

Technical Appendix 7.2: Protected Terrestrial Mammals

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Technical Appendix 7.2: Protected Terrestrial Mammals

Introduction

Background

This Technical Appendix has been prepared to accompany **Chapter 7: Ecology** of the Appin Wind Farm (hereafter referred to as 'the Proposed Development') Environmental Impact Assessment (EIA) Report.

It presents detailed methodologies and results of desk studies and field surveys completed to establish baseline conditions with regards protected and notable terrestrial mammal species (excluding bats which are considered separately in **Technical Appendix 7.3**).

The objective of the baseline studies was to establish the presence and spatial distribution of protected terrestrial mammal species which may be impacted by the Proposed Development.

It should be read with reference to the following Figures, which are included within **Volume 2** of the EIA Report:

- **Figure 7.1:** Ecological Statutory Designated Sites;
- **Figures 7.3a:** Extended Phase 1 Habitat Survey Plan (the Site);
- **Figures 7.3b:** Extended Phase 1 Habitat Survey Plan (the Access Track);
- **Figures 7.5a:** Protected Terrestrial Mammal Survey Results; and
- **Figures 7.5b:** Protected Terrestrial Mammal Survey Results (2025 Update).

Only common species names are used throughout this Technical Appendix. Scientific names for all species referenced are supplied in **Annex 1**. For a description of the habitats present at the Site and along the access track, see **Technical Appendix 7.1** in **Volume 4** of the EIA Report.

Information pertaining to the locations of sensitive terrestrial mammal records, and which are considered confidential is provided in **Confidential Technical Appendix 7.5** in **Volume 5**.

The following confidential Figures are provided in **Volume 5** of the EIA Report:

Confidential Figure 7.6: Terrestrial Mammal Desk Study Records (Sensitive); and

Confidential Figure 7.7: Terrestrial Mammal Field Survey Results (Sensitive).

Such information will not be made publicly available but will be provided to the Energy Consents Unit (ECU), Dumfries and Galloway Council (DGC) and NatureScot.

Site Overview

The term 'Site' in this report refers to the land within the Site boundary as illustrated on **Figure 7.3a**. The 'access track' refers to the access route connected to the Site as illustrated on **Figure 7.3b**.

The Site lies at Appin 6.2 km north of Moniaive, in Dumfries and Galloway. The Site largely comprises commercial forestry plantation, with a number of minor watercourses present throughout the Site.

Methodology

Desk Study

The desk study has included a review of the following key sources summarised in **Table 1**.

Additional peer reviewed literature and industry guidance has also been reviewed and is referred to where relevant.

Table 1 – Desk study key sources and information sought

Key Source	Information Sought	Search Area
NatureScot Sitelink https://sitelink.nature.scot/home February 2025	Proximity to statutory designated sites with terrestrial mammal interests.	Within 10 km of the Site boundary (see Figure 7.1).
NatureScot's Open Data Geoportal https://opendata.nature.scot/datasets/biosphere-reserves/explore?location=57.631597%2C-4.815034%2C9.38 February 2025	Proximity to Biosphere Reserves, with terrestrial mammal interests.	Within 5 km of the Site.
South West Scotland Environmental Information Centre (SWSEIC) September 2021 and update in March 2025	Non-statutory designated sites for nature conservation with qualifying terrestrial mammal interests, and existing notable terrestrial mammal species records.	Within 2 km of the Site boundary, and within 1 km of the access track (see

Key Source	Information Sought	Search Area
		Confidential Figure 7.6)¹.
Saving Scotland's Red Squirrels website and Scottish Forestry website https://scottishsquirrels.org.uk/squirrel-sightings/ February 2025	Red squirrel records and priority areas.	Within the Site and access track, including adjacent habitats.
Scottish Forestry https://www.forestry.gov.scot/publications/21-map-of-red-squirrel-stronghold-areas February 2025	Red squirrel stronghold areas.	Within the Site and access track, including adjacent habitats.

Field Surveys

Detailed information regarding the presence or likely presence of protected and notable terrestrial mammal species within proximity to the Proposed Development has been derived through field survey targeted for the following species:

- red squirrel;
- water vole;
- otter;
- badger; and
- pine marten.

Note, given the Site is not close to a priority area for Scottish wildcat, the potential for the species to be present during surveys was discounted.

