

Denny to Wishaw Network Upgrade

Environmental Impact Assessment Report

Volume 3 Appendices

*Appendix 8.2 – Bat Survey Results – AA, CB and WB
Lines*

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Appendix 8.2

1.1 Introduction

This Technical Appendix accompanies Volume 1, Chapter 8 Biodiversity of the EIA Report. It describes in detail the desk study and field survey carried out to establish baseline conditions relating to bats in the Zone of Influence (Zol) of the New Build Overhead Line (WB Route), along with the CB Route Removal (CB Route) and AA Route Undergrounding (AA Route) (hereafter referred to together as “the Works”). (The bat survey results relating to the Upgraded Lines are presented separately in Appendix 8.9, the results resulting to the Cumbernauld substation are presented in Appendix 8.13 (no other substations had features suitable for bats))

This appendix is supported by Figure 8.6: Bat Ground Level Tree Assessment/ Preliminary Roost Assessment Results (Volume 3: Figures).

Within this appendix, all works associated with the WB Route, CB Route and AA Route are referred to together as the “Works” and the “Site” for the area in which the Works are located. Each route Site will be referred to as the WB Site, CB Site and AA Site.

Information on the relevant legislation and planning policy relevant to bats, encountered within this appendix can be found in Chapter 8 Biodiversity.

1.2 Methodology

Desk Study

Desk study methods and relevant Zol are as described in Volume 1, Chapter 8 Biodiversity.

Field Study

Bat surveys relating to this report were conducted between 25 March 2025 and 11 December 2025, along with bat activity surveys and static detector monitoring which were completed 2022 (based on an earlier indicative wayleave) and the results are referred to separately in Section 1.4; methods for these surveys can be found in Denny to Wishaw Network Upgrade – Bat Survey Report¹, see Annex 1.

Daytime Bat Walkover

A Daytime Bat Walkover (DBW) was carried out in accordance with guidelines published by the Bat Conservation Trust (BCT)² and covered suitable habitat within the Zol (a 50m buffer of compound areas and 10m buffer of all other works). The DBW assessed the habitats present for suitability for roosting, commuting, and foraging bats, with reference to connectivity to the wider landscape. The general suitability of the habitat within the Site (and Zol) was classified according to the definitions provided by the BCT (see Table 1 below).

¹ AECOM (2023). *Denny to Wishaw Network Upgrade: Bat Survey Report*. Prepared for SP Energy Networks. AECOM, Edinburgh.

² Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)*. Bat Conservation Trust, London. <https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-4th-edition>.

Table 1 Bat commuting / foraging suitability categories (adapted from Collins (2023))

Suitability	Description of foraging and commuting habitats
None	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e no habitats that provide continuous lines of shade/protection for flight-lines, or generate shelter/insect population available for foraging bats.
Negligible	No obvious habitats features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream but 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 flight-paths 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 bats for flight-paths 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. Site is close to and connected to known roosts.

Preliminary Roost Assessment and Ground Level Tree Assessment Survey

A Preliminary Roost Assessment (PRA) of structures and a Ground Level Tree Assessment (GLTA) was also carried out at 50 m from the compounds and up to 10 m from all other works, where access was possible and safe.

Potential Roost Features (PRFs) searched for included suitable holes, cracks or splits in trees, and any possible ingress points to buildings. Where such features existed, searches were made for evidence of bat use such as droppings, staining, foraging remains, auditory evidence and the presence of live or dead bats. Following BCT guidance, buildings and trees were assigned a suitability category based on the presence of PRF, as set out in Table 2 and Table 3, respectively.

All identified PRFs in trees were then further categorised as either PRF-Individual (PRF-I), PRF-Multiple (PRF-M), or Further Assessment Required (FAR) (see Table 3) based on ground-level assessment only, without the use of specialist equipment such as mirrors or endoscopes. The suitability classifications assigned at this stage are considered indicative rather than definitive and the results were used to inform further survey requirements.

Table 2 Bat habitat suitability categories (adapted from Collins (2023))

Suitability	Description of roosting habitats (in structures)
None	No habitats on Site likely to be used by any roosting bats at any time of year (i.e., a complete absence of crevices/suitable shelter at all ground/underground levels).
Negligible	No obvious habitat features on Site likely to be used by roosting bats. However, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. 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 and not a classic cool/stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure with one or more potential roost sites 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, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites 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. These structures have the potential to support high conservation status roosts (e.g., maternity or classic cool/stable hibernation site).

Table 3 Bat categories of potential suitability of PRFs in trees (adapted from Collins (2023)²)

Tree suitability	Description of roosting habitats
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF-I	Tree has a PRF which is only suitable for individual or very small numbers of bats; either due to their size or lack of suitable surrounding habitat.
PRF-M	Tree has a PRF which is suitable for multiple bats and may be used by a maternity colony.

PRF Aerial Inspection Survey

PRF aerial tree inspections were conducted within the overhead line wayleave, to focus on those trees most likely to be affected by the Project by Echoes Ecology in late July and early August 2025 on all trees identified to have PRF by the GLTA. Inspections were completed by experienced ecologists with Ladder Safety Awareness Training who are qualified NPTC Tree Climbers with Aerial Rescue. Surveys involved an initial ground inspection of the features and then, if necessary, further inspection with the use of torches, “polekams”, endoscopes, ladders and tree climbing equipment.

Emergence Surveys

Dusk emergence surveys were carried out on three PRF-M trees (WB.BT.46, WB.BT.47 and WB.BT.70) that are at risk of being felled during the Works and where Aerial Inspection Surveys indicated further survey was necessary.

The dusk emergence surveys were carried out by two suitably qualified AECOM ecologists following industry-standard BCT guidance².

Dusk emergence surveys started 15 minutes before sunset and ended 1.5 hours after sunset. Surveys were undertaken in suitable weather conditions, i.e., no rain or strong wind and with temperatures above 10°C at sunset. During the emergence surveys, the PRF-M was watched carefully by the surveyors and, if bats emerged / re-entered the feature(s), the surveyors noted the location, species (using bat detection equipment, see below) and the number of bats. General bat activity was also noted during the surveys to provide context about the use of the Site by bats.

The surveyors used Elekon Batlogger M2 (‘Batlogger’) detectors to identify and record bat calls. The detectors were set to record continuously throughout the survey, in real-time (recording calls and gaps, allowing ‘rhythms’ to be recognised) and in full spectrum (all frequencies), which allows the most comprehensive and detailed analysis.

Following BCT guidance³, the bat detector surveys were supplemented by the use of two Canon infra-red (IR) cameras which were paired with each surveyor. The IR cameras

recorded continuously throughout the survey, supported by use of an infra-red torch and / or floodlights. This allowed enhanced infra-red visibility which would allow any bats exiting or returning to PRF, even in complete darkness, to be viewed in the footage recorded. Cameras were focussed, as appropriate, on individual PRF-M or more widely across the feature being surveyed. After surveys were completed, the infra-red footage was reviewed in full by an experienced ecologist to look for footage of bats emerging PRF.

See Table 4 and Table 5 for emergence survey details.

Table 4 Emergence surveys metadata

Survey Date	Sunset Time	Survey Start Time	Survey End Time	Weather Conditions
WB.BT.46				
27/08/2025	20:21	20:06	21:51	15°, calm breeze with 40% cloud cover, recent rain.
09/09/2025	19:48	19:33	21:18	14°, still air with limited cloud cover, no rain.
WB.BT.47				
27/08/2025	20:21	20:06	21:51	14°, still air with limited cloud cover, no rain.
09/09/2025	19:48	19:33	21:18	16°, calm breeze with 30% cloud cover, no rain.
WB.BT.70				
02/09/2025	20:05	19:49	21:40	14°, calm breeze with limited cloud cover, no rain.
17/09/2025	19:29	19:14	20:59	14°, calm breeze with limited cloud cover, no rain.

Table 5 Photograph of darkest point captured on the IR camera during each emergence bat survey

Tree reference	Survey date	Photograph of the darkest point
WB.BT.46	27/08/2025	
	09/09/2025	
WB.BT.47	27/08/2025	

09/09/2025



WB.BT.70

02/09/2025



17/09/2025



Sonogram Analysis

Analysis of all recordings made during the emergence survey was carried out using Kaleidoscope Pro software (Version 5.6.8) by a suitably experienced ecologist, with reference to guidance materials. This analysis was then audited by an expert bat ecologist to verify identifications.

Analysis of bat call recordings provides information on the species present at each location, as well as the numbers and timing of bat passes. A bat pass is defined as a single automated detector file made up of bat pulses of a single species; this can be for one bat in a file or many bats in a file. The number of passes recorded on automated detectors gives an indication of the level of bat activity at a given location and can be reliably correlated to bat abundance when considered alongside surveyor observation.

Limitations and Assumptions

Glasgow Museums Biological Records Centre, the Local Environment Records Centre (LERC) who provide records for much of the area of the Site south of Bonnybridge, were not taking requests. As such, only commercially available records were reviewed for this portion of the Site. This is not considered a significant limitation to the assessment, as the bat activity surveys and static detector monitoring undertaken in 2022 provides a good indication of the species recorded within the area.

Access was not possible for areas of private dwellings, including farmhouses and residential gardens. However, these areas comprise a small fraction of the Site and the habitats present are assumed to be typical of managed residential and agricultural grounds. As such, they are not expected to significantly contribute to or alter the overall habitat suitability of the Site. Therefore, this is not considered a significant limitation.

Dense conifer plantations were not accessible to surveyors due to dense planting and low-level branching. This is not considered a significant limitation as this habitat is unlikely to support suitable bat habitat / PRF. Fields with livestock present were not accessed for surveyor and livestock safety reasons, features present in or on the border of such fields were viewed from a safe distance with binoculars.

As surveys were conducted in summer and autumn months during peak growing season, some PRFs may have been concealed by foliage out of sight of surveyors.

Active construction (not relating to the Project) was being carried out on some sections of the Site and could not be thoroughly surveyed. These areas (detailed in main chapter), if they remain suitable, should be surveyed prior to construction for bat features in present trees or structures.

Aside from the above the majority of the Site was accessible aside from smaller areas which could not be fully surveyed due to health and safety constraints, such as impenetrable vegetation or unsafe terrain. These data gaps are localised and are not considered to significantly undermine the overall assessment, as the majority of these locations were in areas such railway embankments where tree removal will not be undertaken.

Echoes Ecology identified limitations to conducting the Aerial Assessment Surveys of trees on Site. Complex or deep features could not be fully assessed by surveyors due to the reach of a light source and the endoscope used. Assessment was not sufficient to determine the suitability of the feature for trees: WB.BT.37, WB.BT.46, WB.BT.114, WB.BT.116, WB.BT.124, WB.BT.126. Several trees were deemed unsafe to climb by qualified surveyors after doing a preliminary assessment of the tree structure, health and ground below: WB.BT.07, WB.BT.23, WB.BT.89, WB.BT.102, WB.BT.128, WB.BT.129, WB.BT.130. Land access was not possible on National Rail land which impacted trees WB.BT.16 and WB.BT.20. Any trees which could not be fully inspected were precautionarily recorded as FAR, thus acknowledging that further assessment required to establish if PRFs are present in the tree, which would be undertaken prior to construction should these trees require removal. The assessment follows the precautionary principle and therefore assumes these trees could be used by roosting bats.

Only trees within the overhead line wayleave were subject to Aerial Assessment. This was to target data collection from the areas of greatest potential impact from Works. This is not considered a significant limitation to impact assessment as sufficient data was gathered to allow for an overall assessment of the Project on the bat roost resource, see further below. Specific surveys were not undertaken at visibility splays, as it is understood that micro siting will be targeted in these locations to avoid tree removal. Preconstruction surveys will be undertaken in these locations in the event that any trees do require removal

Full roost surveys (GLTA, Aerial Assessment and emergence surveys) to confirm presence / probable absence of a roost in all trees within the Zol of the Works were not completed due to the scale of the project, however, sufficient data was gathered to allow for an overall assessment of the Project on the bat roost resource likely to be present. A precautionary approach was adopted when assessing roost suitability and conducting impact assessment, whereby roosts have been assumed to be present where trees with roosting suitability were recorded. Full emergence surveys followed BCT guidance on every PRF-M tree within the Zol where their removal was considered certain. For the purposes of impact assessment, data was considered suitable to give a full and robust assessment, applying the precautionary principle, the roost suitability and local species assemblage has been used to complete the impact assessment.

Data describing the bat assemblage baseline for the Site is from 2022, and from a slightly different Works corridor. However, the 2022 Site corresponds closely with the current Site, particularly the WB line, and habitats present are comparable throughout. The bat assemblage of the Site and local area is unlikely to have changed since 2022, given no major habitat differences were recorded and national bat census information³ show relevant populations to be relatively static, and the assemblage recorded in 2022 confirms the presence of all species likely to occur in this locale.

³ Bat Conservation Trust, 2025. The National Bat Monitoring Programme Annual Report 2024. Bat Conservation Trust, London.

1.3 Baseline Conditions

Desk Study

The National Biodiversity Network Atlas (NBN Atlas) returned 25 records of bats within 1km of the Site; 11 of soprano pipistrelle *Pipistrellus pygmaeus*, three common pipistrelle *Pipistrellus pipistrellus*, and 11 Daubenton's bat *Myotis daubentonii*. These records were concentrated near Bonnybridge and Greenbank, Cumbernauld substation in Palacerigg Country Park, and in the South near Airdrie. Of these records, two were probable maternity roosts (inferred from bat count data). One was in the 10km OS grid square including the Bonnybridge substation area of the Site and hosted a roost of 32 Daubenton's bats, the second was a maternity roost with 31 soprano pipistrelles located in the 10km square near the Palacerigg Golf Course (Cumbernauld). Given the records are only to 10km accuracy, it is not possible to confirm if either roost was in the Zol of Works.

The Wildlife Information Centre (TWIC) provided an additional 37 records of bats within 1km of the Site; 15 soprano pipistrelle, 7 common pipistrelle, 15 Daubenton's bat, and one brown long-eared bat *Plecotus auritus*. The remaining records were individuals not identified to species level, and included 3 *Pipistrelle sp.*, 1 *Myotis sp.* and 3 unidentified bats. Most of these records were between Bonnybridge and Greenbank.

Field Survey

Daytime Bat Walkover

Habitats across the Site are mostly unsuitable for bats being mostly urban areas and agricultural land.

The middle section of the AA Route is the most valuable for bats with large sections of broadleaved woodland where the Rowan Tree Burn runs through. This riparian habitat provides ample areas for foraging, has commuting lines created by the river and walking paths and some areas for roosting and vegetation protection from predators. The southern most sections and some areas in the middle are composed of neutral and modified grassland and urban areas. Some of these sections could be deemed moderate due to hedgerows or nearby forest edge for foraging or commuting. The urban and arable fields in the northern section of the line are dominated by arable crop fields and urban development, which are of negligible suitability for bats, but due to the proximity to woodland and riparian habitat, overall, it is assessed to be of low suitability.

Areas of the WB route contain deciduous/broadleaved woodland and riparian woodland habitat along watercourses are creating riparian habitat, and these woodlands offer good roosting, foraging and commuting opportunities and are considered high suitability. This can be seen around towers WB005, WB013, WB016, WB019, WB020, WB045, WB049, WB052. Areas along this line where there are lines of trees or smaller sections of woodland that are connected to the wider landscape or surrounded by agricultural fields would be considered moderate suitability, including around towers WB012, WB021, WB033 and WB039. Other expanses of intensely managed agricultural land, livestock fields and urban areas offer minimal roosting potential and are therefore assigned a suitability rating of low.

The CB Route largely overlaps the AA Route in the northern sections and the WB Route in the southern sections. The overlapping sections will have a same suitability rating as above. The remaining middle section between tower CB020 and CB029 has a mix of lowland mixed deciduous woodland, modified grassland, conifer plantation, wet heathland, arable fields as well as some wetland areas. The deciduous woodland has the highest suitability in this area, however, the woodland strip is narrow and surrounded by fields and conifer plantation, which both have negligible to low suitability for bats. Some hedgerows or strips of trees exist in this area that could be used by foraging or commuting bats, but the wider area in this section is considered to be of low suitability.

Roost Assessment Surveys

No structures were identified within the Survey Area that required a PRA survey.

The initial GLTA identified 184 trees with potential bat roost suitability. Details on the trees and their location are presented in Table 6 below and are also illustrated on Figure 8.6.

PRF trees were mostly concentrated in dense woodland, along road/field edges and along watercourses. This mostly correlated with the High/Moderate suitability habitats identified during DBW.

The majority of PRF-M trees are clustered in seven main locations:

- Roughcastle WS and adjacent area;
- Drum Wood;
- Along access tracks to WB047, near Greenrig Farm;
- Cumbernauld Substation;
- Palacerigg Country Park (West) SINC;
- Luggie Water: Glenhove-Jockey's Well SINC; and,
- Cleuch SINC and adjacent area.

Outside of these areas there are scattered lone /small groups of PRF-M trees. PRF-I trees are concentrated in similar locations.

Table 6 includes a 'Further Assessment Required' column, this details if a tree had a preliminary assessment of PRF-I, PRF-M or FAR, and was likely to be effected by Works – these are trees where further investigations (Aerial Inspection/emergence survey) were targeted to confirm roost presence or likely absence.

After further survey, as shown in the 'Final Suitability' column of Table 6, 37 trees were classified as being 'PRF-M', 83 as 'PRF-I', and 32 as 'FAR'. There were 31 trees that were downgraded to a category of 'none' following aerial inspection.

Fifteen trees with a 'Final Suitability' of PRF-M or FAR which could support notable bat roosts were identified.

