Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

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SLR Project No.: 405.064862.00001

Client Reference No: 03539

26 October 2023

Revision: 01

Document Control

Document Control	
Document Properties	
Organisation	SLR Consulting
Project Name	Longcroft Wind Farm
Report Title	Protected Mammal Survey
Author(s)	Stuart Abernethy
Draft version/final	2
Document reference	405.064862.00001

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1	2 March 2023	Stuart Abernethy	Nicola Tyrell	Nicola Tyrell
2	26 July 2023	Stuart Avernethy / Euam McRae	Nicola Tyrell	Nicola Tyrell
3	26 October 2023	Stuart Abernethy	Nicola Tyrell	Nicola Tyrell
	Click to enter a date.			
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Basis of Report

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Executive Summary

Contents	Summary
Site Location	The site is located north-east of the A697, approximately 8.5km north-north-east of Lauder in the Scottish Borders. The site is within the administrative boundary of Scottish Borders Council. The survey area comprises grassland, heath and is used for grazing and recreation
Proposals	The proposed development is for the installation of 19 wind turbines and associated hardstands and access tracks, a substation compound and battery energy storage system compound.
Existing Site Information	The following documents were reviewed prior to undertaking these surveys: • Gilston Hill Wind Farm Planning Application EIA Ecology Chapter (SLR Consulting, 2016) • Dunside Wind Farm EIA Scoping Report (LUC, 2022) • Dun Law Windfarm Life Extension (SPR, 2020) • Keith Hill Wind Farm Environmental Report (The Energy Workshop, 2010) • Fallago Rig Extension Planning Statement (JLL, 2015) • Longcroft Wind Farm Ecology Desk Study (SLR Consulting, 2023)
Scope of the Survey(s)	The objective of this report is to provide: • An assessment of the potential ecological receptors present on site, identifying any constraint they pose to future development and (if possible) any recommendations for any further surveys, avoidance, mitigation or enhancement measures that are needed. • A badger survey of the site and a 100m buffer area to identify signs of badger and potential for badger to be commuting, foraging and sett-building on Site. • An otter survey of the watercourses within the site and a 250m buffer extending from the channel of the watercourse to identify signs of otter and potential for otter to be commuting, foraging and inhabiting the site. • A water vole survey of the watercourses within the site and a minimum 50m buffer extending from the channel of the watercourse to identify signs of water vole and potential for water vole to be commuting, foraging and inhabiting the site. N.B., signs of water vole were checked for the 250m otter survey buffer area.
Results	**Protected/Notable Species** The site has been assessed as having suitability to support the following species and species groups: • Otter – one couch was found with evidence of historic use along the Soonhope Burn. • Reptiles – an incidental record of adder was observed crossing the access track at the eastern aspect of Hog's Law.
Recommendations	**Protected/Notable Species** • A 30m no-disturbance buffer is to be established around the identified otter couch due to the risk of disturbance from noise, vibration, and vegetation clearance. If adhering to the minimum 30m no-disturbance buffer is not possible, a NatureScot licence application will be required for the disturbance to an otter's place of rest. The application will require a detailed species protection plan and method statement to outline mitigation and any compensatory measures and use of an Environmental

Contents	Summary
	Clerk of Works (ECoW) to oversee any construction that may impact the couch. • Evidence of bats using Structure B (TN25) and features on one ash tree (TN43) that could be used by multiple bats would require further presence/likely absence surveys pre-construction to establish use with (since the features exist within a 30m zone of influence of potential indirect disturbance) to works on the access track. Therefore, there is potential for works to disturb roosting bats if they create a higher level of noise, vibrations and dust than current use. Presence/likely absence surveys should be conducted in the optimal months (May – August inclusive) as these surveys will provide evidence for any future protected species licencing (if required) and to inform any planning authority decision. • Further survey of the structures over winter, using SM4 static detectors to determine bat activity should be conducted to establish if works will disturb hibernating bats. Placement of statics for winter activity within structures with a moderate to high likelihood of bats being present should be undertaken over a minimum of two weeks per survey each month from November to March. • A reptile protection plan will need to be provided as part of a wider Species Protection Plan (likely Planning Condition following pre-construction surveys) detailing measures to minimise impacts on reptiles following the hierarchy of avoidance, mitigation and compensation.

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1.0 Introduction

1.1 Overview

SLR Consulting was approached by RES (the Applicant) to undertake protected mammal surveys as part of an Environmental Impact Assessment (EIA) for the planning stages of the proposed Longcroft Wind Farm (the proposed development), within the Lammermuir Plateau, as shown on **Figure 8.3.1**.

The purpose of the protected mammal survey was to document the potential for protected or otherwise notable species to be present within the site (defined by the red line on Figure 8.3.1) and a 100m boundary buffer, extending out to 250m along any viable watercourses, hereby referred to as the 'survey area'. The results are intended to document potential ecological constraints to the creation of the wind farm.

1.1 Site Location

The site is located north-east of the A697, approximately 8.5km north-north-east of Lauder in the Scottish Borders. The site is within the administrative boundary of Scottish Borders Council.

The site is dominated by upland heath and is managed primarily for the shooting of game birds, with plantation woodland provided on the saddle of Longcroft Hill for shelter and grouse butts in place on South Hart Law and Wedder Law. The Lammermuir Plateau is also used by recreational walkers due to its well-defined access tracks. The section of the site south of the Riddel Law summit is used for sheep grazing and the majority habitat is acid grassland. Elevations in the site include Riddel Law at the centre (392m Above Ordinance Datum), Wedder Law to the east (447m), Cadam Law to the west (360m) and Hogs Law (449m) and Peat Law (414m) at the south of the site.

The Soonhope Burn and Whalplaw Burn flow through the site from north to south into the Cleekhimin Burn where it also connects with the Leader Water as part of the larger River Tweed catchment.

1.2 Scope of Study

The site was assessed for the presence of protected and otherwise notable mammals., focussing on species that are likely to occur in the area, ascertained from known species distribution and habitat suitability. The survey focussed on Eurasian otter (*Lutra lutra*), water vole (*Arvicola amphibius*) and European badger (*Meles meles*). Any field signs of other protected mammals e.g., pine marten (*Martes martes*), red squirrel (*Scuirus vulgaris*), wildcat (*Felis sylvestris*), European brown hare (*Lepus europaeus*), European beaver (*Castor fiber*) and European hedgehog (*Erinaceus europaeus*) were similarly recorded.

The aims of the survey were to:

- Provide baseline data to inform the construction of the proposed development and identify the need for any avoidance, mitigation, enhancement and compensation measures (if required);
- Confirm the presence or absence of protected or otherwise notable mammals within areas which could be affected by the proposed development; and
- Record the location of field signs indicative of their activity should they be present.

This report presents the findings of the survey carried out during the week of March 20th 2023, with follow up surveys being undertaken as required in 2023.

2.0 Legislation, Policy and Guidelines

2.1 Legislation

Full consideration has been given to the relevant nature conservation legislation when carrying out this assessment. This includes the following:

- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Wildlife and Natural Environment (Scotland) (WANE) Act 2011 (as amended); and

The Nature Conservation (Scotland) Act 2004 (as amended) which places a statutory duty on all public bodies to further the conservation of biodiversity through the Scottish Biodiversity Strategy, with Scottish priority species and habitats listed on the Scottish Biodiversity List (SBL), itself based on the former UK Biodiversity Action Plan (UKBAP), and regional biodiversity targets defined through the Local Biodiversity Action Plan (LBAP).

The relevant legislation is detailed in **Appendix 01**.

3.0 Methodology

3.1 Desk Study

Desk study data were acquired for protected / notable species from the Ecology Desk Study Report (SLR, 2023[1]) that summarised data from relevant sources.

3.2 Survey Area

The survey area for ground-based mammals encompassed all potential suitable habitats within the site (access permitting) in line with relevant guidance up to a 100m survey buffer.

Bat roosting potential and suitable habitat was noted during the walkover in all areas that could be assessed given the challenges of surveying in dense coniferous plantation. Any trees identified within the site during the walkover survey that were identified as having features with bat roosting potential were described.

All viable watercourses 250m upstream and downstream of the proposed development , were surveyed for riparian mammals (i.e., otter, water vole plus potential invasive mammal species). Any evidence of protected, notable, or invasive mammal presence was recorded onto Garmin InReach GPS devices, and 1:10,000 and 1:4,000 scale survey maps in the field.