Terrestrial Mammal Study Area

The mammal Study Areas, as shown in **Figure 7.5**, comprised all accessible areas within the Site, extended to include areas of suitable habitats where accessible, out to the following distances in accordance with NatureScot species-specific guidance (NatureScot, 2024a-e):

- the Site plus 50 m buffer for red squirrel;
- the Site plus 50 m for water vole;
- the Site plus 100 m for badger;
- the Site plus 200 m for otter; and
- the Site plus 250 m for pine marten.

Evidence of protected terrestrial mammal species was also recorded within the Study Areas for the extended Phase 1 Habitat surveys (see **Technical Appendix 7.1**) which comprised the Site and access track (and survey buffer; 100 m from the Site and 20 m either side of the access track). Any records of protected terrestrial mammals made during the extended Phase 1 Habitat survey are included within this Technical Appendix, where applicable.

Terrestrial Mammal Survey Methods

The surveys comprised an assessment of habitat suitability for terrestrial mammals and a systematic search of habitat features within the mammal Study Areas. The location and distribution of field signs identifying the presence and/or potential presence of protected terrestrial mammal species were recorded, as summarised in **Table 2**. The survey methodology followed industry standard guidance: Chanin (2003), Cresswell *et al.* (2012), Dean *et al.* (2016), Harris *et al.* (1989), Littlewood *et al.* (2014) and NatureScot (2024a-e).

Table 2 – Terrestrial mammal field survey methodology summary

Species	Survey Methodology Summary
Red squirrel	Walkover search of suitable habitats for potential dreys and feeding remains.
Water vole	Walkover search of suitable habitats for potential burrows, runs, footprints, feeding stations and feeding remains, droppings and latrines.
Otter	Walkover search of suitable habitat for spraints, paw prints, paths, slides, food remains, holts and places used for breeding and/or shelter.
Badger	Walkover search of suitable habitat for signs of badgers, such as footprints, hair, snuffle holes, latrines and sett entrances.
Pine marten	Walkover search of suitable habitat for scats, paw prints, paths, food remains, and dens and places used for breeding and/or shelter.

¹ It should be noted that the Search Area was based on a previous iteration of the access route which deviated slightly from the final access route. However, given the extent of the Search Area it is considered that records from an appropriate area of relevance to the access route have been considered.

Survey Details

Protected terrestrial mammal surveys were carried out from 24th May to 26th May 2021 and 7th September 2021 and 8th September 2021.

In addition, an extended Phase 1 Habitat survey was carried out of the Site (and survey buffer; 100 m from the Site) on 30th July 2021 and 2nd and 3rd August 2021, where signs of terrestrial mammals were searched for. The Site was further subject to an updated habitat 'validation' survey on the 8th October 2024, where any evidence of protected terrestrial mammals was recorded. An extended Phase 1 Habitat survey was conducted at the access track (and 20 m survey buffer either side of the access track) on the 18th August 2022, and this included recording any evidence of protected terrestrial mammals.

An updated protected terrestrial mammal survey was carried out in 29th and 30th April 2025 to provide up to date information of evidence of protected terrestrial mammals on-site.

All surveys were undertaken in conditions conducive to the survey of terrestrial mammals, including normal flow conditions of watercourses within the Study Areas, and not undertaken immediately after periods of heavy rain.

Personnel

Field surveys were undertaken by P. Higginson (May 2021 mammal survey), M. Wood (September mammal survey and extended phase 1 surveys in July/August 2021 and August 2022) and J. Morton (validation survey in October 2024). All surveyors are highly experienced field ecologists with considerable experience in the survey and identification of field signs of protected mammal species in Scotland.

Limitations

Access was permitted to all parts of the Site and access track. Survey buffers within the Study Area were surveyed where accessible with any inaccessible areas surveyed from the Site and/or access track, and searching out into adjacent habitats. It should be noted that some areas of the access route (particularly the western extreme) were not surveyed due to a modest deviation between the access route surveyed and the orientation of the final route. Habitats along and adjacent to the access route are principally existing forestry track and commercial forestry and are considered unremarkable for potential to support protected species. As such, it is considered that the Study Areas were appropriately covered during surveys, with those habitats most likely to be affected robustly surveyed.