Table 6 GLTA and Aerial Assessment Survey Results

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
AA Route							
AA.BT.01	Semi-mature oak	A semi-mature tree on a riverbank with a DBH of approximately 45cm. A north-facing knothole at around 5m with a small opening appears to extend into the trunk, although visibility from the ground is limited.	NS 84239 80275	Located 2m north of an AA tower compound, 4m south of the access, 4m south of the WB proposed access, and 6m south of the AA scaffolding	PRF-I	No	PRF-I
AA.BT.02	Dead tree	A dead tree with a large east-facing wound at approximately 1.5m that leads into an internal cavity. The entrance measures roughly 5 × 5cm and extends into the trunk, with a possible connection to a higher crack around 2m. The tree has a DBH of approximately 35cm and is accessible for endoscopic inspection from the ground.	NS 84208 80273	Located 2m north of an AA tower compound, 2m south of the CB access, 2m south of the WB proposed access, and 7m south of the AA scaffolding	PRF-M	No	PRF-M
AA.BT.03	Mature oak	A mature tree with a DBH of approximately 45cm located near overhead lines. A hole on the south-facing side of the lowest hanging branch has an	NS 84190 80260	Located 6m west of an AA tower compound, 13 m south of the CB access, 13m south of the WB proposed access, 20m	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		opening of approximately 5 × 10cm and extends back into the limb, with potential lateral extension.		south of the AA scaffolding, and 37m east of the CB route			
AA.BT.04	Semi-mature birch	A semi-mature tree within birch woodland with a DBH of approximately 25cm. The trunk is hollow with two visible openings: a large east-facing opening close to ground level that extends upward, and a smaller south-facing opening at around 1.2m that also extends upward out of sight.	NS 84174 80254	Located 17m south of the CB access, 17m south of the WB proposed access, 20m east of the CB route, 22m west of an AA tower compound, and 34m southwest of the AA scaffolding	PRF-M	No	PRF-M
AA.BT.05	Mature oak	A mature tree with a DBH of approximately 65cm and a large, dropped limb. North-facing butt rot extends from ground level to around 80cm, forming a narrow entrance that leads upward into heartwood out of sight and may be accessible to individual bats.	NS 84227 79976	Within an AA tower compound	PRF-I	No	PRF-I
CB Line							

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.01	Mature beech	A mature tree within a hedge with a single wound on a south-facing branch at approximately 5m. The wound entrance is uncluttered and may extend internally, although visibility is limited from the ground. The tree has a DBH of around 80cm and is unsafe to climb.	NS 84409 80933	Within WB visibility splays	PRF-I	No	PRF-I
CB.BT.02	Mature horse chestnut	A mature tree, with a DBH of ~80cm within a hedge with a snapped limb and multiple potential access features. A south-facing knothole at approximately 5m may extend internally, though visibility is limited from the ground. An additional larger, slightly upward-facing opening is present towards the south-east.	NS 84376 80919	Located 3m south of the WB visibility splays	PRF-M	No	PRF-M
CB.BT.03	Mature birch	A mature tree with a DBH of approximately 65cm in sparse woodland between overhead lines. A north-east-facing knothole at around 1.5m has an opening of approximately 5 ×	NS 84198 80176	Located 5m northeast of the tower compound CB036, 34m east of the CB route, 40m northeast of the CB access, 40m northeast of the WB proposed	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		7cm and extends upward into the heartwood out of sight.		access, and 44m south of an AA tower compound			
CB.BT.04	Dead standing birch	A dead standing tree with two main stems and a combined DBH of approximately 30cm. A north-facing hole close to ground level extends upward into the trunk and heartwood, offering limited suitability due to its low position but potentially accommodating a small number of bats.	NS 84148 80138	Within tower compound CB036	PRF-I	No	PRF-I
CB.BT.05	Semi-mature birch	A semi-mature tree with a hollow trunk. A south-east-facing opening approximately 7cm wide is present at around 2m and extends upward within the trunk.	NS 84042 80058	Located 3m south of the CB access and 3m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.06	Mature oak	A mature tree with a small north-west-facing knothole at approximately 3m. The feature may extend internally, though	NS 84030 80061	Located 4m north of the CB access and 4m north of the WB proposed access	FAR	No	FAR

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		this could not be confirmed from the ground.					
CB.BT.07	Mature oak	A mature tree with cracking present on a south-east-facing branch at approximately 4m. It is unclear whether the crack extends internally beyond the visible surface.	NS 83991 80046	Located 1m south of the CB access and 1m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.08	Mature beech	A mature tree, with a DBH of ~1m, located approximately 1.5m from a path with multiple interconnected wounds on one stem. These features extend from around 1.8–3.5m and form a large internal cavity, though visibility is limited and exposure to precipitation is unclear. A separate south-east-facing knothole at approximately 4.5m may also extend internally.	NS 83739 80055	Located 7m northeast of the CB access and 7m northeast of the WB proposed access	PRF-M	No	PRF-M
CB.BT.09	Stunted mature birch	A stunted mature tree with south-east-facing butt rot beginning at approximately 40cm. The cavity extends upward internally, where there is a possible bird's nest.	NS 83464 79972	Located 7m southeast of the CB access and 7m southeast of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.10	Mature beech	A mature tree with a DBH of approximately 80cm located behind a wall. A large, cracked split in the trunk forms multiple crevices suitable for individual bats, although no obvious large cavity entrances were visible from ground level.	NS 83379 79856	Located 5m south of the CB access and 5m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.11	Dead goat willow	A dead branch with a 40cm split down its centre, creating a shelf at 3m on the northeast face of the tree.	NS 83384 79838	Located 5m southwest of the CB access and 20m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.12	Oak	A large, cracked west-facing branch at 4m, though not obvious how deep the crack extends. A similar cracked branch on the southeast face that extends at least 5cm. A final knothole beneath the south-east-facing branch at 1.5m, the hole is 5x5cm and appears to extend upwards and out of sight.	NS 83397 79840	Located 4m northeast of the CB access and 14m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.13	Mature oak	A large, cracked branch at 3m on the south face of the tree.	NS 83438 79809	Located 1m northeast of the CB access and 27m south of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.14	Oak	A south-west-facing cavity on a north-east-facing branch at 3m. The cavity is about 3x3cm, leading into the top side of the limb and extending about 10cm.	NS 83470 79811	Located 7m north of the CB access and 13m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.15	Mature English oak	A mature tree with a DBH of approximately 60cm. A small cavity on the south-east side of a north-west-facing branch at around 8m extends a short distance into the limb and may provide space for a single bat.	NS 83495 79808	Located 6m south of the CB access and 6m south of the WB proposed access	FAR	No	FAR
CB.BT.16	Mature oak	A mature tree with a DBH of approximately 50cm located several metres from the track. A small hole within torn heartwood on the south-facing side at around 6m appears to extend upward into deeper heartwood.	NS 83519 79806	Located 1m north of the CB access and 1m north of the WB proposed access	PRF-I	No	PRF-I
CB.BT.17	Mature oak	A mature tree with two south-east-facing features. A knothole at approximately 5m (with a 7x3cm opening) and a second opening at the junction of a snapped branch around 1m (approximately 5x3cm) below	NS 83552 79804	Located 1m north of the CB access and 1m north of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		both extend several centimetres into the tree.					
CB.BT.18	Mature oak	A mature tree with an east-facing cavity formed by a snapped branch at approximately 2m. The downward-facing entrance may extend internally, although its full extent could not be determined from the ground.	NS 83640 79804	Located 4m north of the CB access and 4m north of the WB proposed access	FAR	No	FAR
CB.BT.19	Mature oak	A mature tree with a DBH of approximately 60cm. A south-west-facing dropped-branch hole at around 2.25m opens into heartwood and extends upward internally by several centimetres.	NS 83667 79801	Located 2m north of the CB access and 2m north of the WB proposed access	PRF-I	No	PRF-I
CB.BT.20	Mature oak	A mature tree with a DBH of approximately 1m. An east-facing dropped-branch hole at around 4m extends into heartwood and continues inward toward the trunk for several centimetres.	NS 83686 79800	Located 2m north of the CB access and 2m north of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.21	Mature beech	A mature tree with extensive butt rot forming a very large cavity within the trunk, approximately 20x30cm. The main entrance is substantial and connects internally, extending for at least 1 m, with an additional opening around 2 m contributing to damp conditions within the cavity.	NS 83733 79801	Located 6m north of the CB access and 6m north of the WB proposed access	PRF-M	No	PRF-M
CB.BT.22	Mature oak	A mature tree with two rolled-in holes on the east-facing side of the trunk. Both features extend slightly into the centre of the trunk and may also continue upward internally.	NS 83829 79793	Located 2m north of the CB access and 2m north of the WB proposed access	PRF-I	No	PRF-I
CB.BT.23	Mature oak	A mature tree with a DBH of approximately 55cm. A south-facing knothole at around 4m extends into the branch for several centimetres and may continue further internally.	NS 83893 79804	Within CB route access	PRF-I	No	PRF-I
CB.BT.24	Mature oak	A mature tree with a DBH of approximately 65 cm close to the track. A large south-east-facing opening low on the trunk contains a smaller upper	NS 83900 79798	Located 6 m south of the CB access and 6m south of the WB proposed access	PRF-M	No	PRF-M

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.25	Mature beech	entrance that extends deeply upward into heartwood out of sight. A mature tree, with a DBH of approximately 55cm, with two adjacent east-facing knotholes at approximately 4m. Each opening may extend into the limb, although their depth could not be confirmed from the ground.	NS 83928 79792	Located 7m south of the CB access and 7m south of the WB proposed access	FAR	No	FAR
CB.BT.26	Mature beech	A mature tree with extensive south-east-facing butt rot. A large entrance leads deeply into the trunk out of sight, with decay extending approximately 1m in height.	NS 83940 79792	Located 7m south of the CB access and 7m south of the WB proposed access	PRF-M	No	PRF-M
CB.BT.27	Mature beech	A mature tree with multiple significant features. A long west-facing split at around 5m forms a crevice that may accommodate several bats, while an east-facing butt-rot feature extends upward into the trunk out of sight. An additional snapped branch facing the long	NS 83975 79795	Located 4m south of the CB access and 4m south of the WB proposed access	PRF-M	No	PRF-M

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		split may conceal further inaccessible crevices.					
CB.BT.28	Mature beech	A mature tree with two north-east-facing knotholes at approximately 6 and 7m. Both openings are small, and it is unclear from the ground whether extends internally. The trunk has a DBH of roughly 50cm.	NS 84016 79794	Located 6m south of the CB access and 6m south of the WB proposed access	FAR	No	FAR
CB.BT.29	Mature beech	A mature tree with a DBH of approximately 1.35m. Numerous snapped branches and small knotholes provides multiple minor features, although none appear deep, resulting in precautionary suitability for individual bats.	NS 84025 79796	Located 4m south of the CB access and 4m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.30	Mature beech	A mature tree with a DBH of approximately 50cm. North-facing butt rot extends approximately 1m in height and includes a very small cavity that	NS 84079 79795	Located 7m south of the CB access and 7m south of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		penetrates a short distance into the trunk.					
CB.BT.31	Birch	A tree with a wound from a broken limb on the south-facing side at approximately 2.5m. The entrance measures around 5 × 3cm and extends a short distance internally, with possible limited upward continuation.	NS 84156 79849	Located 8m west of the tower compound CB035, 30m west of the CB access, and 30m west of the WB proposed access	FAR	No	FAR
CB.BT.32	Semi-mature birch	A semi-mature tree with a DBH of approximately 35cm. An east-facing cavity at around 1.5m has two adjacent openings leading into exposed heartwood, though the cavity appears shallow and does not extend upward.	NS 84161 79846	Located 3m west of the tower compound CB035, 26m west of the CB access, 26m west of the WB proposed access, and 49m west of the CB route	PRF-I	No	PRF-I
CB.BT.33	Mature goat willow	A mature tree with a DBH of approximately 70cm. A torn main branch has caused cracks and splits within the bark and heartwood that may hold individual bats, although the features appear relatively exposed.	NS 84376 79404	Located 2m southwest of the CB access and 2m southwest of the WB proposed access	PRF-I	No	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.34	Mature goat willow	A mature multi-stemmed tree with a combined DBH of approximately 1.25m. A twist fracture on the eastern stem has created a split through the heartwood forming a sheltered cavity that may extend upward.	NS 84246 79365	Located 2 m west of the AA scaffolding, 2m southwest of the CB access, 2m southwest of the WB proposed access, 7m south of the tower compound CB033, 26m west of the CB route, and 35m northwest of the WB visibility splays	PRF-I	No	PRF-I
CB.BT.35	Semi to mature birch	A semi-mature tree with a DBH of approximately 35cm. A low butt-rot feature extends upward internally and may allow bats to gain lift when exiting, while a separate exposed feature higher in the crown could not be fully assessed due to clutter.	NS 84292 79303	Located 5m west of the CB r access, 5m west of the WB proposed access, 10m west of an AA tower compound, 12m east of the CB route, 32m south of the AA scaffolding, 35m south of the WB visibility splays, 41m northwest of the AA C1, 41m northwest of the AA C2, and 41m northwest of the AA006CSE	PRF-M	No	PRF-M

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.36	Semi-mature birch	A semi-mature tree with a DBH of approximately 25cm. A south-west-facing wound at around 0.5m has a small entrance leading into a cavity within the trunk that extends at least 10cm internally.	NS 84337 79238	Located 11m north of an AA tower compound, 15m east of the AA C1, 15m east of the AA C2, 16m east of the CB route access, 16m east of the WB proposed access, 36m northeast of the tower compound CB032, 45m south of the AA006CSE, and 48m east of the CB route	FAR	No	FAR
CB.BT.37	Immature beech	An immature tree with a 2x2cm east-facing wound at approximately 1m. A small entrance leads into a narrow cavity that extends at least 10cm into the trunk.	NS 84326 79232	Located 4m east of the CB access, 4m east of the WB proposed access, 5m north of an AA tower compound, 7m east of the AA C1, 7m east of the AA C2, 24m northeast of the tower compound CB032, and 36m east of the CB route	FAR	No	FAR
CB.BT.38	Mature beech	A mature tree with a 2x2cm north-west-facing knothole at approximately 4m. The feature may extend internally, although this could not be confirmed from the ground. The tree has a DBH of 55cm.	NS 84229 79053	Located 10m east of the CB access and 10m east of the WB proposed access	FAR	No	FAR

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
CB.BT.39	Mature beech	A mature tree with a DBH of approximately 60cm. A large east-facing rolled-in opening leads into a cavity within heartwood and may extend upward, with a similar feature present approximately 1.5m higher where the trunk forks.	NS 84231 79041	Located 9m east of the CB access and 9m east of the WB proposed access	FAR	No	FAR
CB.BT.40	Mature beech	A mature tree with a DBH of approximately 1m. A large area of trunk damage exposes heartwood and may contain small crevices suitable for bats, although no clear upward extension was visible.	NS 84099 78906	Located 6m south of the CB route removal access and 6m south of the WB proposed access	PRF-I	No	PRF-I
CB.BT.41	Mature oak	A mature tree with extensive north-west-facing butt rot measuring approximately 1.7m in height. Multiple small cavities are present throughout the decayed area, several of which extend at least 15cm into the trunk.	NS 83993 78883	Located 6m south of the CB route removal access and 6m south of the WB proposed access	FAR	No	FAR
CB.BT.42	Unknown	A small tree with a hollow trunk. Two low-level openings extend upward into the trunk out of sight and appear large enough	NS 83858 78855	Located 2m south of the CB route removal access and 2m south of the WB proposed access	PRF-M	No	PRF-M

