

Coalburn North Substation

Bat Survey Report

SP Energy Networks

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Quality information

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Table of Contents

1. Introduction	1
Background	1
Overview of the Proposed Development	1
Purpose of this Report	1
Quality assurance	1
2. Legislative and planning policy context	2
Relevant legislation	2
Relevant planning policy	3
National planning policy	3
Local planning policy	3
Local Biodiversity Action Plan	3
3. Methods	4
Protected and notable species	4
Desk study	4
Field survey	4
Bat roost suitability assessment	4
Bat activity surveys	5
Walked transect survey	5
Static bat detector monitoring	6
Data analysis	6
Limitations	6
4. Results	8
Desk study	8
Nature conservation sites	8
Records of bats	8
Field survey	8
Bat roost suitability assessment	8
Bat activity surveys	9
Habitat suitability	9
Walked transect survey	9
Static bat detector monitoring	12
5. Conclusion and Recommendations	13
6. References	14
7. Figures	15

1. Introduction

Background

Coalburn Substation, south of Lesmahagow, South Lanarkshire, is owned by Scottish Power Transmission (SPT), the electricity Transmission Licence holder in south and central Scotland.

In 2022, AECOM was commissioned by SP Energy Networks (SPEN) to undertake bat surveys to inform an Ecological Impact Assessment (EclA) of a proposed new substation to the north of the existing Coalburn Substation. The proposed new substation is referred to as Coalburn North Substation and, in this Report, as the 'Proposed Development'.

In 2020, as a result of renewable energy development in the wider area, SPT was required to extend the existing Coalburn Substation (AECOM, 2021), for which AECOM was appointed by SPEN to conduct an EclA. The Coalburn Substation Extension is currently under construction. This Bat Survey Report, which is in relation to the Proposed Development (i.e. Coalburn North Substation), builds upon and is informed by the ecological data collected in 2020 for Coalburn Substation Extension (where the survey areas overlap).

Throughout this Report, species are given their common and scientific names when first referred to and their common names only thereafter. All distances are cited as the shortest distance 'as the crow flies', unless otherwise specified.

Overview of the Proposed Development

The Proposed Development is located just north of the existing Coalburn Substation, approximately 1 km south of Lesmahagow and west of the B7078 Carlisle Road. The boundary of the Proposed Development is hereafter referred to as the 'Site' as shown in Figure 1. The central Ordnance Survey (OS) grid reference of the Site is approximately NS 82511 37584.

This Bat Survey Report was informed by field survey within the Site plus a 100 m buffer (shown on Figure 1). The exact footprint and layout of the Proposed Development is subject to finalisation, however the survey area (and study area as detailed in Section 3) was adopted to provide sufficient geographical extent to identify ecological constraints which may exist to the Proposed Development.

The survey area predominantly comprises immature Sitka spruce *Picea sitchensis* plantation and rough unmanaged grassland along with a small number of mature beech *Fagus sylvatica* trees. Surrounding habitat comprises immature broadleaved plantation, unmanaged grassland, scrub and lines of mature beech trees. The survey area is considered to be upland and lies at approximately 228 m altitude above sea level.

Purpose of this Report

This Bat Survey Report provides the methods for the desk study and field surveys carried out, and the results obtained, to establish the baseline conditions within the potential Zone of Influence (ZoI) of the Proposed Development, to identify potential ecological constraints (and opportunities) to the Proposed Development, and to identify requirements for further survey and assessment with respect to bats.

Quality assurance

This Report, and the desk study and field survey described within it, has been completed in accordance with the AECOM Integrated Management System (IMS). Our IMS places emphasis on professionalism, technical excellence, quality, as well as covering health, safety, environment and sustainability management. All AECOM staff members are committed to maintaining our accreditation to those parts of BS EN ISO 9001:2015 and 14001:2015, as well as BS OHSAS 18001:2007 that are relevant to consultancy service.

The bat surveys were led by trained and experienced AECOM ecologists, all of whom adhered to the CIEEM Code of Professional Conduct (CIEEM, 2022).

2. Legislative and planning policy context

Relevant legislation

All species of bats found in Scotland are protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (more commonly known as the 'Habitats Regulations'). The Habitats Regulations make it an offence to deliberately or recklessly:

- capture, injure or kill a bat;
- harass a bat or group of bats;
- disturb a bat in a roost;
- disturb a bat while it is rearing or otherwise caring for its young;
- obstruct access to a bat roost or otherwise deny a bat use of a roost;
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and/or,
- disturb a bat while it is migrating or hibernating.

It is also an offence to damage or destroy a breeding or resting place (i.e. a roost) of a bat, whether or not this was done deliberately or recklessly.

A licence must be obtained from NatureScot for any action that could otherwise constitute an offence under the Habitats Regulations. A licence can only be issued for development activities subject to three strict qualifiers being met:

- it must be required for preserving public health or public safety or for some other imperative reasons of overriding public interest, including those of a social or economic nature, and beneficial consequences of primary importance to the environment;
- there must be no satisfactory alternative; and,
- the proposed action must not be detrimental to the maintenance of the species at favourable conservation status.

