

Emmock 400kV Substation
Environmental Impact Assessment (EIA)
Volume 4 | Appendix 9.2

Ecology Survey Report

November 2024



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LIST OF ABBREVIATIONS

EIA; Environmental Impact Assessment

EclA; Ecological Impact Assessment

ESA; Ecological Survey Area

GIS; Geographical Information System

DAFOR; D = Dominant (51-100%), A = Abundant (31-50%), F = Frequent (16-30%), O = Occasional (6-15%) and R = Rare (1-5%)

UK Hab; UK Habitat Classification

LBAP; Local Biodiversity Action Plan

NVC; National Vegetation Classification

GWDTE; Ground Water Dependent Terrestrial Ecosystem

SEPA; Scottish Environment Protection Agency

BRP; Bat Roost Potential

BCT; Bat Conservation Trust

PRF; Potential Roost Feature

PRF-I; Potential Roost Feature – Individual

PRF-M; Potential Roost Feature – Multiple

1. INTRODUCTION

1.1 The Proposals

1.1.1 Scottish Hydro Electric Transmission plc (the Applicant) is applying to Angus Council for full planning permission under the *Town and Country Planning Act (Scotland) 1997*, to install and operate a new 400 kV substation at Emmock, near Tealing in Angus, with associated earthworks, the formation of platforms, landscaping, means of access, means of enclosure, site drainage, and temporary construction compounds.

1.1.2 This appendix presents the methods and results of the habitats and protected species surveys undertaken to inform the Ecological Impact Assessment (EclA) of the Emmock 400 kV Substation, hereafter referred to as the Proposed Development.

1.1.3 It should be read in conjunction with **Chapter 3: Development of the Proposed Development** (Volume 2) of the Environmental Impact Assessment (EIA Report) for full details of the Proposed Development and **Chapter 9: Ecology** for an assessment of the effects of the Proposed Development upon Ecology.

1.1.4 This appendix is supported by the following figures:

- **Figure 9.1.1: The Proposed Development and Survey Area;**
- **Figure 9.1.2: Designated sites within 10km and 5km of the Site;**
- **Figure 9.2.1: Habitat Survey Results;** and
- **Figure 9.2.2: Protected Species Survey Results.**

1.1.5 In addition, images from the surveys are provided in **Annex 9.2.1: Photographs**.

1.1.6 This appendix supports the EclA in addition to **Appendix 9.1 Desk Study and Legal Context** and **Appendix 9.3 Biodiversity Net Gain Assessment Report**.

1.2 Requirement for the Report

1.2.1 LUC was commissioned by the Applicant to undertake habitat and protected species surveys to aid the design process, to inform an assessment of the nature and condition of the habitats present, and to determine the presence or likely absence of protected species from the Proposed Development.

1.3 Terminology and Survey Area

1.3.1 The following terminology will be used throughout this report:

- Site: all land within the planning application (red line) boundary (**Figure 1.1: Site Location**);
- Proposed Development: The infrastructure including the platform, bays, control buildings, access tracks, drainage and landscape features and temporary construction compounds (see Section 3.3 in **Chapter 3: Description of the Proposed Development**); and
- Ecology Survey Area (ESA): The area within the red-line boundary, plus relevant buffers (up to 250 m around the Site, and up to 50 m from the proposed construction route) where access was granted in which all ecology surveys were undertaken in line with good practice guidelines for all ecological features surveyed (see **Figure 9.1.1: The Proposed Development and Ecology Survey Area**).

2. METHODS

2.1 Scope

Desk Study

2.1.1 A desk study was undertaken to obtain historical ecological information relating to the Site and the surrounding habitats to identify any known sensitive habitats, protected species or statutory and non-statutory designated sites. An account of the method adopted, and findings, is provided in **Appendix 9.1 Desk Study and Legal Context** which also sets out the legislative provisions afforded to protected habitats.

Habitats

2.1.2 A habitat survey was conducted within the ESA as described below.

Protected Species

2.1.3 Informed by the habitats present within the Site and the Scoping Report¹, surveys for the following species were undertaken within the ESA:

- Bat;
- Otter (*Lutra lutra*);
- Beaver (*Castor fiber*); and
- Badger (*Meles meles*).

2.1.4 Reference should be made to **Chapter 10: Ornithology** for details of ornithological survey and assessment.

2.2 Field Survey

Overview

2.2.1 Field surveys were conducted within the ESA in August 2023, and April, July, August and September 2024.

2.2.2 There were two main components to the field surveys: the habitat survey and protected species survey. Surveyors classified habitats present within the ESA according to the UK Hab classification system², and recorded habitats with the potential to support protected species as well as documenting any evidence found. Invasive non-native species of plants were recorded where found. The methods are outlined below.

2.2.3 Surveys were completed during accepted survey seasons by experienced field ecologists, in appropriate weather conditions.

2.2.4 All survey data was collected on GIS-enabled field tablets to increase accuracy and facilitate robust interpretation. Where field evidence was recorded, photographs were taken. Photographs can be found within **Annex 9.2.1: Photographs** of this appendix.

UK Habitat Classification System

2.2.5 The habitat survey was undertaken following standard methods² of all habitats within the ESA by experienced ecologists. During the survey, field surveyors walked across all parts of the ESA to map the habitat types and their boundaries, noting sufficient species identification to accurately classify habitat types within each mapped area using the DAFOR³ scale, and photographing habitats to aid habitat classification. Photographs are provided in **Annex 9.2.1: Photographs** of this appendix.

2.2.6 The UK Hab classification system provides a means to classify all habitat types using a primary habitat code with five hierarchical levels of increasing detail. This survey results in a primary habitat code of up to four alternating letters and numbers. One primary

¹ SSEN (July 2024) Environmental Impact Assessment Scoping Report Emmock 400 kV Substation

² UK Hab (2020) UK Habitat Classification Version 1.1. Available online: <https://ukhab.org/>

³ DAFOR scale: D = Dominant (51-100%), A = Abundant (31-50%), F = Frequent (16-30%), O = Occasional (6-15%) and R = Rare (1-5%)

habitat code is used for each mapped area, with up to six secondary habitat codes added where there is a requirement to capture additional information.

- 2.2.7 A habitat condition assessment was also made of each habitat type using the relevant Habitat Condition Sheets published by Natural England⁴.
- 2.2.8 This habitat classification system was used across the ESA and used to identify the presence or absence of habitats of conservation concern, i.e. Annex 1 habitats⁵, habitats listed on the Scottish Biodiversity List⁶ or Local Biodiversity Action Plan (LBAP)⁷ and potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs)⁸.

National Vegetation Classification (NVC)

- 2.2.9 The Domin scale of cover/abundance was used following best practice guidelines⁹. Data collected in the field was assessed and NVC communities and sub-communities where appropriate were assigned to each habitat. As habitats within the ESA were identified as being common and widespread, these were not habitats of conservation concern and did not have associated NVC communities. This habitat classification method is not discussed further within this report.

