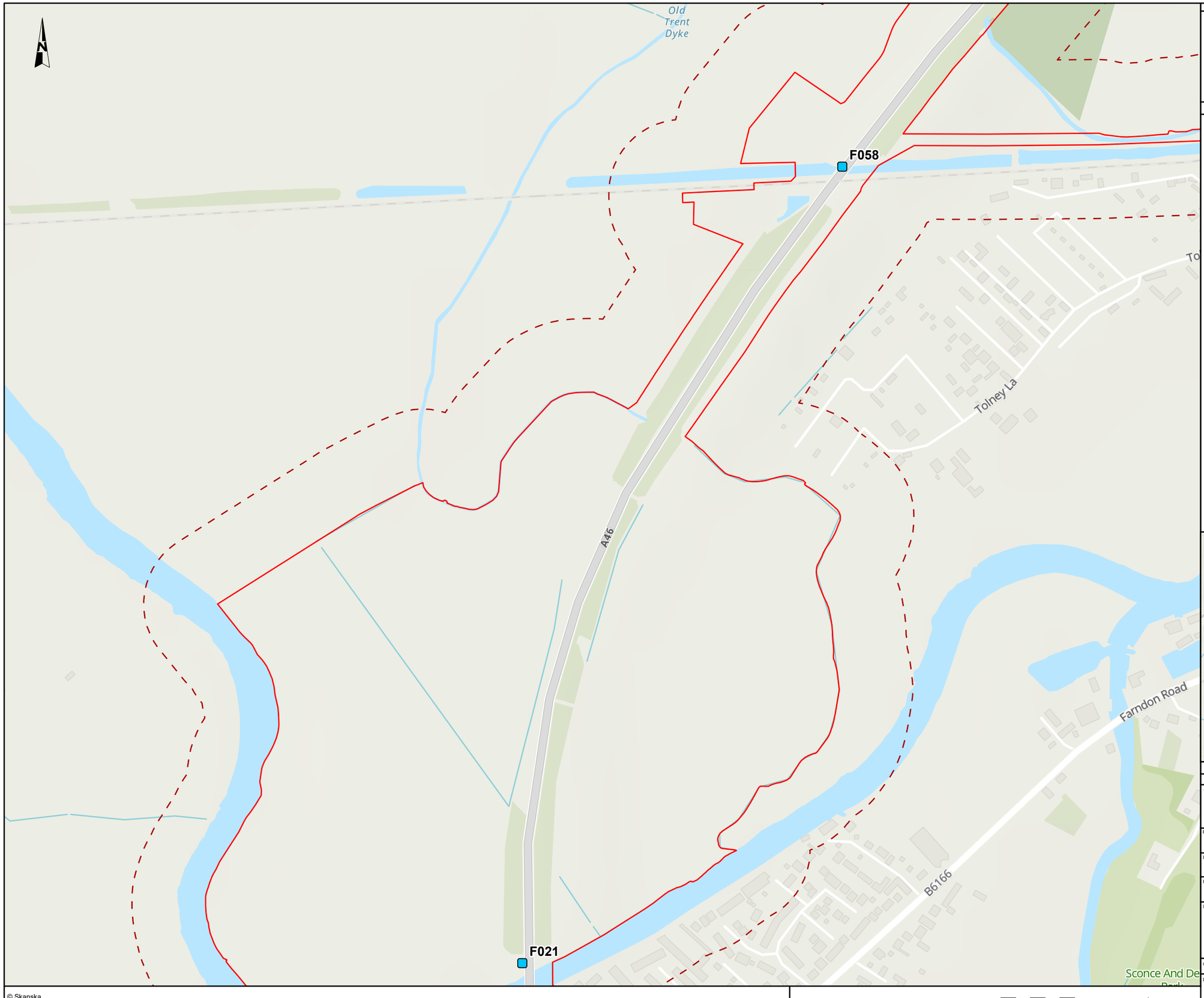
PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 6 of 8

ORIGINAL SIZE A3 | SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 | SKAG | EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW | DR | LE | 00045

PROJECT REF NO. HE551478
REVISION C01



NOTES

Source
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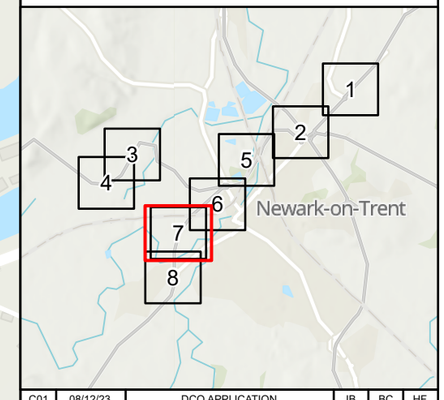
KEY TO SYMBOLS

Order Limits

Order Limits 100m buffer

Stucture/building: suitability for roosting bat

Negligible



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT

national highways

PURPOSE OF ISSUE

DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER

TR010065

PROJECT TITLE

A46 NEWARK BYPASS

DRAWING TITLE

Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 7 of 8

ORIGINAL SIZE A3 SCALE 1:5,000

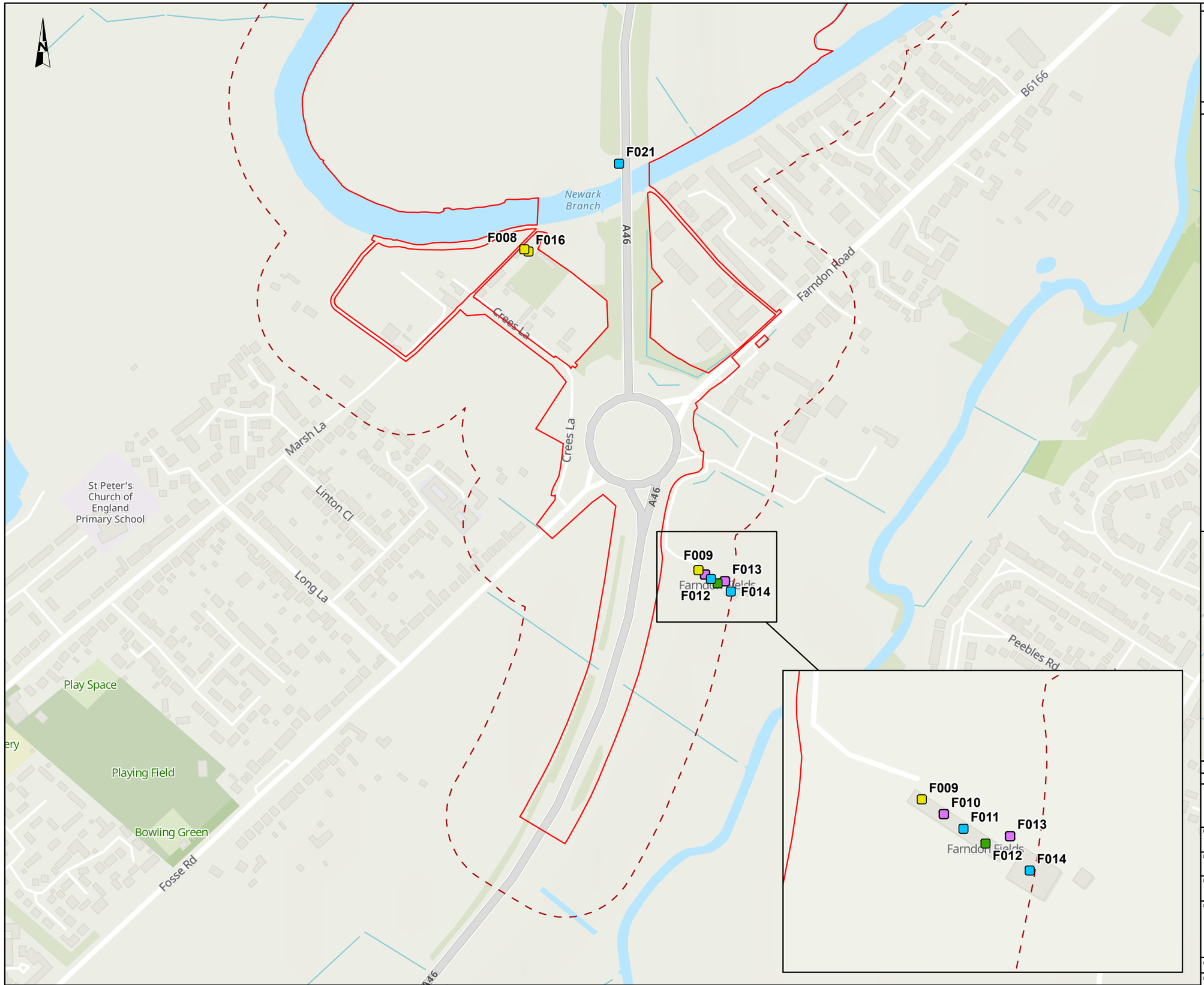
DRAWING NUMBER

HE PIN	ORIGINATOR	VOLUME		
HE551478	SKAG	EBD		
CONWI_CONW		DR	LE	00047
LOCATION		TYPE	ROLE	NUMBER

PROJECT REF NO. HE551478

REVISION C01

0 100 200 Metres



NOTES

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KEY TO SYMBOLS

- Order Limits
- Order Limits 100m buffer

Stucture/building: suitability for roosting bat

- Confirmed
- Low
- Moderate
- Negligible

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE: Appendix G2
Preliminary Roost Assessment (PRA) Results for Buildings and Structures
Sheet: 8 of 8