Under the Nature Conservation (Scotland) Act 2004, public bodies in Scotland have a duty to further the conservation of biodiversity. The Scottish Biodiversity List (SBL) is a list of habitats, plants and animals that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The purpose of the SBL is to identify habitats and species that are of highest priority for biodiversity conservation, thereby helping public bodies to carry out their biodiversity duty.

The following bat species are identified through their listing on the SBL as being of principal importance for biodiversity conservation in Scotland:

- Brandt's bat *Myotis brandtii*;
- Daubenton's bat *Myotis daubentonii*;
- whiskered bat *Myotis mystacinus*;
- Natterer's bat *Myotis nattereri*;
- noctule *Nyctalus noctula*;
- Nathusius' pipistrelle *Pipistrellus nathusii*;
- common pipistrelle *Pipistrellus pipistrellus*;
- soprano pipistrelle *Pipistrellus pygmaeus*; and,

- brown long-eared bat *Plecotus auritus*.

Relevant planning policy

National planning policy

Existing Scottish Planning Policy states in Paragraph 194 that the planning system should:

- “conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities;
- promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way;
- protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods, hedgerows and individual trees with high nature conservation or landscape value; and,
- seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats.”

However, at the time of preparing this Report, Scottish Government had published a draft version of National Planning Framework 4 (NPF4). Although not yet adopted, and subject to change, the draft version of NPF4 clearly sets out that the planning system should “protect, restore and enhance Scotland’s natural assets; make best use of nature-based solutions; and [...] reverse biodiversity loss, including by delivering positive effects for biodiversity from new developments” (<https://www.gov.scot/publications/scotland-2045-fourth-national-planning-framework-draft/documents/>, accessed 19 October 2022). Wherever possible, and proportionate to the scale and nature of the project, the Proposed Development should therefore seek to deliver benefits for biodiversity.

Local planning policy

Local planning policies for South Lanarkshire Council are included in the South Lanarkshire Local Development Plan 2 (LDP2) (South Lanarkshire Council, 2021)¹ which contains several biodiversity and nature conservation-related policies. These include lists of strategic outcomes that detail aims and targets for protected sites and key habitat types, without specific reference to protected mammals.

Local Biodiversity Action Plan

The South Lanarkshire Biodiversity Strategy 2018-2022 (South Lanarkshire Biodiversity Partnership, 2018) adopts an ecosystem-based approach which aims to protect species and habitats by conserving the whole of the environment in which they are found. The Strategy focuses on six ecosystems which are considered to be most important in South Lanarkshire:

- freshwater;
- lowland and farmland;
- peatland;
- upland;
- urban; and,
- woodland.

¹ Approved for adoption on 1 December 2020.

3. Methods

Protected and notable species

As stated in Section 2, all species of bats found in Scotland are protected under the Habitats Regulations. All bat species are consequently considered to be notable species for the purposes of this Report.

Desk study

A desk study was carried out to identify nature conservation designations for which bats are qualifying or notified species, and to search for existing records of bats in proximity to the Proposed Development. The desk study sought to identify:

- statutory designated sites for nature conservation for which bats are qualifying / notified features, including Special Areas of Conservation (SACs) within 10 km and Sites of Special Scientific Interest (SSSIs) within 2 km of the Proposed Development;
- local non-statutory nature conservation sites within 2 km of the Proposed Development for which bats are an identified reason for designation or, where no designation information is available, for which bats are likely to be part of the reason for site selection; and,
- records of bats within 2 km of the Proposed Development Site.

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

Table 1. Desk study data sources

Data source	Date accessed	Data obtained
Glasgow Museums Biological Records Centre (GMBRC)	10 August 2022	<ul style="list-style-type: none"> • Records of bat species within 2 km. • Local designated sites within 2 km.
NatureScot SiteLink website (https://sitelink.nature.scot/home)	25 July 2022	<ul style="list-style-type: none"> • International statutory designations within 10 km. • Other statutory designations within 2 km.
NBN Atlas Scotland website (commercially available records only)	25 July 2022	<ul style="list-style-type: none"> • Commercially available recent (defined as being from the year 2002 onwards) bat species records.
OS 1:25,000 maps and aerial photography	25 July 2022	<ul style="list-style-type: none"> • Habitats and connectivity relevant to interpretation of planning policy and potential protected / notable species constraints.

Field survey

Field survey comprised a search for bat roosting locations and an assessment of the suitability of the Site and the wider Zol for foraging and/or commuting bats. A description of the field survey methods employed is provided below. The surveys were carried out by experienced AECOM ecologists between 26 July and 13 September 2022.