3.3 Otter

3.3.1 Activity Surveys

Otter surveys were undertaken in areas of suitable habitat within the study area by an experienced surveyor in suitable weather conditions. Otter field signs that were searched for,

[1] SLR Consulting (2023) Ecological Desk Study. Longcroft Wind Farm

as described in Bang & Dahlstrøm (2006)[2], Sargent & Morris (2003)[3] and Chanin (2003a & b)[4] [5], included:

- Holts – these are underground shelters where otters live. They can be tunnels within bank sides, underneath root plates or boulder piles and even man-made structures such as disused drains. They can also be excavated from pre-existing badger setts, rabbit burrows and fox dens as well as above ground shelters in dense scrubby vegetation. Holts are used by otters to rest during the day and may be used as natal or breeding sites. Otters may use holts permanently or temporarily;
- Couches/hovers – these are above ground resting-up sites. They may be partially sheltered or fully exposed. Couches may be regularly used, especially in reed beds and on in-stream islands. They may be used as natal and breeding sites. Couches can be very difficult to identify and may comprise an area of flattened grass or earth. Where rocks or rock armour are used as couches, these can be almost impossible to identify without observing the otter in-situ;
- Prints and tracks – otters have characteristic footprints that can be found in soft ground and muddy areas;
- Spraints – otter faeces are often used to mark territories, usually deposited on in-stream boulders or similarly prominent features such as raised ground close to water, under tree roots, beneath bridges and at crossing points of fences or walls. They can also be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains;
- Feeding signs – the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter;
- Paths – these are terrestrial routes that otters take when moving between resting-up sites and watercourses, or during high flow conditions when otters travel along bank sides in preference to swimming; and
- Slides and play areas – slides are typically worn areas on steep slopes where otters slide on their bellies; slides are often found between holts/couches and watercourses. Play areas are used by juvenile otters in play and are usually evident as trampled vegetation and the presence of slides. These are often positioned in sheltered areas adjacent to the natal holt.

Any of the above signs are diagnostic evidence of the presence of otter; however, it is often not possible to identify couches with confidence unless other field signs are also present. Spraint is the most reliable identifiable evidence of the presence of this species.

NatureScot licensed surveyor (Licence: 227548) performed internal inspection of all potential couches and lay-ups, that were accessible, with use of an endoscope.

3.4 Water Vole

Water vole surveys were undertaken in areas of suitable habitat within the study area by an experienced surveyor in suitable weather conditions. Water vole field signs that were

[2] Bang, P. & Dahlstrøm, P. (2006). *Animal Tracks and Signs*. Oxford University Press, Oxford.

[3] Sargent, G. & Morris, P. (2003) *How to find & Identify Mammals*. The Mammal Society, London.

[4] Chanin P (2003a) Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series No. 10. English Nature, Peterborough

[5] Chanin P (2003b) Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No 10. English Nature, Peterborough

searched for, as described in Strachan & Moorhouse (2006)[6] and Strachan et al (2016)[7], included:

- Sightings of water vole;
- Faeces – these are recognisable by their size, shape and content. When reasonably fresh, water vole faeces are also distinguishable from rat droppings by their smell;
- Latrines – faeces are often deposited at discrete locations known as latrines;
- Feeding stations – food items are often brought along pathways and hauled onto platforms which are used as feeding stations. These are recognisable as neat piles of chewed vegetation up to 10 cm long. There can be crossover in size with field vole feeding signs, and therefore other signs may be required to provide diagnostic evidence of the presence of water vole;
- Burrows – these appear as a series of holes along the water's edge; they are distinguishable from rat or field vole burrows by their size, position and characteristics;
- Lawns – these may appear as grazed areas around burrows;
- Nests – woven nests may be found above ground in areas where the water table is high;
- Footprints – water vole tracks may occur at the water's edge and lead into bankside vegetation. Clear prints are distinguishable from rat and field vole footprints by their characteristics and size; and
- Runways in vegetation – low tunnels pushed through vegetation near the water's edge may be visible; these are less obvious than rat runs and are only diagnostic of water vole in the presence of other signs.

Any of the above signs (other than the exceptions noted) can be taken as diagnostic evidence of the presence of water vole.

3.5 Badger

Badger surveys were undertaken in areas of suitable habitat within the study area by an experienced surveyor in suitable weather conditions. Badger field signs that were searched for, as described in Neal & Cheeseman (1996)[8], Bang & Dahlstrøm (2001)[2], SNH (2001)[9], Reynolds and Harris (2005)[10] and Scottish Badgers (2018)[11] included:

- Setts - these are underground tunnels where badgers live. Setts can have large spoil heaps or discarded bedding material at the entrance. Badgers may use setts permanently or temporarily, which can thus be classed as active or inactive;
    - Within a territory, a social group of badgers will have a number of setts of varying size and frequency of use. The number of entrances possessed by a sett of each class is variable and largely dependent upon environmental factors. Setts with a

[6] Strachan, R., Moorhouse, T. & Gelling, M. (2011) *The Water Vole Conservation Handbook*. Third Edition, Wildlife Conservation Research Unit, University of Oxford, Abingdon.

[7] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) *The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. Mammal Society, London.

[8] Neal, E. & Cheeseman, C. (1996). *Badgers*. Poyser Natural History, London.

[9] Scottish Natural Heritage (2001). *Scotland's Wildlife: Badgers and Development*. SNH, Battleby.

[10] Reynolds, P. & Harris, M. (2005). *Inverness Badger Survey 2003*. Scottish Natural Heritage Commissioned Report No. 096

[11] Scottish Badgers. (2018). *Surveying for Badgers: Good Practice Guidelines*. Version 1.

higher position in the hierarchy will be more frequently used, with the main sett being more or less constantly occupied and an outlier sett infrequently so. Outlier setts are often only occupied when seasonal local resources are available.

- *Main setts:* typically possess a comparatively large number of entrances compared to the other setts within the territory (from approximately eight to thirty or more) and are constantly occupied by badgers.
- *Annexe setts:* are clearly linked to the main sett (or sometimes setts of other rank) by well-worn badger tracks. They may comprise any number of entrances and are normally in frequent use by badgers, but they are not necessarily constantly occupied.
- *Subsidiary setts:* support a variable number of entrance holes, normally in the range of three to eight, and are not connected to the main sett by well-worn badger tracks. The frequency of use of subsidiary setts varies greatly, but rarely will they be constantly occupied and often they are in sporadic use.
- *Outlier setts:* usually comprise one or two entrances only and are not connected to the main sett by well-worn tracks. They are often in sporadic use only yet may display periods of highly active use when local seasonal resources are available (for example outlier setts near fruit trees may experience periods of high use during autumn).

  - Sett activity level is assessed on a scale, from highly active to inactive, using estimates of the frequency of use.

- Prints - badgers have characteristic footprints that can be found in soft ground and muddy areas;
- Latrines - faeces are often deposited in dung pits at discrete locations. These are known as latrines and are often used as territorial markers;
- Hairs – badgers have characteristic hairs which can often be found in the soil at sett entrances or snagged on fences; and
- Feeding signs (snuffle holes) – scrapes and small holes created in the ground by badgers foraging for earthworms etc.

Any of the above signs can be taken as diagnostic evidence of the presence of badger.

3.6 Bats

3.6.1 Roosting Bats and Hibernation Potential

Features with potential to support roosting bats within the turbine 450m buffer area, to include any incidental findings within the site were inspected by a suitably experienced ecologist to determine suitability to support breeding, resting or hibernating bats and identify any evidence of occupation. The Bat Conservation Trust's Good Practice Guidelines 3rd Edition (2016) was used to assess the suitability of habitat in the survey area to support roosting bats.

The area assessed included the sections of conifer plantation woodland and habitats up to 450m away from the wind turbines that were practical/accessible. Binoculars were used by the surveyor, where required, to gain improved visual inspections of selected trees from ground level.

Evidence of use by bats includes staining, scratch marks, feeding remains and droppings. Features were classified into potential roost categories of negligible, low, moderate or high

potential, or confirmed roost. For trees, this includes an account of accessibility to suitable foraging and commuting routes.

Interior building assessments (Structure B (TN25)) and a tree climbing survey (T43) to confirm classification of potential roosting features were carried out by an ecologist holding a NatureScot roost visitor licence (165055).

3.7 Other Protected/Notable Mammals

The survey also searched for signs of other mammal presence; including but not limited to; pine marten, red squirrel, wildcat, European brown hare, European beaver and European hedgehog.

3.8 Invasive Non-native Species

Incidental records of invasive non-native species were recorded in conjunction with the protected species surveys.

3.9 Survey Dates and Weather Conditions

The protected mammals survey was undertaken between the Monday 20th and Thursday 23rd of March 2023. Weather conditions were generally mild with short, light rain showers occurring on most survey dates. Heavy rainfall occurred on the morning of the 21st. However, the watercourses within the site did not rise to such a level that any evidence of riparian mammals would have been removed and the rainfall was not categorised as a limitation. Wind gusts ranged from 1 – 5 on the Beaufort wind scale throughout the week.

The survey of the proposed access route and temporary construction compound was carried out by Senior Ecologist Beth Hanlon (BSc (Hons), MSc, ACIEEM) and Senior Ecologist Callum Taylor (MSc, QualCIEEM) between 29 and 30 August 2023. Weather conditions were considered to be appropriate for the survey (temperature = 16°C, cloud cover 50-100%, wind = 3-4 Beaufort scale, rain = occasional light showers).

Tree climbing surveys and interior building checks for bat roosts were conducted on the 23rd October by senior field ecologist Stuart Abernethy ACIEEM and Senior Ecologist Crona McMonagle ACIEEM. The weather was clear with no rain and light winds and a temperature of 12oC.

3.10 Survey Personnel

Stuart Abernethy (MSc, ACIEEM, NatureScot Otter Licence 227548, NatureScot Bat roost visitor licence 165055). Stuart is a Senior Field Ecologist with 5 years' professional consultancy experience and equivalent years' experience in conducting protected species surveys. He was accompanied by Euan MacRae (BSc, QCIEEM). Euan is an Assistant Ecologist with 6 months' professional consultancy experience. Tree climbing survey and internal building inspection was performed by Stuart Abernethy and Crona McMonagle (MSc BSc Hons, ACIEEM), a Senior Ecologist with 7 year's professional consultancy experience.