Ground Water Dependent Terrestrial Ecosystems (GWDTEs)

- 2.2.10 GWDTEs are defined by SEPA¹⁰ and are considered important indicators of sensitive groundwater movement. Potential GWDTEs are identified by their NVC code, which also determines, to an extent, their likely dependence on groundwater. True GWDTEs are then determined as part of a hydrological assessment, as defined in **Chapter 11: Hydrology and Hydrogeology**.
- 2.2.11 As stated above, the habitats present within the ESA were common and widespread with no habitats of potential groundwater dependence identified, thus NVC was not required to classify GWDTEs. As no potential GWDTEs have been identified within the ESA this topic is therefore not discussed further within this report.

Protected Species

- 2.2.12 Protected species surveys were undertaken during the accepted survey seasons¹¹, in appropriate weather conditions. Where appropriate, surveys sought to identify suitable habitat for and direct evidence of protected species. Suitable habitat was considered to include opportunities to shelter, rest, forage and commute. All surveys followed good practice methods¹².

Bat Survey Methodology

- 2.2.13 An assessment for Bat Roost Potential (BRP) was undertaken on trees within the Site following assessment criteria set out in best practice guidance available at the time¹³. This assessment enabled the identification of features which may be directly impacted

⁴ Natural England (2022) Biodiversity Metric 3.1 Auditing and accounting for biodiversity, Technical Supplement. Annex 1: Condition Sheets. Available online: [file:///C:/Users/hutchison_/Downloads/Biodiversity%20Metric%203.1%20-%20Technical%20Supplement%20\(18.05.22\).pdf](file:///C:/Users/hutchison_/Downloads/Biodiversity%20Metric%203.1%20-%20Technical%20Supplement%20(18.05.22).pdf)

⁵ As defined by the Habitats Directive (Council Directive 92/43/EEC), adopted in 1992. Available online: https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en

⁶ NatureScot (2022) Scottish Biodiversity List. Available online: <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list>

⁷ Tayside Biodiversity Partnership (2016) Tayside Local Biodiversity Action Plan 2nd Edition 2016-2026: Incorporating the local authority areas of Angus and Perth & Kinross. Available online: https://www.angus.gov.uk/sites/default/files/Tayside%20Local%20Biodiversity%20Action%20Plan%202016_2026.pdf

⁸ SEPA (2017) Land Use Planning System SEPA Guidance Note 31. Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.

⁹ Rodwell, J. S (2006) NVC User's Handbook, Peterborough. JNCC. Available online: <https://data.jncc.gov.uk/data/a407ebfc-2859-49cf-9710-1bde9c8e28c7/JNCC-NVC-UsersHandbook-2006.pdf>

¹⁰ SEPA (2017) Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available online: <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf>

¹¹ LUC (2022) Ecology Survey Calendar. Available online: https://lucweb.cdn.prismic.io/lucweb/5c9abb2-a167-4b9a-8600-3399d1db7ba9_LUC_EcologySurveyCalendar_2022.pdf

¹² CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater, Coastal and Marine. Version 1.2. Available online: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf>

¹³ Collins, J (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed). The Bat Conservation Trust, London. Available online: https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971

by the Proposed Development (e.g., as a result of vegetation removal to facilitate construction or operation). The BRP surveys aimed to identify roosting features, and record evidence of bat presence (such as droppings) where encountered. The criteria used to categorise BRP are summarised in **Table 9.1** below. The table summarises what surveys, if, any, are required for each category.

Table 9.1: Bat Roost Potential Categories (Bat Conservation Trust (BCT) Guidelines; previous best practice guidance¹³)

BRP Category	Roosting Habitat Features	Commuting and Habitat Features	Survey Requirements
Negligible	Negligible habitat features likely to support roosting, commuting or foraging bats.		No surveys required.
Low	<p>Structures in this category offer one or more potential roost sites for individual, opportunistically roosting bats. These sites do not offer the space, shelter or appropriate conditions to support large numbers of bats or maternity roosts.</p> <p>Trees in this category include those of sufficient size and age to support suitable roosting features, but none are visible from the ground.</p>	Habitat on and around the Site could be used by a small number of commuting bats. This category includes densely urbanised landscapes or linear vegetation features poorly connected to the wider landscape (e.g. gappy hedges in an agricultural context).	<p>One dusk or dawn survey between May and August required for structures.</p> <p>No surveys required for trees.</p>
Moderate	Structures and trees in this category offer one or more roost site that, due to their space, shelter or conditions, offer roosting potential for a range of species. Roosts may be more permanent, rather than opportunistic. Small maternity roosts of common species may form in one of these roost sites	Habitat on and around the Site is well-connected to wider continuous habitat and offers commuting and foraging habitat to a larger number of bats across a number of species. (e.g. tree lines or linked gardens in the urban context, or continuous hedge/ tree lines and watercourses in an agricultural setting).	<p>Two dusk and one dawn surveys required for both structures and trees between May and September with at least one conducted between May and August.</p> <p>Tree-climbing may be an appropriate alternative to dusk and dawn surveys.</p>
High	Structures and trees in this category have one or more potential roost sites that are suitable for large number of bats. Roosts are likely to be permanent and include maternity roosts. Potential roost sites exist for a wide range of species or species of particular conservation interest	<p>Habitat on and around the Site is diverse, continuous and linked to extensive suitable habitat. This category includes well- vegetated rivers, streams, hedgerows and woodland edge.</p> <p>Habitat is sufficiently diverse to offer opportunities to a wide range of species or those of particular conservation interest.</p>	<p>Three surveys, including both dusk and dawn surveys for both structures and trees between May and September with at least two conducted between May and August.</p> <p>Tree-climbing may be an appropriate alternative to</p>

BRP Category	Roosting Habitat Features	Commuting and Habitat Features	Survey Requirements
			dusk and dawn surveys.

- 2.2.14 Since conducting the BRP surveys of trees within the Site in 2023, the Bat Conservation Trust (BCT) has released a 4th edition of the survey guidance¹⁴, hereafter referred to as the current best practice guidelines. Changes have been made in this edition regarding the categorisation of trees which affects the corresponding survey requirements. **Table 9.2** below provides a description of the categories as provided in the previous best practice guidelines (BCT Guidelines 3rd edition¹³), the current best practice guidelines¹⁴, and a conversion column allowing translation between the two systems.
- 2.2.15 To ensure a consistent approach, blocks of woodland along the principal construction route surveyed in 2024 followed the previous best practice guidelines and applied the conversion as detailed in Table 9.2 below.

Table 9.2: Bat Roost Potential Category Conversion Table between previous and current best practice guidelines

BRP Category, previous best practice guidance (3 rd edition) ¹³	BRP Category, current best practice guidance (4 th edition) ¹⁴	Conversion Description
Negligible	Negligible	As defined in Table 2.1 above.
Low	PRF-I	Trees in this category have one Potential Roost Feature (PRF) suitable only for individual bats or very small number of bats either due to size of lack of suitable surrounding habitats.
Moderate	Either PRF-I or PFR-M	Trees in this category must be individually re-assessed based on the survey information collected as they may fit into either PRF-I or PRF-M. Trees with features suitable only to individual bats are reclassified as PRF-I, while trees with a feature suitable to support multiple bats are reclassified as PRF-M.
High	PRF-M	Trees in this category have one or more PRFs suitable for multiple bats and may therefore be used by a maternity colony.