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB Line		to provide internal roosting space.					
WB.BT.01	Mature ash	A mature tree within a hedge with a single knothole on an upper branch at approximately 10m, facing south. Visibility from the ground is limited, and it is unclear whether the feature extends internally.	NS 84032 80795	Located 10m south of the WB visibility splays, 15m north of the CB access, 15m north of the WB proposed access, 22m northwest of the tower compound CB038, 28m southwest of the WB pulling positions, 30m southeast of the WB access, 36m southwest of the CB route, and 38m south of the tower compound CB039	PRF-I	No	N/A
WB.BT.02	Mature oak	A mature tree with a DBH of approximately 1m. A knothole at around 4m on the east-facing side is likely to extend upward and may connect with a more exposed rot feature above. The branch may be hollow, and bird droppings at the entrance suggest previous use by birds.	NS 84567 80621	Within the wayleave	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.03	Mature oak	A mature, healthy tree with a DBH of approximately 1.2m. A south-east-facing knothole at around 4m is likely to extend upward to a secondary feature approximately 0.5m higher, while a second adjacent feature appears to terminate internally. Bird droppings are present at the entrance to the primary feature.	NS 84415 80612	Within the wayleave	PRF-M	Yes	NONE
WB.BT.04	Mature oak	A mature tree with a DBH of approximately 1.2m showing extensive damage to the north-facing side of the trunk. Exposed heartwood and multiple crevices suggest a cavity behind the outer wood, which may be open to precipitation at the top.	NS 84349 80608	Within the wayleave	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.05	Mature sycamore	A mature, unhealthy tree with a DBH of approximately 1m and evidence of extensive internal decay. East-facing butt rot extends from ground level to approximately 35cm and appears to rise internally, with one section sheltered by heartwood, though the full extent is unclear. Additional features include a cluttered west-facing knothole at around 5m and a large south-west-facing cavity at approximately 3m extending into a main branch, which may connect internally to other openings.	NS 84760 80477	Within the wayleave	PRF-M	Yes	NONE
WB.BT.06	Mature oak	A mature, heavily damaged tree with areas of spongy heartwood on the south-facing side. Small cavities may be present within the damaged sections, though their extent is unclear from ground-level inspection.	NS 84848 80360	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.07	Mature beech	A large tree that has snapped at approximately 4m, leaving a severely decayed and exposed standing trunk. Multiple potential access features are present throughout, including possible cavities within the fallen section and gaps behind rolled, healed wood on the remaining trunk.	NS 84875 80357	Within the wayleave	PRF-M	Yes	FAR
WB.BT.08	Unknown	Butt rot is present from approximately 20–60cm above ground level and may extend internally into a cavity. The drop zone is poor, and the full extent of decay could not be determined from the ground.	NS 84904 80322	Located 8m east of the WB wayleave, 21m east of the WB scaffolding, 27m northeast of the WB proposed access, and 27m northeast of the WB access	PRF-M	Yes	NONE
WB.BT.09	Mature birch	A mature, damaged tree with a DBH of approximately 40cm. A north-facing rot feature between 1–1.4m extends approximately 15cm into a cavity containing many slugs. Appears to be space for one or two bats.	NS 84898 80314	Located 1m east of the WB wayleave, 14m east of the WB scaffolding, 17m east of the WB proposed access, and 17m east of the WB access	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.10	Dead standing birch	A dead standing tree with extensive damage on the west-facing side. A long vertical crack from approximately 2.5–4m extends into an internal cavity, though it is unclear whether it is open at the top. Evidence of an old bird nest is present within the crack.	NS 84905 80307	Located 8m east of the WB wayleave, 23m east of the WB scaffolding, 24m east of the WB proposed access, and 24m east of the WB access	PRF-M	Yes	PRF-I
WB.BT.11	Dead standing birch	A dead standing multi-stemmed tree. The western-most stem is split at approximately 1.2m, providing access into a dry, sheltered cavity suitable for a single bat.	NS 84814 80281	Located 5 m west of the WB wayleave, 28m south of the WB proposed access, 28m south of the WB access, and 36m south of the WB scaffolding	PRF-I	Yes	PRF-I
WB.BT.12	Mature birch	A damaged mature tree with a DBH of approximately 20cm. Butt rot extends from ground level to around 0.5m and continues internally into a honeycombed cavity that rises to approximately 1m, where a secondary small entrance is present. The cavity appears to extend further upward beyond this point.	NS 84842 80280	Within the wayleave	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.13	Dead standing birch	A dead standing tree with a DBH of approximately 60cm. An enlarged woodpecker hole facing north-west at around 2.5m leads into a webbed internal cavity that appears spacious but does not seem open at the top.	NS 84819 80275	Within the wayleave	PRF-M	Yes	NONE
WB.BT.14	Mature sycamore	An early mature, multi-stemmed tree with a combined diameter of approximately 1.2m before stems diverge. A north-facing tear-out on the main stem at around 5m appears to extend into a cavity and contains a small tree growing from within. The cavity may accommodate a small number of bats.	NS 84890 80248	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.15	Mature beech	A mature tree with a small north-facing knothole at approximately 2m. The feature extends into the limb and is exposed from above but appears to provide enough internal space for one or two bats.	NS 84770 80243	Located 5m south of the WB proposed access and 5m south of the WB access	FAR	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.16	Mature oak	A mature tree with a DBH of approximately 1m. North-facing butt rot extends from ground level to around 40 cm, though it is unclear whether it continues upward. A small knothole at approximately 3.5m may connect to a limited cavity, with no other features visible from the opposite side of the railway.	NS 84817 80236	Located 5m west of the WB wayleave, 14m south of the WB proposed access, 14m south of the WB access, and 20m west of the WB scaffolding	PRF-I	Yes	FAR
WB.BT.17	Mature birches and oaks	Several mature but slender trees within railway fencing. The group could not be fully inspected, and no obvious features were observed, though potential access points may be present on the railway-facing sides.	NS 84902 80235	Within the wayleave	FAR	No	N/A
WB.BT.18	Mature beeches and oaks	Several mature but slender trees within railway fencing. Ground-level inspection did not reveal obvious features, though access points facing the railway may be obscured from view.	NS 84873 80198	Within the wayleave	FAR	No	N/A
WB.BT.19	Mature birches and oaks	Several mature but slender trees within railway fencing. No clear features were identified	NS 84840 80194	Within the wayleave	FAR	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.20	Mature oak	during inspection, but visibility was limited towards the railway side. A mature but slender tree with a DBH of approximately 40cm. A south-facing hole at the base of upper branches around 12m likely leads into a cavity behind heartwood, with a clear drop zone below.	NS 84891 80192	Within the wayleave	PRF-M	Yes	FAR
WB.BT.21	Fallen mature oak	A fallen mature tree with a DBH of approximately 60cm. Formerly high knotholes are now around 1.5m above ground and face north-east, extending into a hollow trunk that appears dry and sheltered.	NS 84798 80189	Located 7m north of the WB proposed access, 7m north of the WB access, 27m west of the WB wayleave, and 43m west of the WB scaffolding	PRF-M	No	N/A
WB.BT.22	Dead standing oak	A dead standing tree with a DBH of approximately 80cm located close to a path. Multiple areas of lifted bark are present, particularly on the north-east-facing section at around 1. m that could provide summer roosting opportunities for individual bats.	NS 84875 80184	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.23	Dead standing oak	A dead standing tree with a DBH of approximately 4 cm immediately adjacent to a path. A south-east-facing knothole at around 6m extends upward into an internal cavity.	NS 84846 80178	Within the wayleave	PRF-M	Yes	FAR
WB.BT.24	Mature oak	A dying mature tree with a DBH of approximately 40cm adjacent to a path. Extensive damage and exposed heartwood on the southwest face of a trunk are associated with butt rot that extends upward into a likely larger cavity. There are with access points to this cavity at approximately 1m and 2m on the east and southwest face respectively.	NS 84800 80177	Located 5m south of the WB proposed access, 5m south of the WB access, 27m west of the WB LOD, and 45m southwest of the WB scaffolding	PRF-M	No	N/A
WB.BT.25	Mature oak	A mature tree with a DBH of approximately 80cm located around 2.5m from a path. A small hole within a tear-out at approximately 2.5m appears to lead into a shallow but exposed internal cavity.	NS 84860 80177	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.26	Mature oak	A two-stemmed mature tree with a combined DBH of approximately 1.1m. A south-facing tear-out at around 3.5m extends into a large cavity, with a similar feature present approximately 1.5m above where the top of the cavity is visible.	NS 84891 80171	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.27	Mature oak	A mature, gnarled tree with a DBH of approximately 80cm. An upward-facing tear-out at around 3m on the south-east side extends into a cavity at the top, though its internal size is unclear.	NS 84831 80149	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.28	Mature oak	A mature tree with a DBH of approximately 1m. A long north-west-facing tear-out between 6–7.5m exposes heartwood and may extend further upward internally.	NS 84825 80130	Located 5 m west of the WB wayleave, 22m west of the tower compound WB053, 48m south of the WB proposed access, and 48m south of the WB access	PRF-M	Yes	NONE
WB.BT.29	Mature oak	A mature tree with a DBH of approximately 50cm. A west-facing tear-out at around 3.5m exposes heartwood and may	NS 84855 80071	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.30	Mature oak	conceal an internal cavity with access at the top of the tear-out. A mature tree with a DBH of approximately 1m. A tear-out on a south-pointing branch at around 6m faces east and likely extends into a small cavity within the branch. A second knothole facing south-east at approximately 15m may also lead into a cavity, though visibility is limited.	NS 84849 80071	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.31	Semi-mature oak	A semi-mature tree with a DBH of approximately 50cm. An east-facing tear-out between 1.4–2m extends upward into a dry internal cavity.	NS 84854 80055	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.32	Mature oak	A mature tree with a DBH of approximately 40cm. A small south-east-facing wound at around 1m extends upward into a narrowing cavity that may provide limited space for one or two bats, with a slightly constrained drop zone due to the leaning trunk.	NS 84906 80041	Within the wayleave	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.33	Mature beech	An early mature tree with a south-east-facing wound extending from approximately 0.5–1.5m. The feature leads into a small, dry cavity that is relatively shallow and exposed, but may provide space for one or two bats.	NS 84884 80038	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.34	Mature beech	A mature tree with a DBH of approximately 1.3m. Upward-facing exposed heartwood with associated cracks is present at around 10m, which may collect water, although a concealed dry cavity cannot be ruled out.	NS 84884 80036	Within the wayleave	PRF-I	Yes	NONE
WB.BT.35	Mature beech	A mature tree with a DBH of approximately 80cm. A large east-facing tear-out extends from ground level to around 3m, with rolled and healed edges forming small gaps that could provide exposed roosting space for one or two bats.	NS 84864 80032	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.36	Mature oak	A mature tree with a DBH of approximately 1m. A south-west-facing knothole on a north-west-pointing branch at	NS 84844 80025	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.37	Mature oak	around 5m extends inward towards the trunk and may lead into an internal cavity. A mature tree with a DBH of approximately 60cm. A trunk wound between approximately 1.4–2.5m conceals a cavity behind heartwood, with an entrance at the upper edge that extends upward by at least 50cm. A grey squirrel was present at the time of survey.	NS 84916 80013	Within the wayleave	PRF-M	Yes	FAR
WB.BT.38	Mature oak	A mature tree with a DBH of approximately 80cm. A north-east-facing wound at around 3.5m extends into a small cavity within a branch, which appears relatively open and may offer limited space for a small number of bats.	NS 84914 79993	Within the wayleave	PRF-I	Yes	NONE
WB.BT.39	Mature oak	A largely mature tree with a DBH of approximately 1.2m adjacent to wet woodland. A concealed west-facing cavity is present at the base of a broken branch around 3m, potentially extending deeper into the trunk,	NS 84841 79954	Located 3 m west of the WB wayleave.	PRF-M	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		with an additional east-facing tear-out at a similar height that exposes a cavity within the branch and may be damp.					
WB.BT.40	Semi-mature willow	A coppiced semi-mature tree with a cracked underside on a twisted east-pointing branch at around 5m, facing south. A similar feature is present lower on the same limb facing south-west, though visibility is limited and both features appear relatively exposed.	NS 84892 79478	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.41	Mature birch	A mature double-stemmed tree with a combined DBH of approximately 75 cm. A rolled-in north-west-facing hole at around 1.5 m leads into rotted heartwood with a small upper entrance, while a second precautionary knothole 5 m above may extend deeper but could not be fully assessed.	NS 84784 79450	Located 9 m northwest of the WB wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.42	Dead standing birch	A dead standing tree with split trunks. One trunk has a north-facing opening at approximately 80 cm that extends upward into a hollow trunk by at least 10 cm out of sight.	NS 84782 79415	Within the wayleave	PRF-M	No	N/A
WB.BT.43	Mature oak	A mature multi-stemmed tree within woodland. A knothole on the northeast most stem at around 1.5m extends upward into a larger cavity out of sight, with a stepped internal opening.	NS 84752 79365	Located 2m northwest of the WB wayleave and 17m northwest of the tower compound WB049	PRF-M	No	N/A
WB.BT.44	Mature beech	A mature tree with a DBH of approximately 1.2m. A large opening on the trunk between 1.5–2m extends upward into an internal cavity.	NS 84775 78759	Located 4m east of the WB proposed access and 4m east of the WB access	PRF-M	Yes	PRF-I
WB.BT.45	Mature beech	A mature tree with a DBH of approximately 1.2m. An east to south-east-facing knothole at around 3m may extend upward into an internal cavity.	NS 84778 78735	Located 2m east of the WB proposed access and 2m east of the WB access	PRF-M	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.46	Mature beech	A large multi-stemmed tree with a DBH of approximately 2m. A south-facing rot feature at around 4m extends into a large internal cavity with additional openings suggesting the trunk may be hollow and potentially connected internally, resulting in damp conditions. Additionally at 2m, there is a north-east-facing opening that may extend into the above feature.	NS 84783 78710	Located 4m east of the WB proposed access and 4m east of the WB access	PRF-M	Yes	PRF-M (but no emergence after 2 survey visits)
WB.BT.47	Mature ash	A mature tree with a DBH of approximately 50cm. Two east - facing holes at around 4m lead into a sizeable cavity that may extend upward within the trunk.	NS 84289 78704	Within the wayleave	PRF-M	Yes	PRF-M (but no emergence after 2 survey visits)
WB.BT.48	Dead tree	A dead standing tree with four north-facing woodpecker holes at approximately 5m, all approximately 4x4cm. Each opening may extend internally, although visibility from the ground is limited.	NS 84088 78659	Within the wayleave	FAR	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.49	Mature ash	A mature tree with a DBH of approximately 80cm. A south-east-facing knothole at around 10m may lead into a small cavity, with a similar but smaller feature present on a side branch above.	NS 83962 78655	Within the wayleave	PRF-I	No	N/A
WB.BT.50	Mature oak	A mature tree with a DBH of approximately 80cm. A long west-facing wound, roughly 30x5cm at around 1m opens into a cavity that may extend upward within the trunk, with additional nearby openings that could connect to the same internal space.	NS 83891 78646	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.51	Dead standing beech	A very large dead standing tree with a DBH of approximately 2m. Numerous lifted bark sections and rot features are present throughout, with a prominent north-east-facing rot hole at around 10m that may open into a very large internal cavity.	NS 83943 78641	Within the wayleave	PRF-M	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.52	Mature beech	A mature damaged tree, with a DBH of 1m, with extensive tear-out from ground level to approximately 2.5m. Large north-east-facing cavities at around 1.5m appear to extend upward into substantial internal space, with multiple adjacent entrances.	NS 83927 78634	Within the wayleave	PRF-M	No	N/A
WB.BT.53	Dead standing beech	A very large dead standing tree, with a DBH of 1.4m, with widespread woodpecker holes and rot features across the trunk. No single dominant feature is present, but overall conditions suggest extensive internal decay.	NS 83910 78632	Within the wayleave	PRF-M	No	N/A
WB.BT.54	Dead tree	A dead standing tree with a north-facing shearing crack at around 7m. The crack may extend upward internally, although its full extent could not be assessed from the ground. Tree has a DBH around 15cm.	NS 84104 78630	Within the wayleave	FAR	No	N/A
WB.BT.55	Dead standing ash	A dead standing tree with a DBH of approximately 50cm. A north-west-facing rot hole at around 6	NS 83903 78609	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.56	Mature oak	m may extend into an internal cavity, though visibility is limited. A small mature tree with a DBH of approximately 40cm. Exposed north-facing heartwood at around 2.5m has a basal gap that may extend upward into a cavity, with possible slight opening at the top.	NS 84939 78596	Located 5m west of the WB proposed access and 5m west of the WB access	PRF-M	Yes	NONE
WB.BT.57	Mature oak	The tree has a DBH of 45cm, with butt rot present on the south-facing base, creating an area of exposed heartwood that may allow bats to shelter behind loose material. A knothole on the west-facing side has a large opening and appears to extend upward into the trunk, though the full extent cannot be confirmed from the ground.	NS 83908 78592	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.58	Dead tree	A dead standing tree with a large, exposed cavity in the trunk measuring approximately 25 × 15cm and extending around 50cm internally. The cavity is relatively open and exposed but may provide short-term shelter for bats.	NS 83896 78587	Within the wayleave	FAR	No	N/A
WB.BT.59	Willow	A wound is present on a north-east-facing branch at approximately 1.5m with an opening around 8 × 5cm. The feature may extend into the limb but is very exposed, and internal depth is unclear from the ground.	NS 83628 78510	Within the wayleave	FAR	No	N/A
WB.BT.60	Mature birch	A large south-facing rot hole at approximately 3m, on a tree with a DBH of 50cm. The feature appears dry and extends upward into a cavity out of sight. The internal extent of the feature cannot be fully assessed from ground level.	NS 83437 78497	Within the wayleave	PRF-I	No	N/A
WB.BT.61	Dead standing beech	A dead standing tree with lifted bark throughout the trunk. No discrete cavities were identified	NS 84956 78497	Located 8m west of the WB proposed access, 8m west of the WB access, and 27m	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.62	Goat willow	on branches overhanging the track, though the tree has much lifted bark 60cm. A north-west-facing wound at around 1.5m measuring approximately 30 × 10cm opens into a cavity within the trunk. The cavity may be relatively large, though its upward extent is unclear from the ground. Tree has a DBH of 40cm.	NS 83453 78493	north of the CB route removal access Within the wayleave	FAR	No	N/A
WB.BT.63	Dead standing oak	A dead standing tree, with a DBH of 60cm, with lifted bark present across the trunk. No obvious cavities were identified on overhanging branches.	NS 84960 78481	Located 7m west of the WB proposed access, 7m west of the WB access, and 11m north of the CB route removal access	PRF-I	Yes	NONE
WB.BT.64	Mature willow	A south-facing hole in exposed heartwood at approximately 3m appears to extend upward into a cavity. The full depth of the feature cannot be visualised from the ground. DBH of the tree is approximately 2m.	NS 83252 78442	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.65	Mature willow	An area of exposed heartwood is present on deadwood at approximately 1.2m, facing south. A small opening at the	NS 83204 78413	Within the wayleave	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.66	Mature beech	top leads into a very limited cavity likely suitable for a single bat. East-facing trunk rot with exposed heartwood creates multiple cracks and crevices. It is unclear whether these features connect to a larger hollow cavity when viewed from the track. DBH is approximately 50cm.	NS 85007 78396	Within WB proposed access	PRF-I	No	N/A
WB.BT.67	Mature oak	A rotted branch stub at approximately 1.5m on the southeast side contains multiple cracks and crevices. These features may support individual bats but are relatively exposed to the elements. Tree has a DBH of 70cm.	NS 85009 78392	Within WB proposed access	PRF-I	No	N/A
WB.BT.68	Mature beech	A south-west-facing rotted opening approximately 50cm long and 8cm wide is present around 1m from the ground. The feature appears to extend upward into the trunk out of sight.	NS 85016 78386	Located 4m northeast of the WB proposed access and 4m northeast of the WB access	PRF-M	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.69	Mature beech	A tree with a DBH of 70cm, supporting a large area of butt rot on the west-facing base extends from ground level to approximately 2m. An opening at the upper aspect appears to extend further upward into the trunk and could provide space for multiple bats if sufficiently deep.	NS 85070 78284	Within WB proposed access	PRF-M	No	N/A
WB.BT.70	Mature rowan	The trunk, with a DBH of 40cm, appears hollow, with a main entrance at approximately 1.5m facing south-east. The cavity may extend upward, although the internal structure appears splintered rather than smooth.	NS 82275 77226	Within WB proposed access	PRF-I	Yes	PRF-M (but no emergence after 2 survey visits)
WB.BT.71	Mature beech	The trunk has a hollow centre that extends upward as far as can be seen and may support multiple bats. Access is provided by a knothole at approximately 1.5m on the east-facing side, with additional access via basal rot. Tree has a DBH of 60cm.	NS 81368 76376	Located 2m northwest of the WB wayleave, 14m northwest of the WB proposed access, 14m northwest of the WB access, 20m northwest of the tower compounds WB033 & CB017, 20m northwest of the tower compounds WB033 &	PRF-M	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
				CB017, and 29m northwest of the CB route			
WB.BT.72	Mature beech	A knothole at approximately 1.5m on the west-facing side leads upward into the trunk. A gap where fused stems meet creates a small cavity with space for a few individual bats.	NS 81347 76366	Located 6m northwest of the WB LOD, 20m northwest of the WB proposed access, 20m northwest of the WB access, 29m northwest of the tower compounds WB033 & CB017, 29m northwest of the tower compounds WB033 & CB017, 34m northwest of the CB route, and 36m north of the WB pulling positions	PRF-I	Yes	NONE
WB.BT.73	Semi-mature dead standing Scot's pine	A single woodpecker hole is present on the trunk of a dead tree (DBH = 50cm) at approximately 15m, facing south, though its depth is	NS 77385 74375	Located 36m west of the WB wayleave.	PRF-M	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.74	Mature sycamore	unclear. Two additional woodpecker holes are present on an upper branch around 20m, facing south-west. Three large cavities are present that extend upward into the trunk. One east-facing cavity at approximately 6m is open from above, while two west-facing cavities at around 3.5–4m appear connected, though full connectivity is unclear from the ground. Tree has a DBH of 80cm.	NS 77421 74329	Located 12m west of the WB wayleave.	PRF-M	No	N/A
WB.BT.75	Mature oak	A diametrical split is present in an upper east-facing branch at approximately 12m. The split may form a sheltered cavity within the branch and is protected from precipitation by its orientation. Tree DBH is 70cm.	NS 77439 74309	Within the wayleave	PRF-M	No	N/A
WB.BT.76	Semi-mature sycamore	A single tear-out is present on the trunk at approximately 6m, facing east. The hole does not appear to extend upward into a branch but may provide	NS 77425 74309	Located 12m west of the WB wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.77	Semi-mature oak	temporary shelter for an individual bat. Tree DBH is 50cm. A diametrical split is present in a broken branch at approximately 10m, facing south-west. The entrance is downward-facing and sheltered, though it is unclear whether the feature extends into the branch. Tree DBH is 40cm.	NS 77400 74305	Located 38m west of the WB wayleave.	PRF-I	No	N/A
WB.BT.78	Semi-mature birch	A wound on the trunk between approximately 1.7 and 2m faces southwest. The feature may extend into a hollow branch but has a cluttered entrance that may limit suitability. Tree DBH is 20cm.	NS 77293 74292	Outside of the 50m buffer for any relevant works	PRF-I	No	N/A
WB.BT.79	Mature birch	The tree has a DBH of 40cm. North-facing cavities are present in the heartwood where the trunk has snapped at approximately 2m. The features do not appear to extend deeply into the trunk but may provide shelter for individual bats.	NS 77451 74256	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.80	Mature goat willow	A crack is present on the south-east-facing side between approximately 2.5 and 3m. The feature is slightly upward-facing and may form a dry cavity near its upper extent. Tree has a DBH of 40cm.	NS 77495 74206	Within the wayleave	PRF-M	No	N/A
WB.BT.81	Mature beech	A mature tree with a DBH of 40cm. Feature is a slightly upward-facing wound on the west-facing side between approximately 1.2 and 1.5m extends into a small cavity. The feature appears dry and likely suitable for a small number of bats only.	NS 78226 74080	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.82	Mature beech	A mature tree with a 25cm DBH. A knothole is present on the west-facing side of the trunk at approximately 2.5m, positioned above a small branch. It is unclear whether the feature extends internally.	NS 78220 74024	Within the wayleave	PRF-I	Yes	NONE
WB.BT.83	Mature beech	A long west-facing wound on the trunk has a small cavity at its upper aspect around 2.5m. The cavity likely extends only a	NS 78222 74006	Located 4 m southeast of the WB wayleave.	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.84	Mature dead standing hawthorn	short distance and may accommodate a single bat. The tree has a 25cm DBH. Extensive damage from trunk splitting and butt rot is present but does not appear to extend upward. A small hole within a west-facing tear-out may extend back into a limb and could support a single bat.	NS 78091 73586	Within the wayleave	PRF-I	Yes	NONE
WB.BT.85	Mature beech	The north-facing half of the trunk is extensively exposed with numerous small cavities in heartwood. Damage extends from the base to approximately 10m and may offer multiple small roosting opportunities. DBH is 50cm.	NS 78048 73578	Located 1m north of the WB proposed access, 1m north of the WB access, 9m west of the WB wayleave, 36m west of the WB scaffolding, and 45m southwest of the tower compound WB020.	PRF-I	Yes	PRF-I
WB.BT.86	Mature beech	A rot hole on the south-east-facing side at approximately 1m extends into heartwood via a 10cm opening. Though the extent which this extends into the large internal cavity is unclear. Additionally, there is a large tear-out on the north-facing side containing	NS 77986 73562	Located 1m south of the WB proposed access and 1m south of the WB access.	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		splintered heartwood that may connect internally, but this cannot be confirmed from the ground. Tree has a DBH of 50cm.					
WB.BT.87	Dead standing beech	An open rot hole, in a tree with a DBH of 20cm, at approximately 2m facing south-east extends around 7cm internally. The feature is relatively exposed but may provide space for one or two bats.	NS 78013 73559	Located 10m south of the WB proposed access, 10m south of the WB access, and 42m west of the WB wayleave.	PRF-I	Yes	NONE
WB.BT.88	Mature oak	A mature tree with a DBH of 80cm. Numerous snapped branches and wounds are present throughout the tree, many at height and difficult to assess from the ground. Several features expose heartwood and may lead into cavities, though connectivity and depth are unclear.	NS 77696 73428	Within WB proposed access.	PRF-M	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.89	Dead standing rowan	The tree is a dead with a DBH of 75cm. A hollow branch contains two connected entrances at approximately 2m and slightly above, which may extend upward out of sight. Additionally, a second branch on the northeast side with two entrance between 1.5 and 2m, the highest of these appears to extend inwards far enough to support an individual bat. The trunk of the tree is hollow with a large entrance on the northeast face via butt rot, how far this extends is unclear.	NS 77710 73427	Located 7m southeast of the WB proposed access and 7m southeast of the WB access	PRF-M	Yes	FAR
WB.BT.90	Rowan	Multiple rotted branch collars and wounds create interconnected entrances into a hollow trunk. The main cavity extends upward beyond visibility, though surrounding vegetation creates a cluttered drop zone.	NS 77635 73395	Located 3m southeast of the WB proposed access and m southeast of the WB access.	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.91	Semi-mature Scot's pine	A mature tree missing its canopy with three woodpecker holes are in the upper trunk at approximately 4m, all facing east. The holes are relatively uncluttered but may be exposed to precipitation from above.	NS 78037 73235	Located 2m west of the WB wayleave, 15m north of the WB visibility splays, 18m southwest of the WB proposed access, 18m southwest of the WB access, 26m southwest of the tower compound WB019, and 31m west of the WB scaffolding	PRF-M	No	N/A
WB.BT.92	Dead standing mature pine	A woodpecker hole at approximately 3m faces south and may extend downward. Additional splits and multiple woodpecker holes between 4–6 m likely connect to a larger internal cavity, though features may be relatively open. DBH is around 5 cm	NS 78086 73233	Within the wayleave	PRF-M	Yes	NONE
WB.BT.93	Dead standing unknown tree	The tree is snapped and open at the top with exposed heartwood from approximately 1m upward. Multiple 5cm holes, likely made by woodpeckers, on the northwest and southeast aspect of the trunk likely connect to an internal cavity,	NS 78089 73231	Within the wayleave	PRF-M	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.94	Mature rowan	though depth and connectivity cannot be confirmed. A dead limb approximately 35cm above ground is hollow internally and has two entrances. The cavity is narrow but may accommodate individual bats, though the feature is very low.	NS 78115 72494	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.95	Mature sycamore	A single wound on an upper branch at approximately 10m faces southwest and has an uncluttered oval entrance. The feature may extend into the trunk, though internal depth cannot be confirmed from the ground.	NS 78081 72464	Within the wayleave	PRF-M	No	N/A
WB.BT.96	Mature willow	The tree has a DBH of 50cm and has a rot hole at approximately 1. m on the east-facing side extends a short distance behind the outer heartwood. The cavity likely becomes honeycombed internally, and suitability appears limited.	NS 78110 72460	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.97	Mature birch	A butt rot feature at the base of the trunk begins around 0.7m, facing south-west. The cavity may extend upward into the trunk as far as can be seen from the ground.	NS 78091 72444	Within the wayleave	PRF-M	No	N/A
WB.BT.98	Mature rowan	An upward-facing tear-out on a fallen stem contains a hollow cavity with space for several bats, though exit would require climbing. A second tear-out on a narrow dead stem extends into a restricted hollow cavity.	NS 78135 72412	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.99	Mature rowan	A south-west-facing butt rot feature where two stems have separated extends into a narrow hollow cavity within a cracked limb. The space appears limited and likely suitable for only a small number of bats. Tree has a small DBH of 20 cm.	NS 78142 72409	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.100	Rowan	Butt rot is present on both stems up to approximately 1m, each extending into narrow hollow cavities. Internal visibility is limited, and no bats	NS 78151 72405	Located 7m east of the WB wayleave, 27m northeast of the WB proposed access, 27m northeast of the WB access, and 31m northeast	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		were observed at the time of survey.		of the tower compound WB016			
WB.BT.101	Mature birch	A small tear-out at the base of a branch on the north stem at approximately 5m may extend upward into the branch. Additional cracking on the upward-facing side suggests the feature may be damp.	NS 78147 72404	Located 3m east of the WB wayleave, 25 m northeast of the WB proposed access, 25m northeast of the WB access, and 28m northeast of the tower compound WB016	PRF-I	Yes	NONE
WB.BT.102	Dead standing beech	A dead tree with a DBH of 1.8m. Numerous woodpecker holes are present, most of which appear superficial. Two more substantial holes on the east and west faces of an upright limb at approximately 5m may lead into a deeper cavity.	NS 78135 72390	Within the wayleave	PRF-M	Yes	FAR
WB.BT.103	Dead standing unknown tree	The tree has a DBH of 40cm and is extensively rotten with a cavity on the north-west-facing side at approximately m. The cavity appears to extend upward into a small internal space.	NS 78155 72360	Located 1m east of the WB wayleave, 13m east of the WB proposed access, 13m east of the WB access, and 17m east of the tower compound WB016	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.104	Mature beech	Butt rot on the east-facing base extends up to approximately 1m and appears to lead into an internal cavity. Additional superficial damage is present on the west-facing side of the trunk. Tree has a DBH of 80cm.	NS 78164 72331	Located 3m east of the WB wayleave, 15m east of the WB proposed access, 15m east of the WB access, and 19m east of the tower compound WB016	PRF-I	Yes	PRF-I
WB.BT.105	Mature rowan	The tree grows horizontally and has a single large wound starting at ground level that extends into a hollow trunk. The feature curves downward before extending upward internally and faces northeast at approximately 1.7m above ground.	NS 78184 71630	Within the wayleave	PRF-M	No	N/A
WB.BT.106	Mature rowan	The tree has north-facing butt rot that is present from around 50cm up the trunk and extends upwards into a hollow trunk. The opening faces north and appears to provide access into an internal cavity.	NS 78189 71627	Within the wayleave	PRF-M	No	N/A
WB.BT.107	Mature beech	No potential roost features were identified during the inspection.	NS 78173 71624	Within the wayleave	PRF-M	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.108	Mature beech	A small hole on the main trunk at approximately 1.5m does not appear to extend but could shelter a single bat. A second hole, around 6x6cm at the base of a branch around 2m may extend slightly into the tree and curves internally, though its suitability is limited.	NS 78151 71621	Within the wayleave	PRF-I	No	N/A
WB.BT.109	Mature beech	A large wound at the base of the trunk extends upward into a hollow interior as far as can be seen from the ground and faces southeast. A smaller hole beneath exposed heartwood on a lower branch around 2m faces east, though its internal extent is unclear.	NS 78158 71617	Within the wayleave	PRF-M	No	N/A
WB.BT.110	Mature beech	A mature tree with a single small knothole is present at approximately 4.2m on the west-facing side. The entrance appears narrow and unlikely to accommodate more than a single bat, if any.	NS 78180 71615	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.111	Mature beech	Extensive butt rot on a mature tree, present from ground level and extending upward into a hollow trunk as far as visibility allows. The feature faces northwest.	NS 78184 71614	Within the wayleave	PRF-M	No	N/A
WB.BT.112	Mature beech	A sheltered wound on the main trunk at approximately 0.5m faces northeast and does not appear to extend deeply but could be used temporarily by individual bats. A second large pruning cut at around 5m faces north, though it is unclear whether this feature extends internally.	NS 78206 71595	Within the wayleave	PRF-M	No	N/A
WB.BT.113	Semi-mature beech	A large wound on a semi-mature tree, at approximately 0.5m on the south-facing trunk extends upward into the tree. Internal access narrows significantly to around 3cm, limiting suitability to small individuals.	NS 78216 71594	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.114	Mature beech	A mature tree with a DBH of 60cm, with significant butt rot which creates a large hollow cavity with an entrance extending from ground level to around 1m. The cavity extends upward at least 50cm and faces southwest, though the upper extent cannot be visualised.	NS 78225 71578	Located 1m east of the WB wayleave, 2 m west of the WB proposed access, 2m west of the WB access, and 14m east of the tower compound WB013	PRF-M	Yes	FAR
WB.BT.115	Semi-mature beech	A small hole is present at the base of a branch at around 2.2m, facing north-east. The entrance is uncluttered, though it is unclear whether the feature extends internally.	NS 78209 71576	Within the wayleave	PRF-I	No	N/A
WB.BT.116	Mature beech	Extensive butt rot, on a tree with a DBH of 80cm, which forms a large, exposed area of heartwood from ground level to approximately 1.5m. A branched hollow cavity extends upward out of sight and faces southeast, with several smaller internal features also present.	NS 78230 71576	Located m east of the WB proposed access, 5m east of the WB access, 7m east of the WB wayleave, and 20m east of the tower compound WB013	PRF-M	Yes	FAR
WB.BT.117	Mature beech	Tree is thin with an approximate DBH of 30cm and has butt rot between approximately 0.8m	NS 78229 71565	Located 8m east of the WB wayleave, 8m east of the WB proposed access, 8m	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.118	Mature beech	and 1.2m, facing south-west. A small crevice extends upward from this area and may provide space for a single bat, though the feature is exposed. A small canker hole, 4x4cm, on the underside of a high branch may extend a short distance internally, though full depth cannot be confirmed. A peeling bark feature on the east-facing trunk at around 2.5m could accommodate one or two bats. Tree has a DBH of 1.2m.	NS 77981 71393	east of the WB access, and 22m east of the tower compound WB013 Within the wayleave	PRF-I	Yes	NONE
WB.BT.119	Mature beech	Butt rot on the south-facing trunk extends from ground level to approximately 1m. At least two crevices within the exposed heartwood could shelter one or two bats each, while minor peeling bark on the west face appears negligible.	NS 77985 71377	Within the wayleave	PRF-I	Yes	NONE
WB.BT.120	Mature beech	Butt rot on the west-facing base extends upward around 40cm. An internal cavity continues at least a further 20cm upward out	NS 77988 71360	Within the wayleave	PRF-M	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		of sight. Tree has a DBH of 40cm.					
WB.BT.121	Mature beech	A small tree with a DBH of 30cm, which has a small east-facing knothole at approximately 4.5m that may extend a short distance internally. The feature appears suitable for a single bat only.	NS 77995 71337	Within the wayleave	PRF-I	Yes	NONE
WB.BT.122	Mature beech	Butt rot extends from the base up to 2m, with a narrow cavity extending into the trunk at around 1.5m and continuing upward approximately 20cm. At the top of this feature the cavity extends into a secondary stem, extending another 20cm, but is very narrow. Likely to support one bat at most. Tree has a DBH of 50cm.	NS 78000 71327	Located 3m southeast of the WB wayleave, m southeast of the WB proposed access, m southeast of the WB access, and 20m southeast of the tower compound WB012	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.123	Mature ash	A mature tree with a DBH of 1.25m, supporting rot feature at a branch collar around 3m which heartwood may conceal a cavity behind a lower entrance, though access is difficult due to terrain. Additional snapped branches on the east face of the tree at 4m may lead to exposed heartwood. There is also major woodpecker damage on a branch at 10m on the south face of the tree, providing several small potential roosting features.	NS 77830 71302	Within the wayleave	PRF-I	Yes	NONE
WB.BT.124	Mature rowan	A mature tree with a DBH of 1m supports many holes that are likely all connected to a central cavity. The first of these entrances is at 1m, and the other 6+ holes cover all aspects of the tree ranging from 1-5m.	NS 77661 71180	Within the wayleave	PRF-M	Yes	FAR
WB.BT.125	Rowan	A small rot hole at the point where branches split around 1.3m extends into a branch. The feature may be too small or	NS 77659 71167	Within the wayleave	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.126	Mature rowan	damp and is difficult to assess fully from the ground. Tree has many stems and a DBH of about 40cm. A large mature tree with a DBH of 40cm and two main hollow stems, with peeling bark present throughout. On the western stem, a large knothole at approximately 1.5m facing south extends downward into a substantial cavity within the trunk and may connect with the adjacent stem. A secondary upward feature is partly blocked by moss and may extend further into the cavity. On the eastern stem, a very small knothole at 1.5m facing east indicates internal hollowing, with potential for additional entrances higher up.	NS 76952 70700	Within the wayleave	PRF-M	Yes	PRF-I
WB.BT.127	Mature birch	A mature but thin tree with a DBH of 20cm located within woodland. A north-east-facing wound between 1.5–2m exposes heartwood, where the	NS 76498 70457	Within the wayleave	PRF-I	Yes	PRF-I