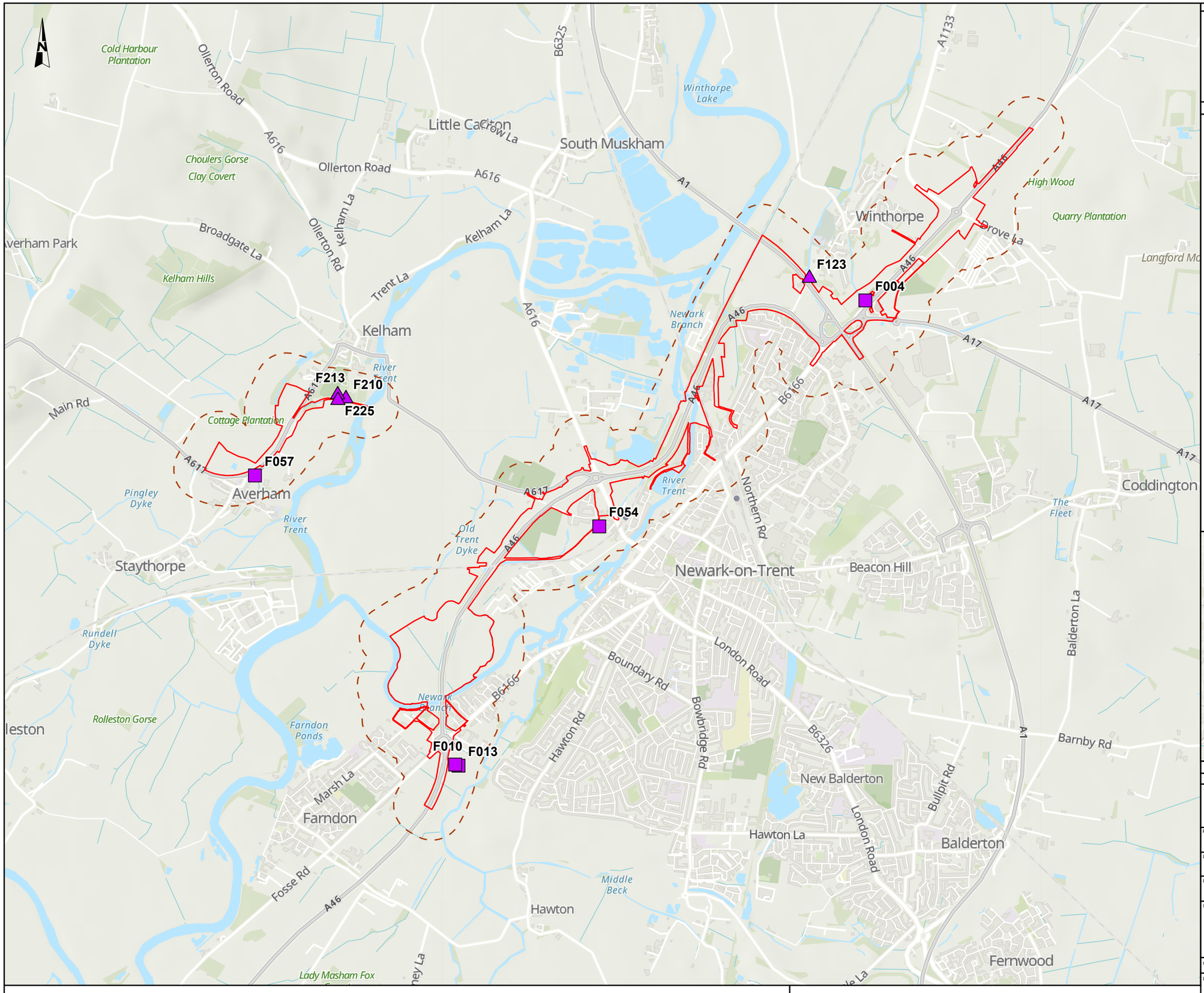
ORIGINAL SIZE: A3 SCALE: 1:5,000

DRAWING NUMBER: HE PIN HE551478 | ORIGINATOR SKAG | VOLUME EBD | LOCATION CONWI_CONW | TYPE DR | ROLE LE | NUMBER 00048

PROJECT REF NO.: HE551478

REVISION: C01

Appendix Figure G-3: Confirmed bat roost locations



NOTES

Source
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KEY TO SYMBOLS

- Order Limits
- Order Limits 250m buffer
- Tree - confirmed bat roost
- Building - confirmed bat roost

0 1,000 2,000 Metres

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE: Appendix G3
Confirmed Bat Roost Locations

ORIGINAL SIZE: A3 SCALE: 1:30,000

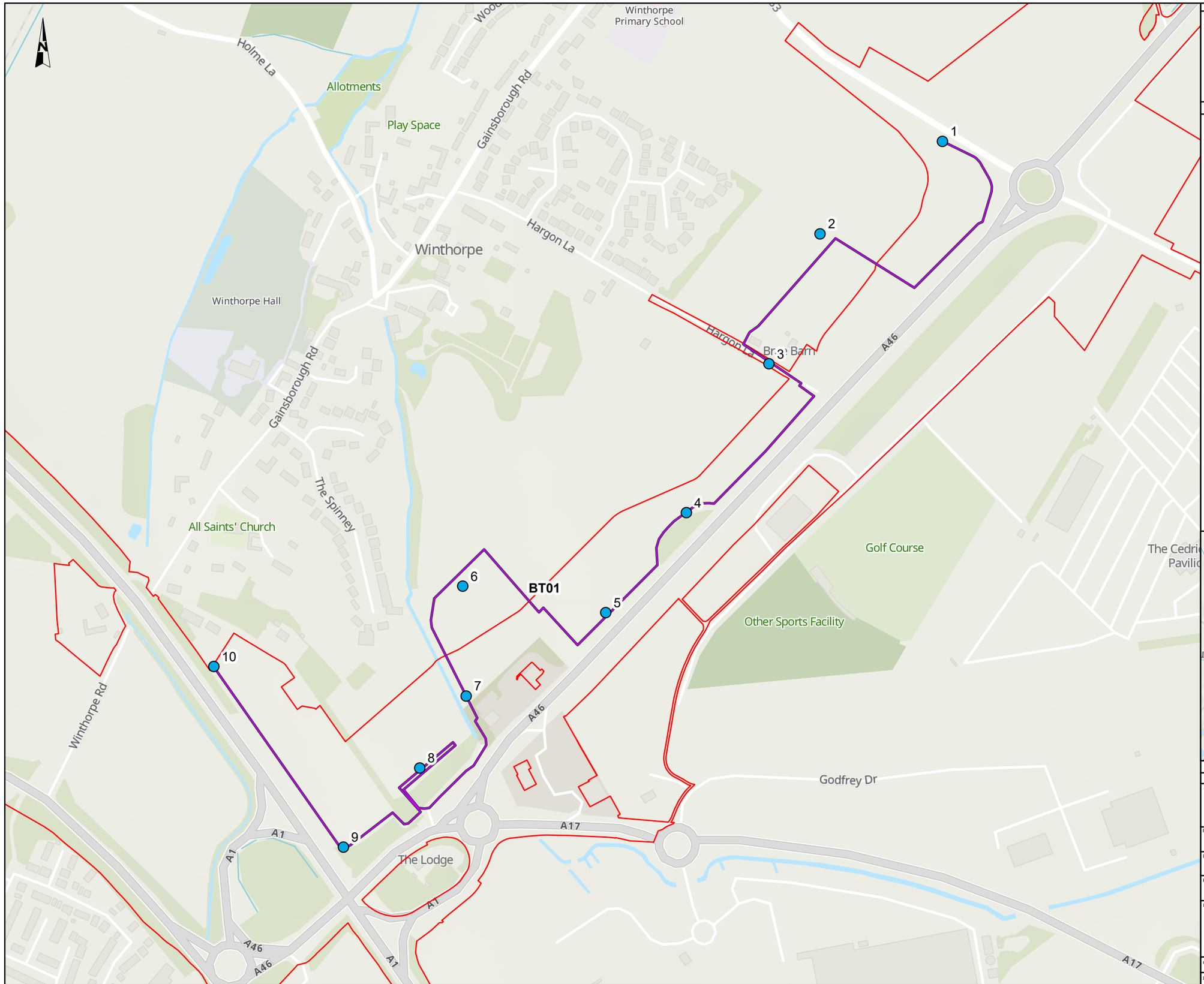
DRAWING NUMBER
HE PIN: HE551478 | ORIGINATOR: SKAG | VOLUME: EBD
LOCATION: CONWI_CONW | TYPE: DR | ROLE: LE | NUMBER: 00065