The locations of some badger latrines were not recorded within the Site during the July 2021 extended Phase 1 Habitat survey (see **Results** section). This is not considered a limitation to the assessment as it is considered that much of the Site is potentially suitable for badger.

Results

Desk Study

Statutory Designated Sites for Nature Conservation

This section should be read with reference to **Figure 7.1**.

The Site does not form part of any statutory designated site for nature conservation with qualifying protected mammal species interests, nor is it within 10 km of such a designated site.

Non-statutory Designated Sites for Nature Conservation

Consultation with SWSEIC indicated that the Site does not form part of any non-statutory designated site for nature conservation and no such sites are located within the Search Area.

A review of NatureScot's Open Data Geoportal identified that with the Site is within the Transitional Zone of the Galloway and Southern Ayrshire Biosphere Reserve, which is recognised as an internationally world class environment for people and nature. The Biosphere Reserve covers a large area (9,000 km²) of south-west Scotland's land and sea.

A review of the Saving Scotland's Red Squirrels website identifies the Site to be on the periphery of the Nith Valley Priority Areas for Red Squirrel Conservation (PARC). PARCs are landscapes where grey squirrel control networks are present, which aim to provide coordinated and sustained protection of the resident red squirrels. The Site also lies within a Scottish Forestry designated priority area for grey squirrel control, which itself spatially overlaps with the PARC.

Existing Protected and Notable Terrestrial Mammal Species Records

The consideration of existing records is also limited to those reported since (and including) 2010, to ensure that the most up to date (and thus relevant to the Proposed Development) records are considered.

Mammal species (excluding bats) returned from the Search Area comprised red squirrel (44 records between 2013 and 2020). There were 19 records of otter, but these were all historic and all greater than 30 years old. There were also three records of the invasive species grey squirrel (2013 to 2021).

The majority of red squirrel records were returned in woodland habitats bordering the southern Site boundary (i.e. Cairnhead).

Further details of records from the desk study are provided in **Confidential Technical Appendix 7.5**, with record locations depicted on **Confidential Figure 7.6**.

Review of the Saving Scotland's Red Squirrels website identified no records of red squirrel within the Site. However, records were returned in woodland habitats neighbouring the Site and access track in areas such as Shinnelhead, Polskeoch, Craigengillan and Auchrae.

Field Surveys

Terrestrial Mammal Survey

This section provides an overview of protected and notable terrestrial mammal observations recorded during surveys. Field survey results are shown in **Figure 7.5** and **Confidential Figure 7.7 for sensitive records**, with accompanying photographs provided in **Annex 2**.

Water Vole

No evidence of water vole was recorded within the Study Area, with watercourses in the Site largely considered to be unsuitable for the species. However, during the updated habitat validation survey in October 2024, a possible water vole burrow was identified within the Site beside a pool of still water associated with White Burn (grid reference: NX73088 98351; **Photograph 1**; see **Figure 7.5**). No conclusive evidence of water vole presence was identified at the burrow entrance; however, it was considered that the burrow had potential to belong to the species as feeding remains of rushes (bitten at a 45-degree angle) were identified adjacent. It is therefore considered possible for this to belong to water vole. It should be noted that the survey in April 2025 identified no evidence of usage of the burrow by water vole.

Otter

Watercourses within the Study Area were typically considered to provide highly suitable foraging and commuting opportunities for otter, with suitable habitat for holt creation also likely to be present within woodland and bankside habitats within and adjacent to the Site.

Otter presence was confirmed within and adjacent to the Site with live sightings, tracks and spraints recorded. Potential holts and resting places (locations confidential) were also recorded within the Site. A summary of otter records from the various field surveys is presented in **Table 3**.