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.128	Mature birch	stem has effectively snapped. At the top of the wound is a small cavity extending up to 10cm, suitable for a single bat at most. A large mature multi-stemmed tree with a combined DBH of approximately 1m. Several areas of lifted bark are present between 3–4m, each offering space suitable for individual bats. No larger cavities were observed from ground level.	NS 76303 70347	Within the wayleave	PRF-I	Yes	NONE
WB.BT.129	Mature birch	A mature tree with a DBH of 25cm. A tear-out between 2.5–3m facing south extends upward into a fairly exposed cavity.	NS 76296 70301	Within the wayleave	PRF-I	Yes	FAR
WB.BT.130	Mature birch	A mature tree with a DBH of 50cm comprising two main stems. Butt rot on the southwest face extends from ground level up to 1m, leading into a sizeable cavity that continues upward into the larger, more upright stem. Above this, a tear-out reaches	NS 76324 70288	Located 4m southeast of the WB wayleave, 7m southeast of the WB proposed access, 7m southeast of the WB access, and 40m southwest of the tower compound WB006	PRF-M	Yes	FAR

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		approximately 2.5m and connects to a further cavity extending into the smaller branch, which appears large and sheltered.					
WB.BT.131	Mature birch	A mature multi-stemmed tree with a combined DBH of 60cm. On the northwest stem, a south-east-facing wound at 1m extends upward into a small heartwood cavity. The feature may be relatively exposed, as a second small opening is present slightly higher up, although this appears too small for bat access.	NS 76303 70287	Within the wayleave	PRF-I	Yes	PRF-I
WB.BT.132	Mature birch	A south-west-facing tear-out at approximately 0.5m extends upward into the stem. The cavity appears limited in size and does not lead to a substantial cavity.	NS 76023 70134	Within the wayleave	PRF-I	Yes	NONE

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
WB.BT.133	Beech	A large, uprooted tree with a crack at approximately 0.7m above ground on the south-facing side leading into a large trunk cavity. Additional lifted bark is present around 4m on the south-facing side, some of which may support a single bat.	NS 76005 69297	Within the wayleave	PRF-M	No	N/A
WB.BT.134	Mature beech	A mature tree with a DBH of 1.7m. A south-east-facing knothole at 3.5m measuring approximately 4 × 4cm extends into the trunk and may connect to a larger cavity, though this cannot be confirmed from ground level. A second smaller west-facing knothole at 3m (approximately 3 × 3cm) could accommodate a single bat and may also extend internally.	NS 75929 69255	Located 7 m west of the WB wayleave.	FAR	No	N/A
WB.BT.135	Mature ash	A mature tree with a DBH of 1m located on the edge of water. A large knothole on the north-facing side overhanging the water measures approximately 20 × 12cm. While it does not appear to extend directly	NS 75941 69246	Within the wayleave	PRF-I	No	N/A

Tree Reference	Description	Feature Description	Location (OSGR)	Relationship to the Project	GLTA Suitability	Further assessment undertaken (Aerial)	Final suitability
		upward, it may extend downward into the trunk and then upward internally.					
WB.BT.136	Mature beech	A mature multi-stemmed tree with a combined DBH of 1.5m, located over 6m from the track behind a fence line. A cracked and rotted branch on the northeast face at approximately 2m has an 8 × 7cm opening at its base that extends into a hollow branch cavity. The feature may connect to an opening on the upper aspect of the branch, though visibility from the track is limited.	NS 76164 68349	Located 2m southwest of the WB proposed access and 2m southwest of the WB access	PRF-I	No	N/A

Emergence Surveys

No bats were recorded to emerge from trees that were subject to emergence surveys. In general bat activity during the surveys was high in the surrounding area and bats were observed by surveyors on Site as well as recorded on the Batlogger devices. Species that were recorded included common pipistrelle, soprano pipistrelle and a myotis species. Individual bats were recorded commuting along tree lines as well as foraging amongst the vegetation.