PROJECT REF NO.: HE551478

REVISION: C01

H. Appendix: Location of bat activity transects and static detectors

Appendix Figure H-1: Bat activity transects



NOTES

Source
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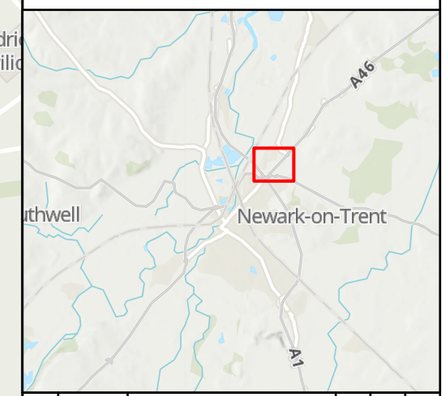
KEY TO SYMBOLS

Order Limits
Listening point
Transect number
BT01



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

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DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

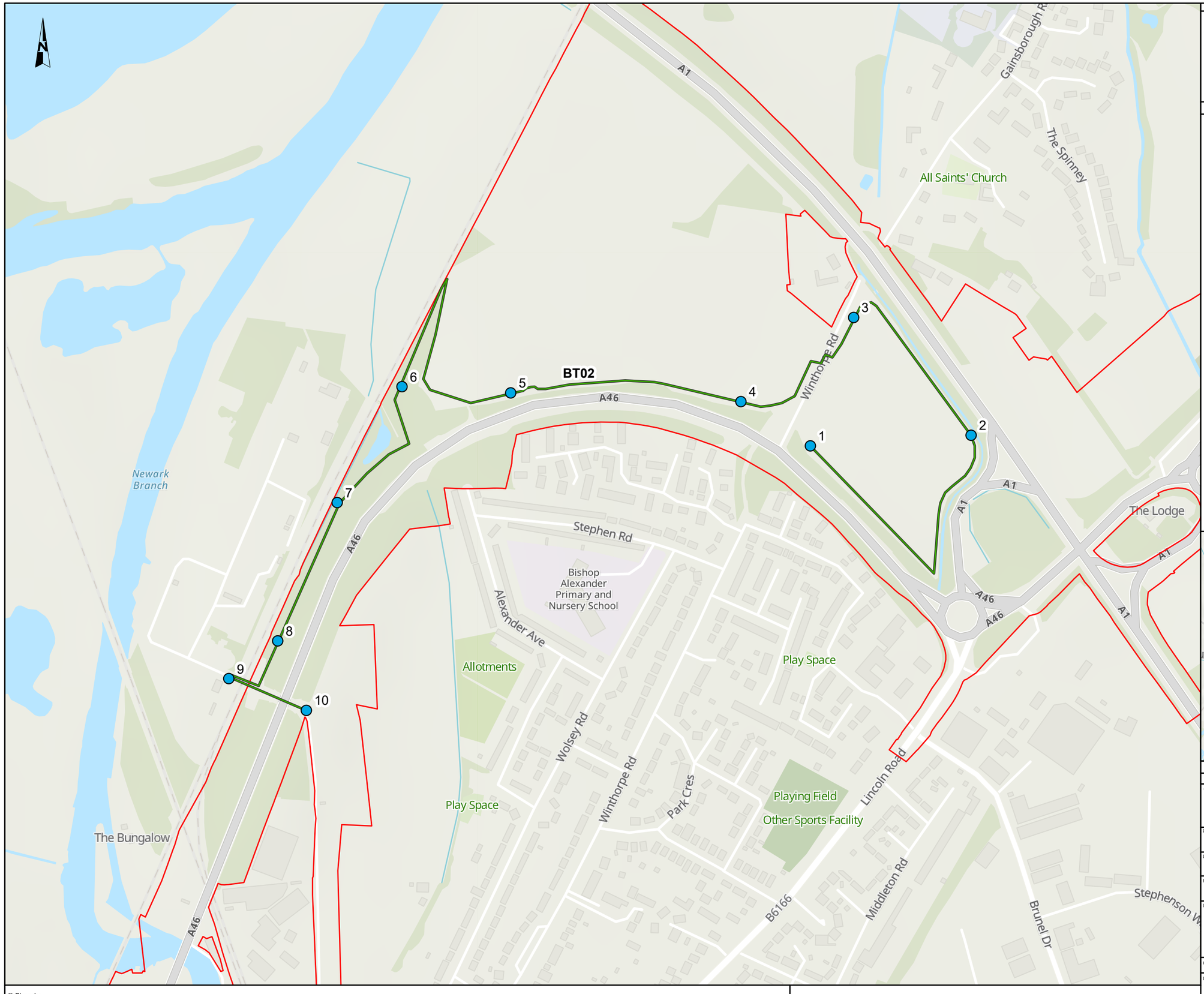
DRAWING TITLE
Appendix H.1
Bat Activity Transects: BT01
Sheet: 1 of 6

ORIGINAL SIZE A3
SCALE 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW | TYPE DR | ROLE LE | NUMBER 00119
LOCATION

PROJECT REF NO. HE551478
REVISION C01

0 200 400 Metres



NOTES

Source
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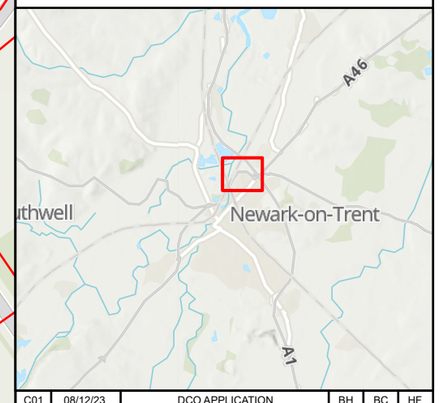
KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT02



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE: Appendix H.1
Bat Activity Transects: BT02
Sheet: 2 of 6

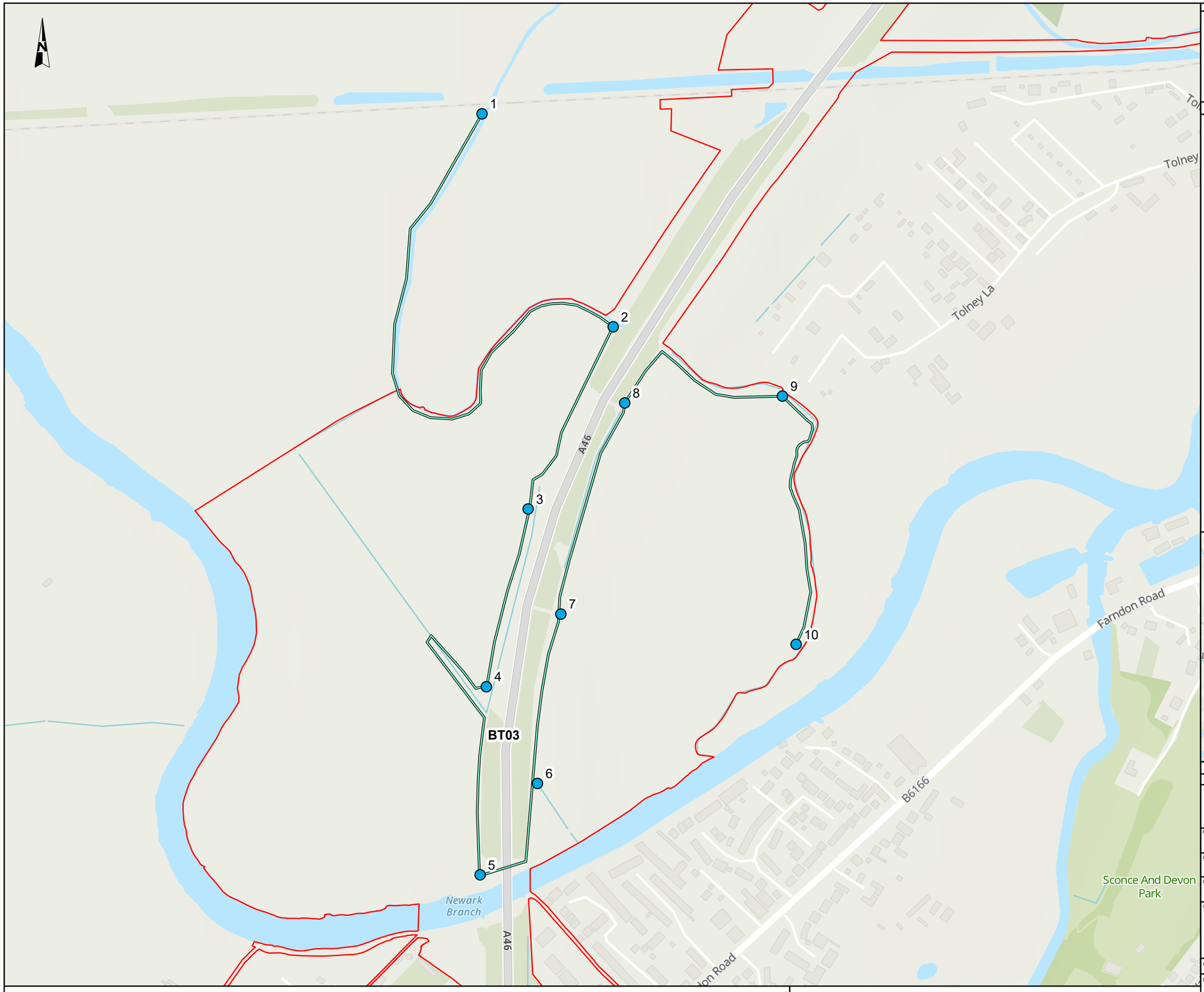
ORIGINAL SIZE: A3 | SCALE: 1:5,000

DRAWING NUMBER HE PIN	ORIGINATOR	VOLUME	LOCATION	TYPE	ROLE	NUMBER
HE551478	SKAG	EBD	CONWI_CONW	DR	LE	00120

PROJECT REF NO.: HE551478

REVISION: C01

0 200 400 Metres



NOTES

Source
Ecology data collected by Mott MacDonald, 2022-2023.
Service Layer Credits

KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT03

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE:
Appendix H.1
Bat Activity Transects: BT03
Sheet: 3 of 6

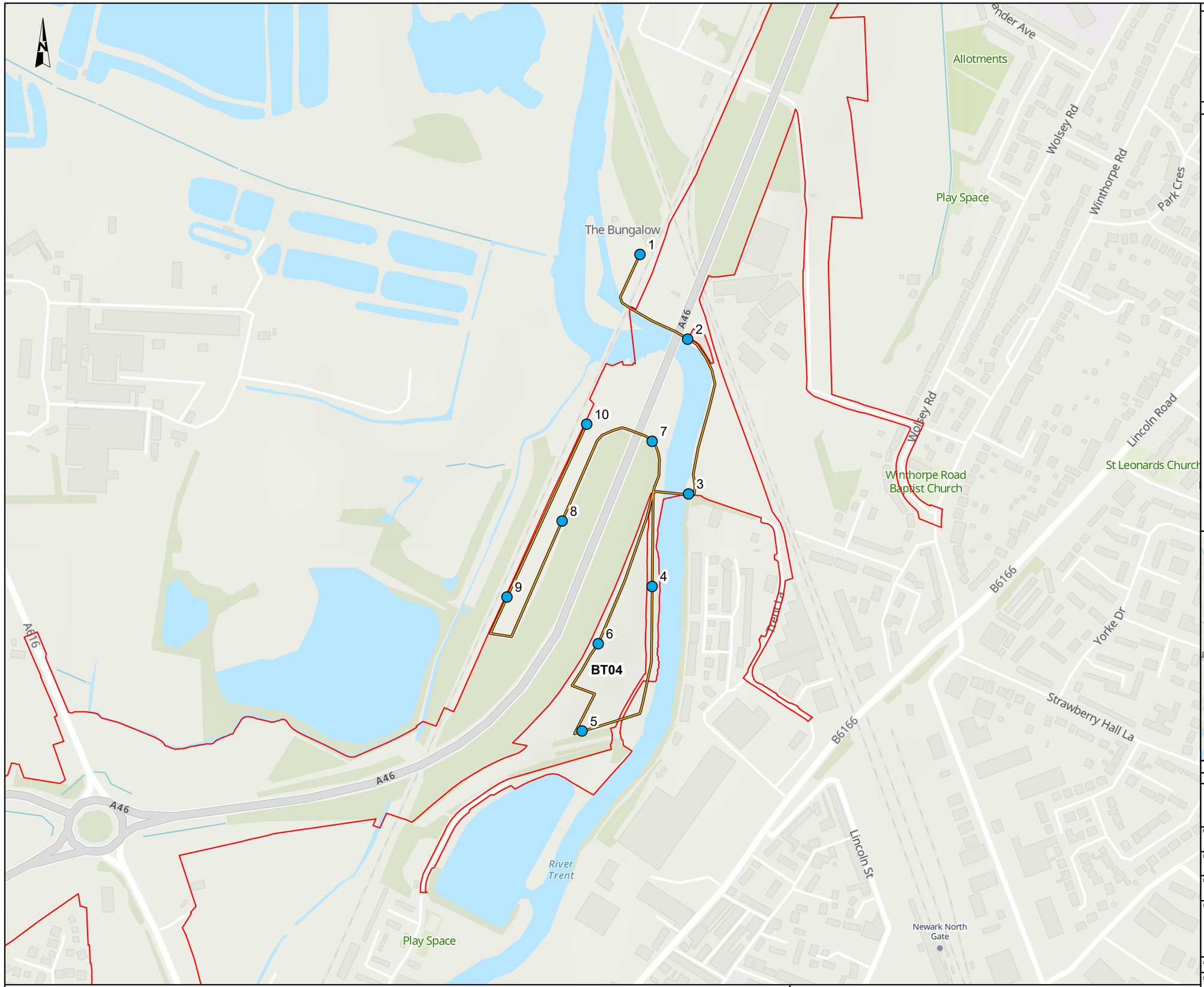
ORIGINAL SIZE: A3 | SCALE: 1:5,000

DRAWING NUMBER: HE551478 SKAG EBD CONWI_CONW DR LE 00121
(HE PIN | ORIGINATOR | VOLUME | LOCATION | TYPE | ROLE | NUMBER)

PROJECT REF NO.: HE551478

REVISION: C01

0 200 400 Metres



NOTES

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KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT04

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE:
Appendix H.1
Bat Activity Transects: BT04
Sheet: 4 of 6

ORIGINAL SIZE: A3
SCALE: 1:5,000

DRAWING NUMBER HE PIN	ORIGINATOR	VOLUME			PROJECT REF NO.
HE551478	SKAG	EBD			HE551478
CONWI_CONW LOCATION		DR TYPE	LE ROLE	00123 NUMBER	REVISION C01

0 200 400 Metres

NOTES

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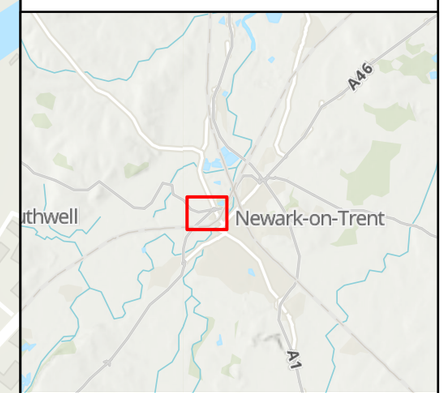
KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT05a



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE: Appendix H.1
Bat Activity Transects: BT05a
Sheet: 5 of 6

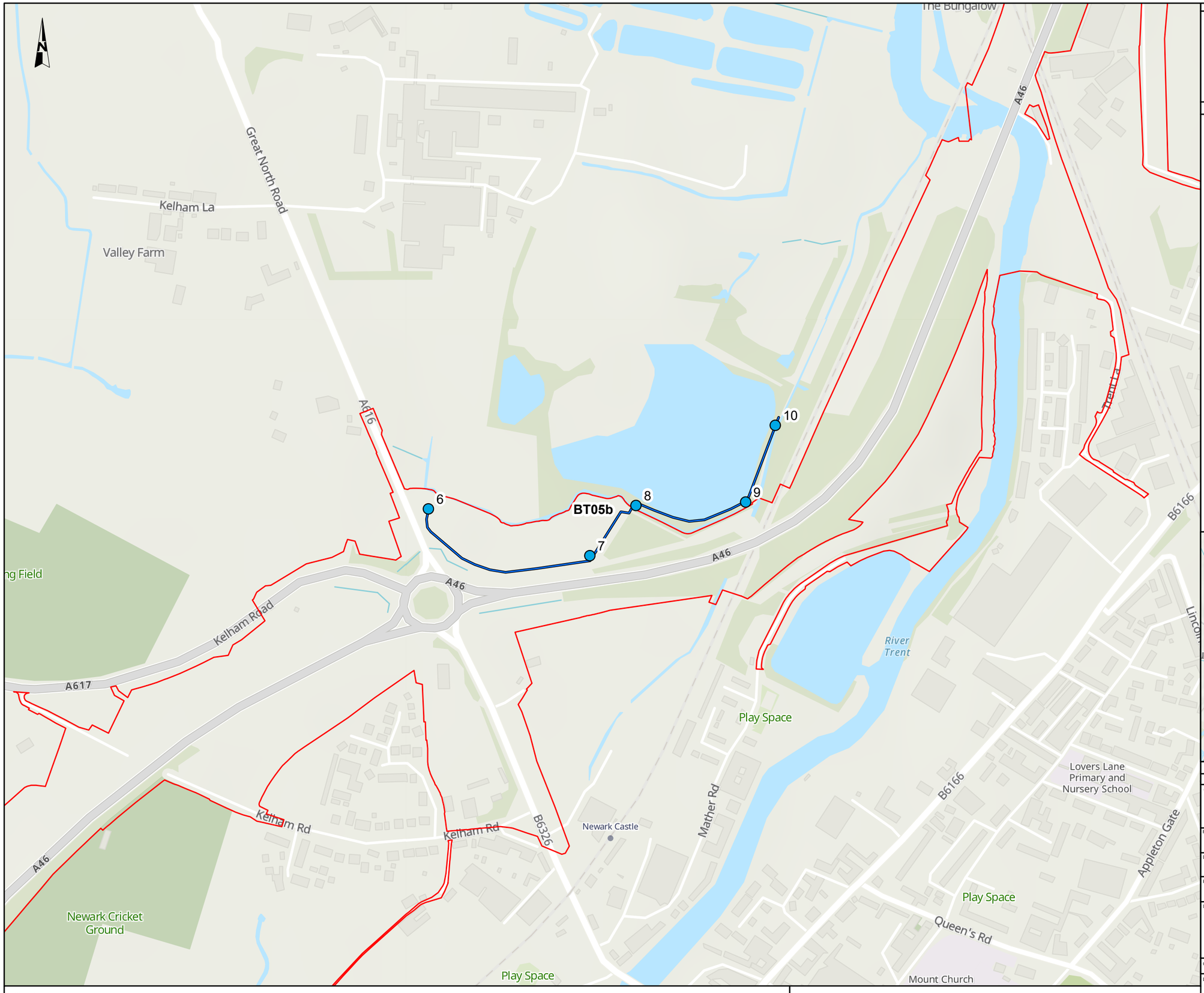
ORIGINAL SIZE: A3 SCALE: 1:5,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME | TYPE | ROLE | NUMBER
HE551478 SKAG EBD CONWI_CONW DR LE 00122
LOCATION