- 2.2.16 A Preliminary Bat Roost Assessment (PBRA) was undertaken in 2024 of eight bridges along the principal construction route. These surveys were undertaken to inform the development of the principal construction = route, and to inform the survey and mitigation that would be required should detailed engineering proposals indicate that works on these structures were necessary to facilitate construction of the Proposed Development. As these structures were surveyed in 2024, the PRBAs followed the current best practice guidelines¹⁴. Each structure was assigned a potential suitability for roosting bats as defined in **Table 9.3** below.

Table 9.3: Preliminary Bat Roost Assessment of Structures

BRP Category	Roosting Habitat Features	Commuting Habitat Features	Survey Requirements
Negligible	No obvious habitat features on site likely to be used by roosting bats, although a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats, although a small element of uncertainty remains.	No nocturnal surveys required.

¹⁴ Collins, J. (ed) (2023) Bat Surveys for Professional Guidelines: Good Practice Guidelines. Bat Conservation Trust, London. Available online: https://cdn.bats.org.uk/uploads/pdf/Resources/For-professionals/Bat-Survey-Guidelines-23-FINAL-NO-PRINT-10.10.23.pdf?v=1696925348&_gl=1*1da91ae*_ga*MjU5MjA0MDIxLjE2NTI3ODc1M0M.*_ga_G28378TB9V*MTcwNTQwMDM1MC41LjAuMTcwNTQwMDM1MC4wLjAuMA..

BRP Category	Roosting Habitat Features	Commuting Habitat Features	Survey Requirements
Low	A structure with one or more potential roost site which could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide suitable roosting habitat for regular use or large numbers of bats.	Habitat that could be used by a small number of bats as flight-paths, but is isolated.	One dusk survey to be conducted between May and August.
Moderate	A structure with one or more potential roost site which could be used by bats due to their size, shelter, protection, conditions and surrounding habitats but unlikely to support a roost of high conservation status.	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.	Two dusk surveys at least three weeks apart, between May and September, with at least one between May and August.
High	A structure with one or more potential roost sites that are obviously suitable for use by large numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection, conditions and surrounding habitats. These structures have the potential to support roosts of high conservation status such as maternity colonies or hibernation roosts.	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 edges.	Three dusk surveys at least three weeks apart, between May and September, with at least two between May and August.

2.2.17 Nocturnal surveys were conducted of the Emmock Road Bridge on 6th and 29th August, and 19th September 2024 following the current best practice guidelines¹⁴. Three surveyors were positioned on either side of the structure. A night-vision aid (NVA) camera was utilised on the downstream side of the bridge during the second and third surveys. Each surveyor was equipped with a heterodyne detector to allow real time identification of the species, which are determined through species-specific frequency. Anabat Express recorders were deployed to record calls on either side of the bridge throughout the survey, with data then analysed to give a full understanding of bat activity in and around the Site. Surveys began 15 minutes before sunset and continued for 90 minutes thereafter.

2.2.18 Where emergence and/or re-entry behaviour was observed, roosts were categorised as either:

- **Confirmed roost:** Roost confirmed to be in use due to direct surveyor observation or from NVA footage showing a bat emerging or re-entering a roosting feature.
- **Potential roost:** In some circumstances it may not be possible to confirm a roost as a result of direct emergence or re-entry. For example, where a single animal is performing roosting behaviour, but movement is too fast to accurately to record. While this is classified as a potential roost, in applying the precautionary principle and for the purposes of species licencing these locations are classified as legally protected resting sites (i.e. roosts).

2.2.19 During each survey weather conditions were dry and visibility was good. The temperature during the first survey was 15°C at the beginning of the survey and 14°C at the end. The temperature during the second survey was 14°C throughout. The temperature during the third survey was 12°C at the beginning of the survey, lowering to 10°C at the end. Insects were present throughout the second survey, but not noted during the first or third survey.

Otter Survey Methodology

2.2.20 An otter survey was undertaken on all watercourses located within the ESA in accordance with recognised best practice¹⁵. Ecologists searched for evidence of suitable habitat for, and direct evidence of, otter. Watercourses were categorised into four

¹⁵ NatureScot (2016) Protected Species: Otters. Available online: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/protected-species-z-guide/protected-species-otters>

suitability classifications based on a variety of characteristics including wet width, water depth, suitable foraging resources, suitable resting sites, and connectivity to suitable habitats. Descriptions of suitability categories are provided in **Table 9.4** below.

Table 9.4: Watercourse Suitability for Otter

Suitability	Description
Optimal	Typically larger, main watercourses (at least 1m in wet width). These watercourses contain flow at all times of year (not just in spate) and will support foraging resources (such as amphibians and fish). Rocky banksides or vegetation overhangs will provide suitable resting places, and large boulders will provide ideal sprinting sites.
Sub-optimal	Generally a substantial watercourse, greater than 0.5m in width. These watercourses will comprise stone and rock substrate, with occasional boulders. There may be limited resting opportunities, however vegetation overhangs, and occasional rocky crevices may be present.
Suitable	These watercourses may be sporadically used by otter, with connectivity to optimal or sub-optimal watercourses. These watercourses themselves will typically be no wider than 0.5m, with a relatively shallow flow of water. Substrate may comprise stone and earth, and banksides may comprise grassland.
Unsuitable	Generally will be a narrow channel, which may contain very little water. The channel may be very densely vegetated with limited suitability to support otter foraging resources.

2.2.21 Where watercourses were considered suitable to support otter, these were surveyed in detail to locate field signs.

2.2.22 Field signs searched for include:

- Resting sites;
- Spraint (including age and description: fresh, recent, old);
- Prints, tracks, slides and runs; and
- Feeding remains.

2.2.23 Where resting sites were recorded, these were assessed for their potential to be used as a breeding or natal site. Resting sites were classified in accordance with descriptions detailed in **Table 9.5** below.

Table 9.5: Otter Resting Site Classification

Resting Site Type	Description
Natal Holt	A discreet holt site that is used by a bitch to birth cubs, where they will normally remain for up to three months, before being moved to a secondary holt. These sites are seldom located during surveys and they are rarely recorded without the aid of camera traps. It is generally accepted that most natal holts will contain bedding material and sprinting activity is minimal whilst occupied.
Holt	A cavity or hole on or adjacent to a watercourse. It may be in the ground, under tree roots, within rocks or caves; where it cannot be readily observed. If a holt is confirmed as active it usually contains field evidence such as spraint.
Hover	A bolt hole or ledge that provides temporary cover or a place to eat prey. It is not fully enclosed, and the back of the feature can normally be observed. There may be spraints, footprints and feeding evidence present.
Couch	An above-ground shelter normally used for lying-up and grooming. They may take the form of a depression in tall vegetation or may be covered in a vegetated grass 'roof'.
Breeding Site	An area of land in which otters breed. The site may be large, and it is usually more important to protect this site than an individual natal holt.