Bat Surveys 2022

Overall, habitats across the Potential Route Corridor (PRC) which was assessed in 2022 (as detailed in the Bat Survey Report¹, and provided in Annex 1) were considered of Moderate suitability for bats by current BCT guidelines (at that time⁴). This is similar to assessment described above, particularly for the WB Route which corresponds most closely with the PRC.

The bat assemblage is unlikely to have changed since 2022 given no major habitat differences were recorded since then. The 2022 bat activity surveys comprised a suite of transects and monitoring with static detectors which focussed on key habitats for bats. The surveys confirmed the presence of soprano pipistrelle, common pipistrelle, Myotis sp. (including Daubenton's), Leisler's *Nyctalus leisleri*, noctule *Nyctalus noctule* and brown long-eared bat, however the majority of activity was from pipistrelle species. Transect locations and results are summarised in Table 6. The majority of the activity was detected within South Drum Claypit Site of Importance for Nature Conservation (SINC). Using the Wray 2010 method⁵ habitat was assessed as of local value for bats (for both commuting and foraging).

Table 6: Summary of Bat Activity (transect) Surveys 2022

Location	Species activity	Habitat features
Forth and Clyde Canal Corridor	High soprano pipistrelle Moderate common pipistrelle Occasional Myotis	Commuting and foraging corridor with tree lines and watercourse
Roughcastle Woodland Strip	High soprano pipistrelle and common pipistrelle	Mixed woodland for shelter and foraging
Bonnyhill Road and Bonnyhill Farm	High soprano pipistrelle and common pipistrelle Occasional Myotis	Linear features for commuting

⁴ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust, London

⁵ Wray S., Wells, D., Long, E. and Mitchell-Jones, T. (2010) Valuing Bats in Ecological Impact Assessment. In Practice Issue 70, December, pp23-25.

Footpath (south of Bonnyhill Farm)	High soprano pipistrelle and common pipistrelle	Sheltered corridor for commuting
South Drum Claypit SINC	High soprano pipistrelle and common pipistrelle	Foraging ground
Crowbank	High soprano pipistrelle and common pipistrelle	Mixed scrub and grassland for foraging
Forest Wood SINC	High soprano pipistrelle and common pipistrelle	Woodland for foraging
Fannyside Moor	Low soprano pipistrelle and common pipistrelle	Open moorland, poor foraging potential
Palacerigg Golf Course	High soprano pipistrelle and common pipistrelle	Open habitat for commuting
Luggie Water	High soprano pipistrelle and common pipistrelle	Riparian corridor and watercourse for foraging and commuting

The majority of bat registrations recorded by the static detectors were of pipistrelles. Soprano pipistrelles were dominant in the northern locations, whereas a more even split between soprano and common pipistrelles was recorded in the southern locations. Myotis species were recorded at all locations but were notably higher at South Drum Claypit SINC pond. Leisler's and noctule bats were detected infrequently across locations indicating occasional use rather than consistent reliance on these habitats. Brown long-eared bat calls were potentially under reported due to their quiet calls but were confirmed present throughout the monitoring locations.

A summary of the results of the static bat detector monitoring is presented below in **Table 7**. Within the Species activity column, species were labelled dominant or co-dominant when registrations far outweighed registrations of other species. A label of high refers to registrations between 501 – 1,000, moderate refers to registrations between 101 – 500, low refers to registrations between 25 – 100, and occasional refers to registrations under 25.

Table 7: Summary of static bat detector monitoring 2022

Location	Species activity
Footpath (south of Bonnyhill Farm)	Soprano pipistrelle – Dominant Common pipistrelle – High Myotis sp. – Low Leisler's – Occasional Noctule – Low Brown long-eared – Low

South Drum Claypit SINC	Soprano pipistrelle – Dominant Common pipistrelle – High Myotis sp. (including Daubenton's) – High Leisler's – Occasional Brown long-eared – Occasional
Crowbank	Soprano pipistrelle – Co-dominant Common pipistrelle – Co-dominant Myotis sp. – Low Leisler's – Occasional Noctule – Occasional Brown long-eared – Occasional
Luggie Water	Soprano pipistrelle – Co-dominant Common pipistrelle – Co-dominant Myotis sp. – Moderate Leisler's – Low Noctule – Occasional Brown long-eared – Occasional

1.4 Summary

The desk study returned 62 recent records of bats, comprising of 25 records from the NBN Atlas and 37 from TWIC. These records included soprano pipistrelle, common pipistrelle, Daubenton's bat, brown long-eared bat and *Myotis* sp. and included two records of larger roosts.

Habitat suitability across the Site is varied, but mostly Low. High suitability areas are generally associated with broadleaved woodlands and riparian corridors adjacent to large rivers. Low suitability areas are primarily characterized by extensive agricultural land.

No structures with suitability for roosting bats were identified. In total, there were 183 trees identified as having PRF based on initial GLTA. Of these, after aerial survey, 37 are preliminarily and precautionarily classified as being 'PRF-M', 83 as 'PRF-I', and 32 as 'FAR' across the AA, CB and WB routes collectively. There were 31 trees that were downgraded to a rating of 'none' after further assessment. PRF trees were mostly concentrated in broadleaved woodland or along watercourses, waterbodies, field edges and road verges.

The 2022 surveys confirmed that six species of bat use (parts of) the Site: soprano pipistrelle, common pipistrelle, Daubenton's bat, brown long-eared bat, Leisler's bat and noctule.

Given the suitability of certain habitats, and availability of suitable PRF, it is possible that all listed species may roost, forage and/or commute within the Site and ZoI. It is further possible that significant roosts of some species (e.g. maternity colonies) may be present. The assessment has followed the precautionary approach to take account of this, see limitations section above.

Annex 1 – 2022 Bat Activity Survey Report

Denny to Wishaw Network Upgrade

Bat Survey Report

SP Energy Networks

Project number: 60602788

January 2023

Quality information

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between 20/07/2022 and 23/09/2022 (for fieldwork) and on 28/09/2022 (for desk study) and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

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1. Introduction

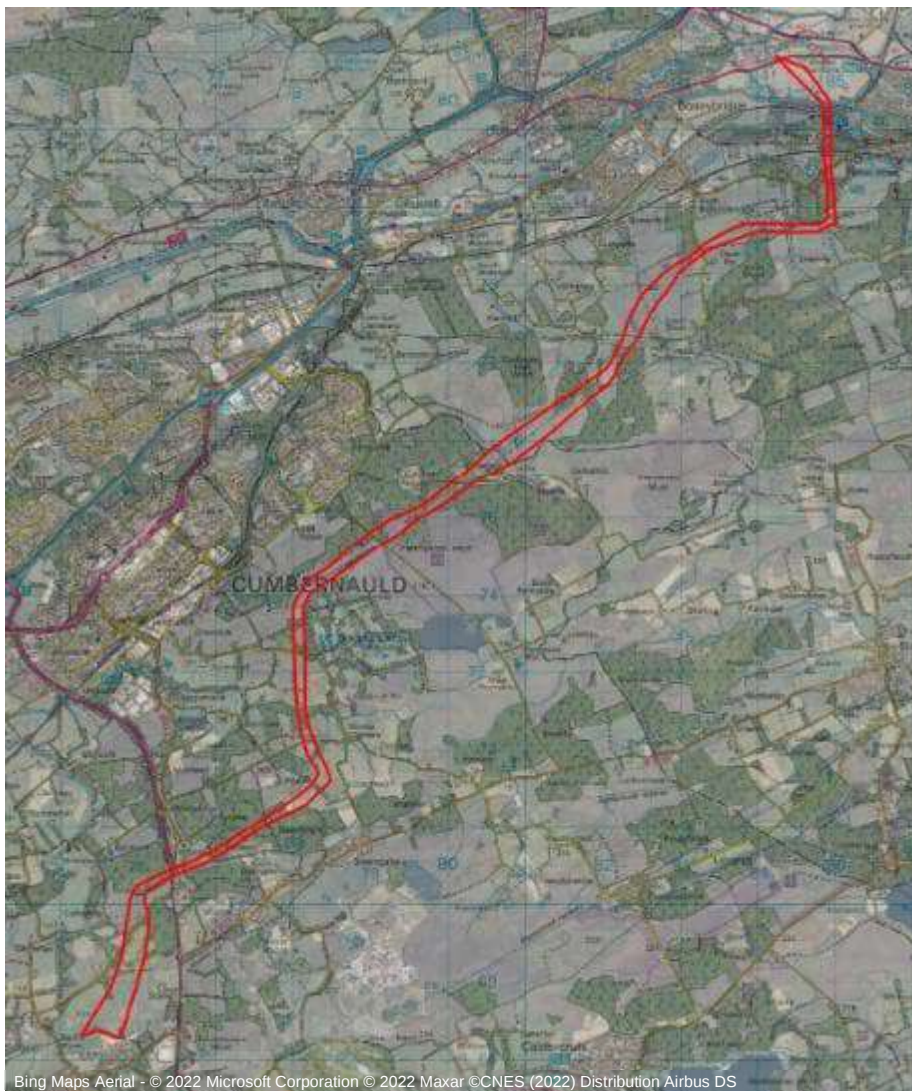
1.1 Background

AECOM was appointed by SP Energy Networks (SPEN) to carry out an Ecological Impact Assessment (EcIA) as part of the wider Environmental Impact Assessment (EIA) for the Denny to Wishaw Network Upgrade project. As part of this appointment, AECOM carried out a suite of bat surveys to identify potential bat-related ecological constraints to a new overhead power line (OHL) between Bonnybridge (west of Falkirk) and Glenmavis (north of Airdrie).

Works for the new line will involve the construction of OHL towers, installation of OHL cables, and connection of this to the existing OHL line and to an existing substation, all of which are likely to require the establishment of temporary construction compounds and access routes for machinery. These works are referred to together as the 'Proposed Development'.

The exact location of the OHL infrastructure is not currently known. However, the Proposed Development will take place within a corridor which varies from 80 m to 470 m wide, hereafter termed the 'Proposed Route Corridor' or 'PRC'. This is illustrated by the red outline on Figure 1 and below on Image 1.

Image 1. The Proposed Route Corridor superimposed on aerial image



The PRC ascends from approximately 30 m above sea level at Bonnybridge Substation in the north, to approximately 120 m ASL at Tippet Craig and then fluctuates in height between 110 m ASL and 180 m above sea level before reaching Glenmavis in the south. The landscape is predominantly one of agricultural land, much of which is damp grazed fields, and large areas of plantation woodland, often dominated by exotic conifer species and also extensive areas of bog and heathland with scattered blocks of immature / semi-mature broadleaved trees, mixed woodland and scrub. These habitats do not provide optimal roosting opportunities for bats on the whole, however there are localised dwellings and mature trees that may be suitable for roosting bats. The habitat does however offer some foraging suitability. The PRC is also crossed by numerous linear features including the Forth and Clyde Canal, semi-natural watercourses such as the Luggie Burn and field boundaries (often hawthorn hedges), and in places woodland edges, all of which provide commuting routes and foraging opportunities. There are also fourteen Local Nature Conservation Sites (LNCS) which cover localised areas of the PRC (and several others within 100 m of the PRC) which include suitable foraging habitat likely to be relatively rich in aerial invertebrates (such as marshy grassland, waterlogged areas and ponds), though none of these are designated specifically for bats.

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.

1.2 Purpose of this Report

This Report provides the methods for the desk study and field surveys carried out, and the results obtained, to establish baseline conditions for bats within the PRC, to identify potential bat-related constraints (and opportunities) to the Proposed Development, and to identify requirements for further survey and assessment with respect to bats.

1.3 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 a consultancy service.

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

2. Legislation, planning policy and guidance

2.1 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*.

2.2 Relevant planning policy

2.2.1 National Planning Policy

Scottish Government approved National Planning Framework 4 (NPF4) on 11 January 2023. NPF4 supersedes Scottish Planning Policy as well as NPF3. It will be formally adopted on 13 February 2023 and will therefore be applicable to the Proposed Development. NPF4 includes the following statements of policy intent: *“To protect, restore and enhance natural assets making best use of nature-based solutions”* and *“To protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks.”* Wherever possible, and proportionate to the scale and nature of the project, the Proposed Development should therefore deliver benefits for biodiversity, in addition to protecting existing biodiversity. NPF4 also states that major development will only be supported where nature networks *“are in a demonstrably better state than without intervention”* using best practice and including future monitoring and management where appropriate.

2.2.2 Local planning policy

The PRC spans two local council areas: Falkirk and North Lanarkshire. Relevant local planning policies for each are detailed below.

2.2.2.1 Falkirk Local Development Plan

Local planning policies for the Falkirk Council area are detailed in the Falkirk Local Development Plan 2 (Falkirk LDP2), adopted August 2020. Further guidance is provided in SG07: Biodiversity and Development and SG08: Local Nature Conservation and Geodiversity Sites. Policies of Falkirk LDP2 relevant to nature conservation are summarised in Table 1, below.

Table 1. Summary of relevant policies within Falkirk LDP2

Planning policy	Relevant purpose
PE13 Blue and Green Network	Sets out in broad terms how the Central Scotland Green Network, a national development within National Planning Framework 3 (NPF3) and in draft NPF4, will be implemented in the Falkirk area. The spatial focus will be on a series of green and blue network components and corridors.
PE14 Countryside	There will be a limit to the expansion of settlements and land outwith these boundaries is designated as countryside.
PE16 Protection of Open Space	Open space is vital to the quality of places, and fulfils a range of purposes including recreational, landscape, ecological, surface water management and active travel. The Council has prepared an Open Space Strategy, which is based on a detailed audit of its parks and open spaces, and sets out a vision, standards and priority actions for improving the open space resource. If the open space is of significant ecological value then development of the open space will not occur.
PE19 Biodiversity and Geodiversity	Sets out standard legal requirements for protected sites and levels of justification for permitting developments affecting them (the stringency dependent on the nature of the designation), and requirements for mitigation.
PE20 Trees, Woodland and Hedgerows	Sets out that Scottish Government's policy on Control of Woodland Removal will be followed, and that ancient, semi-natural and long-established woodland, including sites identified in the Scottish Ancient Woodland Inventory, will be protected as a resource of irreplaceable value ¹ . Also that enhancement and management of existing woodland and hedgerows will be encouraged and management plans implemented where necessary, and preference for locally native species in new and replacement planting.
PE22 The Water Environment	The water environment within the Council area is important in terms of its landscape, ecological, recreational and land drainage functions. This policy aims to improve the water environment.

¹ Note that SPP applies the word 'irreplaceable' to ancient semi-natural woodland only (see Section 2.2.1), and SPP is taken to override Falkirk LDP2 since local development plans are required to align with national policy.

2.2.2.2 North Lanarkshire Local Development Plan

Local planning policies for the North Lanarkshire Council Area are detailed in the North Lanarkshire Local Development Plan (North Lanarkshire LDP) (adopted July 2022). Further guidance is provided in Supplementary Planning Guidance 20: Biodiversity and Development. Policies of the North Lanarkshire LDP relevant to the nature conservation are summarised in Table 2, below.

Table 2. Summary of relevant policies within North Lanarkshire LDP

Planning policy	Relevant purpose
PROT A POLICY Natural Environment and Green Network Assets	States that the Council will safeguard natural heritage assets including International sites (e.g. European sites), National sites (e.g. SSSIs and Ancient Woodland), Local sites (e.g. Seven Lochs Wetland Park, SINCs, Local Nature Reserves, Geodiversity Sites), Urban Green Network (e.g. wildlife corridors, trees & woodlands, watercourses & wetlands and flood plains), and Protected species.

2.3 Guidance

Both council areas also have a dedicated Local Biodiversity Action Plan (LBAP).

2.3.1 Falkirk Council LBAP

Second Nature: A Biodiversity Action Plan for Falkirk Council area (FLBAP) is the LBAP for the northern part of the PRC. The FLBAP contains a list of local priority species for the Falkirk area. This includes brown long-eared bat and soprano pipistrelle bat, both of which are also associated with the habitat action plans for Woodland and Urban areas.

2.3.2 North Lanarkshire Council LBAP

The North Lanarkshire Biodiversity Action Plan (NLBAP) 2015-2020 is the LBAP for the southern part of the PRC. The NLBAP contains a Species Action Plan for Bats within the broader Urban Action Plan. The plan states that all bat species found in Scotland are considered in the Species Action Plan, but specifically references common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Daubenton's bat, brown long-eared bat and Natterer's bat.

3. Methods

3.1 Desk study

To supplement the field survey (see Section 3.2), a desk study was carried out to identify²:

- statutory designated sites for nature conservation for which bats are qualifying / notified features, including SACs within 10 km and SSSIs within 2 km of the PRC;
- local non-statutory nature conservation sites within 1 km of the PRC 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 PRC.

In addition, the desk study aimed to obtain local policies related to nature conservation.

The desk study was carried out using the data sources in Table 3.