PROJECT REF NO.: HE551478

REVISION: C01

0 200 400 Metres



NOTES

Source
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KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT05b

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	BH	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE
Appendix H.1
Bat Activity Transects: BT05b
Sheet: 6 of 6

ORIGINAL SIZE: A3 | SCALE: 1:5,000

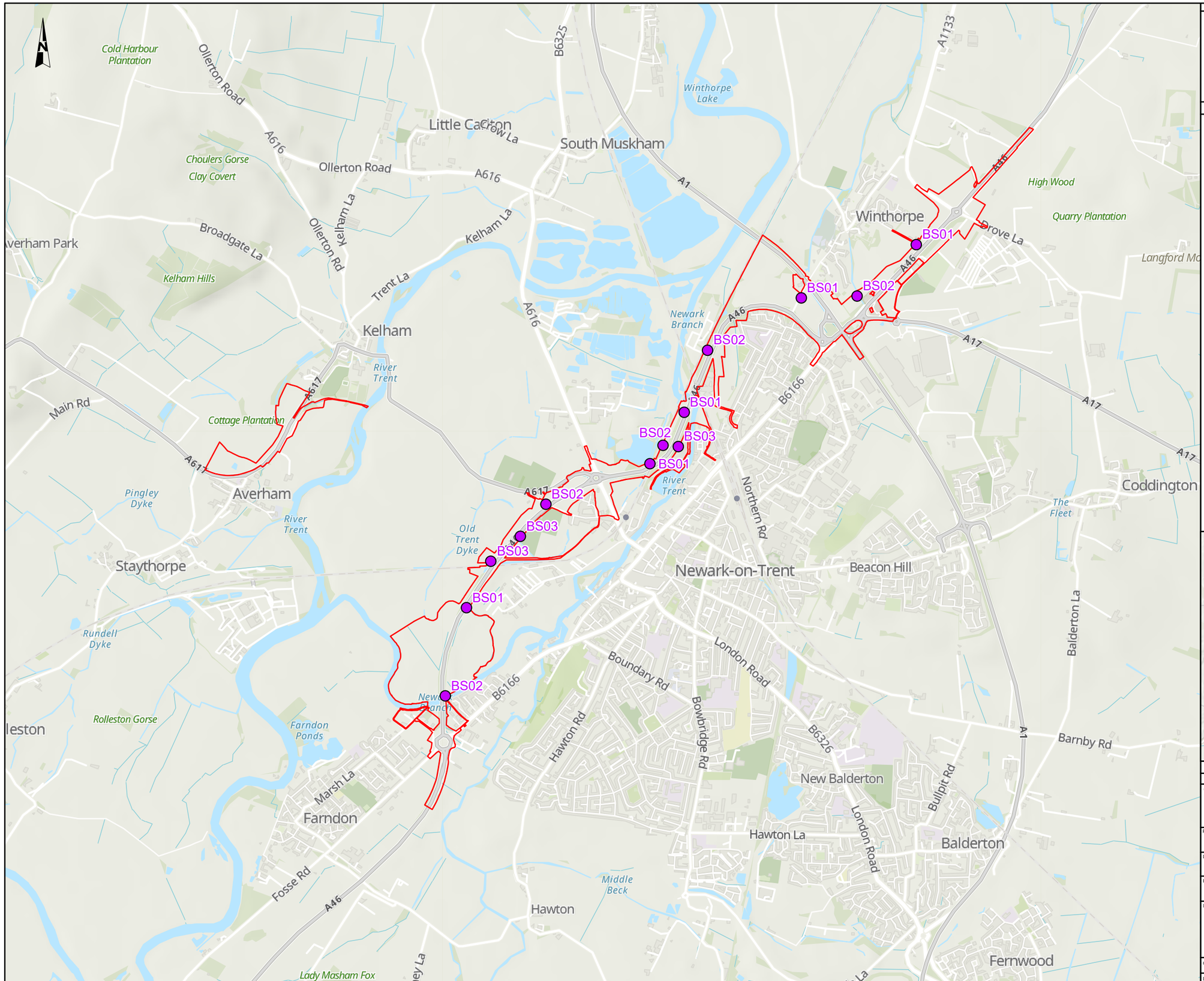
DRAWING NUMBER
HE PIN: HE551478 | ORIGINATOR: SKAG | VOLUME: EBD
LOCATION: CONWI_CONW | TYPE: DR | ROLE: LE | NUMBER: 00124

PROJECT REF NO.: HE551478

REVISION: C01

0 200 400 Metres

Appendix Figure H-2: Bat static detector locations



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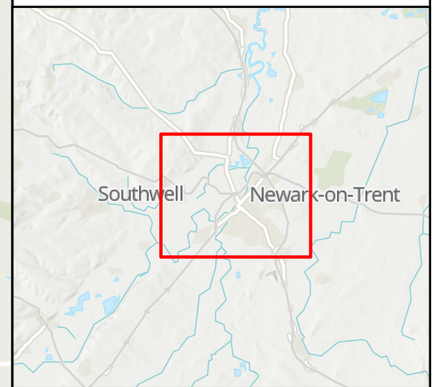
KEY TO SYMBOLS

- Order Limits
- Bat static detector



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
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CLIENT
national highways

PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix H.2
Bat Static Detector Locations