2.2.24 The assessment of resting site status was determined by the quality of the feature and the ability to provide key requirements for otters. This included cover and seclusion for an individual to sleep or rest, the provision of nursery or breeding habitat (including the potential for natal holts), the supply of critical factors such as feeding resources (ponds, lochs and water features) freshwater for cleaning and drinking, and the provision of suitable seclusion away from disturbance.

2.2.25 This assessment was subjective and corroborated by the abundance of field evidence located in, or around, the features. Diagnostic evidence such as spraints, urination “green” spots, spraint mounds, sign heaps, grooming hollows, footprints, paths and slides, was interpreted to determine the status of the feature.

2.2.26 Where spraint was recorded, it was allocated an age class in accordance with the following descriptions:

- Fresh: The spraint is still very moist and pungent, and was likely to have been deposited within the last few hours or days.
- Recent: The spraint has become decayed but retains consistency and some odour. It is dry and colour is more faded. It is likely to have been deposited within the last week or two.
- Old: The spraint is desiccated and powdery having lost its shape and most odours. Usually remains are still evident and identifiable, usually by the abundance of fish-bone or scales. It is likely to have been deposited approximately a month ago (sometimes longer).

Beaver Survey Methodology

2.2.27 A beaver survey was undertaken on all watercourses located within the ESA in accordance with recognised best practice¹⁶. Ecologists searched for evidence of suitable habitat for, and direct evidence of, beaver. Watercourses suitable for beaver are broadly similar to those suitable for otter as defined in **Table 9.5** above.

2.2.28 Where watercourses were considered suitable to support beaver, these were surveyed in detail to locate field signs.

2.2.29 Field signs searched for include:

- Feeding signs;
- Food caches;
- Scent-mounds;
- Slides;
- Dams;
- Burrows;
- Lodges; and
- Canals.

Badger Survey Methodology

2.2.30 A badger survey was undertaken of all suitable habitat located within the ESA in accordance with recognised best practice¹⁷. Suitable habitat is considered to be sheltered areas with free-draining soils; normally woodland, scrub or mosaics that incorporate these habitat types. Where suitable habitat was identified, direct evidence was searched for, including:

- Badger setts;
- Tracks, prints and paths including scratched logs and fallen wood;
- Guard hair;
- Latrines and dung pits categorised as fresh, recent or old;
- Snuffle holes (i.e. surface foraging); and
- Feeding remains.

2.2.31 Badger setts were defined by the descriptions in **Table 9.6** below.

¹⁶ NatureScot (2024) Standing advice for planning consultations – Beavers

¹⁷ Scottish Badgers (2018) Surveying for Badgers; Good Practice Guidelines. Available online: https://www.scottishbadgers.org.uk/wp-content/uploads/2020/12/Surveying-for-Badgers-Good-Practice-Guidelines_V1-2020-2455979.pdf

Table 9.6: Badger Settle Descriptions

Sett Type	Description
Main	These usually have a large number of entrances with large spoil heaps. The sett generally looks well used. They may have well used paths to and from the sett and between sett entrances.
Annexe	These usually have a large number of entrances with large spoil heaps. The sett generally looks well used and is connected to the main sett by clear tracks and paths.
Subsidiary	These setts often only have a few entrances and are located at least 50m from a main sett. They are not continuously active and evidence may be limited.
Outlier	These setts may have only one or two entrances with little spoil. Used sporadically, these setts often show little signs of use.

2.2.32 When setts were identified, the total number of entrances was recorded, and the above-ground area occupied by the sett mapped. Each entrance was inspected for evidence.

Other Observations

2.2.33 While surveys for other species were not specifically undertaken, incidental observations of other species were made, particularly where legislation protections were relevant. For example, ad-hoc sightings of amphibians were noted where encountered.

2.3 Constraints and Limitations

2.3.1 UKHab was used at the request of SSEN Transmission. This is a relatively newer classification system that is being increasingly used. Resources such as conversion tables are available for surveyors, and the survey team undertook UKHab training prior to conducting surveys. Where potential habitats of conservation concern were encountered, the more detailed NVC system was used. As such, the use of the UK Hab system is not considered to be a substantial limitation.

2.3.2 Surveys in August 2023, April, July, August and September 2024 were completed during the optimal surveys season for habitat and vegetation studies. Weather conditions were optimal, with sunny and dry conditions. Therefore, the data gathered is considered robust for the purposes of informing the EIA Report.

2.3.3 The timeframe in which a survey is undertaken provides a snapshot of the floral and faunal species present within the survey area. While surveys provide an overview of the habitats and species present, they cannot be used to determine long-term trends in species and habitat populations or behaviours. Ecological surveys are limited by a variety of factors which affect the presence of flora and fauna such as season, migration patterns and species behaviour. Evidence of species is not always discovered during the survey. This does not mean that a species is absent.

2.3.4 The surveys aimed to avoid periods directly following heavy rainfall, particularly for otter and water vole. This was to minimise the risk of surveying areas where evidence had been washed away and to reduce the health and safety risk of these surveys.

2.3.5 Limited land access was granted for the land surrounding the principal construction route, therefore surveys relating to the principal construction route were conducted from the public highway where access was not available. Surveyors were able to visually assess the habitats within 50m of the principal construction route using binoculars. Land access restrictions also affected the PBRAs of the Claverhouse Road bridge over Gelly Burn. Additionally, the preliminary roost assessment of the bridge over the A90 was limited due to health and safety as the A90 is a live dual carriageway. Where limitations were encountered surveyors took a cautious approach in assigning a bat roost potential category.

2.3.6 A hibernation assessment of the Emmock Road Bridge was conducted on 22nd August during daylight hours. However, as the bridge is located over a watercourse, not all crevices could be inspected with an endoscope for health and safety. Further, due to the time of year, no hibernation surveys could be undertaken to inform the impact assessment. A precautionary approach has therefore been taken in assessing the hibernation potential of the bridge.

2.3.7 No NVA camera was used during the first emergence survey of the Emmock Road Bridge, and during the second and third surveys an NVA could not be positioned on the upstream side due to dense giant hogweed (*Heracleum mantegazzianum*) on the north-west bank and sloping ground on the south-west bank. Three surveyors were used for each survey, therefore this deviation from

the guidelines is not considered likely to have impacted the assessment of potentially significant effects to the local bat population in EIA terms.

- 2.3.8 During the first emergence survey of the Emmock Road Bridge, one of the Anabat Express detectors suffered a technical fault such that no data was recorded.
- 2.3.9 Several bridges along the principal construction route were identified to offer Low Bat Roost Potential. It is not known at this stage whether these structures require strengthening works that could affect potential roost features. Guidance states that structures with Low bat roost potential should be subject to a minimum of one emergence survey. However, many of these structures are low bridges formed by pipe culverts with stone headwalls which would be suitable for pre-works endoscopy by a licensed bat surveyor should works be required. In addition, the A90 overbridge could not be safely surveyed given its position above the A90 dual carriageway; should works be required to this structure, surveys would need to be conducted as pre-works inspections by a licensed bat surveyor once suitable measures are in place regarding traffic management and at-height access.
- 2.3.10 On balance, these limitations are not considered to be a constraint to the conclusions of this report.