Table 3. Desk study data sources

Data source	Accessed	Data obtained
Falkirk LBAP (https://www.falkirk.gov.uk/services/environmental-management/biodiversity.aspx)	30 November 2022	• Information on locally important ecosystems, habitats and species.
Falkirk LDP2 (https://www.falkirk.gov.uk/services/planning-building/planning-policy/local-development-plan/)	28 September 2022	• LDP policies relevant to nature conservation. • Information on locally designated nature conservation sites.
Falkirk LDP – SG08 Local Nature Conservation and Geodiversity Sites (https://www.falkirk.gov.uk/services/planning-building/planning-policy/supplementary-guidance/ldp2.aspx)	28 September 2022	• Local non-statutory nature conservation designations.
Glasgow Museums Biological Records Centre (GMBRC)	25 August 2022	• Local non-statutory nature conservation designations. • Protected / notable species records.
NatureScot SiteLink website (https://sitelink.nature.scot/home)	28 September 2022	• European sites. • Other statutory designations.
NBN Atlas Scotland	14 November 2022	• Protected / notable species records.
North Lanarkshire LBAP (https://www.northlanarkshire.gov.uk/your-council/council-strategies-and-plans/council-strategies/environment-strategy/biodiversity)	30 November 2022	• Information on locally important ecosystems, habitats and species.
North Lanarkshire LDP (https://www.northlanarkshire.gov.uk/sites/default/files/2022-03/Local%20Development%20Plan%202019%20Accessible%20PDF%20Final_0.pdf)	26 January 2022	• LDP policies relevant to nature conservation. • Local non-statutory nature conservation designations.
North Lanarkshire LP – SPG20 Biodiversity (https://www.northlanarkshire.gov.uk/planning-and-building/planning-applications/our-supplementary-planning-guidance)	28 September 2022	• Additional guidance relating to development and biodiversity.
Ordnance Survey (OS) 1:25,000 maps and aerial photography	28 September 2022	• Habitats and connectivity relevant to interpretation of planning policy and

² Note there are no statutory designated sites for nature conservation (Special Area of Conservation (SAC) or Sites of Special Scientific Interest (SSSI)) for which bats are qualifying/notified species in Scotland. Thus, such sites were not searched for in this desk study.

Data source	Accessed	Data obtained
		potential protected / notable species constraints.
The Wildlife Information Centre (TWIC)	15 August 2022	Protected / notable species records.

3.2 Field survey

Field survey comprised bat activity transects and static bat detector monitoring. In addition, an assessment was made of the overall habitat suitability of the PRC for supporting bats. The surveys were carried out by experienced AECOM ecologists between 20 June and 23 September 2022.

Bat Roost Suitability (BRS) assessment of specific features (i.e. individual trees and structures) was not carried out for the following reasons of practicality: a) the large scale of the PRC and the extremely large number of trees within it, and b) that the specific route of the Proposed Development within the PRC was unconfirmed at the time of survey. Recommendations regarding further survey are given in Section 5.2.

3.2.1 Bat habitat suitability assessment

The general suitability of habitat within the PRC was classified according to the definitions provided in Collins (2016) (see Table 4).

Table 4. Bat habitat 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.

3.2.2 Bat activity surveys – transects

In accordance with Collins (2016) the overall suitability of the PRC for bats was deemed to be Moderate (as detailed in Section 4.2.1), therefore one bat activity survey per month (hereafter referred to simply as 'transects') between April and October was recommended by the guidance. Transects were carried out once per month from June to September 2022, inclusive.

Given its length, it was not feasible to conduct a transect along the entirety of the PRC. In line with guidance (Collins, 2016), walked transect sections and listening points (LPs) were devised beforehand in view of the habitat composition of the PRC and adjacent land, to provide an adequate sample of bat activity in typical habitat. Areas with potential to be of greater value to bats were included in the transects and LPs, such as the Forth and Clyde Canal, local nature conservation sites and typical woodland edges. Access issues (including permissions and use of paths where vegetation was considered too rough to safely walk through at night) affected placement of transects and LPs (parts of which were placed in similar habitat connected to and near the PRC rather than completely

within it), and sometimes also resulted in minor deviations during the surveys (see limitations below). Surveyors drove between transect sections and LPs as necessary.

Transect 1 was entirely walked and covered the northern part of the PRC from the Forth and Clyde Canal to the southern end of South Drum Claypit SINC. No listening points were employed on this transect.

Transect 2 involved short walked sections north of and including Palacerigg Country Park and along the Luggie Water, with an additional five LPs to the south accessed by car. The LPs involved surveyors remaining stationary for five minutes and recording all bat activity at that single location.

Owing to the nature of the land in the PRC, Transect 1 included larger amounts of habitat potentially suitable for bats, with large areas of more mature woodland, numerous waterbodies and linear features such as the canal and tree-lined footpaths. Transect 2 included larger amounts of less suitable habitat, but with localised higher quality areas in the short walked sections. The far south of the PRC, which is dominated by agricultural land with less mature plantation woodland and brownfield areas, was sampled by the five LPs.

The transects are shown on Figure 2. Details of the transect surveys are given in Tables 5 and 6.

Table 5. Details of Transect 1 surveys

Survey Date	Time of sunset	Start time	End time	Weather conditions
23 June 2022	22:09	22:10	00:08	Calm, warm, dry with light drizzle at end of survey. 13°C – 14°C.
13 July 2022	21:57	22:00	01:05	Clear, warm and dry. 13°C – 10°C. Previous day hot.
09 August 2022	22:06	22:06	00:57	Mild, warm and dry. Light breeze, light cloud. 18°C.
21 September 2022	19:20	19:30	22:19	Calm, dry and cloudy all day. Light breeze. 16°C.

Table 6. Details of Transect 2 surveys

Survey Date	Time of sunset	Start time	End time	Weather conditions
20 June 2022	22:05	22:05	01:51	Dry, cloudy, moderate breeze. 15°C – 12°C.
07 July 2022	22:00	21:55	01:05	Dry, moderate cloud, light breeze. 14°C.
08 August 2022	21:09	21:13	23:34	Dry, cloudy, still. 15°C.
07 September 2022	19:55	19:55	21:28	Cloudy, light air, light drizzle, 17°C. Thunderstorms previous morning.

3.2.3 Bat activity surveys – static bat detector monitoring

Static detectors were deployed to record general bat activity within the PRC over an extended period of time. The static detector locations were chosen to be representative of typical and more suitable bat habitat within the PRC, with two locations per transect. Static detector locations are shown on Figure 2 and Figure 3 (to give habitat context) and described in Table 7 along with details of deployment and recording periods. See limitations regarding deployments below.

The detectors were Wildlife Acoustics SMmini and SM4 models, recording in full spectrum and programmed to start recording 30 minutes prior to sunset and to finish recording 30 minutes after sunrise. All detectors were deployed with the same settings, and the same models were used each time.

Table 7. Details of static bat detector monitoring

Location reference	Location name and habitat description	Detector Type	Deployment period* (all 2022)	Recording periods** (all 2022)	Month (all 2022)	Total no. active recording nights (consecutive nights)	Temperature range (°C) (from active recording nights only)
S1	Transect 1 Along wooded footpath south of Bonnyhill Farm.	SM Mini	23 June – 21 September	23 Jun – 20 Jul 20 Jul – 09 Aug 09 Aug – 22 Aug	June	8 (8)	8.25 – 25.25
					July	31 (31)	6.5 – 24
					August	22 (22)	7.75 – 22.5
S2	Transect 1 Adjacent to pond in South Drum Claypit SINC.	SM Mini	23 June – 21 September	23 Jun – 06 Jul 20 Jul – 03 Aug 10 Aug – 22 Aug	June	8 (8)	8.75 – 25.75
					July	17 (5, 12)	7.75 – 20.75
					August	14 (2, 12)	8.75 – 21.5
S3	Transect 2 In scrub next to grassy clearing at Crowbank.	SM4	07 July – 07 September	08 Aug – 25 Aug	August	18 (18)	8.75 – 24.5
S4	Transect 2 On woodland / field edge next to Luggie Water.	SM4	20 June– 07 September	20 Jun – 07 Jul 07 Jul – 08 Aug 08 Aug – 07 Sep	June	10 (10)	9.5 – 25.75
					July	31 (31)	5.75 – 25.75
					August	31 (31)	5.5 – 22
					September	7 (7)	5.5 – 19.25

* Deployment period refers to the full period that the device was out in the field, whether actively recording or not.

** Recording periods refer to blocks of time within which the detector was actively recording (influenced by factors such as whether memory reached capacity or equipment failed).

3.3 Data analysis

Analysis of 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, this is not always possible based on call parameters alone. All recordings were first processed using the Kaleidoscope Pro auto-identification feature. 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 at least 5% of auto-identified noise files. This analysis was then audited by an expert bat ecologist to verify identifications.

Where a large number of bat calls were identified in the checked auto-identified noise files of static detectors, the remainder of the unchecked 'noise' was assigned an identity based on the proportions of each identified species within the checked noise. For example, if 5% of the checked auto-identified noise files were found to be common pipistrelle calls, then 5% of the unchecked noise files were also assumed to be common pipistrelle calls.

It was intended to use the Mammal Society Ecobat online tool³ to determine whether the recorded bat data is typical, poorer or more notable than bat data held by Ecobat for the region in question. However, Ecobat was offline at the time of producing this Report, and Ecobat staff were unable to assist when contacted. In the absence of Ecobat, the Wray (2007) method of assessing importance of bat commuting routes and foraging habitat was used instead. The static detector data were assessed together given similarity of habitats and detected species at each location. The PRC was assigned scores according to species rarity and abundance, roosting potential and habitat characteristics (see Appendix A for details of the Wray method). The Wray method was however considered to assign an inappropriately high value, which was downgraded by professional judgement for the reasons explained in Section 3.4.

3.4 Limitations

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

The route of Transect 1 varied slightly between surveys for the following access and safety-related reasons:

- Transect 1 was initially designed to include a short section north of the canal. However, access issues arose when the bridge over the canal was closed at certain times thus preventing surveyors from crossing. Access to this section was therefore only possible during the August transect. Owing to access issues that developed during the survey season, the section of Transect 1 passing The Wheel Caravan Park was necessarily rerouted to the north during the September transect; and,
- A short variation was made to the section of Transect 1 west of Beam Road during the September survey (see Figure 4a where off-transect bat records indicate the deviation), for reasons of safety in avoiding an area where numerous ticks and several tick bites had occurred.

The route of Transect 2 also varied slightly as follows.

- Transect 2 initially included a short section at Crowbank. This section was not repeated after the June transect as it was considered too unsafe to navigate at night owing to steep banks and extremely tussocky vegetation.
- A small deviation occurred during the June transect in Palacerigg Country Park, owing to navigational error. However, the correct path was quickly re-found, and no bats were recorded along the short deviation.

³ <http://www.ecobat.org.uk/>

Given that the above transect variations are very short in comparison to the transects as a whole, that the habitat in these sections is similar to that surveyed elsewhere along the transects, and that in most cases similar habitat to that along the original route was covered, there is limited consequence of the variations and the transects are considered to have gathered an adequate sample of bat activity.

Three of the static detectors were affected by technical issues:

- detector S1 memory reached capacity at an early point due to an unexpectedly high volume of recorded data, despite using standard and appropriate settings. Thus no recording took place between 22 August and 21 September. Detector S1 still recorded on more than the required five nights per month in June, July and August;
- detector S2 had the same issues with memory storage as described above and no recording took place between 06 July and 20 July, between 03 August and 10 August and between 22 August and 21 September. However, S2 still recorded on more than the required five nights per month in June, July and August;
- detector S3 experienced an unknown failure between 07 July and 08 August, and did not record during this period. S3 also failed between 25 August and 07 September owing to memory storage reaching capacity. Thus detector S3 recorded on a total of 17 days, but only in August.

Only one detector successfully recorded during September, however recording during the key breeding period months of June, July and August exceeded requirements (minimum five consecutive nights) at S1, S2 and S4. S3 exceeded the requirement for August, and S4 recorded an additional five consecutive nights in September.

Owing to the timing of commission and access arrangements, the transect surveys and static detector surveys commenced in June, thus missing April/May, and October was excluded. Although Collins (2016) includes these months in the possible survey period, it notes that conditions in April and October are often unsuitable for bat surveys in Scotland, thus the absence of April and October surveys is not considered an issue. It is recommended however that supplementary bat transect and static detector surveys be carried out in May 2023. As explained above, static detector data for September was collected only from static detector location S4, and data from S3 is only available from August, therefore ideally supplementary surveys would also be carried out at S1 and S2 in September 2023, and at S3 in June, July and September 2023.

The Mammal Society Ecobat tool, which compares recorded bat activity with other bat data held for the region in question, was not available for use at the time of analysis and when producing this Report. The Wray method, which was used in place of Ecobat, does not involve a comparison of recorded bat activity with regional bat data, and some of the Wray criteria were difficult to assign, such as numbers of bats (which does not correspond to number of bat recordings, since single bats often cause many recordings), number of nearby roosts (not known at time of producing this Report, and therefore based only on the general likelihood of roosts in the habitats available). In particular, the Wray method placed certain species in the 'Rarest' category which was not considered appropriate in this case, for the reasons discussed in Section 4.2.4.

As mentioned above, no bat roost suitability assessment or emergence / re-entry surveys were carried out because of the very large number of trees within the PRC, and because the exact route of the Proposed Development (which will be significantly narrower than the PRC) and requirements for wayleave tree felling have not been finalised. However, it is highly likely that some trees with potential for bat roost suitability would require felling in localised areas, and destruction of structures or works near to possible bat roosts may also be required to facilitate the Proposed Development. Therefore further surveys are recommended in Section 5.

4. Results

4.1 Desk study

4.1.1 Nature conservation sites

There are no nature conservation sites designated specifically for bat species within the search distances specified in Section 3.1.

4.1.2 Records of bats

GMBRC did not return any records of bats.

TWIC, however, returned a total of 17 records of three confirmed species: Daubenton's bat, common pipistrelle and soprano pipistrelle.

TWIC returned a total of eight records of Daubenton's bat. Three Daubenton's bat records (from David Dodds Associated Ltd) were from the 'Union Canal' which would be 15 m east of the PRC at nearest. A single record, also from David Dodds Associated Ltd, was from the 1 km grid square covering the Falkirk Wheel, Carmuir and part of Camelon, 65 m east of the PRC at nearest. An additional four records (Bats and the Millennium Link) were from Carmuir, immediately north of the Firth and Clyde Canal and 385 m east of the PRC at nearest.

TWIC returned three records of common pipistrelle. Two of these (Bats and the Millennium Link) were from Carmuir and one was from the 1 km grid square covering the Falkirk wheel.

TWIC also returned six records of soprano pipistrelle. Three (Bats and the Millennium Link) were from Carmuir and three (David Dodds Associated Ltd) were from the 1 km grid square containing the Falkirk Wheel.

In addition, TWIC returned a single SNH record of an unidentified pipistrelle species (most likely common pipistrelle or soprano pipistrelle) from part of Bonnybridge, 940 m west of the PRC at nearest.

The NBN Atlas Scotland held an additional 23 records of bats (ten were duplicates of TWIC records and were excluded):

- seven records of Daubenton's bat (BCT);
- one record of an unidentified *Myotis* sp. (BCT);
- three records of common pipistrelle (BCT);
- eight records of soprano pipistrelle (BCT / NatureScot); and,
- three records of unidentified bats (BCT).

The above NBN records were clustered in the far north of the PRC (around the Forth and Clyde Canal, Bonnybridge and Falkirk), around Palacerigg Country Park and the Luggie Water, and in the far south near New Monkland and Drumshangie Moss.

None of the results from TWIC or NBN Atlas specified whether the records were of bat roosts or bat activity, nor were any numbers of the bats present provided.

4.2 Field survey

4.2.1 Bat habitat suitability assessment

The PRC was assigned Moderate Suitability for commuting and foraging bats. There are habitats including woodland, scrub, hedges and treelines which are connected to the wider landscape and could be used by foraging and commuting bats. However, these habitats are rarely of high quality (only a very small proportion of the woodland is mature and semi-natural, and much of it comprises dense non-native conifer plantation). There are some tree-lined watercourses however these are relatively infrequent given the size of the PRC. Furthermore, a large proportion of the PRC is open farmland, and locally open peatbog/heath, which do not constitute good foraging habitat and (except where there are field lines with hedges/trees etc.) are also lacking in commuting opportunities. No

information on roosts is currently available, however potential for bat roost suitability is mainly limited to localised broadleaved woodland/individual trees (non-native conifer plantation is of negligible value in this respect and there are few structures in the PRC).

Habitats on site are described in detail in the separate Phase 1 Habitat Survey Report (AECOM, 2022).

4.2.2 Bat activity (transect) surveys

The results of the transect bat activity surveys are summarised in Tables 8 and 9. Note that the numbers of bat registrations⁴ in this table is not likely to correspond to actual numbers of bats (since single bats often cause multiple registrations)..

Overall, bat activity during Transect 1 (the walked transect) was sparse with localised areas of higher activity. Most registrations were of soprano pipistrelle (58%, maximum of 91 registrations in one night), followed by common pipistrelle (39%, maximum of 36 registrations in one night) and one registration of an unidentified pipistrelle. There was also a total of three registrations of *Myotis* sp across all Transect 1 surveys (2% of registrations). Bat activity was focussed in the following main areas along Transect 1, and the location of the bat recordings are shown on Figure 4a:

- the south side of the canal;
- footpaths within Roughcastle WS;
- Bonnyhill Road;
- the footpath south of Bonnyhill Farm; and,
- around the ponds within South Drum Claypit SINC.

Table 8. Transect 1 - Walked transect bat activity survey results

Survey date (2022)	Species	Total number of registrations	Comment
23 June	Common pipistrelle	3	All registrations from Beam Road between 10:45 and 10:48.
	Soprano pipistrelle	9	Four registrations from the south side of the canal between 00:02 and 00:08. One registration from a footpath within Roughcastle WS at 23:47. Four registrations from Beam Road at 10:48 and 10:49.
13 July	<i>Myotis</i> spp.	1	One registration from within Roughcastle WS at 22:38.
	Common pipistrelle	16	Two registrations from the south side of the canal at 22:23 and 22:26. Fourteen registrations from plantation around The Wheel Caravan Park from between 22:58 and 23:36.
	Soprano pipistrelle	23	Ten registrations from the south side of the canal between 22:21 and 22:28. Two registrations from Bonnyhill Road at 22:55 and 22:59. One registration from a watercourse at Bonnyhill Farm at 23:36. Eight registrations from the footpath southern of Bonnyhill Farm and west of Beam Road from between 23:50 and 00:09. Two registrations from South Drum Claypit SINC at 00:57 and 01:02.
09 August	<i>Myotis</i> spp.	2	Two registrations from the footpath south of Bonnyhill Farm at 23:01 and 23:13.
	Common pipistrelle	36	Four registrations from within Roughcastle WS between 22:06 and 22:18.

⁴ A registration is defined as the presence of a bat call within a 15 second interval. This is a standard definition to allow quantitative comparison of bat activity.