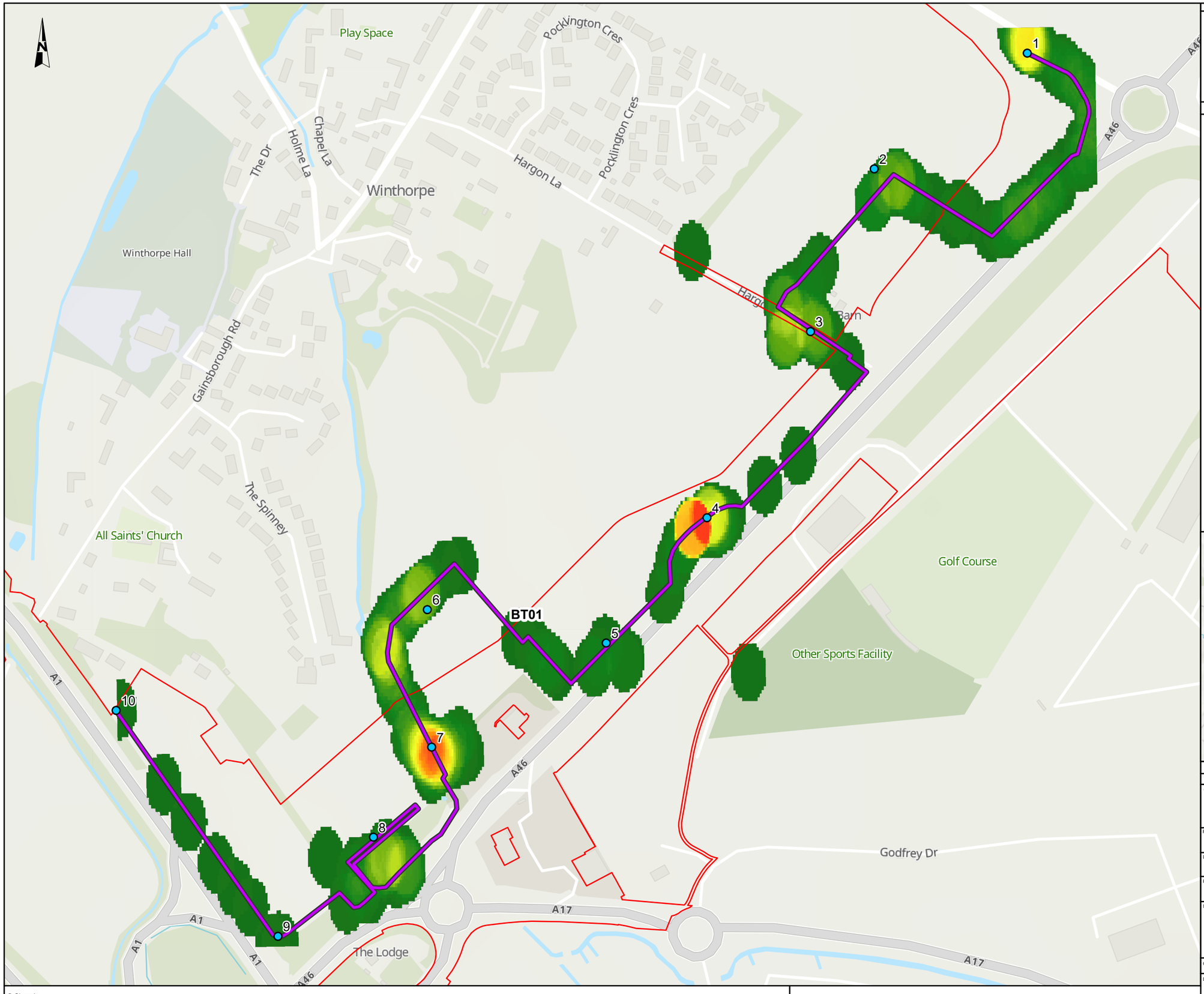
ORIGINAL SIZE A3 | SCALE 1:30,000

DRAWING NUMBER
HE PIN: HE551478 | ORIGINATOR: SKAG | VOLUME: EBD
LOCATION: CONWI_CONW | TYPE: DR | ROLE: LE | NUMBER: 00028

PROJECT REF. NO. HE551478
REVISION C01

0 1,000 2,000 Metres

I. Appendix: Bat activity transect survey heat maps



NOTES

Source
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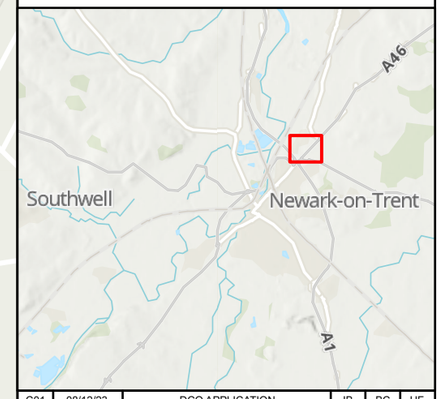
KEY TO SYMBOLS

Order Limits
Listening point
Transect number
BT01
Bat distribution
Higher density
Lower density



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix I
Bat Activity Transect Survey Heat Map
BT01
Sheet: 1 of 6

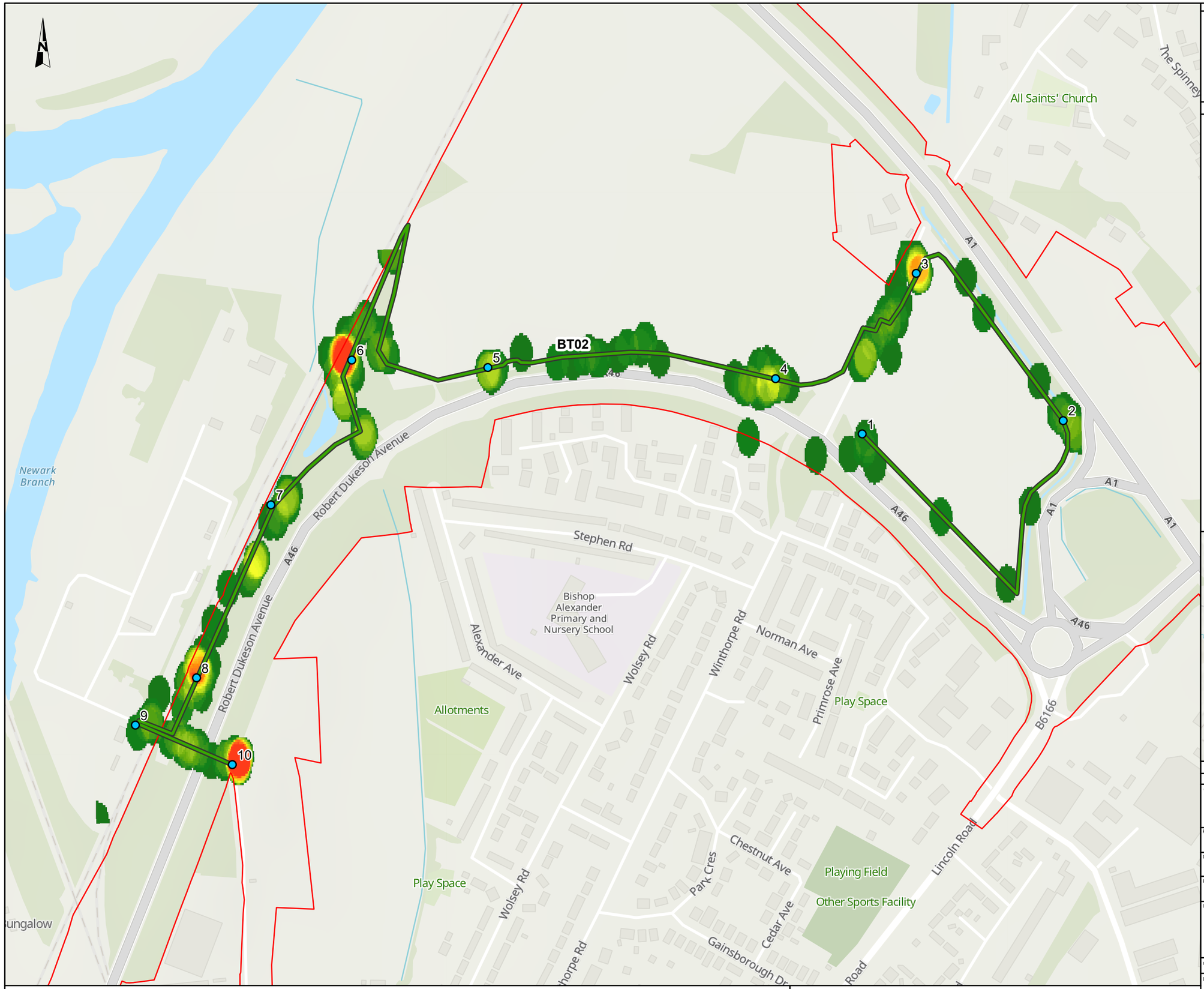
ORIGINAL SIZE A3
SCALE 1:4,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00098
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO.
HE551478

REVISION
C01

0 100 200 Metres



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KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT02

Bat distribution

- Higher density
- Lower density

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE:
Appendix I
Bat Activity Transect Survey Heat Map
BT02
Sheet: 2 of 6