3. BASELINE CONDITIONS

3.1 Desk Study

3.1.1 A desk study was undertaken to inform habitat and vegetation surveys. An account of the method adopted, and findings, is provided in **Appendix 7.1: Desk Study and Legal Context** which also sets out the legislative provisions afforded to habitats, notably habitats of conservation concern. A summary of the desk study findings is provided below.

Designated Sites

3.1.2 No statutory or non-statutory international, European or nationally designated sites were identified within the Site. There are no LNCS within the Site, while the principal construction route crosses over the Dighty Burn LNCS via the Emmock Road Bridge.

3.1.3 The closest statutory site is Auchterhouse Hill SSSI, approximately 2.8 km northwest of the Site. It is designated for its subalpine dry heath.

3.1.4 There are three blocks of woodlands listed on the Ancient Woodland Inventory (AWI)¹⁸ as Long-Established Plantation Origin (LEPO) woodlands within 2 km of the Site. These include a block approximately 0.1km southwest of the Site and a block approximately 0.3km west which are no longer wooded. There are a further nine LEPO woodlands within 2 km of the principal construction route of which two LEPO woodlands are immediately adjacent to the principal construction route along Emmock Road. Surveys found the woodland south of the east-west Emmock Road to be Woodland and forest - Other woodland; broadleaved, most of which was in moderate condition with a small section of fairly poor condition immediately west of the A90. This woodland was predominantly mature beech, with occasional hawthorn, sycamore and elder, and rarely holly. Surveys found the woodland west of the north-south Emmock Road to be Woodland and forest - Other woodland; mixed in poor condition comprised predominantly of beech and sycamore.

Habitats

3.1.5 The desk study did not identify any habitats of conservation concern within the ESA.

Protected Species

3.1.6 The desk study identified no records of protected species within the Site and 486 records of protected and notable species within the ESA within the last 15 years. Of these, 98 records were of bats. Refer to **Appendix 9.2: Desk Study and Legal Context** for further details.

3.2 Field Study

Site Description

3.2.1 The Site was dominated by agricultural fields comprising arable cropland, with smaller extents of cattle-grazed modified grassland.

3.2.2 Land use within and around the ESA is predominantly agricultural with the aforementioned Tealing Substation to the southeast of the Site. The proposed construction route is predominantly hardstanding public roads bordered by agricultural fields and woodlands. The proposed construction route crosses a small number of watercourses, most notably the Dighty Burn and Fithie Burn.

3.2.3 Agricultural fields within the Site were predominantly separated by post and wire fences, with a small number of gappy defunct hawthorn (*Crataegus monogyna*) hedgerows.

3.2.4 The Fithie Burn forms the southwest boundary of the Site. The watercourse was considered to be in poor condition, with a line of trees associated with the ditch also in poor condition. The watercourse is crossed by the proposed construction route at the existing Tealing Substation.

¹⁸ NatureScot (2024) Ancient Woodland Inventory Map. Available online; <https://opendata.nature.scot/datasets/snh::ancient-woodland-inventory/explore>.

- 3.2.5 A second short watercourse is present on the east boundary of the Site, and comprises a field drain.
- 3.2.6 There are no buildings within the Site, although there are a small number of buildings within the wider ESA. Balkemback Farm is immediately northeast of the Site, three private residential buildings known collectively as Balkemback Cottages are located within 150 m north of the Site, and a private residential building is located approximately 240 m northwest of the Site boundary. The existing Tealing Substation is located within the ESA, with a small number of farm and residential buildings located within the ESA adjacent to the proposed construction route. None of the buildings have been subject to survey as no works are proposed to these buildings.

Habitat Descriptions

- 3.2.7 A total of eight habitats were recorded within the ESA, as illustrated in **Figure 9.2.1: Habitat Survey Results**. Photographs are presented in **Annex 9.2.1: Photographs**. All habitat definitions are as per the UKHab Classification System^{Error! Bookmark not defined.}. The ESA covered approximately 194ha while the Site is approximately 77.9 ha. The Site is located approximately 2.5 km north of Dundee and 350 m west of the existing Tealing Substation in the Angus council area.
- 3.2.8 **Table 3.1** below outlines the habitats present, the areas and percentages of each within the Site and ESA.

Table 3.1: Habitats within the Site and ESA

Habitat Name	UKHab Code	Area within the Site (ha)	Percentage	Area within the ESA (ha)	Percentage
Grassland - Other neutral grassland	c1a5	0.2	0.3%	0.8	0.5%
Cropland - Temporary grass and clover leys	c1b	13.8	17.7%	16.5	2.4%
Cropland - Cereal Crops	c1c	34.6	44.4%	110.3	65.2%
Cropland - Non-cereal crops	c1d	5.7	7.3%	7.2	1.3%
Grassland - Modified grassland	g4 with secondary codes 59 and 60	22.5	28.9%	49.4	23.2%
Urban - Allotments	N/A	0	0%	0.6	0.6%
Urban - Artificial unvegetated, unsealed surface	N/A	1.1	1.4%	4.7	3.1%
Woodland and forest - Other woodland; broadleaved	w1g6	0	0%	1.8	1.6%
No access	N/A	0	0%	2.7	2.3%
Total		77.9	100%	194	100%

- 3.2.9 The Site was dominated by arable agriculture, with fields noted to be in use for growing cereal (c1c) and non-cereal (c1d) crops. Fields of Temporary grass and clover leys (c1b) were also recorded which comprised recently seeded perennial rye grass *Lolium perenne* for production of silage. In addition, extents of Modified grassland (g4) were recorded, which were grazed by cattle and dominated by perennial rye grass, with additional species such as creeping buttercup *Ranunculus repens* and white clover *Trifolium repens*.
- 3.2.10 Part of the Balkemback Farm farmyard and an unsealed access track is present within the north of the Site, which comprises 1.1ha of Urban – Artificial unvegetated, unsealed surface.

- 3.2.11 A total of 450 m of Hedgerows (1180) were identified within the Site. The two hedgerows present within the Site comprised hawthorn and were noted to be in poor condition. One hedgerow is located in the centre of the Site while the other is located in the southeast immediately adjacent to a watercourse.
- 3.2.12 A total of 550 m of Lines of Trees (w1g6) was identified within the Site. Two lines of trees are present within the southeast of the Site, both were associated with watercourses. Tree species noted included ash, which showed signs of ash dieback, hawthorn and willow *Salix* sp.
- 3.2.13 A total 2.6 km of Rivers and Lakes – Other Rivers and Streams was identified within the ESA, with 460 m present within the Site, with 190 m classed as Medium and 270 m classed as Low. One watercourse, the Fithie Burn forms the southern boundary of the Site while a second watercourse forms a canalised ditch along the eastern boundary. The two watercourses converge at the southeast corner of the Site.
- 3.2.14 Small extents of Other neutral grassland were recorded in the ESA, outwith the Site. This comprised false oat grass *Arrhenatherum elatius* and cocksfoot *Dactylis glomerata*, with creeping thistle *Cirsium arvense*, nettle *Urtica dioica* and scattered ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus* trees.