			Two registrations from Bonnyhill Road, both at 22:21. Twenty-one registrations from plantation around The Wheel Caravan Park from between 22:34 and 22:55. Seven registrations from the footpath south of Bonnyhill Farm from between 23:00 and 23:07. Two registrations in and around Wester Drum from between 23:50 and 23:53.
	Soprano pipistrelle	50	Three registrations between the canal and railway between 21:49 and 21:55. Nine registrations from footpaths within Roughcastle WS between 22:03 and 22:14. Four registrations from Bonnyhill Road from between 22:19 and 22:24. Nine registrations from plantation around The Wheel Caravan Park from between 22:35 and 22:54. Eleven registrations from the footpath south of Bonnyhill Farm from between 22:59 and 23:39. Seven registrations in and around Wester Drum from between 23:42 and 00:06. Seven registrations from in and around South Drum Claypit SINC from between 00:23 and 00:57.
21 September	Common pipistrelle	12	Eight registrations from the footpath south of Bonnyhill Farm between 20:33 and 20:55. Four registrations from Beam Road and a connected minor track between 20:05 and 20:16.
	Soprano pipistrelle	91	One registration from south of the canal at 22:04. One registration from Bonnyhill Road at 21:40. 64 registrations from plantation south of The Wheel Caravan Park and the footpath south of Bonnyhill Farm from between 20:53 and 21:18. Eighteen registrations from Beam Road and a minor track between 20:08 and 20:28. Seven registrations from South Drum Claypit SINC between 19:35 and 19:41.
	Unidentified pipistrelle	1	A single registration along the footpath south of Bonnyhill Farm at 20:58. This was most likely a soprano pipistrelle given the large amounts of activity from this species during the transect at this location.

Bat activity on Transect 2 was also localised. In contrast to Transect 1, most registrations on Transect 2 were of common pipistrelle (53%, with 64 registrations total and maximum of 29 in one night). There were also 56 registrations of soprano pipistrelle (46%, at most 32 in one night) and one registration of an unidentified *Myotis* sp.

Bat activity was relatively consistent along the walked section of Transect 2, with slightly less activity over Fannyside Moor. Activity at listening points was generally low with the greatest amount of activity recorded in one night at LP1, where there were eight common pipistrelle registrations and six soprano pipistrelle registrations. The locations of the bat recordings and LPs are shown on Figure 4b.

Table 9. Transect 2 – Walked and driven transect bat activity survey results

Survey date (2021)	Species	Total number of registrations	Comment
20 June	<i>Myotis</i> spp.	1	One registration at LP3 at 01:35.
	Common pipistrelle	16	Two registrations at Crowbank at 22:36 and 22:44. Six registrations in Forest Woods SINC between 22:57 and 00:02. Two registrations on Fannyside Moor at 22:44 and 22:48.

			Two registrations around the edge of Palacerigg Golf Course at 23:18 and 23:19. One registration along the Luggie Water at 00:35. Two registrations at LP3 at 01:30 and 01:31. One registration at LP4 at 01:43.
	Soprano pipistrelle	17	Six registrations at Crowbank between 22:39 and 22:45. One registration in woodland south of Fannyside Road at 23:55. Two registrations on Fannyside Moor at 22:45 and 22:48. Five registrations around the edge of Palacerigg Golf Course between 23:18 and 23:42. Three registrations along the Luggie Water between 00:34 and 00:45.
07 July	Common pipistrelle	17	Twelve registrations in woodland south of Fannyside Road between 23:57 and 00:03. Two registrations along the Luggie Water at 23:27 and 23:28. Three registrations at LP1 between 22:45 and 22:48.
	Soprano pipistrelle	1	One registration in Forest Woods SINC at 00:06.
08 August	Common pipistrelle	29	Eight registrations around the edge of Palacerigg Golf Course between 21:44 and 21:56. Twelve registrations along the Luggie Water between 22:15 and 22:42. Eight registrations at LP1 between 22:52 and 22:55. One registration at LP2 at 23:12.
	Soprano pipistrelle	32	Ten registrations in Forest Woods SINC between 21:25 and 21:26. Nine registrations around the edge of Palacerigg Golf Course between 21:37 and 21:53. Five registrations along the Luggie Water between 22:17 and 22:43. Six registrations at LP1 between 22:52 and 22:56. One registration at LP2 at 23:12. One registration at LP4 at 23:25.
07 September	Common pipistrelle	2	One registration on Fannyside Moor at 21:14. One registration at LP2 at 20:29.
	Soprano pipistrelle	6	Two registrations between Fannyside Road and Palacerigg Golf Course between 21:12 and 21:20. One registration along the Luggie Water at 20:37. Three registrations at LP2 at 20:32 and 20:33.

4.2.3 Static bat detector monitoring

The static detector results are shown below in Table 10. Numbers without brackets in Table 10 have been adjusted upwards where necessary (see numbers in brackets) to account for bat calls mistakenly auto-identified as noise (see Section 3.2.3).

The dataset of recorded bat registrations sometimes exhibits significant deviations from normal distribution, where the majority of nights have a low number of recordings and a minority a very high number, leading in some cases to a strongly skewed distribution. The median is therefore more representative of nightly activity than the mean, although it could not be adjusted for unidentified calls in noise (see footnote to Table 10), and therefore both values are given in Table 10.

The greatest activity overall, by median, was at S2 towards the north of the PRC, which also showed the highest average at 409 registrations per night for the full recording period. This was followed by S1, S3 and S4. S2 was also consistent in showing the most activity in each month, most likely because it was sited near a pond that was evidently well-used by foraging Daubenton's bat (see below). In contrast, activity at S1 was distinctly higher in August and much lower in June/July, and at

S4 activity was distinctly higher in June and much lower in July/August/September. Note that although the mean number of registrations at S3 is similar to the means for S4, the median is much lower and is considered more representative for the reasons discussed in the previous paragraph.

The large number of calls at S2 can likely be attributed to the more suitable and varied habitat in the vicinity including a large pond, scrub, rough grassland and wetland patches. The pond in particular (despite stocking with fish) is likely to support a healthy aerial invertebrate population to support foraging bats, especially Daubenton's bat which favours this habitat and was most abundantly recorded here. There are also hedges and blocks of scrub acting as likely commuting features towards this area. However, there are few to no roosting opportunities close to S2.

A minimum of six bat species were confirmed to be present within the PRC following analysis of static detector data: common pipistrelle, soprano pipistrelle, Leisler's bat, noctule, brown long-eared bat and Daubenton's bat. At least some calls could be attributed to these species with confidence. The majority of *Myotis* calls could not be attributed to a particular species (see Section 3.4) however, Daubenton's bat social calls (which made up a small proportion of all the recorded *Myotis* calls and were only identified at S2) are distinctive and thus this species is confirmed to be present. At least some of the unidentified *Myotis* calls are likely also from Daubenton's bats, this being a fairly common species and by far the most common of the *Myotis* species. Registrations of unidentified pipistrelle species were almost certainly of common pipistrelle or soprano pipistrelle, which were recorded in abundance, and did not show call characteristics of, for example, Nathusius' pipistrelle *Pipistrellus nathusii*.

The vast majority (97.8%) of bat registrations recorded by the static detectors were of pipistrelles, comprising 73.7% soprano pipistrelles, 23.4% common pipistrelle and 0.6% unidentified pipistrelles (the latter consisting of social advertisement calls without echolocation call, or of calls between frequency parameters which could not be identified to species with certainty). The remaining registrations were of *Myotis* sp. (including confirmed Daubenton's calls) (2.1%), Leisler's (0.1%), noctule (0.04%) and brown long-eared bat (0.06%).

The static detectors in the north (S1 and S2) and south (S3 and S4) all overwhelmingly recorded pipistrelle calls. However, these varied in the proportions of each species. Registrations at S1 and S2 (north; Transect 1) were mostly soprano pipistrelles, which accounted for on average 88% of pipistrelle calls per month, with common pipistrelle calls only accounting for 11%. However, S3 and S4 (south; Transect 2) recorded a more even split, with soprano pipistrelles accounting for 60% of pipistrelle calls and common pipistrelle accounting for 40%. A similar pattern was observed during the transect surveys where the percentages of soprano and common pipistrelle were 58% and 39% respectively in the north and 46% and 53% in the south. This may reflect relative proximity of roosts. Feeding buzzes were commonly recorded for common and soprano pipistrelle whereas social calls were rare.

Myotis sp. were recorded at all detectors. However, Daubenton's bat social calls only occurred at S2, which also showed by far the most *Myotis* sp. recordings, at 17 registrations per night on average (compared to S1=<1; S3=3; S4=1), although *Myotis* sp. contributed only 4.2% of the total registrations recorded at S2 owing to far more abundant pipistrelle presence. This is consistent with the habitat at S2 – a large pond with localised riparian and aquatic vegetation, which is highly suitable for foraging Daubenton's bat, but is also a habitat type viable for other species in particular soprano pipistrelle.

Nyctalus spp. registrations (verified by an expert on Leisler's bat) made up a small proportion of all registrations (2.2%), comprising 41 Leisler's and 15 noctule registrations. Leisler's was recorded at all static detectors, and noctule at all except S2. However, there was a maximum of only two Leisler's bat calls in one night, which necessarily implies a maximum of two bats and quite probably one bat in each night they occurred. Across the whole recording period, Leisler's bat occurred on 5% of nights at S1, 8% at S2, 22% at S3 and 24% at S4. Commercially-available NBN records show a south-westerly distribution in Scotland, with the closest record only 16 km from the PRC; however the Mammal Society states that they occur north to the Highland Boundary⁵, and also describes a south-western distribution in Scotland for noctule. Given also that *Nyctalus* spp. can commute long distances (Harris and Yalden, 2008) it is not unexpected that they occurred in the PRC and that the highest frequencies were towards the south. 22% and 24% for Leisler's bat are moderately high frequencies, but this must be set against the fact that each occurrence only involved one or two bats in each night they

⁵ <https://www.mammal.org.uk/species-leislars-bat/>

occurred, which together with absence from the transect survey results, and the narrowness of the Proposed Route Corridor, does not suggest that the PRC is of particular importance for this species. Importance of the PRC for noctule would also appear to be low given that this species was recorded still less than Leisler's bat.

Brown long-eared bat was only very rarely recorded, but did occur at all four static locations. This species has a particularly quiet call that can only be detected at very short range, hence it is often subject to under recording. It is therefore almost certainly more frequent in the PRC than the results suggest, in particular where there are broadleaved woodland/trees (the favoured foraging habitat).

Table 10: Static bat detector survey results by location and month

Location	Month	Common pipistrelle*	Soprano pipistrelle	<i>Pipistrellus sp.</i>	<i>Myotis sp.</i>	Leisler's	Noctule	Brown long-eared	Total no. of registrations**	No. of active nights	Mean no. registrations per active night***	Median no. registrations per active night****
S1	June	70 (70)	380 (380)	0 (0)	2 (2)	0 (0)	0 (0)	1 (1)	453 (453)	8	57 (57)	55
	July	225 (225)	959 (950)	0 (0)	11 (2)	1 (1)	1 (1)	11 (2)	1207 (1181)	31	39 (38)	33
	August	667 (667)	4240 (4181)	0 (0)	8 (8)	2 (2)	10 (2)	3 (3)	4930 (4863)	22	224 (221)	195
S2	June	395 (395)	2575 (2575)	1 (1)	86 (86)	0 (0)	0 (0)	0 (0)	3057 (3057)	8	382 (382)	393
	July	161 (161)	5914 (5818)	101 (20)	493 (199)	3 (3)	0 (0)	0 (0)	6671 (6201)	17	392 (365)	375
	August	298 (298)	5806 (5603)	27 (16)	89 (78)	1 (1)	0 (0)	1 (1)	6222 (5997)	14	444 (428)	392
S3	August	3337 (3030)	3897 (3475)	19 (4)	47 (39)	4 (4)	3 (3)	1 (1)	7309 (6556)	18	406 (364)	131
S4	June	1009 (911)	1650 (1446)	0 (0)	14 (10)	1 (1)	0 (0)	0 (0)	2674 (2368)	11	243 (215)	116
	July	2397 (1889)	2354 (2126)	12 (2)	38 (38)	14 (14)	0 (0)	0 (0)	4815 (4069)	31	155 (131)	70
	August	1102 (1034)	2666 (2252)	80 (12)	53 (39)	14 (7)	1 (1)	5 (5)	3920 (3350)	31	126 (108)	35
	September	45 (45)	81 (75)	0 (0)	9 (3)	1 (1)	0 (0)	1 (1)	136 (125)	7	19 (18)	22

* Numbers in brackets are the numbers of bats auto-identified by Kaleidoscope. The numbers outside the brackets have been adjusted upwards, where needed, in proportion to the percentage of checked auto-identified noise determined to contain bat calls.

** A registration is defined as a bat call occurring within a 15 seconds interval, for comparability. The number of registrations is almost always higher than the number of actual bats because single bats often make multiple passes and therefore cause multiple registrations.

*** Rounded to nearest integer. Discrepancies between registrations of individual species and the totals result from this rounding. Active nights means the nights the detector was active (i.e. powered and actively recording).

**** Median was only calculated from the original data without adjustment for checking of auto-identified noise, because this would require excessive effort to manually check a very large proportion of the noise and to assign any calls in the noise to particular nights.

4.2.4 Habitat assessment by Wray method

The Wray method was used in the absence of Ecobat (see Section 3.3) to assess habitat for bats. The results of habitat assessment by the Wray method (see Appendix A) for all static detector locations were broadly similar, and thus the PRC has been assessed as a whole as shown in Table 11.

Table 11: Results of Wray method of habitat assessment

Criteria	Result	Justification	Score
Species	Rarest	Leisler and/or noctule present at all static locations, both of which are in the Wray 'Rarest' category for Scotland.	20
Number of bats	Small number of bats	Only a very small number of registrations of species other than pipistrelles were detected, which would likely have been present in very low numbers given the very low numbers of registrations. Pipistrelle registrations were far more frequent, and judging by transect results the numbers appear to be small (the static results give high numbers of registrations but large numbers of registrations can result from a small number of bats).	10
Roosts	Small number	Potential for bat roost suitability in trees is limited in the PRC, given that broadleaved trees are localised and non-native conifers dominant, and structures are relatively sparse along most of the PRC.	3
Habitat (commuting)	Walls, gappy or flailed hedgerows, isolated well-grown hedgerows, and moderate field sizes.	Hedgerows tend to be defunct and are not common or well-connected within the PRC. There are however woodland edges and occasional streams.	3
Habitat (foraging)	Larger or connected woodland blocks, mixed agriculture and small villages / hamlets.	The PRC contains many blocks of often poor quality woodland which tend to be interconnected, or near to other blocks. There are localised broadleaved woodlands/trees. There is also mixed grazing and other types of localised open land (e.g. bog) and scattered dwellings.	4
Total (commuting)			36 (20+10+3+3)
Total (foraging)			37 (20+10+3+4)

The PRC scores 36 for commuting habitat and 27 for foraging habitat, indicating a commuting and foraging area of Regional value. In this case 'Regional' is could be taken to mean the West Central Belt Natural Heritage Future Zone⁶.

However, the Wray method is considered to over-value the habitat in the PRC for bats. Leisler's bat and noctule, which the Wray method considers 'Rarest', exhibited very low activity levels (see Section 4.2.3). The known distributions and potentially long commuting distances of these species (see Section 4.2.3) also suggest that the occurrence of these species in the PRC (particularly towards the south where most registrations occurred) is not unexpected, and it is therefore not considered appropriate to assign them to the 'Rarest' category in this case. Given the longer foraging ranges of these species, the narrow PRC (and the even narrower Proposed Development, when finalised) within a wide area of very similar habitat represents an insignificant amount of habitat for these species. Additionally, Leisler's bat and noctule are large bats that fly high and fast, typically over open land, thus any localised wayleave clearance for the Proposed Development would not be likely to represent any barrier to these species. Indeed, AECOM ecologists have noted that these species sometimes favour large structures for commuting, and the Proposed Development could in fact be utilised by them as a commuting aid. For these reasons, the Wray method rarity criterion is considered to result in significant over-valuation. Adjusting the species criterion one step down to 'Rarer' gives a score of 5 for this category, and a total score of 21 and 22 for commuting habitat and foraging habitat respectively. This is equivalent to Local value and is considered far more appropriate and realistic.

⁶ SNH (2002). Natural Heritage Futures: West Central Belt.
Available: <https://digital.nls.uk/pubs/e-monographs/2020/216666900.23.pdf>.

5. Discussion and recommendations

5.1 Summary

The habitat present within the PRC is considered of Moderate suitability for bats by BCT guidelines. The bat activity surveys comprised transects and monitoring with static detectors which confirmed the presence of soprano pipistrelle, common pipistrelle, *Myotis* sp. (including Daubenton's), Leisler's, noctule and brown long-eared bat within the PRC, however the majority of activity was from pipistrelle species. The most activity was detected at S2, within South Drum Claypit SINC. Using the Wray (2010) method, but adjusted by professional judgement as explained in Section 4.2.4, habitat in the PRC is considered of Local value for bats (for both commuting and foraging). No roost surveys were carried out in 2022.

At the time of producing this Report, no details were available for the Proposed Development and associated works, other than that the Proposed Development would be located within the Proposed Route Corridor. However, works for the Proposed Development will involve the construction of OHL towers, installation of OHL cables and connection of the OHLs to existing substations/towers, all of which are likely to require the establishment of temporary construction compounds and access routes for machinery. It is currently understood that habitat used for construction areas would be reinstated on completion of works, and there would be extremely small permanent habitat loss to infrastructure. However, localised woodland could be felled to create required wayleaves, which may have an impact on both foraging and roosting bats, although as mentioned above this is unlikely to significantly affect Leisler's bat and noctule which often fly high and cover long distances, and the localised nature of any felling and retention of almost all habitat also suggests limited impact on other bat species.

Compliance with NPF4 and best practice requires that the Proposed Development considers and engages the following mitigation hierarchy where there is potential for impacts on relevant ecological features:

1. avoid features where possible;
2. minimise impact by design, method of working or other measures (mitigation) (e.g. by enhancing existing features); and,
3. compensate for significant residual impacts (e.g. by providing suitable habitats elsewhere).

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. The rationale for the proposed mitigation and/or compensation should be provided with planning applications (where relevant), including sufficient detail to show that these measures are feasible and would be provided.

5.2 Recommendations

In the main, the impacts of the Proposed Development on habitats will predominantly affect minimal areas of improved and semi-improved land which is of limited value to bats, and can readily be reinstated. Where possible (for locations of, for example, OHL towers, access routes or temporary compounds) improved grassland, poor semi-improved grassland, bracken, tall ruderal vegetation and hardstanding should be preferentially used over other habitats such as semi-natural woodland or scrub.

Where possible, effort should also be made not to fracture linear features, which could be used by commuting bats, such as hedgerows, treelines and strips of woodland along watercourses and paths.

Owing to the timing of commission and access arrangements, the transect surveys and static detector surveys commenced in June, thus missing April/May, and October was excluded. Although Collins (2016) includes these months in the possible survey period, it notes that conditions in April and October are often unsuitable for bat surveys in Scotland, thus the absence of April and October surveys is not considered an issue. It is recommended however that supplementary bat transect and static detector surveys be carried out in May 2023. As explained above, static detector data for September was collected only from static detector location S4, and data from S3 is only available from August, therefore ideally supplementary surveys would also be carried out in September 2023 at

S1, S2 and S3, and at S3 in June/July 2023. In summary, it is therefore suggested that bat activity surveys in 2023 comprise:

- transect survey (Transect 1 and Transect 2) in May 2023 only, if possible including one pair of dusk / dawn surveys within a 24 hour period on each transect;
- static detector re-deployment at S1, S2, S3 and S4 to record a minimum of five consecutive days of data in May 2023. Ideally, deployment at S1, S2 and S3 would also be carried out in September 2023, and June/July 2023 at S3.