3.11 Limitations

An ecological study provides only a 'snapshot' of the conditions prevailing at the time of survey. Lack of evidence of any one protected species does not necessarily preclude them from being present on site later. Whilst it is considered unlikely that any significant evidence of protected or otherwise notable mammal species has been overlooked, due to the nature of the subjects of ecological surveys it is feasible that species that use the site may not have been recorded by virtue of their seasonality, cryptic behaviour, habit or random chance. It is

considered unlikely, however, that additional surveys of the site at this time would materially alter the conclusions of this report.

The land to the west and south of the access track could not be accessed at the time of survey. Where possible this land was surveyed from a distance with binoculars. This is a limitation to the results as much of Soonhope Burn could not be directly accessed for survey, therefore riparian mammal field signs may have been missed. Additionally, the pond near Soonhope Burn could not be accessed to conduct a HSI assessment.

During the tree climbing survey, one ash tree had been damaged by high winds and suffered significant limb loss. Therefore, it was deemed unsafe to climb up to the canopy branches to the assess some of the features identified during the ground level PRA. However, after tree climbing to check the lower roosting features of the tree, status remained unchanged as it still provided high potential to bats.

During the internal inspection survey for bat roosting activities in buildings within 30m of the access track, the full extent of the attic space of Structure B (TN25) could not be assessed due to the conversion into adjoining rooms with a sealed roof and walls. Therefore, a full check of wooden support beams and timber joists for roosting bats was not possible.

Two additional buildings (TN25, Structure A) require internal inspection (access was not available at the time of survey with access being expected imminently).

3.11.1 Weather

Sections of the eastern bank of the Whaplaw Burn were inaccessible due to the slope gradient. The survey was conducted from the western bank and features that could be used by riparian mammals were not recorded. Therefore, this limitation has not been deemed to impact the results of the survey.

4.0 Results

A summary of the target notes recorded on Site are listen in

Table A2-1 P, **Appendix 02**. Locations are shown in **Figure 8.3.2**

4.1 Otter

Desk study data[12] indicates that otter has been recorded within 2.2km of the site within the last 15 years, with the most recent recording in 2011. Summary of all otter signs recorded during March 2023 surveys are shown in **Table 4.1**. Note that all identified otter signs were found in the Soonhope Burn. For full descriptions, locations, and photographs of otter signs, see **Appendix 2**, **Table A2-1**.

Table 4-1: Summary of Otter Activity

Otter Activity Signs	Number of Signs
Active Holts	0
Potential Otter Holts	0
Couches	1
Overall abundance of other signs of otter activity (including fresh and old spraints and prints)	2

[12] SLR (2023) Ecology Desk Study Report. Longcroft Wind Farm. Prepared for RES.

4.1.1 Habitat Suitability

The three main watercourses of the site; Soonhope Burn (TN9), Whaplaw Burn (TN13) and Jock's Burn (TN16) were all deemed to have low potential for otter. Notable features that could be used for shelter such as overhanging banks, tree root systems and rock piles were infrequent or entirely absent along most of all surveyed watercourses.

Bankside vegetation within the site and the access track survey area was of generally poor value for otter with few areas of dense scrub offering potential areas of shelter. The southern section of the Soonhope Burn was considered to provide moderate value for short-term shelter for otter with degraded banks leaving overhangs and potential lay-ups (TN11).

The tributaries and drains running throughout the site were either dry at the time of survey (TN12) or deemed too shallow to provide potential for commuting or foraging otter at any time other than periods of heavy rainfall (TN9, TN10).

4.2 Water Vole

No recordings of water vole were found during the desk study and no evidence of water vole on the site was identified during the protected mammals walkover survey. Evidence of extensive stoat (*Mustela erminea*) control by the estate was recorded on all watercourses and multiple linear features throughout the site (TN6) and there may be additional measures to reduce the history of predation on water vole by American mink (*Neovision vision*) [13].

4.2.1 Habitat Suitability

Dry heathland found within the site typically consists of a mosaic of different vegetation types, including grasses, sedges, and shrubs. The recorded habitats do provide suitable cover and food resources for European water voles, which primarily feed on grasses, sedges, and other herbaceous plants found along the watercourses.

The grassland habitat recorded alongside Soonhope Burn within the buffer of the access track is suitable for water vole, however the water levels at the time of survey were too shallow for water vole use, and no evidence of water vole presence was recorded along this length.

4.3 Badger

Desk study records show badger *Meles meles* as being recorded within the site in 2015. No evidence of badger on the site was identified during the protected mammals walkover survey.

4.3.1 Habitat Suitability

Habitat at the southern end of the site and along the access track includes arable land used for grazing, patches of plantation woodland and access tracks that are good ecological value to badger due to the connectivity to more suitable habitat that is less fragmented.

No paths or setts were noted within the plantation woodlands on the site (TN19, TN20) or within the access track survey area (TN21, TN22) and poor understories provide little intrinsic value for foraging badgers.

[13] Macpherson, J.L. & Bright, P.W. (2010). Movements of radio-tracked American mink (Neovison vison) in extensive wetland in the UK, and the implications for threatened prey species such as the water vole (Arvicola amphibius). European Journal of Wildlife Research 56, 855-859

The more upland habitat in the northern end of the site is a mosaic of heather and acid grassland (TN18) providing low ecological value to badger, with no evidence of commuting, foraging and sett building around any of the proposed wind turbine locations.

4.4 Great Crested Newt

4.4.1 Habitat Suitability Index

Records of amphibians within 2km of the site as provided by the desk study include the common frog *Rana temporaria* and common toad *Bufo bufo.* No record of great crested newt *Triturus cristatus* were recorded within 5km of the site within the past 10 years.

Two ponds were assessed using the great crested newt habitat suitability index (HSI), with pond locations shown on **Figure 8.3.4** and scores of the HSI in **Appendix 03**. Both ponds are found within the boundary of the Site and Table 5-1 provides the scores for the two ponds, below. All ponds were categorised as having **below average** likelihood that GCN would be present.

A 6370m^2 pond (TN23) alongside Soonhope Burn could not be accessed for a HSI assessment. There was limited observable marginal vegetation and no duckweed or algae covering the water surface. Mature trees shaded the eastern edge of the pond, and mature trees on an island in the centre of the pond also contribute to shade levels. Waterfowl were observed on the pond. Local residents in the south of the access track survey area reported high levels of newts on the access track after periods of heavy rainfall, but is it unknown if these are great crested newt.

Table 4-2: Habitat Suitability Index Score

Pond Number	Grid Reference	Size (m^2)	Shade (%)	Macro (%)	Fish	Fowl	Habitat	Result
1	NT 53573 57088	13	0	5	Absent	Minor		0.51 – **Below average**
2	NT 55816 56622	87	5	5	Absent	Minor		0.56 – **Below average**

4.5 Bat

The desk study returned no records relating to bat species within 2km of the site. However, within 10km of the site, records relating to eight different bat species were returned, including:

- **Daubenton's bat** Myotis Daubentonii;
- Natterer's bat *Myotis nattereri***;**
- **Noctule** *Nyctalus noctule;*
- Leisler's bat Nyctalus leiseri;
- Nathusius' pipistrelle *Pipistrellus nathusii*
- Common pipistrelle Pipistrellus pipistrellus
- Soprano pipistrelle *Pipistrellus pygmaeus*; and
- **Brown long-eared bat** *Plecotus auritus*.

No evidence of bat was recorded during the field survey.

Four structures and eight trees within the access track survey area were assessed for their suitability to support roosting bats, provided on **Figure 8.3.3**. Two structures had moderate suitability for roosting bats while two structures had negligible suitability. Four trees had high suitability for roosting bats, while one had moderate suitability, and three had low suitability. **Appendix 4** provides further details on these structures, the features present and their suitability to support roosting bats. Of the structures and trees, two buildings and one tree are within 30m of the proposed access track, considered the zone of influence ("ZoI") of any potential disturbance due to increased noise, vibration and dust during construction phases and modification to the access track.

Structure A (TN24) was inspected internally and externally. Evidence of bats foraging around the building and inside the converted attic space were recorded (i.e., bat droppings attached to the exterior windows and on interior walls within the upstairs converted attic space including in the eaves). Access was not achieved to the full attic space (i.e., gable end areas between the rafters and attic space walls); therefore, it is assumed that bat roost activity may be present in this location that would be attributable to the bat activity detected. No evidence of maternity roosts or bachelor colonies were found in the building (cautionary judgement made given limitations of full access to inspection).

Structure B (TN25) was inspected internally and externally. Evidence of bats using the loft space as a continuous and historical roost were found, with large piles of droppings and urine staining on the insulation and two dead bats recorded.

One large ash tree (TN43) was inspected internally and externally by qualified tree climbers holding NatureScot bat roost visitor licences. The main feature on the tree was a large trunk cavity 4m up from the ground. The cavity showed evidence of previous use by barn owl and jackdaw due to presence of pellets and nests. The cavity is exposed on the northern aspect from an adjoining hole in the tree, that also extends vertically into the main stem for 40cm and horizontally for 100cm. No evidence of bats was found within the cavity at the time of survey but it does provide dry conditions for multiple bats to use during the summer as a transitional day roost. Features higher up the tree were not checked due to substantial damage caused by recent storms, including Storm Babet. The status of the tree as having high potential for bat roosting remains unchanged following the further tree climbing checks.