Table 3: Terrestrial mammal (non-sensitive) survey results – Otter

Grid Reference	Description
NX 75621 97011	Live sighting of an adult otter (likely male) observed foraging near 'Old Auchenbrack' along Shinnel Water directly adjacent to the Site (May 2021 mammal survey).
NX 74578 97056	Large fresh otter spraint located on-site along a tributary stream that flows north into Appin Burn (May 2021 mammal survey).
NX 74433 97108	Old otter spraint. Located on-site along Magmalla Burn (May 2021 mammal survey).
NX 74432 97106	Fresh otter spraint on a tree stump, although could potentially also belong to mink. Located on-site along Magmalla Burn (May 2021 mammal survey).
NX 72749 97870	Old otter spraint located on-site along Appin Burn (May 2021 mammal survey).
NX 72407 97909	Old otter spraint located on-site along Appin Burn (May 2021 mammal survey).
NX 71747 98070	Old otter spraint located on-site along Appin Burn (May 2021 mammal survey).
NX 75023 96880	Old otter spraint located 90 m off-site along a tributary that flows into Appin Burn (May 2021 mammal survey).
NX 71215 98422	Otter spraint located on-site along Appin Burn (September 2021 mammal survey).
NX 72899 97806	Otter spraint located on-site along Appin Burn (September 2021 mammal survey).
NX 74111 97302	Otter spraint located on-site along Appin Burn (September 2021 mammal survey).
NX 74889 97883	Otter spraint located on-site along Shinnel Water (September 2021 mammal survey).
NX 74650 97348	A live sighting of a single juvenile otter walking along an on-site forest track. The track is approximately 200 m north of Appin Burn in the eastern section of the Site (July 2021 extended Phase 1 Habitat survey; Photograph 2).
NX 74335 98464	A probable otter entry point (i.e. slide) located on-site along the Shinnel Water watercourse (October 2024 updated habitat validation survey; Photograph 3).
NX 72803 97864	An old likely otter spraint located on-site on a prominent rock adjacent to Appin Burn (October 2024 updated habitat validation survey; Photograph 4).
NX 73828 97346	Otter tracks identified on-site, on exposed ground adjacent to Appin Burn watercourse. Considered to be reasonably fresh (October 2024 updated habitat validation survey; Photograph 5).
NX74485 97159	Spraint x 2 (old), updated April 2025 mammal survey.
NX74530 97164	Spraint x 2 (old), updated April 2025 mammal survey.
NX74431 97090	Spraint, multiple (old), updated April 2025 mammal survey.
NX74202 96987	Spraint (old), updated April 2025 mammal survey.
NX74111 96873	Spraint (old), updated April 2025 mammal survey.
NX73864 96741	Spraint, updated April 2025 mammal survey.
NX73787 96744	Spraint (old), updated April 2025 mammal survey.
NX73701 96748	Spraint (old), updated April 2025 mammal survey.

Grid Reference	Description
NX73636 96760	Spraint (old), updated April 2025 mammal survey.
NX73544 96791	Spraint, multiple (old), updated April 2025 mammal survey.
NX73520 96810	Spraint (old), updated April 2025 mammal survey.
NX73450 96811	Spraint (old), updated April 2025 mammal survey.
NX73131 96876	Spraint x 2 (old), updated April 2025 mammal survey.
NX73991 97318	Otter prints and tail marks, updated April 2025 mammal survey.
NX73364 97522	Possible otter feeding remains (skinned toad), updated April 2025 mammal survey.
NX73371 97508	Spraint (fresh), updated April 2025 mammal survey.
NX72925 97744	Spraint x 3, updated April 2025 mammal survey.
NX72838 97834	Spraint (multiple), updated April 2025 mammal survey.
NX72761 97870	Spraint (old), updated April 2025 mammal survey.
NX72650 97865	Spraint (old), updated April 2025 mammal survey.
NX72404 97904	Spraint (old), updated April 2025 mammal survey.
NX72253 97923	Spraint (old), updated April 2025 mammal survey.
NX72054 97972	Spraint (old), updated April 2025 mammal survey.
NX71965 97996	Spraint, multiple (old), updated April 2025 mammal survey.
NX71532 98127	Spraint, multiple (old), updated April 2025 mammal survey.
NX71395 98286	Spraint (old), updated April 2025 mammal survey.
NX71296 98361	Spraint (old), updated April 2025 mammal survey.
NX71150 98479	Spraint (old), updated April 2025 mammal survey.
NX74243 96529	Spraint, updated April 2025 mammal survey.

Appin Burn, Shinnel Water, Dalwhat Burn were considered to be suitable for supporting foraging and commuting otters, with adjacent woodlands and banksides considered to offer potential for resting places and holt sites. Forestry tracks within the Site were also appraised as likely otter commuting routes.