Bat roost suitability assessment

The bat roost suitability of all trees and buildings within the Site plus a minimum 100 m buffer (see Figure 1) was assessed following guidance published by the Bat Conservation Trust (BCT) (Collins, 2016). The assessment was conducted on 26 July 2022.

Potential roost features (PRF) were identified from the ground and externally (i.e. without use of an endoscope), using binoculars and torch where necessary, and trees and buildings were classified as having 'Negligible', 'Low', 'Moderate' or 'High' bat roost suitability, according to the definitions provided in Collins (2016) (see Table 2 below).

PRFs searched for included suitable holes, cracks or splits in trees. Where such features existed, searches were made as far as possible for evidence of bat use such as droppings, staining, foraging remains, auditory evidence and the presence of live or dead bats.

Table 2. Bat roost suitability categories, adapted from Collins (2016)

Suitability	Description of roosting habitats
Negligible	Negligible habitat features likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more PRF(s) that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Bat activity surveys

Walked transect survey

The Proposed Development will result in an area of permanent habitat loss, therefore survey for foraging and commuting bats was also carried out. Based on an initial assessment of aerial mapping and taking into account the habitat information collected in previous ecology surveys conducted in 2020-2022 (AECOM, 2021; AECOM, 2022), it was determined that the habitats within the survey area would not likely provide more than Low suitability for foraging and commuting bats, as defined by Collins (2016) (see Table 3).

Table 3. Bat roosting and commuting/foraging suitability categories (taken from Collins, 2016)

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

Bat activity surveys were carried out following the standard methodology described in Collins (2016) which involves the completion of walked transects recording bat activity at dusk; except for the inclusion of a spring season survey (see 'Limitations' below).

A single transect route was devised to cover all areas of habitat which could be used by bats for commuting and/or foraging. The transect was walked by experienced AECOM surveyors on three occasions throughout the bat activity season. A static bat detector was also deployed in the survey area to supplement the walked transects. Details of the activity surveys are given in Table 4. The transect route is illustrated on Figure 1.

Following Collins (2016), the transect surveys commenced around sunset and ended approximately two hours after sunset. All surveys were digitally recorded using a Elekon Batlogger M detector. Where possible, subject to light levels and visibility, the surveyor recorded the flight direction, height and behaviour of bats which were detected/seen. Weather details were recorded using a standard thermometer and descriptions of other conditions were recorded subjectively.

Data collected during surveys were subsequently analysed using Kaleidoscope Pro specialist software, to review where any bat passes may have been faint or not heard in the field and to confirm species.

Table 4. Bat activity survey details

Date	Start time	End time	Time of sunset	Temp (°C)	Cloud cover (1-5)	Precipitation	Wind (Beaufort)	Description
26 July 2022	21:33	23:37	21:33	11	1-5	0	1	Dry, calm, cool, partially cloudy, good conditions.
09 August 2022	21:06	22:46	21:06	16	2	0	0	Dry, very calm, mild, partially cloudy, good conditions.
13 September 2022	20:05	21:45	19:39	14 – 10	1	0	0	Dry, very calm, mild to cool, clear, good conditions.

Static bat detector monitoring

One Wildlife Acoustics SM4 static detectors was deployed by AECOM within the Site to record general bat activity over an extended period of time. The static detector was placed at OS grid reference NS 82509 37512. The location is shown on Figure 1 and described in Table 5, which also gives the details of deployment times and conditions. The location was representative of the habitat types within the Site and wider Zol.

The detector was programmed to start recording 30 minutes prior to sunset and to finish recording 30 minutes after sunrise. The number of active recording nights for each detector is as shown in the penultimate column of Table 5.

Table 5. Details of static detector deployment

Location and habitat	Detector Type	Deployment period	No. active nights	No. active nights per month	Temperature notes
On a line of broadleaved trees between rough grassland and conifer plantation	SM4	26/07/22 to 13/09/22	12	July – 6 August – 6 September – 0	July – 6 to 34°C August – 7 to 27°C September – n/a

Data analysis

Analysis of all recorded bat calls was carried out using Kaleidoscope Pro software to allow identification to species level where possible (in some cases, such as *Myotis* species, it is not always possible to identify to species level based on call parameters alone. Unidentified *Myotis* bats are hereafter referred to as *Myotis* sp). All recordings were first processed using Kaleidoscope Pro auto-identification software. An ecologist experienced in bat call analysis then checked a proportion of auto-analysed recordings including a minimum of 5% of common pipistrelle and soprano pipistrelle call registrations, 100% of registrations of all other bat species, and 5% of noise files. This analysis was then audited by an expert bat ecologist to verify identifications.

Limitations

Desk study information is dependent on records having been submitted for the area of interest. As such, a lack of records for particular habitats or species does not necessarily mean they are absent from the area of interest. Similarly, the presence of records for particular habitats and species does not automatically mean they still occur within the area of interest or are relevant in the context of the Proposed Development.

Access for surveyors was restricted in some areas in the north-west of the survey area due to a lack of landowner permission (see Figure 1). However, this did not present a significant constraint to bat surveys, as the survey area was adequately covered from adjacent areas.