4.5.1 Habitat suitability

The pockets of plantation and broadleaved woodland, gorse, and Soonhope Burn within the survey area are suitable for foraging and commuting bats. The landscape in unlit with a high volume of flowering plants to support invertebrates providing good foraging conditions. Additionally, there are a number of mature veteran trees in the landscape with features suitable for roosting bats, detailed in **Appendix 4**.

4.6 Other Notable Species

Desk study records show adder *Vipera berus* as being recorded within the site in 2012 and one adder was recorded crossing the footpath on the access track to the east of Hog's Law (TN4). Adder were also recorded frequently by during ornithological visits, with seven sightings or evidence such as shed skin noted. Adders are given limited protection under the Wildlife and Countryside Act 1981. Common lizard *Zootoca vivipara* was also recorded at the time of ornithological surveys.

The grassland and scrub habitat within the access track survey area is suitable for reptiles, although none were recorded during the survey. Two large piles of logs were recorded within the access track survey area which could be used as hibernacula by reptiles, amphibians and hedgehog (TN30).

No evidence of red squirrel or pine marten was recorded during the survey. The plantation woodlands surrounding the access track are suitable for both species, however the woodlands are small and fairly isolated from each other, and in some cases are only connected by non-vegetated fences. It is therefore unlikely that red squirrel and pine marten are present within the Site.

4.7 Incidental Records of Birds

Two Schedule 1 birds were recorded on site. A barn owl *Tyto alba* was identified in the north of the site during the riverine survey of the Whalplaw Burn. A barn owl box was also noted at the northern end of the Soonhope burn (TN5). A hen harrier *Circus cyaneus* was flushed from the heath during the riverine survey of the Jock's Burn in the northeast of the Site. Barn owl and hen harrier are Schedule 1 species.

Swallow *Hirundo rustica* and house martin *Delichon urbicum* were recorded nesting on two cottages (TN24 and TN25) in the north of the access track survey area, with each building supporting several nests. These birds foraged heavily over the surrounding grasslands and watercourses.

Two agricultural barns (TN26, TN27) within the access track survey area were unsuitable for breeding barn owl due to a lack of sizeable ledges, but could be used by perching barn owl, and nesting small birds. A bird's nest, unconfirmed species but likely pigeon, was recorded in a plantation woodland (TN28) within the access track survey area. One unoccupied barn owl nest was found within a tree cavity of a mature ash (TN43) with deposited pellets found one the floor of the cavity and a jackdaw nest further up the vertical height of the tree.

A kingfisher *Alcedo atthis* (Schedule 1) was recorded foraging over Soonhope Burn in the southern extent of the access track survey area (TN29).

5.0 Discussion and Conclusions

5.1 Otter

Otter spraints were noted at three locations along the Soonhope Burn.

One desiccated spraint was found at the northern end of the burn on tussocky grass growing out of a rock within the water channel (TN1). An additional spraint was found on tussocky grass on top of a bankside rock within the mid-section of the burn (TN2). Both spraints were recognised as fresh, although broken, indicating recent otter presence in the burn. The third spraint was categorised as intact and old and located underneath a heathery overhang on the east bank of the Soonhope Burn (TN3). The overhang provides shelter and a dry-stone base for otter to use as a short-term lay-up for grooming and rest and has been categorised as a couch.

The watercourses within the ste would provide suitable commuting habitat for otter but the lack of suitable shelter provided along the bankside and underneath vegetation would deter otter from using it as a long-term resting place or breeding purposes. No places of otter shelter were identified within the direct footprint of the proposed turbine infrastructure and any access track additions or upgrades.

The potential for increased disturbance, via vehicular traffic and site personnel using the access tracks that traverse Soonhope Burn, as well as potential indirect impacts of pollution from earth movement and vegetation clearance, may cause temporary, indirect disturbance to otter. Therefore, a pre-construction otter survey will be necessary along any sections of watercourse crossed by a proposed access track and any sections of the works that fall within 30m of a watercourse (the survey itself extending 250m up and downstream of the proposed works areas plus up to 30m inland from the watercourse edge). The pre-construction assessment should be carried out within 48 hours prior to works commencing to check for usage of the sites close to the proposed landfall and for otter holts or other resting sites that may have become occupied since this survey.

It is possible that a protected species licence application to NatureScot will be required to allow the works to legally proceed, should a place of otter shelter within 30m inland or up to 250m up/downstream of works be identified (30m if non-breeding). Measures to minimise impacts on otters should follow a hierarchy of avoidance, mitigation, and compensation. Monitoring surveys may be necessary to establish breeding status if a holt is identified with potential to be used for the purposes of breeding or if the use of a holt requires to be established.

5.2 Water Vole

No evidence of water vole was observed on the site at the time of survey, and bankside habitat was consistently low ecological value for water vole due to the low gradient from the high-water line, infrequently recorded vegetation that would support water vole foraging and poor herbaceous cover along commuting routes. The observation by surveyors of the extensive anti-mink measures (TN6) taken by the estate on all the major water courses within the Site also indicates that water voles would have been subject to historic high levels of mink predation and less likely to be present. There is a low likelihood that water vole populations will have established back into the area as the distance of the watercourses from the main River Tweed tributary of the Leader Water would reduce the likelihood of water vole presence into the upland slopes of the site.

Risk of damage/disturbance to water vole places of shelter by the proposed development is therefore considered to be unlikely. A pre-construction otter survey can seek to monitor for water vole activity prior to works commencing.

5.3 Badger

No evidence of badger was found by surveyors at the time of survey. Due to the size of the Site, the survey targeted those areas of highest potential for badger i.e., the five significant stands of plantation woodland in the south (TN19, TN20). With no badger signs identified here, the remaining large areas of open grassland and heath on the site (TN18) were

considered highly unlikely to support badgers, particularly in conjunction with the topography of the area and lack of sustainable food sources.

One incidental badger sett was identified in a small stand of woodland approximately 1.5km from the site, in a less elevated area and adjacent to agricultural fields and pasture.

5.4 Bat

Two structures and eight trees were assessed as having suitability for roosting bats. Additionally, the woodland, scrub, and riparian habitat within the site is suitable for foraging and commuting bats. Bats and their roosts are protected from damage and disturbance by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and the Wildlife and Countryside Act 1981 (as amended).

Evidence of bats using the interior of Structure B (TN25) was found at the time of the interior building inspection surveys, as droppings attached to the walls and windows would indicate bats flying inside of the loft space combined with limitations to inspect the full attic space (that may support a roost). As bat droppings were found inside the rooms of the attic and no dead bats were found, it would indicate that bats are able to enter and exit the rooms via the gaps in the wooden wall beams and roofing. While a full assessment of the converted room of the attic could be carried out, it was not possible to fully inspected between the eaves and room so a precautionary approach is taken to not dismiss the likelihood of bats using the space between the celling and the roof joists as a roost.

It is considered that the features identified on the building including the slate roofing, exposed brickwork at the east gable end and access to the attic space provides short term summer roosting opportunities for individual bats. No evidence of long-term roosting or maternity roosting behaviour was recorded at the time of survey.

In line with the BCT survey guidelines for a building with (assumed confirmed) bat roost, three survey visits that include dusk emergence / dawn re-entry (dusk preferable) using infrared are recommended during the bat active season (April to September, inclusive) with visits a minimum of two weeks apart. At least two of the visits must be between May and August inclusive.

Ash trees to the south of the access track are recorded as high for bat roosting potential. On climbing one ash tree that falls within 30m of the access track, features that would allow multiple bats and colonies of bats were recorded on the main stem. It is therefore recommended that this tree is further assessed to establish the potential for disturbance that would be caused by the enlargement or improvement of the access track. In line with the BCT survey guidelines for a tree with high bat roosting potential, three survey visits that can be a combination of tree climbing checks and dusk emergence using infrared are recommended during the bat active season (April to September, inclusive) with visits a minimum of two weeks apart. At least two of the visits must be between May and August.

All additional surveys detailed herein must be carried out in the appropriate season in advance of construction works and preparation commencing whilst allowing ample time for and species licence applications to be lodged and agreed prior to works progressing within any zones of influence. This will be taken forward in **Chapter 8: Ecology and Biodiversity** of the EIA.

Further survey of the structures over winter, using SM4 static detectors to determine bat activity should be conducted to establish if works will disturb hibernating bats. As access to areas of the roof void are limited it is unlikely to provide enough information based on surveyor inspection alone. Therefore, complimentary methods such as deploying automated bat detectors would be useful at recording bats at non-classic sites where void dwelling species may linger. Automated/static surveys in structures during the late autumn, winter and early spring period should be undertaken between November and March. Placement of

statics for winter activity within structures with a moderate to high likelihood of bats being present should be undertaken over a minimum of two weeks per survey each month from November to March (BCT, 2023[14]).

5.5 Non-mammal - Reptiles

Adders and common lizard are protected against intentional or reckless killing and injury under the Wildlife and Countryside Act 1981 (as amended). Both species are frequent on open habitats such as the site's heathland and moors.