Invasive Non-Native Species

- 3.2.15 No invasive non-native species were identified within the Site, nor within the 250 m search area surrounding it. Large stands of giant hogweed were identified along the proposed construction route, east and west of the north-south section of the Emmock Road and around the Emmock Road Bridge. These areas are shown in **Figure 9.2.1**.

Protected Species

Bats

- 3.2.16 There is limited habitat present within the Site to support bats roosting, foraging or commuting.
- 3.2.17 The Fithie Burn forms the southwest boundary of the Site and may provide some potential for commuting and foraging bats as it is tree-lined. One mature sycamore tree on the northwest boundary of the Site was considered to have moderate bat roost potential¹³ due to the presence of three potential roost features, including one limb wound. The location of this tree is shown in **Figure 9.2.1**. Following the descriptions and conversion provided in **Tables 3.2** and **3.3**, this tree has been reclassified as PRF-I¹⁴ due to the features having suitability for only individual bats.
- 3.2.18 Habitats within and immediately surrounding the proposed construction route provide foraging and commuting potential for bats, notably within woodlands and along watercourses including the Dighty Burn and Fithie Burn. The woodlands, particularly the LEPO woodlands, were considered likely to provide roosting opportunities.
- 3.2.19 Eight bridges within the proposed construction route were subject to a PBRA with the results detailed in **Table 3.2** below.

Table 3.2: Preliminary Bat Roost Assessment Results

Bridge number	National Grid Reference	Survey Results	BRP Category
1	NO 41554 33185	Concrete bridge with expansion joints carrying the A90 dual carriageway over the Dighty Burn LNCS. Potential for there to be gaps in the expansion joints offering roosting opportunities for bats. The watercourse and riparian habitats offer good foraging and commuting potential.	Low
2	NO 41252 33151	Bridge carrying Claverhouse Road over the Gelly Burn. This bridge has stone headwalls, but no drop zone as it is low to the ground and watercourse. The north side of the bridge was not accessible. The structure is adjacent to the confluence with the Dighty Burn, and this watercourse and riparian woodland offer good foraging and commuting potential.	Low
3	NO 41799 35059	Concrete overbridge carrying the eastern extent of Emmock Road over the A90. One expansion joint was missing mortar or sealant but was	Low

Bridge number	National Grid Reference	Survey Results	BRP Category
		otherwise in good condition. Further investigation may be required if structural works are proposed.	
4	NO 40005 34116	Stone arch bridge carrying the western extent of Emmock Road over the Dighty Burn LNCS. Gaps were identified within the headwalls and underneath the arch. The bridge is surrounded by broadleaf woodland comprising part of the Dighty Burn LNCS, and offers good foraging and commuting potential.	Moderate
5	NO 39417 36726	Culvert carrying a minor road over a field drain that flows towards the Fithie Burn. This bridge is comprised of plastic pipes and stone headwalls which had some gaps, though the drop zone for bats is limited as the bridge is low to the ground and watercourse.	Low
6	NO 39648 36723	Twin concrete box culvert carrying the western access road to the existing Tealing Substation over the Fithie Burn. This structure was found to be in very good, well-sealed condition with no gaps. The surrounding habitat was considered to provide good commuting and foraging connectivity to the wider area.	Negligible
7	NO 39458 37116	Twin concrete pipe culvert carrying a minor road over the Fithie Burn. Gaps were identified within the stone headwalls. The surrounding habitat was considered to provide good commuting and foraging connectivity to the wider area.	Low
8	NO 41175 36478	Stone box culvert carrying a minor road (part of the eastern access road to the existing Tealing Substation) over the Tealing Burn. The underside of the bridge was predominantly smooth, with limited gaps in the mortar of the stone headwalls. The surrounding habitat was considered to provide good commuting and foraging connectivity to the wider area.	Low

Bat Emergence Survey Results

- 3.2.20 An emergence survey of the Emmock Road Bridge over the Dighty Burn was conducted on 6th August, 29th August and 19th September 2024. During the survey on 6th August 2024 one pipistrelle bat was observed emerging from a gap in the brickwork on the upstream, western side of the bridge. In addition, two potential emergences were recorded on the downstream side, from the underneath of the arch. These were classed as potential emergences due to uncertainty in their exact origins. No bats were observed emerging from the bridge during the second survey on 29th August 2024. During the third survey, two soprano pipistrelles was observed emerging from gaps in the brickwork on the downstream, eastern side of the bridge.
- 3.2.21 Following completion of the emergence surveys, further details regarding licensing and mitigation measures relating to any structural works to this bridge have been provided.
- 3.2.22 Bats were recorded foraging along the Dighty Burn LNCS and around the Emmock Road during the emergence surveys. Species recorded were common pipistrelle, soprano pipistrelle, and Myotis.

Otter

- 3.2.23 The watercourse forming the southwest boundary of the Site, the Fithie Burn, was considered suitable for commuting and foraging otter as the dense vegetation along the burn provides potential shelter for both an otter and its prey. The watercourse on the eastern boundary of the Site was not considered suitable for foraging or commuting otter due to the lack of connectivity, and lack of vegetation providing shelter for an otter or its prey. No evidence of otter was identified on either watercourse during the surveys.
- 3.2.24 The Dighty Burn which flows under the proposed construction route was considered suitable for commuting and foraging otter, although surveys did not identify any evidence. Otter is known to be present on this watercourse (A.Dennis, pers. obs.).

Beaver

- 3.2.25 The Fithie Burn was considered suitable for commuting beaver as the dense vegetation provides shelter, though the wider landscape does not provide shelter as it is heavily managed agricultural land. The watercourse forming the eastern boundary of the Site was not considered suitable for foraging or commuting beaver. No evidence of beaver was found on either watercourse during the surveys.
- 3.2.26 The Dighty Burn which flows under the proposed construction route is suitable for commuting and foraging beaver, although surveys did not identify any evidence.

Badger

- 3.2.27 The habitats present within the Site are not considered suitable for badger sett excavations due to the Site being largely flat and heavily managed, and while agricultural land is generally suitable for foraging badger, the intensity of the farming practices within the Site and limited widths of unmanaged field margins mean the Site is considered have limited suitability for badger. No evidence of badger was identified during the surveys.
- 3.2.28 Woodland habitats immediately adjacent to the proposed construction route are located along the northeast extent of Emmock Road, and either side of the Emmock Road Bridge. These habitats were dominated by mature broadleaved trees, particularly beech, sycamore and ash. The strip of broadleaved woodland along the northeast extent of Emmock Road was noted to include open grassy areas; this strip provides connectivity into further extents of woodland to the east and southwest, including to woodland habitats along the Dighty Burn. The woodland habitats either side of the proposed construction route at the Emmock Road Bridge are well-connected via extensive woodland along the Dighty Burn. These habitats provide suitable foraging, commuting and sett building habitat for badger, although surveys did not identify any evidence.