Bat roost suitability surveys were conducted during the growing season and therefore the level of vegetative cover was greater than would be optimal to identify roosting features, however in the context of potential roosting features/habitats present (a small number of Low or Moderate BRS features restricted to a localised patch of mature beech), this was not concluded to result in a significant limitation to the findings of this appraisal.

Bat activity surveys were conducted over two nights in the summer season and one night in the autumn season. However, it is recommended that bat activity surveys in Low suitability habitat for bats are conducted in spring, as well as summer and autumn (Collins, 2016). The lack of a spring survey represents a limitation to the ability to capture the full extent of seasonal variability in bat activity. However, the survey effort remains within the recommended intensity level to adequately understand the activity levels of bats within the potential Zol of the Proposed Development.

The autumn bat activity survey start time was 26 minutes later than recommended (Collins, 2016). It is therefore possible that early-emerging bats in close proximity to the survey area were not captured by surveyors on that survey. However, the survey effort remains within the recommended intensity level. Therefore, the late autumn survey start time is considered a minor limitation.

The static bat detector was operational for twelve consecutive nights out of the 48-night period during which it was deployed. This was due to a technical fault. The detector therefore only recorded the 5-consecutive nights suggested by Collins (2016) for the summer season, and not for spring or autumn. Regardless, the static bat detector captured meaningful data to a volume that is adequate to significantly aid the understanding of how the survey area is used by bats.

Further bat surveys (e.g. emergence / re-entry surveys) to determine presence / absence of bats in features with BRS were not undertaken. Published guidance (Collins, 2016) recommends Low BRS features do not require further survey. One Moderate BRS feature (a tree) was not subject to further survey, another tree is a confirmed bat roost. Both trees are at a distance from the Proposed Development at which significant disturbance is not predicted for the expected construction works. Therefore, lack of further surveys is not considered to be a limitation.

4. Results

Desk study

Nature conservation sites

There are no nature conservation sites designated specifically for bat species within the search distances specified in Section 3.

Records of bats

No records of bats were returned by GMBRC or identified from NBN Atlas within the study area.

Field survey

Bat roost suitability assessment

The trees assessed as having suitability to support roosting bats are described in Table 6 and are shown on Figure 1. Features assessed as having Moderate suitability may provide conditions suitable for smaller numbers of breeding or hibernating bats, but further surveys would be required to investigate this further. As detailed above in the limitations section, one Moderate BRS feature and a confirmed bat roost were not subject to further surveys. This was because they are at a sufficient distance from the Proposed Development that there are no impacts predicted to these features.

The bat roost suitability assessment identified eight mature beech trees in the south-west of the survey area, all of which are located outside the Site but within approximately 15 m at the closest point. Six trees were classified as having Low suitability for roosting bats. These trees had features such as rot holes, damaged limbs and flaking bark but were generally exposed to the elements. One tree was assessed as having Moderate bat roost suitability, situated 25 m from the Proposed Development boundary (T06, Figure 1). It has a large hole just above ground level that extends up into the trunk. One tree (T08, Figure 1) was previously identified as a roost for a single noctule (AECOM, 2022), located 24 m from the Proposed Development. The roost was assessed as not suitable for use as a maternity roost.

Table 6. Bat roost suitability assessment results

Tree reference	Tree description	Description of potential roost feature(s)	Bat roost suitability	Distance to Site (m)
T01	Mature beech tree in line of trees bordering plantation woodland	Rot hole 3 m up tree facing north-east. No evidence of use visible from ground.	Low	82
T02	Semi-mature beech tree in line of trees bordering plantation woodland	Rot hole in trunk at 1.5 m facing north-east. Extends up trunk. Spider web covering entrance and full of detritus (e.g. decayed deadwood). No evidence of use visible from ground.	Low	79
T03	Mature beech tree in line of trees bordering plantation woodland	One of several trunks damaged through senescence with wood flap covering cavity, but very exposed to the elements at 1.5 m, facing north-east. No evidence of use visible from ground.	Low	72
T04	Senescent - mature beech tree in line of trees bordering plantation woodland	Cavity in trunk up to 2 m, facing north-east. No evidence of use visible from ground.	Low	87
T05	Dead trunk of beech tree in line of trees bordering plantation woodland	Rot hole in middle of trunk facing west at 1 m. No evidence of use visible from ground.	Low	53
T06	Mature beech tree in line of trees bordering plantation woodland	Large hole just above ground extends up into trunk, facing south-west. Potentially suitable for a number of roosting bats. No evidence of use visible from ground.	Moderate	25
T07	Mature beech tree in line of trees bordering plantation woodland	Limb damaged from senescence with woodpecker holes. If the whole branch is found to be hollow then it is very exposed and unlikely to be a bat roost. No evidence of use visible from ground.	Low	15
T08	Mature beech tree in line of trees bordering plantation woodland	Hole still present where previously there was a confirmed noctule roost. Although, no evidence of use visible from ground.	Confirmed roost	24