No bat roost suitability surveys were carried out in 2022, owing to the very large number of trees in the PRC. However, some bat roosts will likely be lost, most likely as a result of localised felling for wayleaves. Bat roosts are protected by law, therefore to ensure compliance with legislation and best practice further survey regarding bat roosts is recommended. Given the size of the Proposed Development it is considered impractical to carry out traditional ground-based bat roost suitability assessment (followed by emergence / re-entry surveys) of all trees and buildings within the PRC with potential for bat roost suitability (which would include all semi-mature to mature broadleaved trees in the PRC). It is therefore recommended (pending further consideration of the implementation of such a method) that the following be carried out:

- a bat trapping and radio-tagging survey, focussed on the most relevant areas, to track bats to their roosts during the day using radio receivers.

When the route of the Proposed Development is finalised, and localised areas of tree clearance are identified, it may also be feasible and appropriate to carry out targeted ground-based bat roost suitability survey at that time, followed if necessary by emergence / re-entry surveys.

6. References

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Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition)*. Bat Conservation Trust, London.

Harris, S. and Yalden, D.W. (2008). *Mammals of the British Isles: Handbook (4th Edition)*. The Mammal Society, Southampton.

Wray S, Wells D, Long E and Mitchell-Jones T (2007) *EclA: Specific issues associated with bats*. Presentation at the Mammal Society/ Zoological Society of London/IEEM Symposium on Advances in EclA for Mammals.

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7. Figures

Figure 1 – Route Location

Figure 2 – Bat Survey Area

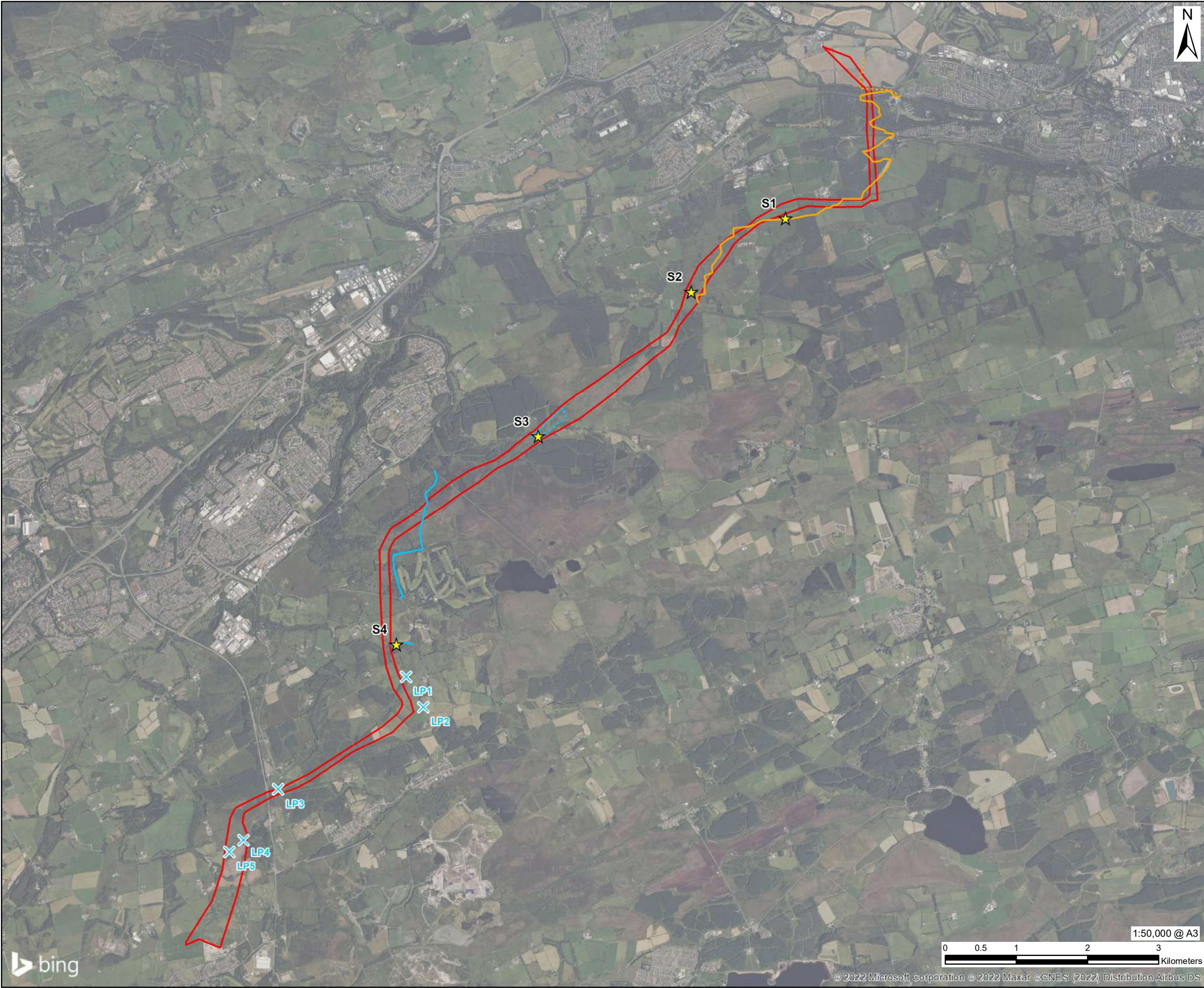
Figure 3 – Bat Static Detector Locations

Figure 4a – Bat Survey Results – Transect 1

Figure 4b – Bat Survey Results – Transect 2



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FIGURE TITLE
Route location
FIGURE NUMBER
Figure 1
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PROJECT
Denny to Wishaw Network Upgrade

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
Tanfield
Inverleith Row
Edinburgh
EH3 5DA

- LEGEND**
- Proposed Route Corridor
 - Static detectors
 - Transect 1
 - Transect 1 - section dropped
 - Transect 2
 - Transect 2 - section dropped
 - Transect 2 Listening Points (LP)

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ISSUE PURPOSE
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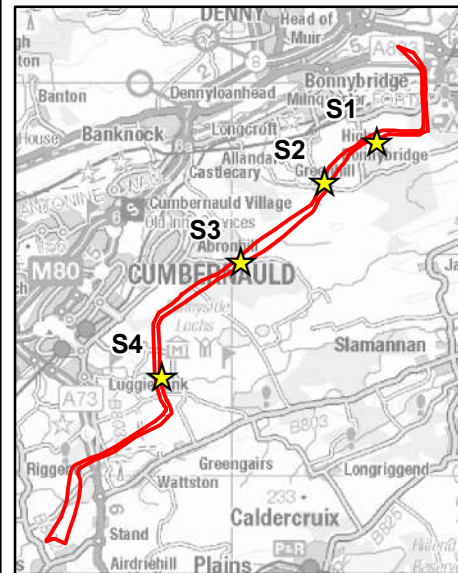
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 Proposed Route Corridor  Static detectors	



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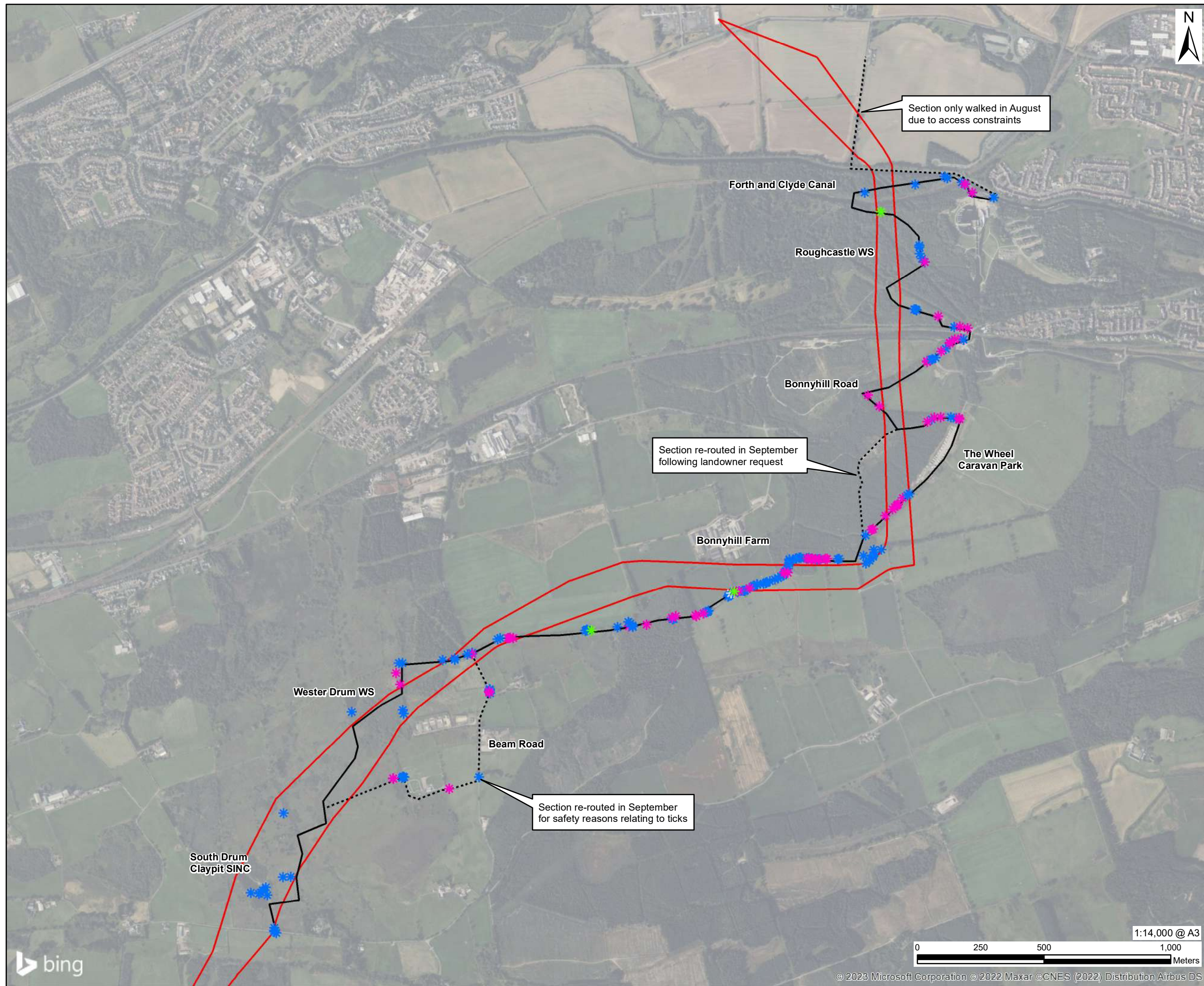
Bat Static Detector Locations

FIGURE NUMBER

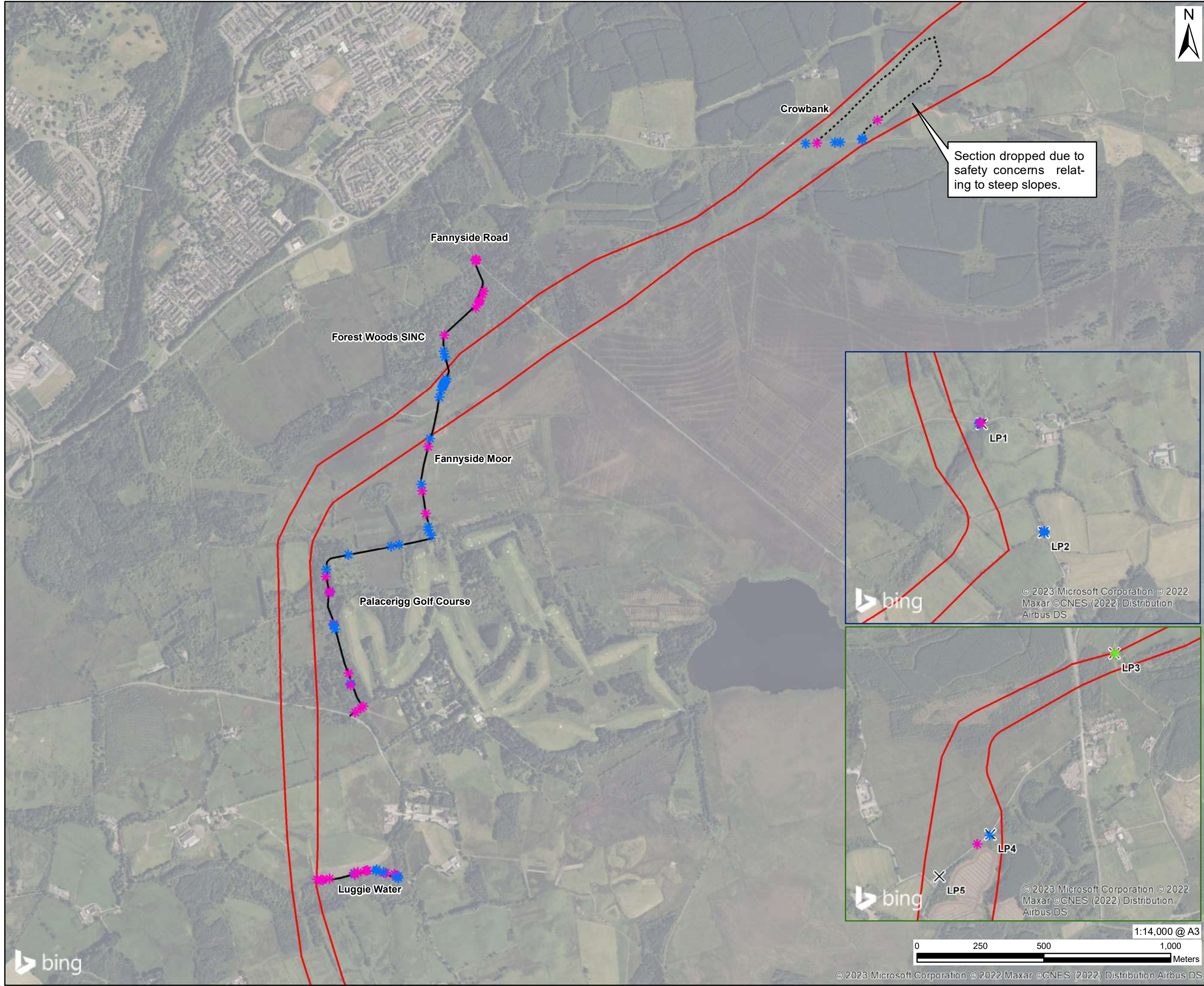
Figure 3

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Denny to Wishaw Network Upgrade

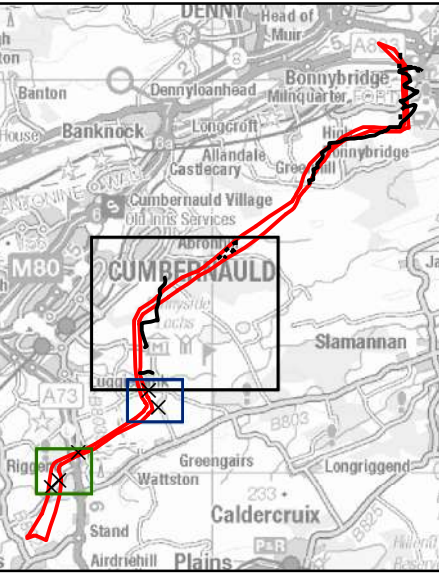
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LEGEND
[Red outline box] Proposed Route Corridor
[Black line] Transect 2
[Dashed black line] Transect 2 - section dropped

Transect results (June - September)

- [Green star] Myotis sp.
- [Pink star] Common pipistrelle
- [Blue star] Soprano pipistrelle



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'SINC' = Site of Importance for Nature Conservation
'WS' = Wildlife Site

ISSUE PURPOSE
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FIGURE TITLE
Bat Survey Results - Transect 2

FIGURE NUMBER
Figure 4b

Sheet
1 of 1

Appendix A Wray Method for assessing importance of bat commuting routes and foraging habitat

Wray *et al* (2010) developed a method for evaluating the importance of bat foraging areas and commuting routes. The method considers a range of factors, including the rarity of the bat species present (see Table A1), the number of bats recorded, whether there are roosts nearby and on the characteristics of the commuting / foraging habitat.

Table A1. Assessment of the rarity of bat species in Scotland (adapted from Wray *et al* (2010))

Rarity in Scotland	Species
Rarest (population under 10,000)	whiskered bat, Brandt's bat, Alcaethoe <i>Myotis alcathoe</i> , noctule, Nathusius' pipistrelle, Leisler's.
Rarer (population 10,000 – 100,000)	Daubenton's bat, Natterer's bat, brown long-eared.
Common (population greater than 100,000)	Common pipistrelle, soprano pipistrelle.

To value the importance of a foraging area or commuting route to bats, scores are assigned to the factors described above, as shown in Table A2. A score from each column is taken, depending on the 'best fit' for the situation (e.g. considering the rarest bat recorded using a habitat), and they are added together to arrive at a total score. Geographic importance is then assigned to a commuting route or area of foraging habitat, on the basis of this score, as shown in Table A3.

Table A2. Method for valuing commuting routes and foraging areas (adapted from Wray *et al* (2010))

Species	Number of bats	Roosts / potential roosts nearby	Foraging habitat characteristics	Type and complexity of linear feature
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established vegetation (1)	Absence of (other) linear features (1)
-	-	Small number (3)	Suburban areas or intensive arable land (2)	Un-vegetated fences and large field sizes (2)
Rarer (5)	Small number of bats (10)	Moderate number or not known (4)	Isolated woodland patches, less intensive arable and/or small towns and villages (3)	Walls, gappy or flailed hedgerows, isolated well-grown hedgerows and moderate field sizes (3)
-	-	Large number of roosts, or close to a SSSI designated for the species (5)	Larger or connected woodland blocks, mixed agriculture and small villages / hamlets (4)	Well-grown and well-connected hedgerows, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within a Special Area of Conservation (SAC) for the species (20)	Mosaic of pasture, woodland and wetland areas (5)	Complex network of mature well-established hedgerows, small fields and rivers / streams (5)

Table A3. Scoring system for assigning geographic importance to commuting routes and foraging areas

Geographic importance	Score
International	>50
National	41 – 50
Regional	31 – 40
County	21 – 30
Local	11 – 20
Site	1 – 10