Other Species

- 3.2.29 One common toad (*Bufo bufo*) was recorded in the centre of the Site during the surveys in August 2023. No other species were identified during the surveys. The arable farmland within the Site is likely to be used by brown hare (*Lepus europaeus*) which has been recorded in similar habitats during surveys in the wider Angus area. Woodland and garden habitats within the wider ESA are likely to be used by hedgehog (*Erinaceus europaeus*), as these habitats provide the range of food and shelter favoured by this species.

4. INTERPRETATION

4.1 Habitats of Conservation Concern

- 4.1.1 There are two habitats of conservation concern within the ESA. ‘Hedgerows and Treelines’ is listed as a priority habitat under the Farmland Ecosystems section of the Tayside LBAP⁷, while ‘Rivers and Burns’ is listed in the Water and Wetland Ecosystems section of the LBAP. The LBAP aims to encourage retention of hedgerow trees and the restoration of gappy hedgerows.
- 4.1.2 “Rivers” are listed within the Scottish Biodiversity List, however the watercourses within the Site are heavily canalised and man-made such that they are not considered to qualify as the SBL priority habitat. However, the Fithie Burn is considered a habitat of conservation concern under the ‘Rivers and Burns’ category of the Tayside LBAP.
- 4.1.3 The Proposed Development would likely result in the loss of approximately 0.5 km of habitat, including ‘Hedgerows and Treelines’ which is a habitat of conservation concern in the Tayside LBAP.
- 4.1.4 The watercourses within the Site would be retained. Both watercourses are connected to the Dighty Burn LNCS which itself is located within the proposed construction route approximately 2.7 km south of the Site measuring in a straight line and further via the watercourses; see **Appendix 7.1 Desk Study and Legal Context** for further details. While the watercourses within the Site are heavily modified, they have the potential to contribute to the wider blue-green network within the Tayside landscape.

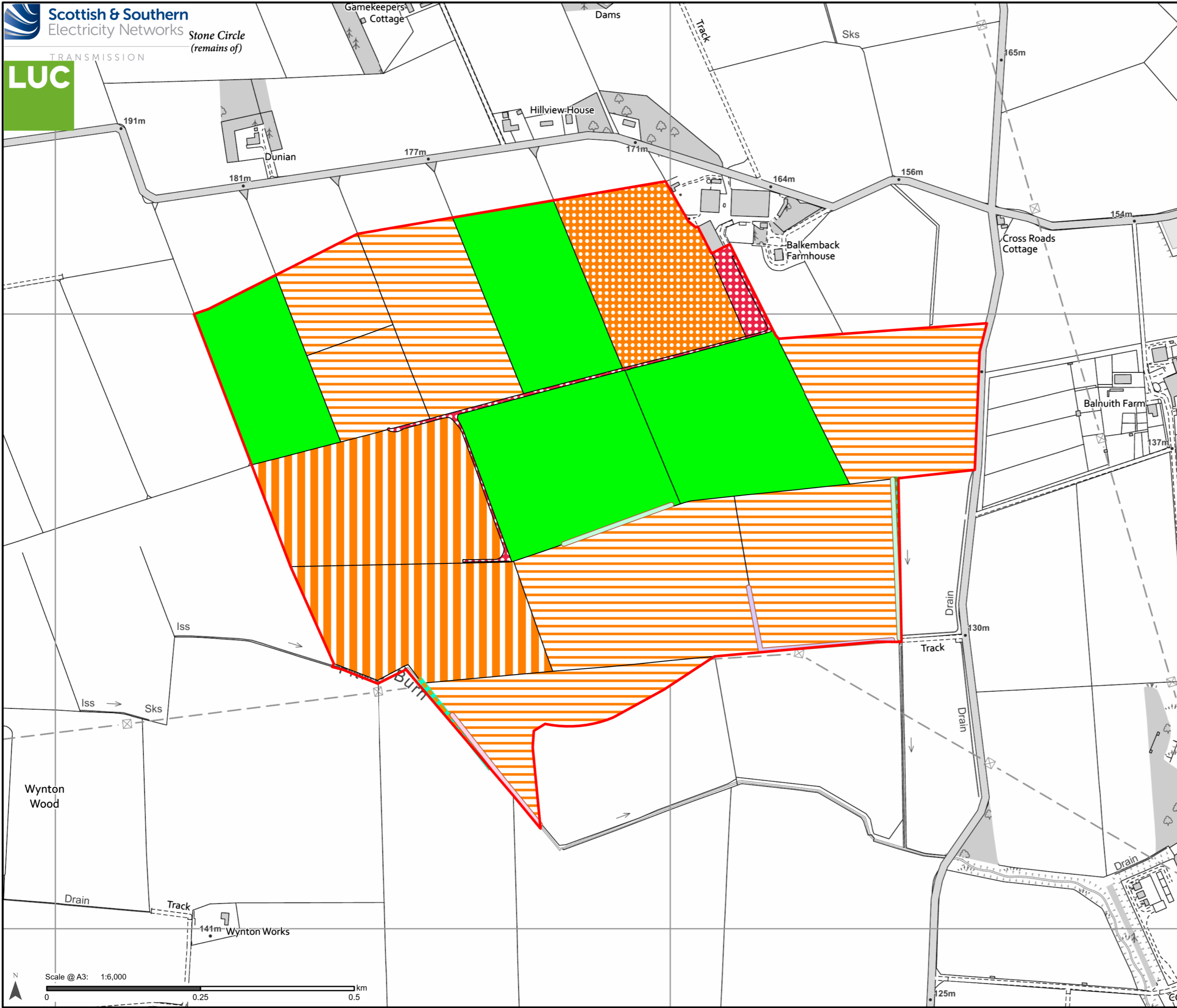
4.2 Protected Species

- 4.2.1 Bats are considered unlikely to utilise the Site in significant numbers. Individual bats could make use of the linear watercourse features on the south and east boundaries of the Site to commute, and two trees identified during the surveys provide roosting opportunities, although this is likely to be individual bats on a transient basis. The Site is unlikely to support significantly large populations of bats, nor life history stages of any bat species.
- 4.2.2 Emmock Road Bridge has been confirmed as a bat roost for individual pipistrelle bats. This makes it a low conservation status roost. It has also been assessed as having the potential to support individual or small numbers of hibernating bats, though no surveys have been undertaken during the hibernation season.
- 4.2.3 Otter and beaver could be present on watercourses adjacent to the Site and where they are crossed by the proposed construction route, although no evidence was identified during the surveys. The Site is unlikely to support significantly large populations of either otter or beaver, nor life history stages of either species.
- 4.2.4 Surveys identified no evidence of badger within the ESA, though some suitable habitat was identified for foraging and commuting badger. If badger is present within the area, the species is likely to use the ESA in a transient manner due to the intensively managed habitats present. The woodlands along the proposed construction route provide suitable habitat for badger and are well connected to suitable habitat in the surrounding landscape, though no evidence was identified during the surveys.
- 4.2.5 Other species such as amphibians, brown hare and hedgehog are likely to be present within the Site at low densities as habitats offer some limited suitability for these species.