Bat activity surveys

Habitat suitability

A large part of the central and western survey area comprises very dense immature Sitka spruce plantation, reaching to a maximum height of approximately 8 m. The forestry rides and dry abandoned pastures across the survey area contain semi-improved neutral grassland. There is a line of scattered beech trees to the west and south of the Sitka spruce plantation. The beech trees are obviously planted, and whilst mature, some appear to be stunted in their growth stage and most have features of senescence (e.g. rot holes). In the north of the survey area lies an area of immature broadleaved plantation of rowan *Sorbus aucuparia*, silver birch *Betula pendula* and beech, and dense scrub of hawthorn *Crataegus monogyna*. Marshy grassland was identified in the east of the survey area and is dominated by soft rush *Juncus effusus* and/or sharp-flowered rush *Juncus acutiflorus*. There is an area of shallow standing water in the south-east of the survey area. This was dry at the time of survey but is considered likely to contain some water for the majority of the year. Heavily sheep-grazed improved grassland is present in a relatively small area in the east and south-west of the survey area.

The survey area and the immediate area surrounding the Site contains relatively poor quality bat habitat. Within 1 km of the Site, the south is dominated by bog, the east by intensively managed farmland, and the north and west by coniferous plantation, with some broadleaved woodland. The Site is connected to the wider landscape by habitat that is likely to be used by bats for commuting. The highest quality bat habitat in the general area is likely to be the River Nethan, 2.3 km to the west of the Site. Based on the habitat and features present, geographical context and previous survey data, it has been assessed that the survey area is of Low suitability to bats for commuting and foraging.

Walked transect survey

The results of the walked transect bat activity survey are summarised in Table 7. The figures presented are the number of bat registrations² recorded and not the total number of bats. Generally, bat activity during the walked

² A species registration is defined as the presence of a call of that species identified within a 15 second sound file. This is a standard definition to allow quantitative comparison of bat activity.

transect surveys was of a locally frequent level. The transect conducted in August registered the most bat recordings of the three with 64% of all registrations, and comprising 151 registrations of common pipistrelle and 78 of soprano pipistrelle. The second highest number of registrations were recorded during the July transect, with 28% of all bat recordings. Of these, 44 were common pipistrelle and 57 were soprano pipistrelle, with one additional recording of noctule. The transect conducted in September had the fewest registrations of the three nights, with only 8% of all recordings. This comprised sixteen common pipistrelle, eleven soprano pipistrelle and one *Myotis* sp. registrations. The recording of the *Myotis* sp. bat could not be confirmed to species level.

Bat activity was focussed in the following main areas along the transect route, and the location of the bat recordings are shown on Figure 2:

- in the west, outside the Site, in a forestry ride with a line of mature trees;
- at the southern end of the Site with a line of mature trees adjacent to rough grassland; and,
- in the north-east, outside the Site, in a forestry ride adjacent to dense scrubland.

Table 7. Walked transect bat activity survey results

Survey date (2022)	Species	Total number of registrations	Comment
26 July 2022	Soprano pipistrelle	57	<ul style="list-style-type: none"> Fourteen recordings from the forestry ride with a line of mature trees from 22:38 to 22:39. 34 recordings from the line of mature trees adjacent to rough grassland from 22:48 to 23:32. Nine recordings in a tight cluster by the line of mature trees adjacent to rough grassland from 22:59 to 23:00.
	Common pipistrelle	44	<ul style="list-style-type: none"> A single recording from the forestry ride with a line of mature trees at 22:31. A cluster of six recordings from the forestry ride with a line of mature trees from 22:40 to 22:42. Two recordings in the north-west of the survey area in a forestry ride at 22:31 and 22:36. One recording from an open forestry ride in the north of the survey area at 22:24. Two from the line of mature trees adjacent to rough grassland from 22:49 to 23:51. Six recordings in a tight cluster by the line of mature trees adjacent to rough grassland from 22:56 to 22:57. 25 recordings from the forestry ride adjacent to dense scrubland from 22:19 to 22:22. One recording from the track in the east of the survey area at 23:05.
	Noctule	1	<ul style="list-style-type: none"> One recording from the forestry ride adjacent to dense scrubland at 22:15.
09 August 2022	Common pipistrelle	151	<ul style="list-style-type: none"> Five recordings in the north-west of the survey area in a forestry ride from 22:27 to 22:29. One recording from the forestry ride with a line of mature trees at 22:33. 125 recordings by the line of mature trees adjacent to rough grassland (see inset on Figure 2) from 21:34 to 22:43. Six recordings from an open forestry ride in the north of the survey area at 22:21. This was probably all the same bat(s). Ten recordings from the forestry ride adjacent to dense scrubland from 22:16 to 22:21. Three recordings from around the track in the east of the survey area from 22:07 to 22:13. A single recording from around the track in the east of the survey area at 22:46.
	Soprano pipistrelle	78	<ul style="list-style-type: none"> Eight recordings in the north-west of the survey area in a forestry ride from 22:22 to 22:27. Thirteen recordings from the forestry ride with a line of mature trees from 21:26 to 21:35. One recording from an open forestry ride in the north of the survey area at 22:22. 52 recordings by the line of mature trees adjacent to rough grassland from 21:39 to 22:37. One recording from the forestry ride adjacent to dense scrubland at 22:18. Three recordings from on the track in the east survey area at 22:05 and 22:07.
13 September 2022	Common pipistrelle	16	<ul style="list-style-type: none"> One recording in the north-west of the survey area in a forestry ride at 20:30. Thirteen recordings from the forestry ride with a line of mature trees with one at 20:30, the others from 20:42 to 20:44. One recording south of the Site at 20:47. Two recordings from on the track in the east of the survey area from 20:09 to 20:11.