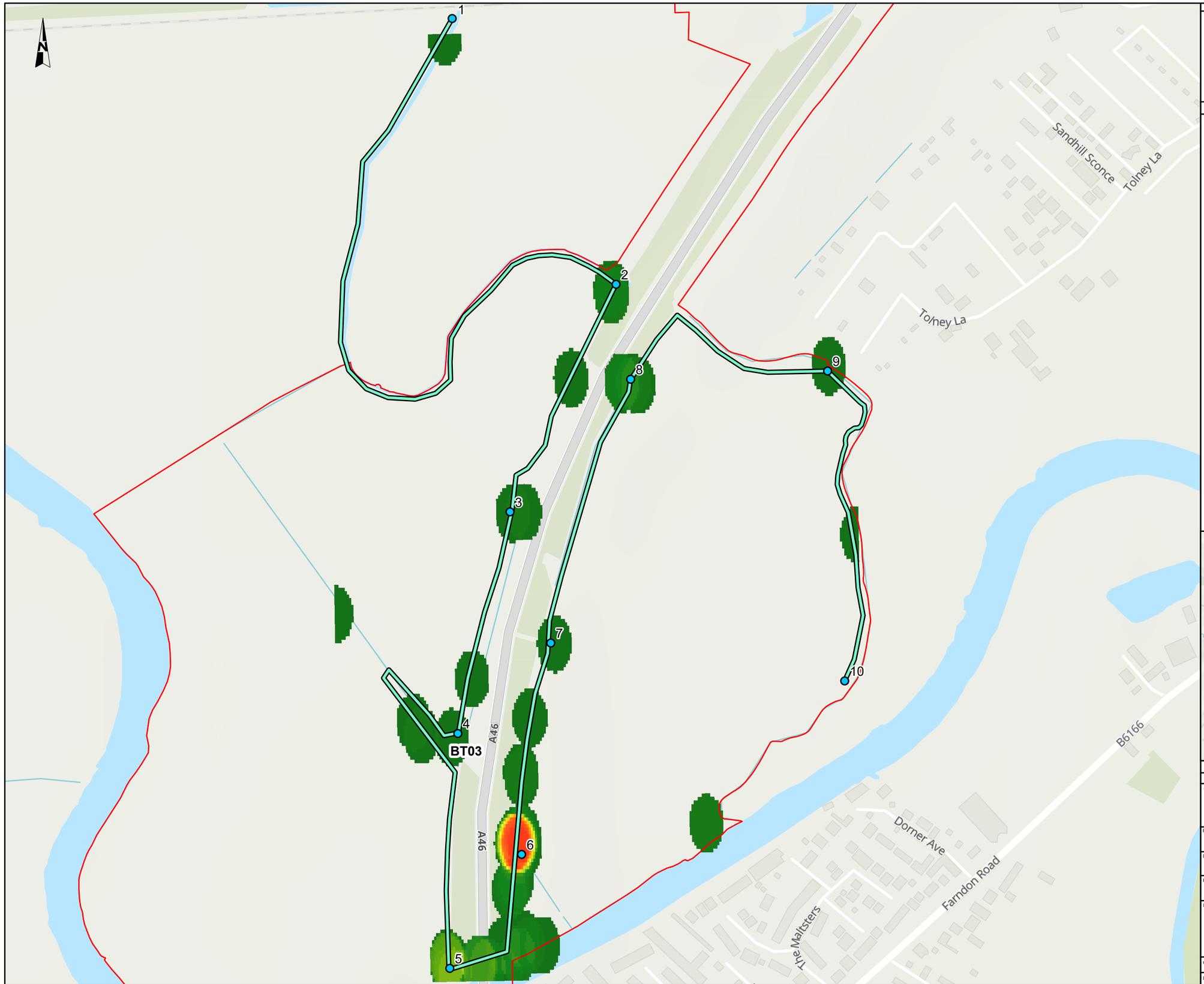
ORIGINAL SIZE: A3 | SCALE: 1:4,000

DRAWING NUMBER: HE PIN HE551478 | ORIGINATOR SKAG | VOLUME EBD | LOCATION CONWI_CONW | TYPE DR | ROLE LE | NUMBER 00099

PROJECT REF NO.: HE551478

REVISION: C01

0 100 200 Metres



NOTES

Source
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Service Layer Credits

KEY TO SYMBOLS

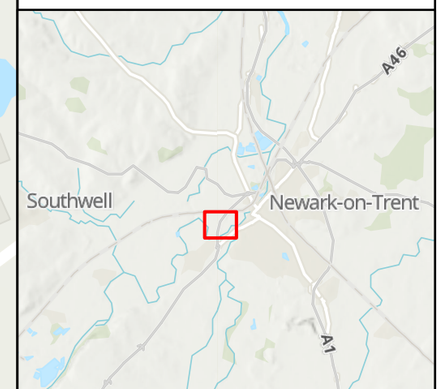
- Order Limits
- Listening point

Transect number

- BT03

Bat distribution

- Higher density
- Lower density



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

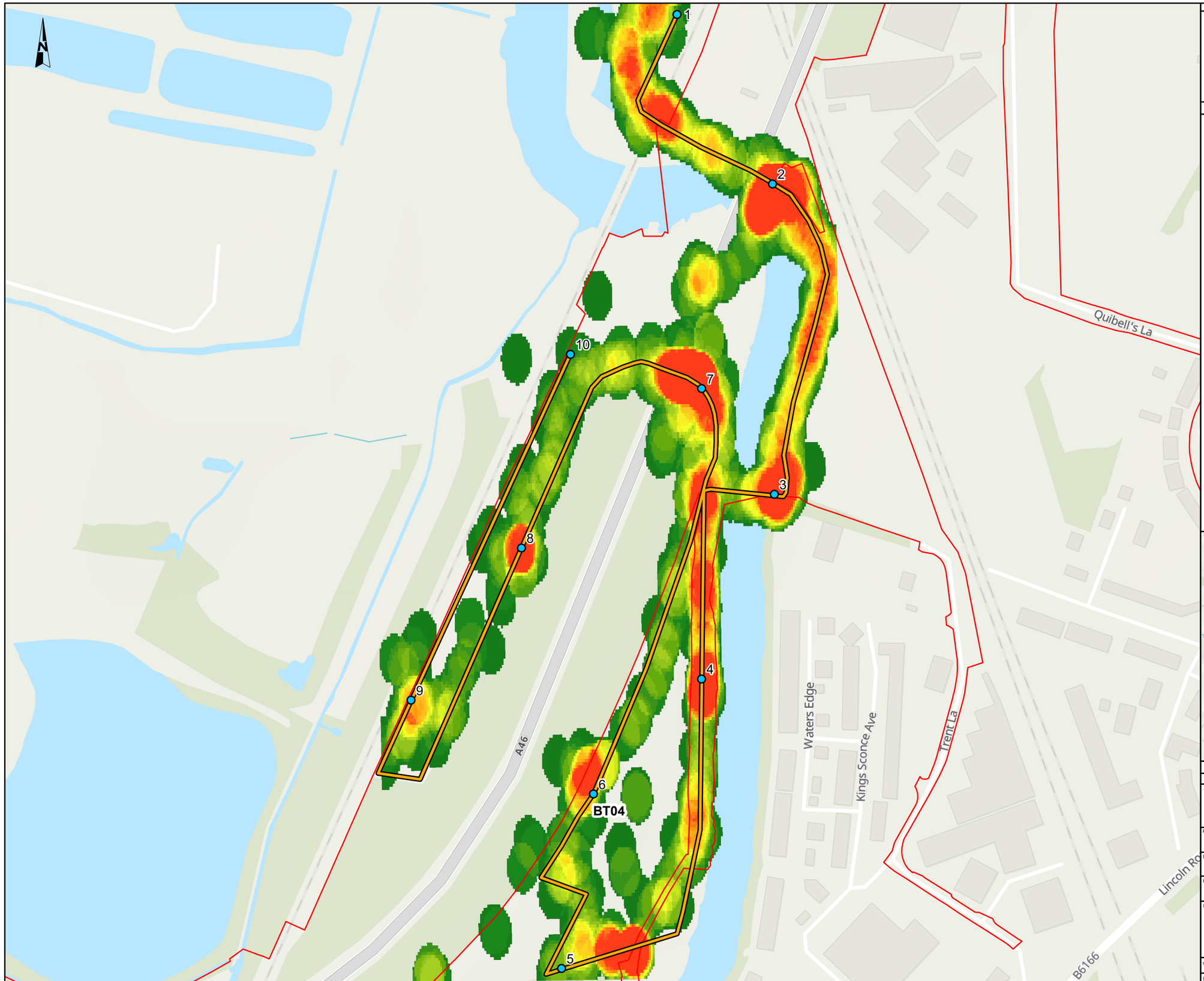
DRAWING TITLE:
Appendix I
Bat Activity Transect Survey Heat Map
BT03
Sheet: 3 of 6

ORIGINAL SIZE: A3
SCALE: 1:4,000

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW | TYPE DR | ROLE LE | NUMBER 00100
LOCATION

PROJECT REF NO.: HE551478
REVISION: C01

0 100 200 Metres



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KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT04

Bat distribution

- Higher density
- Lower density

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

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DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix I
Bat Activity Transect Survey Heat Map
BT04
Sheet: 4 of 6