Both adders and common lizards are reliant on habitat connectivity between areas of shelter and basking sites. As such, scrub clearance may constitute indirect disturbance, particularly at habitat edges/transitional zones. Additionally, increased vehicular and site personnel traffic may cause direct disturbance to any basking reptiles.

With eight individual records of adder and 3 records of common lizard recorded during the protected mammals and ornithological visits, the potential for protected reptiles on the Site is high and it is expected that a Species Protection Plan (SPP) for reptiles will be a requirement for the proposed works. This will detail mitigation measures and opportunities for habitat enhancement to maintain and increase reptile diversity on the site.

[14] Collins. J (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.

Figures

Figure 8.3.1 Site and Survey Boundaries

Figure 8.3.2 Protected Species Evidence

Figure 8.3.3 Bat Roost Potential

Figure 8.3.4 Habitat Suitability Index

Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

SLR Project No.: 405.064862.00001

26 October 2023

350000
352000
354000
356000
358000

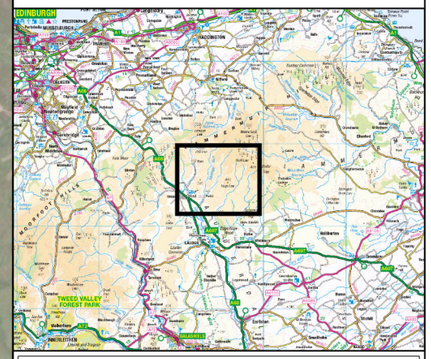
658000
656000
654000

405.064862.00001.0011.0 Site Location and Survey Area

N

LEGEND

- Site Boundary
- Site Boundary 50 m Buffer
- Site Boundary 100 m Buffer
- Site Boundary 250 m Buffer
- Proposed Turbine Location
- Watercourse



0 1 2

Kilometres

Maxar, Microsoft

res

SLR

LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

SITE AND SURVEY BOUNDARIES

FIGURE 8.3.1

Scale 1:30,000 @ A3

Date OCTOBER 2023

Aerial Imagery (2022): Esri, Maxar, Earthstar Geographics and the GIS Community

350000 351000 352000 353000 354000 355000 356000 357000 358000 359000

660000 659000 658000 657000 656000 655000 54000

405.064862.00001.0012.0 Protected Mammal Survey

N

TN 8 TN 13 TN 17 TN 9 TN 14 TN 15 TN 10 TN 18 TN 11 TN 16 TN 12 TN 20 TN 19

0 1 2

Kilometres

LEGEND

- Site Boundary
- Site Boundary 250 m Buffer
- Proposed Turbine Location
- Target Note
- Watercourse

Evidence of Otter

- Couch
- Non-Intact Spraint
- 30 m No Disturbance Area

LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

PROTECTED MAMMAL SURVEY

FIGURE 8.3.2a

Scale	Date
1:30,000 @ A3	OCTOBER 2023

Aerial Imagery (2022): Esri, Maxar, Earthstar Geographics and the GIS Community

352400 352600 352800 353000 353200 353400 353600 353800

656000 655800 655600 655400 655200

N

TN 12

TN 20

0 100 200

Metres

LEGEND

Site Boundary

Site Boundary 250 m Buffer

Proposed Turbine Location

Target Note

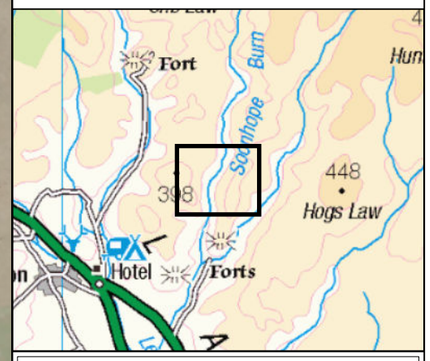
Watercourse

Evidence of Otter

Couch

Non-Intact Spraint

30 m No Disturbance Area



LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

PROTECTED MAMMAL SURVEY

FIGURE 8.3.2b

Scale 1:5,000 @ A3

Date OCTOBER 2023

405.064862.00001.0012.0 Protected Mammal Survey

352500
353000
353500
654000
653500
405.064862.00001.0040.0 Bat Roost Potential

N

24
25
43
44
45
46
26
27
48
47
50
49

0
100
200
Metres

LEGEND

Site Boundary

Access Track

Summer Roost Suitability

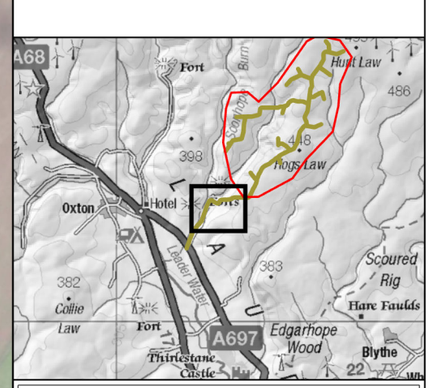
High

Moderate

Low

Negligible

Summer Bat Roost Suitability
30 m Buffer



power for good

SLR

LONGCROFT WIND FARM

PROTECTED MAMMAL SURVEY REPORT

BAT ROOST POTENTIAL

FIGURE 8.3.3

Scale 1:5,000 @ A3

Date OCTOBER 2023

350000 351000 352000 353000 354000 355000 356000 357000 358000 359000

660000 659000 658000 657000 656000 655000 654000

405.064862.00001.0015.0 Habitat Suitability Index

N

Soonhope Pond 1

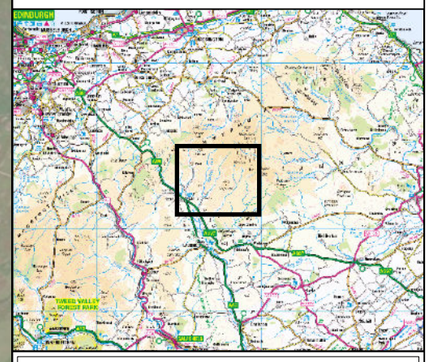
Bog Pond 1

0 0.5 1

Kilometres

LEGEND

- Site Boundary
- Site Boundary 500 m Buffer
- Proposed Turbine Location
- Pond with GCN Presence
- Potential GCN Colonising Distance (1 km)



res

SLR

LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

HABITAT SUITABILITY INDEX

FIGURE 8.3.4a

Scale	Date
1:30,000 @ A3	OCTOBER 2023

Aerial Imagery (2022): Esri, Maxar, Earthstar Geographics and the GIS Community

352000 353000 354000 355000

658000

657000

405.064862.00001.0015.0 Habitat Suitability Index

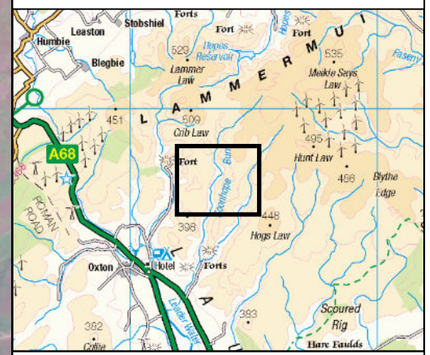
N

Soonhope
Pond 1

0 250 500
Metres

LEGEND

- Site Boundary
- Site Boundary 500 m Buffer
- Proposed Turbine Location
- Pond with GCN Presence
- Potential GCN Colonising Distance (1 km)



LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

HABITAT SUITABILITY INDEX

FIGURE 8.3.4b

Scale 1:10,000 @ A3

Date OCTOBER 2023

355000

356000

357000

657000

656000

405.064862.00001.0015.0 Habitat Suitability Index

Bog Pond 1

N

LEGEND

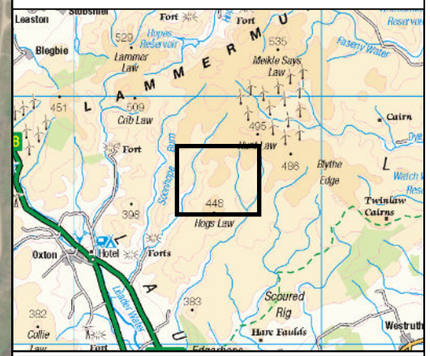
Site Boundary

Site Boundary 500 m Buffer

Proposed Turbine Location

Pond with GCN Presence

Potential GCN Colonising Distance (1 km)



0 250 500

Metres

res

SLR

LONGCROFT WIND FARM

LONGCROFT ECOLOGY SURVEYS

HABITAT SUITABILITY INDEX

FIGURE 8.3.4c

Scale 1:10,000 @ A3

Date OCTOBER 2023

Appendix 01 Relevant Legislation

Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

SLR Project No.: 405.064862.00001

26 October 2023

Relevant Legislation

Otter

Full consideration has been given to the relevant nature conservation legislation when carrying out this assessment. This includes the following:

Otter is a European Protected Species (EPS), protected under the Conservation (Natural Habitats, &c.) Regulations 1994. As such, in Scotland it is an offence to deliberately or recklessly:

- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb an otter in a den or any other structure or place it uses for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to a den or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of one) obtained after 10 June 1994.

It should be noted that otter shelters are legally protected at all times, whether an otter is present or not.

Otter is also included on the Scottish Biodiversity List (SBL), where it is listed for avoidance of negative impacts (The Scottish Government, 2013).