Soprano pipistrelle	11	<ul style="list-style-type: none"> Seven recordings from the forestry ride with a line of mature trees from 20:37 to 20:40. A single recording from the forestry ride with a line of mature trees at 20:44. Two recordings in the north-west of the survey area in a forestry ride at 20:28. One recording from the forestry ride adjacent to dense scrubland at 20:16.
<i>Myotis</i> sp.	1	<ul style="list-style-type: none"> One recording from north-west of the Preliminary Site Boundary in a forestry ride at 20:26.

Static bat detector monitoring

A total of at least six bat species were recorded by the static detector: soprano pipistrelle, common pipistrelle, unidentified *Myotis* sp., Leisler's bat *Nyctalus leisleri*, noctule and brown long-eared bat. It is unknown how many species of *Myotis* are present as the species cannot readily be distinguished by call parameters.

The majority (75%) of bat registrations recorded by the static detectors were of pipistrelles: 44% were soprano pipistrelles, 31% common pipistrelle and 0.63% unidentified pipistrelles (some consisted of social advertisement calls without an echolocation call, which could not be certainly identified to pipistrelle species). Social calls were commonly recorded for common and soprano pipistrelle bats. Feeding buzzes were also commonly recorded for common and soprano pipistrelle. The group with the next most numerous registrations were unidentified *Myotis* sp. *Nyctalus* species accounted for 12.5% of bat registrations; 3.8% were Leisler's bat, 2.5% were noctule and 6.2% were for an unidentified an unidentified to *Nyctalus* species (*Nyctalus* sp.). Leisler's social calls and other, more common calls, such male advertisement calls, were identified. This allowed for a high degree of confidence in the identification of Leisler's bat. Brown long-eared bat accounted for 1.4% of bat registrations. The static bat detector survey results are detailed in Table 8 below.

Table 8. Static bat detector survey results by location and month

Month	Soprano pipistrelle	Common pipistrelle	Unknown pipistrelle	<i>Myotis</i> sp.	Leisler's bat	Noctule	<i>Nyctalus</i> sp.	Brown long-eared	Total no. of registrations	No. of active nights	Median (mean) no. registrations per active night**
July	137	88	2	48	16	9	18	7	325	6	17 (73)
August	144	107	2	16	8	7	21	2	307	6	12 (38)
September	0	0	0	0	0	0	0	0	0	0	n/a

* A species registration is defined as the presence of a call of that species identified within a 15 second sound file. This is a standard definition to allow quantitative comparison of bat activity. The number of passes is almost always higher than the number of actual bats because single bats often make multiple passes.

** Rounded to nearest integer. Active nights means the nights the detector was active (i.e. powered and working).

5. Conclusion and Recommendations

Within the survey area there are bat roosting opportunities in mature beech trees, found on the edges of coniferous plantation forestry and in forestry rides. One tree was noted as a confirmed noctule roost in 2020. If this bat roost is to be directly impacted by works (e.g. loss of tree) or indirectly impacted by works (e.g. through disturbance), then a suitable compensation strategy must be planned and implemented, as required. However, it is deemed unlikely this tree (or the tree with Moderate BRS) will be impacted by the anticipated construction works, due to the distance from the Proposed Development. Therefore, a European Protected Species licence is unlikely to be required to permit works. If works are required at closer distance to this tree, or particularly intensive works (especially piling) are required, then disturbance of any bats roosting in the tree could occur. In this case it would be necessary to obtain a licence from NatureScot to permit such works to take place. As the tree was only found to support a single bat and is not considered to be suitable for use as a maternity roost, it is likely that a licence to cause disturbance would be granted, as effects on the conservation status of noctule, both locally and nationally, would be extremely unlikely.

A locally frequent level of bat passes were recorded on transect surveys, over three nights in July, August and September. The majority of registrations were soprano pipistrelles and common pipistrelle with one *Myotis* sp. and one noctule registration. Bat activity was heavily concentrated in the south and east of the transect route, along a line of mature trees and north-east of the transect route, adjacent to dense scrubland.