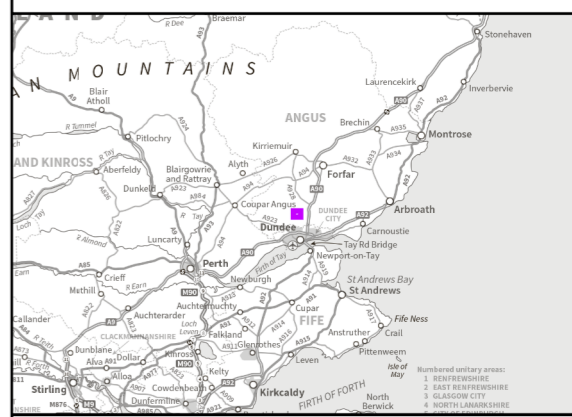
ANNEX 9.2.1 – PHOTOGRAPHS

Table 9.2.1: Photographs

Photographs	
	
View across the north of the Site	View across the north of the Site
	
Overgrown vegetation surrounding the Fithie Burn	Overgrown vegetation surrounding the Fithie Burn
	
Overgrown vegetation surrounding the Fithie Burn	Overgrown vegetation surrounding the Fithie Burn



- Emmock red line boundary
- UKHab habitat type (baseline)**
- Other rivers and streams (Medium)
- Other rivers and streams (Low)
- Line of Trees
- Line of Trees - Associated with bank or ditch
- Native Hedgerow
- Cereal Crops
- Non-cereal crops
- Temporary grass and clover leys
- Modified grassland
- Artificial unvegetated, unsealed surface



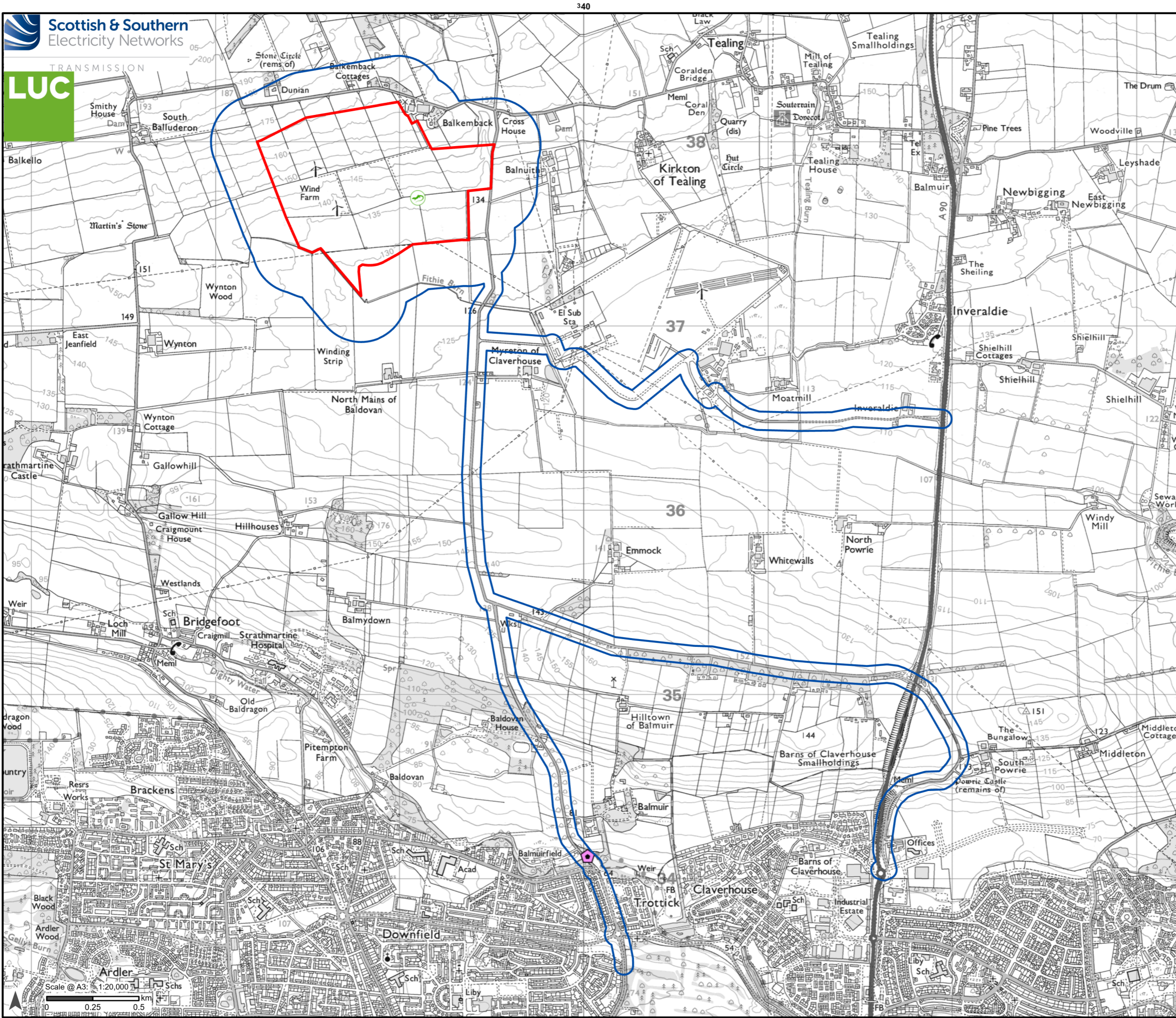
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Project No: LT382
Project: Emmock 400 kV Substation

Title:
Baseline Habitat Survey Results

Drawn by: IB
Date: 04/10/2024

Figure: 9.2.1

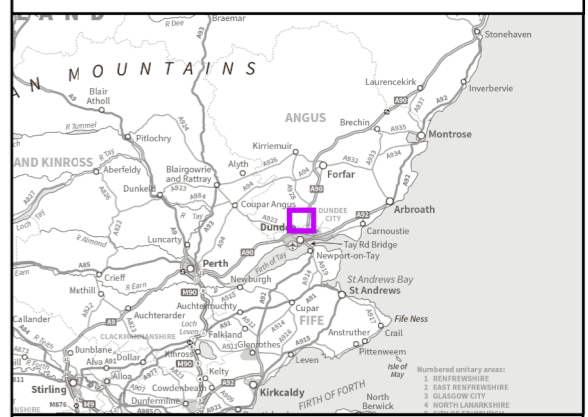


- Emmock red line boundary
- Ecology survey area (250m buffer from red line boundary and 50m buffer on access tracks)
- Amphibian
- Other

735000m.N

340

340000m.E



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Project No: LT382
 Project: Emmock 400 kV Substation

Title:
 Protected Species Survey Results

Drawn by: IB Date: 04/10/2024

Figure: 9.2.2