Water Vole

Water vole receives partial protection through its listing on Schedule 5 of The Wildlife and Countryside Act 1981 (as amended). In Scotland, this legal protection is currently restricted only to the water vole places of shelter or protection; it does not extend to the animal itself. It is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection; or
- Disturb a water vole while it is using any such place of shelter or protection.

Water vole is a Priority Species on the Scottish Biodiversity List (SBL) (Scottish Government, 2013), where it is listed for both conservation action and for avoidance of negative impacts. This species has suffered significant declines in recent decades, mainly due to habitat loss and degradation, population fragmentation and predation by American mink (*Mustela vison*).

Badger

Both badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended in Scotland). Under this legislation it is an offence to:

- Kill, injure, take, possess or cruelly ill-treat a badger;
- Interfere with a sett by damaging or destroying it;
- Obstruct access to, or any entrance of, a badger sett;
- Disturb a badger whilst it is occupying a sett;
- Allow a dog to enter a sett;
- Possess, sell or offer for sale a live badger; or
- Be in possession or control of a dead badger or anything derived from a dead badger.

Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)

Under the conservation (Natural Habitats, &c.) Regulations 1994 (The Habitats Regulations) (as amended in Scotland) it is an offence to deliberately capture, kill or disturb wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). Otter, wildcat and all bat species are listed under Schedule 2 of the Habitat Regulations.

The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2019

These Regulations amend the Conservation (Natural Habitats, &c.) Regulations 1994, which make provision for the transposition of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

Wildlife and Countryside Act 1981 (as amended)

Under the Wildlife and Countryside Act 1981 (as amended in Scotland) it is an offence to intentionally or recklessly:

- Kill, injure or take and wild animal listed under Schedule 5 to the Act;
- Damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; and
- Disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection.

Otter, water vole, pine marten, red squirrel, wildcat and all bat species are listed under Schedule 5 of the Act.

Water voles receive partial protection of their places of shelter only; this has long since been expected to change with water vole receiving full protection in future to align with their steep populations declines and increasing risk of extinction on mainland Great Britain.

Nature Conservation (Scotland) Act 2004 (as amended)

The Nature Conservation (Scotland) Act 2004 places duties on public bodies in relation to the conservation of biodiversity, increases protection of Sites of Special Scientific Interest (SSSI), amends legislation on Nature Conservation Orders, provides for Land Management Orders for SSSIs and associated land and strengthens wildlife enforcement legislation, among other requirements. It also amends the legislation for protected species, introducing

new conditions to the 'incidental results of a lawful operation' defence for all wild birds and certain species of animal and plant.

The Act places a duty on every public body to further the conservation of biodiversity consistent with the proper exercise of their functions.

It also requires Scottish Ministers to designate one or more strategies for the conservation of biodiversity as the Scottish Biodiversity Strategy, and to publish lists of species of flora, fauna and habitats of principal importance. The lists of species of flora and fauna and habitats of principal importance in Scotland is known as the Scottish Biodiversity List (SBL)[15].

The Wildlife and Natural Environment (Scotland) Act 2011 (as amended)

The Wildlife and Natural Environment (WANE) (Scotland) Act 2011 (as amended) makes changes to existing legislation covering specific wild fauna (e.g., birds, rabbits, hare etc), deer management, game management/licensing, species licensing, snaring, protection of badgers, muirburn, invasive non-native species, protected areas and enforcement/liability in relation to certain offences. In relation to bats, the WANE Act:

- Introduces the offence of 'knowingly causing or permitting' certain 'acts' within Sections 6, 7 and 15A as 'offences' under the W&C Act 1981;
- Permits derogation of disturbance and/or destruction of bat roosts by the appropriate authority for development purposes, subject to specific requirements of licensing; and furthermore
- Wildlife crime now requires to be documented in an annual report, as a result of Section 20 of the WANE Act, which inserted a new Section 26B into the W&C Act 1981. It prescribes that Ministers must lay a report every calendar year on offences which relate to wildlife, to include information on incidences and prosecutions during the year and on research and advice relevant to those offences.

Protection of Badgers Act 1992 (as amended)

The Protection of Badgers Act 1992 (as amended in Scotland) makes it illegal to kill, injure or take a badger or to interfere with a badger sett intentionally or recklessly (i.e., damage/destroy a sett). Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020

The Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020 increases the maximum available sentences in relation to a range of offences concerning animal health and welfare and wildlife; provides regulatory powers for the issuing of fixed penalty notices; and provides authorised persons with new powers regarding animals taken into their possession.

Note that the Scottish Government has passed legislation to maintain the same levels of legal protections of wildlife in Scotland post EU-exit[16].

[15] Scottish Biodiversity List (updated 2020) Available online: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list

16 NatureScot (2020). *EU Exit (Brexit) information.* Available online: https://www.nature.scot/eu-exit-brexit-information

Appendix 02 Target Note Tables

Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

SLR Project No.: 405.064862.00001

26 October 2023

Table A2-1 Protected Mammal Survey Target Notes

Target Note Number	Grid Reference	Species	Location	Detail/Description	Photograph
1	NT 53426 57796	Otter	Soonhope Burn	One desiccated semi-dry otter spraint found on tussock on top of rocks within the northern section of the Soonhope Burn within 20m of a bridge drain. No other evidence of otter was found in this area	
2	NT 53297 55910	Otter	Soonhope Burn	One broken but fresh spraint found on tussock on top of rock within mid-section of the Soonhope Burn. No additional evidence found in this location.	

Target Note Number	Grid Reference	Species	Location	Detail/Description	Photograph
3	NT 52967 55229	Otter	Soonhope Burn	Otter couch on rocky bank of southern section of Soonhope Burn. One desiccated, dry spraint located within entrance. No other evidence of otter was found in this area.	

Table A2-2 Incidental Records

Target Note Number	Grid Reference	Species	Location	Detail/Description	Photograph
4	NT 56441 54582	European adder (*Vipera berus)*	Eastern access track	One male adder c.50cm long was recorded crossing the access track between the sections of heather.	

Target Note Number	Grid Reference	Species	Location	Detail/Description	Photograph
5	NT 53742 57503	Barn owl (*Tyto alba)*	West of farm buildings	One barn owl box was recorded as attached to a Scots pine *Pinus sylvestris* within 30m of a repurposed stable. No evidence of barn owl using the box was recorded including feathers or pellets. Box was slightly degraded but still in a state that could be used.	
6	NT 54407 55824	Stoat	Soonhope Burn, Whaplaw Burn, Jock's Burn	Traps for stoat *Mustela erminea* were observed throughout the site, typically placed on beams crossing watercourses and along linear features. The measure of mink control has been introduced by the estate and not NatureScot.	
7	NT 53754 54959	Rabbit	Coniferous plantation woodland	Rabbit burrows were frequently recorded throughout the site, with the largest warrens seen within the areas of conifer plantation with a gradient of >20%. The woodland west of the Fern Cleugh drain was found to have the greatest number of burrows in on habitat.	

Table A2-3 Protected Mammal Habitat

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
8	NT 53427 57795	Soonhope Burn	At the point Soonhope Burn enters the northern section of the Site, bankside habitat is primarily grassland with occasional patches of common rush *Juncus effusus* along a bankside gradient of 10 – 30%. A rocky water channel indicates that that bordering substrate is earth and rock with no loam observed at this point of the watercourse. Features that could be used for shelter including overhanging banks, tree root systems and large boulders are absent along this section. Water flow speed is 0.8m/s and channel depth varies from 5cm to 30cm at the widest parts. Evidence of otter using the watercourse for commuting was found along this section but no evidence of using it for long-term residence was observed.	
9	NT 53750 57417	Howe Cleugh watercourse	Soonhope burn is fed by multiple valley drains from the upland sections of the site with this example shown of Howe Cleugh, forming between Waddels Cain and Saddler Rig to the east side of Soonhope Burn. At the time of survey Howe Cleugh was <50cm wide and <10cm deep and there was no evidence of it being used by protected species for habitation commuting or foraging. The abundant bankside vegetation is neutral grassland with mixed common mosses including Common haircap *Polytrichum commune* and Springy turf moss *Rhytidiadelphus squarrosus*. The drain had limited cover within the valley basin with moderate cover provided by bracken at the upper sections of the	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
			drain. However, it was deemed of poor value to riparian mammals.	
10	NT 53340 56664	Riddle Law drain	One drain from the Riddle Law upland summit as an example of the bordering vegetation of common reed, bracken and heather. The watercourse is shallow with a depth of <10cm and width between 20cm and 50cm at the widest part. The drain is considered to provide poor ecological value for protected species habitation due to the water depth and exposure, with no evidence of protected species using it.	
11	NT 53355 56604	Soonhope Burn	The Soonhope Burn southern section was found to have banksides comprising of rock and sediment more frequently compared to the northern section. The earth and vegetated banksides were also more degraded, leaving overhangs and providing habitat for burrows, and use by rabbit was recorded. The habitat at the southern end of the watercourse was considered to provide moderate shelter for otter to use as short-term lay-ups but there was no evidence of long-term use at the time of survey as typical places for otter shelter such as tree roots, boulders and rock piles were absent.	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
12	NT 53871 56036	Soonhope Burn unnamed drain east	Mapped drains to the Soonhope burn running west from the summit of Riddle Law were frequently dry during survey, with evidence that channel flow occurs only during periods of heavy rainfall. Heather is the dominant vegetation type along these drains of dwarf shrub heath and the channel is acid grassland indicator species. No evidence of current or historical use by protected species was found along the semi-dry drains within the Site.	
13	NT 54885 57855	Whaplaw Burn	Whaplaw Burn flows along the valley between the upland points of Riddle Law to the west and Wedder Law and Hogs Law to the East and is fed by Longhope Burn to the north. Whaplaw Burn northern sections provided poor ecological value to otter due to the lack of habitat features that could be used for shelter, as the dominant habitat was common reed and moss with patches of heather. No evidence of fish was found at this distance from the Cleekhimin Burn to which it flows, reducing the foraging potential. The northern section of the Whaplaw Burn is also considered to provide poor ecological value to water vole due to the limited bankside gradient for burrow creation and cover from predation and unsuitable foraging habitat, with a low abundance of grass species. The width of Whaplaw Burn ranged from 0.5m to 1.5m at the northern section of the site with an average flow speed of 0.5m/s. The channel depth averaged 20cm and the channel substrate was earth and pebble with infrequent patches of loam along the bankside.	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
14	NT 54822 57061	Whaplaw Burn	Sections of Whaplaw Burn were recorded as inaccessible due to the slope gradient on the eastern bank so had to be assessed from the western bank only. Individual trees were recorded on these sections that improve the stability of the sloping bank but were typically juvenile/immature so there was no suitable exposed root system that could be used for shelter by otter.	
15	NT 54887 56935	Whaplaw Burn	Southern sections of Whaplaw burn had low bankside gradient and the vegetation of the eastern bank showed evidence of dominant bracken *Pteridium aquilinum* and limited opportunity for shelter for otter. Similarly, the west bank of Whaplaw burn had low bankside gradient and abundant mosses and rush with a ground flora including cock's foot grass *Dactylis glomerata,* Yorkshire fog *Holocus lanatus* and creeping bent *Agrostis stolonifera.*	 