Static detector surveys recorded a total of at least six bat species: soprano pipistrelle, common pipistrelle, an unidentified *Myotis* sp., Leisler's bat, noctule and brown long-eared bat. It is unknown how many species of *Myotis* are present, as the species cannot be readily distinguished by call parameters. Over twelve nights in July and August, 632 bat calls were registered, of which 75% were pipistrelle species, 10% were *Myotis* sp., 12.5% were from the two *Nyctalus* species and 1.4% were brown long-eared bat.

6. References

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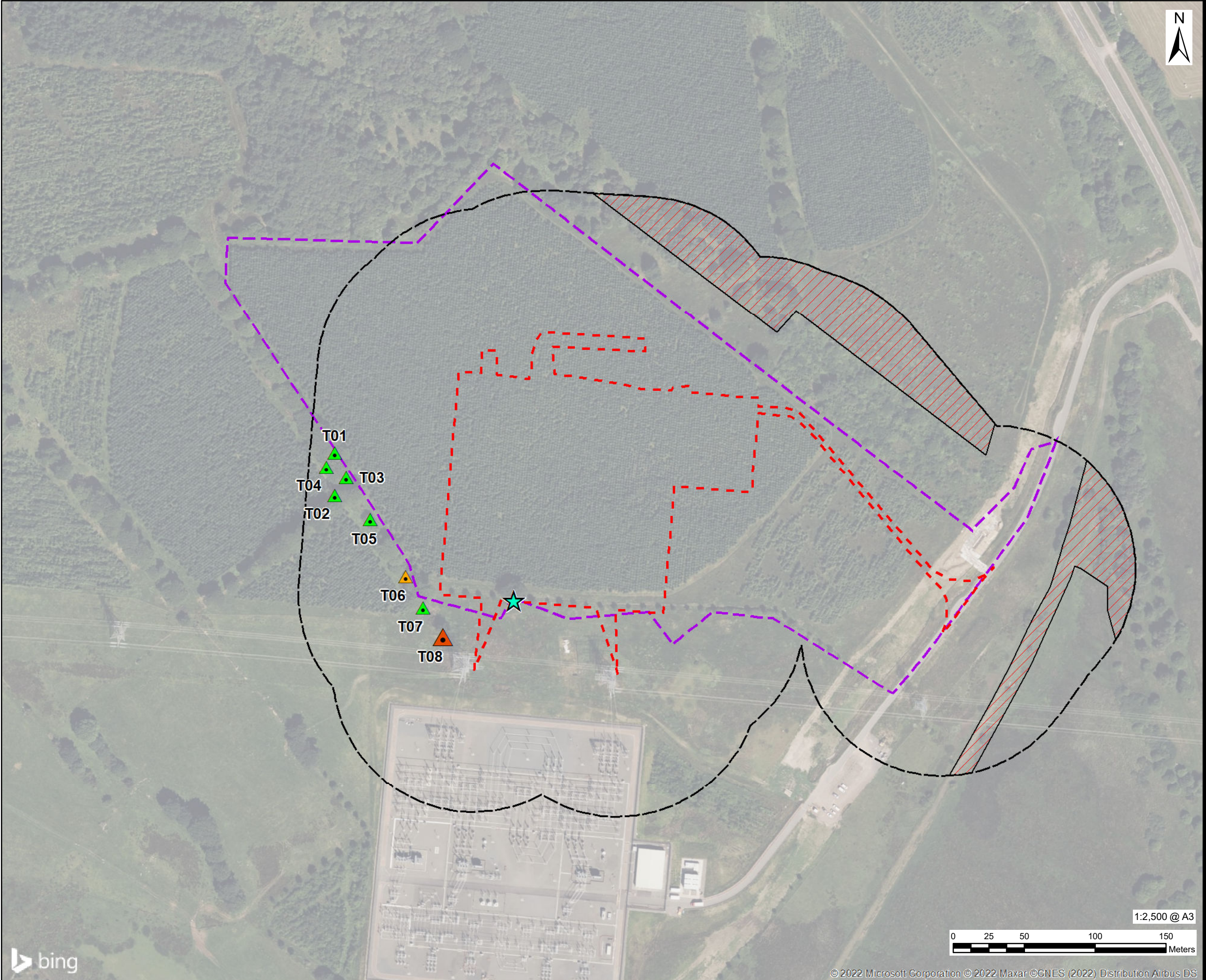
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- LEGEND**
- Preliminary Site Boundary
 - 100 m Site Boundary buffer
 - No Access area
 - Bat Transect Route
 - Static bat detector
- Trees with Bat Roost Suitability**
- Low BRS tree
 - Moderate BRS tree
 - Confirmed bat roost

NOTES
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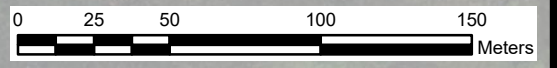
ISSUE PURPOSE
FINAL