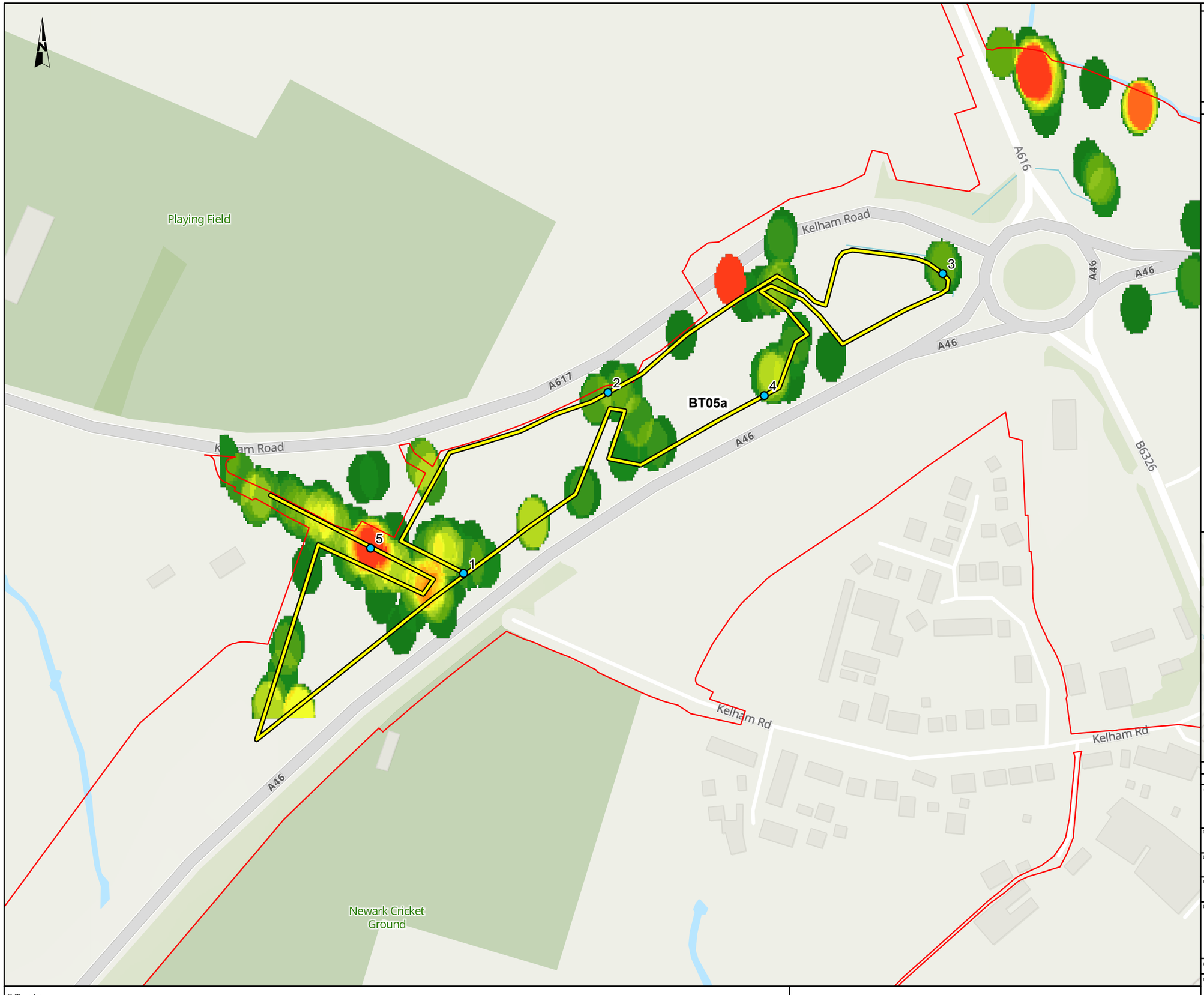
ORIGINAL SIZE A3
SCALE 1:2,500

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
LOCATION | TYPE | ROLE | NUMBER
CONWI_CONW DR LE 00101

PROJECT REF NO.
HE551478

REVISION
C01

0 100 200 Metres



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KEY TO SYMBOLS

Order Limits
Listening point
Transect number
BT05a
Bat distribution
Higher density
Lower density

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
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PURPOSE OF ISSUE
DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER
TR010065

PROJECT TITLE
A46 NEWARK BYPASS

DRAWING TITLE
Appendix I
Bat Activity Transect Survey Heat Map
BT05a
Sheet: 5 of 6

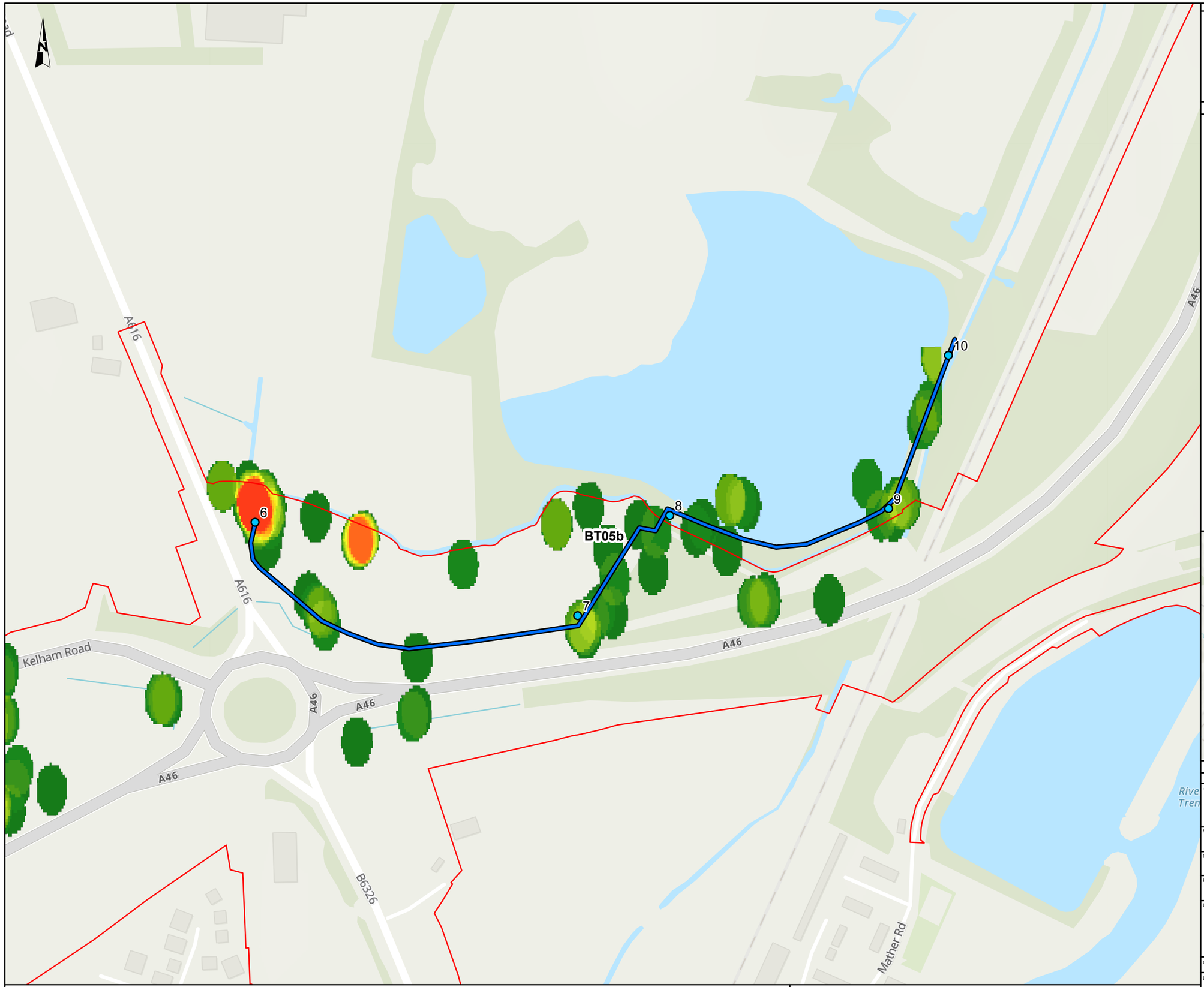
ORIGINAL SIZE A3 SCALE 1:2,500

DRAWING NUMBER
HE PIN | ORIGINATOR | VOLUME
HE551478 SKAG EBD
CONWI_CONW DR LE 00102
LOCATION | TYPE | ROLE | NUMBER

PROJECT REF NO. HE551478

REVISION C01

0 100 200 Metres



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KEY TO SYMBOLS

- Order Limits
- Listening point

Transect number

- BT05b

Bat distribution

- Higher density
- Lower density

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
C01	08/12/23	DCO APPLICATION	JB	BC	HF

CLIENT: national highways

PURPOSE OF ISSUE: DCO APPLICATION

DEVELOPMENT CONSENT ORDER NUMBER: TR010065

PROJECT TITLE: A46 NEWARK BYPASS

DRAWING TITLE
Appendix I
Bat Activity Transect Survey Heat Map
BT05b
Sheet: 6 of 6

ORIGINAL SIZE: A3 | SCALE: 1:2,500

DRAWING NUMBER (HE PIN | ORIGINATOR | VOLUME): HE551478 | SKAG | EBD
(LOCATION | TYPE | ROLE | NUMBER): CONWI_CONW | DR | LE | 00103

PROJECT REF NO.: HE551478

REVISION: C01

0 100 200 Metres

J. Appendix: eDNA analysis result of tree F210

Order Number: 2372

Swift Ecology

[redacted]

Sample Code	DNA Extraction Code	Species Identified	ID Method	Ct value	% match
SEL-2372-1	EG-2023-1596	Undetermined. Unfortunately, this sample failed to yield DNA of sufficient quality/quantity upon multiple extraction attempts and thus failed qPCR and DNA sequencing analyses		N/A	N/A

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Order Number: 2372

Swift Ecology

[redacted]

What do my results mean?

DNA extraction code - this identifies the DNA extraction sample within our laboratory so that it can be revisited if necessary. We keep these extractions for a minimum of 3 months.

ID method: *qPCR* - These results are obtained using species specific qPCR tests. A positive result indicates the presence of DNA from the species reported.

ID method*: DNA sequencing* - where qPCR fails or is not possible, standard DNA sequencing will be performed. Sequences are then matched against a database.

Ct value - This is a relative measurement of the amount of species DNA in the sample, derived from the qPCR data. The lower the value the more DNA present in the reaction. This helps to predict the abundance of one species relative to another **in the sample**. Note: this relative abundance is not directly transferable to the site the samples were collected from.

% match - this value is the percentage match of sequences derived from DNA sequencing compared to the database. Due to differences in DNA sequence between individuals within a species this match may not always be exactly 100%.

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