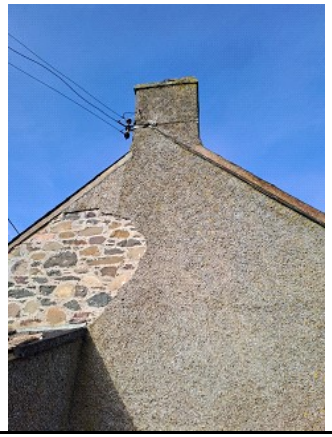
Target Note Number	Grid Reference	Location	Detail/Description	Photograph
16	NT 56530 56389	Jock's Burn south	Jock's Burn is the most easterly watercourse within the Site and originates from drains flowing south from Hunt Law and North Hart Law to the north and Wedder Law to the west. The gradient of the channel provides a fast current of 0.8m/s – 1m/s and the bankside vegetation were noted to be consistent throughout the survey section. The bankside was not recorded to have features that could be used by otter for shelter, including overhanging banks, tree root systems or rock piles. Habitat was also noted to be of low ecological value to water vole due to the lack of suitable vegetation cover and bankside gradient above the water table for burrow creation.	
17	NT 56454 58157	Jock's Burn northern section	The northern section of Jock's burn originating from North Hart Law is a minor field drain covered by overhanging common reed, deergrass *Trichophorum cespitosum* and heather. The channel width is c.20cm and depth of c.5cm with a slow flow rate of 0.3m/s. One hen harrier *Circus cyaneus* was flushed from the vegetation along the narrow drain but no evidence of protected or otherwise notable mammals were recorded at this section of the watercourse.	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
18	NT 54260 56675	Riddle Law, eastern aspect	Upland habitat for turbine placement is a mosaic of heather and acid grassland with sections of soft rush that were indicative of boggier ground and along drainage channels. The habitat is of low ecological value to protected mammals such as badger, with no evidence of commuting, foraging and sett building around any of the proposed turbine locations. The upland habitat is of high ecological value to rodents including field vole *Microtus agrestis*, bank vole *Myodes glareolus* and shrews *Sorex araneus* that would use the heather and unmanaged grassland for cover when moving around the site. Therefore, the upland habitats are high ecological value for birds of prey including barn owl. The large population of managed game birds on this habitat including pheasant *Phasianus colchicus*, partridge *Perdix perdix* and red grouse *Lagopus lagopus scotica* can influence the presence of birds of prey within the area including hen harrier.	
19	NT 54213 55381	Woodland north of Ferny Cleugh drain	Section of conifer plantation at northeastern base of Longcroft Hill, adjacent to Whaplaw Burn c.1 hectare (ha). No evidence of protected species using the woodland was found at the time of survey. Surrounding habitat is currently used for grazing consisting of neutral grassland. Fencing encompasses all plantation woodland within the site and there is evidence of damage to fencing by small mammals digging underneath but no damage was recorded by larger mammals such as badger.	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
20	NT 53872 55872		Mixed plantation found at the summit between Riddle Law to the north and Longcroft Hill to the south measuring 2.6ha. Woodland is used by land management to raise birds for shooting on the estate and is made up of immature Sitka spruce *Picea sitchensis*, Scots pine and goat willow *Salix caprea.* Evidence of wildlife using the woodland include roe deer *Capreolus capreolus* and rabbit *Oryctolagus cuniculus.* No evidence of protected mammals was found within the woodland	
21	NT 53390 53810		Plantation woodland	n/a
22	NT 52427 52810		Plantation woodland	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
23	NT 52363 52887		This 6370m^2 pond alongside Soonhope Burn could not be accessed for a HSI assessment. There was limited observable marginal vegetation and no duckweed or algae covering the water surface. Mature trees shaded the eastern edge of the pond, and mature trees on an island in the centre of the pond also contribute to shade levels. Waterfowl were observed on the pond. Local residents reported high levels of newts on the access track after periods of heavy rainfall, but is it unknown if these are great crested newt.	
24	NT 52975 53774		Structure A – details in Appendix 4. Swallow/house martin nests under eaves.	 

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
25	NT 53017 53727		Structure B – details in Appendix 4. Swallow/house martin nests under eaves.	 

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
				
26	NT 52826 53526		Structure C – details in Appendix 4. Suitable for nesting small birds or resting barn owl.	

Target Note Number	Grid Reference	Location	Detail/Description	Photograph
27	NT 52814 53493		Structure D – details in Appendix 4. Suitable for nesting small birds or resting barn owl.	
28	NT 52514 52857		Bird nest recorded in a plantation woodland. Species was unknown but is likely pigeon.	
29	NT 52094 52339		Kingfisher sighting over Soonhope Burn	n/a
30	NT 52856 53699		Two large log piles, made up of felled timber, which could be used as hibernacula by reptiles, amphibians and hedgehogs.	n/a

Table A2-4 Unmapped Incidental Records

Target Note Number	Grid Reference	Date	Species	Description
31	NT 55596 58438	24/04/2022	Adder	
32	NT 56625 57832	25/04/2022	Common lizard	Two common lizards observed basking on tussock
33	NT 56515 56503	26/04/2022	European hare	NT 56515 56503
34	NT 56317 56543	26/04/2023	Adder	
35	NT 55458 57572	26/04/2023	Adder	
36	NT 54270 56748	09/05/2022	Common lizard	
37	NT 53748 57440	09/05/2022	Common lizard	
38	NT 54773 56215	09/05/2022	Violet oil beetle *Meloe violaceus*	 In grass adjacent to watercourse. SBL species for which there is a UK recording scheme: https://www.coleoptera.org.uk/meloidae/home

Target Note Number	Grid Reference	Date	Species	Description
39	NT 55190 54525	11/05/2022	Adder	 Snake skin found
40	NT 569 584	26/04/2022	Adder	
41	NT 570 583	26/04/2022	Adder	
42	NT 568 580	26/04/2022	Adder	

Appendix 03 Pond Habitat Suitability Index

Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

SLR Project No.: 405.064862.00001

26 October 2023

Table A3-1 Habitat Suitability Index

Project No.		Pond Number	P1	P2
Project Name	Longcroft Wind Farm	Pond Name	Soonhope Pond	Bog Pond
		Pond Grid reference	NT 53573 57088	NT 55815 56621
		Pond shape (ellipse, rectangle, circle or irregular)	circle	irregular
Factor No.	Factor Name	Parameter		
1	Geographical location	from the map provided in arg guidance note	B	B
		SI value	**0.50**	**0.50**
2	Pond area	in meters squared	13	87
		SI value	**0.03**	**0.17**
3	Permanence	years dry in a decade	0	1
		SI value	**0.90**	**1.00**
4	water quality	bad, poor, moderate or good	Good	poor
		SI value	**1.00**	**0.33**
5	shade	% coverage	0	5
		SI value	**1.00**	**1.00**
6	waterfowl	absent minor major	minor	minor
		SI value	**0.67**	**0.67**

7	fish	likelihood of presence nil, possible, few, major	nil	nil
		SI value	**1.00**	**1.00**
8	pond count	number of ponds within 1 km	1	1
		SI value	**0.66**	**0.66**
9	Terrestrial habitat	good, mod, poor, none	mod	mod
		SI value	**0.67**	**0.67**
10	Macrophytes	% coverage	5	5
		SI value	**0.36**	**0.36**
		Habitat Suitability Index Score	**0.512604465**	**0.560747206**
		Habitat Suitability Index Score (to 2 decimal places)	**0.51**	**0.56**