PROJECT NUMBER
60635450

FIGURE TITLE
Bat Survey Locations and Bat Roost Suitability Results

FIGURE NUMBER
1

1:2,500 @ A3





**Transect results
26/07/2022**

- Noctule
- Common pipistrelle
- Soprano pipistrelle

**Transect results
09/08/2022**

- Common pipistrelle
- Soprano pipistrelle

**Transect results
13/09/2022**

- ◇ Myotis sp.
- ◇ Common pipistrelle
- ◇ Soprano pipistrelle

NOTES

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FINAL

PROJECT NUMBER

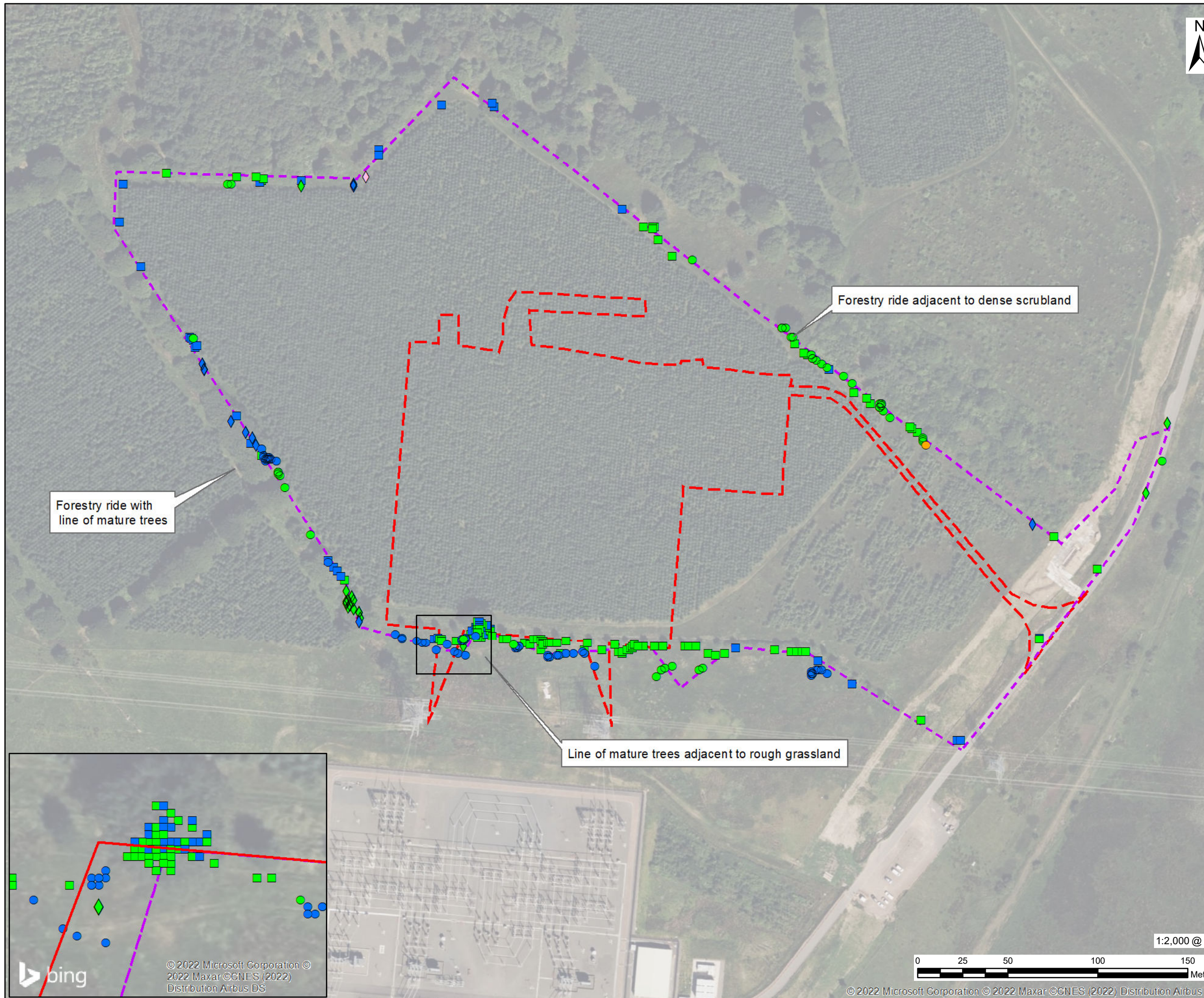
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FIGURE TITLE

Bat Transect Survey Results

FIGURE NUMBER

2

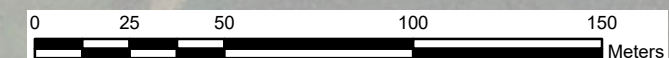


Forestry ride with line of mature trees

Forestry ride adjacent to dense scrubland

Line of mature trees adjacent to rough grassland

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