Badger

No badger setts were located during the various field surveys, however latrines and snuffle activity (i.e. foraging signs) were recorded within the Site during the updated habitat validation survey in October 2024. Latrines were also recorded within the Site during the July 2021 extended Phase 1 Habitat survey, however the specific locations of these were not recorded.

Habitats within the Site, and directly adjacent are considered suitable for badger. Suitable habitats include woodlands, watercourse banksides, moorland and farmland, as such habitats provide opportunities for foraging, commuting and sett creation. See **Table 4** for survey results related to badger.

Table 4: Terrestrial mammal (non-sensitive) survey results – Badger.

Grid Reference	Description
NX 73309 98446	A possible badger latrine located along an on-site woodland track. The fresh latrine contained seeds and some fur. An unusual red colour indicating a diet of berries (October 2024 updated habitat validation survey; Photograph 6).
NX 73002 98427	An area of badger snuffle activity located on-site within an area of clear-felled woodland (October 2024 updated habitat validation survey; Photograph 7).

Pine Marten

A possible pine marten scat was recorded by a rowan tree situated along an on-site plantation access track during the September 2021 mammal survey (grid reference: NX 74591 97610).

Woodlands within and adjacent to the Site are considered to be suitable habitats for foraging, commuting, resting and breeding pine marten

No evidence of pine marten during the April 2025 mammal survey.

Red Squirrel

No evidence or sightings of red squirrel was found during any survey within the Study Area; however, habitats were considered suitable for the species.

Other Mammals

Given the Site is not close to a priority area for Scottish wildcat, the potential for the species to be present during surveys was discounted and no evidence of the species was found.

No evidence or sightings of mountain hare were recorded within the Study Area; however, habitats present were considered potential suitable to support the species.

Additional signs of mammal species were recorded on-site during the various surveys. This included roe deer, fox, field vole, hedgehog and brown hare.

No evidence of any other protected and/or notable terrestrial mammal species was recorded during surveys.

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Annex 1 – Scientific Names


Table A1-1 provides common and scientific names of terrestrial mammal species included in this Technical Appendix, and within **Chapter 7: Ecology**.

Table A1-1 – Terrstrial Mammal Names

Common Name	Scientific Name
Badger	<i>Meles meles</i>
Brown hare	<i>Lepus europaeus</i>
Field vole	<i>Microtus agrestis</i>
Fox	<i>Vulpes vulpes</i>
Grey squirrel	<i>Sciurus carolinensis</i>
Hedgehog	<i>Erinaceus europaeus</i>
Mountain hare	<i>Lepus timidus</i>
Otter	<i>Lutra lutra</i>
Pine marten	<i>Martes martes</i>
Red squirrel	<i>Sciurus vulgaris</i>
Roe deer	<i>Capreolus capreolus</i>
Water vole	<i>Arvicola amphibius</i>
Wildcat	<i>Felis silvestris</i>

Annex 2 – Photographs

Table A2-1 - Photographs of protected and notable terrestrial mammal records recorded during field survey

	
<p>Photograph 1: A possible water vole burrow identified within the Site beside a pool of still water associated with White Burn (October 2024 updated habitat validation survey).</p>	<p>Photograph 2: A live sighting of a single juvenile otter walking along an on-site forest track. The track is approximately 200 m north of Appin Burn in the eastern section of the Site (July 2021 extended Phase 1 Habitat survey).</p>
	
<p>Photograph 3: A probable otter entry point (i.e. slide) located on-site along the Shinnel Water watercourse (October 2024 extended Phase 1 Habitat survey).</p>	<p>Photograph 4: An old likely otter spraint located on-site on a prominent rock adjacent to Appin Burn (October 2024 updated habitat validation survey).</p>



Photograph 5: Otter tracks identified on-site on exposed ground adjacent to Appin Burn. Considered to be reasonably fresh (October 2024 updated habitat validation survey).



Photograph 6: A possible badger latrine located along an on-site woodland track. The fresh latrine contained seeds and some fur. An unusual red colour indicating a diet of berries (October 2024 updated habitat validation survey).



Photograph 7: An area of badger snuffle activity located on-site within an area of clear-felled woodland (October 2024 updated habitat validation survey).



Photograph 8: Otter prints and tail marks in dry sand by watercourse.