Appendix 04 Bat Preliminary Roost Assessment

Longcroft Windfarm

Technical Appendix 8.3: Protected Mammal Survey Report

RES

SLR Project No.: 405.064862.00001

26 October 2023

Table A4-1 Structures surveyed for bat roost suitability

ID	Target Note	Features	Aspect	Summer roost Suitability	Description
Structure A	24	Multiple lifting/missing roof tiles.	North and south	High	**Exterior:** Single storey pebble-dashed semi-detached cottages. The tiled, gable roof had skylights and wooden soffits. There were four chimneys, with one looking noticeable newer than the others. **Interior:** Loft space was built separate from the timber roof beams in one enclosed section split between two rooms. Wooden slats making up the wall and roof in one of the rooms was degraded with clear gaps. Access to original attic could be reached via crawlspace. Gaps in slate roofing could be seen within crawlspace **House 1**  Layout of the loft space of house 1  Gaps in window fittings that may allow bats to enter and exit the loft

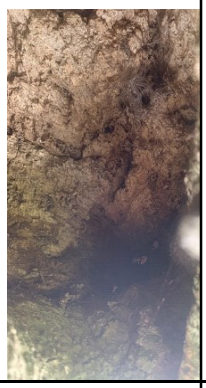
ID	Target Note	Features	Aspect	Summer roost Suitability	Description
					 Deep cavities in plaster at gable ends provides roosting potential within the stonework  Possible perch feeding remains of butterfly wing **House 2**  Crawlspace between roofing and converted attic wall created limited access to view the roofing apex  Bat dropping found on gable end wall

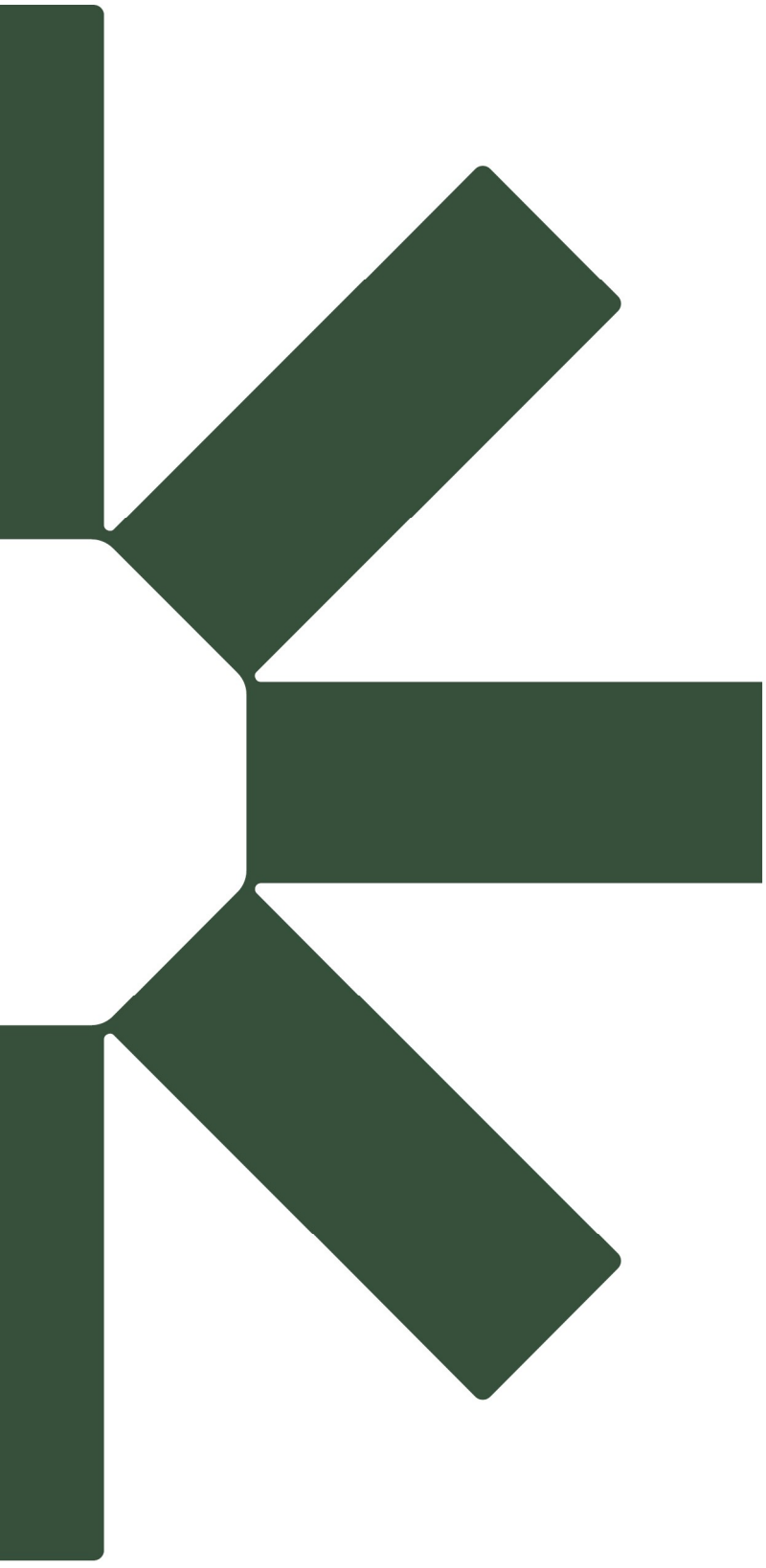
ID	Target Note	Features	Aspect	Summer roost Suitability	Description
Structure B	25	Multiple lifting/missing roof tiles. Gap between roof and guttering. Ivy on supporting wall south side. Gaps in the prefabricated attic conversion allow bats into the attic to fly around. No evidence of roosting within the attic present Bat droppings found within attic on walls and on floor. Bat droppings found on exterior windowpanes.	North and south	High	**Exterior:** Single storey pebble-dashed semi-detached cottages. The tiled, gable roof had skylights and wooden soffits. There were two chimneys. Dense ivy covered the south wall and some of the guttering. Gap of 1cm between guttering and wall. East gable end pebble dash cladding had fallen off and exposed brickwork underneath. **Interior:** Loft space accessible in both houses with limitations to access eaves due to roof drop. High numbers of bat droppings in patches within the loft of House 3 and two dead pipistrelle species found. Roof apex could be checked in both loft spaces **House 3**  Dense patch of bat droppings at northern side of loft  Dense patch of bat droppings and urine staining at southern side of loft

ID	Target Note	Features	Aspect	Summer roost Suitability	Description
					 Dead pipistrelle bats found in the loft space of house 3  Loft space of house 3 showing access to gable end but limited access at eaves. **House 4**  Loft space of house 4. Access limited at edges of roofing eaves but roof apex could be checked

ID	Target Note	Features	Aspect	Summer roost Suitability	Description
					 Patch of accumulated bat droppings on stack of insulation
Structure C	26	Slight gaps between the rafters and corrugated tin roof, but not leading to sheltered crevice.	All internal roof	Negligible	Single storey barn with half brick, half wooden slate walls. No internal or external wall or roof cladding. Corrugated tin roof supported by steel structural beams and wooden rafters. Barn entrances are half steel door, and half roller door, but largely very open. This structure was storing hay.
Structure D	27	Slight gaps between the rafters and corrugated tin roof, but not leading to sheltered crevice.	All internal roof	Negligible	Single storey barn with half brick, half wooden slate walls. No internal or external wall or roof cladding. Corrugated tin roof supported by steel structural beams and wooden rafters. Barn entrances are half steel door, and half roller door, and gate, but largely very open. This structure was storing grain.
Tree A	43			High	Large mature ash tree with deep cavities within trunk at 4-6m height and at 15-20m height. Due to recent high winds the tree has suffered significant limb loss and this may have affected the roosting potential. Old jackdaw nests were found in the limb features that had fallen and has left a nest within the tree exposed at east and west aspects. One unoccupied barn owl nest was found within the trunk feature and on further checks of the feature it is a cavity that extends vertically up into the tree at least 40cm, it is dry and

ID	Target Note	Features	Aspect	Summer roost Suitability	Description
		   			has space for multiple bats. The horizontal space of the same feature extends into the tree at least 1m and has vertical cracks extending out from it that individual bats could use as summer day roosts.

ID	Target Note	Features	Aspect	Summer roost Suitability	Description
					
Tree B	44			High	Large mature ash tree.
Tree C	45			High	Large mature ash tree.
Tree D	46	Tear out of branch, 15m up.	East	High	Large mature ash tree. 20m in height, DBH 80cm. Dense leaf cover and steep slope preventing detailed survey.
Tree E	47	Cavity (8cm wide) 4m up.	North	Low	Large mature beech tree. 17m in height, DBH 60cm.
Tree F	48	Tear out 2m up Tear out 5m up	East North	Moderate	Large mature beech tree. 16m in height, DBH 60cm.
Tree G	49	Cavity (8cm wide) in split trunk 1m up.	East	Low	Split ash tree. 11m in height.
Tree H	50	Cavity (8cm wide) 80cm up	South	Low	Hawthorn tree. 5m in height.



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