Technical Appendix 7.1

Desk Data, Arboreal and Riparian Mammals Report

SCOTTISHPOWER RENEWABLES

Table of contents

List of Figures

1 Introduction

1.1 Project Background

1. This appendix presents information relevant to the Harestanes South Windfarm Extension (hereafter the 'Proposed Development'). It should be read in conjunction with the Environmental Impact Assessment (EIA) Report for full details of the Proposed Development.

2. The 'Site' earmarked for the Proposed Development is located at Forest of Ae; encompassed by the Application Boundary as shown in **EIA Report Figure 1.2: Application Boundary**.

1.2 Ecological Background

3. No previous ecological surveys have been undertaken in relation the Proposed Development.

4. Prior to the protected species surveys a desk-based assessment was completed in the form of the Scoping Report (WSP, 2020). The Scoping report **Scoped In** the following sensitive receptors as relevant to the Site: habitats including bog and Ground Water Dependent Terrestrial Ecosystems (GWDTE) (the latter are fully addressed within EIA Report **Chapter 6: Hydrology, Hydrogeology, Geology and Soils**), otter *Lutra lutra*, water vole *Arvicola amphibius*, red squirrel *Sciurus vulgaris*, pine marten *Martes martes*, badger *Meles meles*, bats, fish, reptiles and amphibians. Surveys for ecological receptors which were **Scoped Out** based on prevailing habitats and geographical location include freshwater invertebrates (including freshwater pearl mussel *Margaritifera margaritifera*), great crested newts *Triturus cristatus* and terrestrial invertebrates.

5. Surrounding the Site there are three existing windfarms which are the operational Harestanes Windfarm (Scottish Power, 2004a and Scottish Power, 2004b), Minnygap Windfarm (Renewable Energy System (RES), 2009) and Dalswinton Windfarm (Airtricity Developments, 2003).

6. The operational Harestanes Windfarm is located directly north and contiguous with the Site within the Forest of Ae and was constructed in 2014. The Environmental Statement (ES) for the operational Harestanes Windfarm was produced in 2004 following surveys completed within 2002 and 2003 (Scottish Power, 2004a and Scottish Power, 2004b).

7. The ES surveys found no definitive evidence of water vole, with field vole *Microtus agrestis* common in the area. However, it was assumed that water vole was present on the very western periphery of the windfarm site. Otter spraint was found in the valleys of the Water of Ae, Capel Water and Glenkiln Burn. Red squirrel surveys concluded a very high level of presence of red squirrel in suitable habitat at Forest of Ae, mainly in the north and south. However large areas of young Sitka spruce in the middle of the Site were found to be too young and unlikely to support red squirrels. Pine marten was found to be likely present in low numbers in the Forest of Ae, with no evidence found during surveys but a few historic records were present.

8. The ES surveys for Minnygap Windfarm found limited evidence of otter in the form of spraints recorded during the surveys. No evidence of red squirrel, badger, water vole or great crested newts recorded during the field surveys but suitable habitat was present for these species. Red squirrel was considered to be present on the forests bordering the Minnygap site including the Forest of Ae.

9. The ES surveys for Dalswinton Windfarm found foraging and sprainting activity by otters. No other evidence of protected species was recorded in the Dalswinton Windfarm site and the forest was considered too immature to support red squirrel.

[1] For the purpose of this report protected species are those legally protected by legislation while notable species includes species of interest such as those listed on the Scottish Biodiversity List (SBL), Local Biodiversity Action Plan (LBAP) or invasive and non-native species.

1.3 Scope of Report

10. This appendix presents the following information:

- designated sites and protected or notable species[1] desk study records;
- habitat suitability assessment for arboreal and riparian mammals; and
- dedicated arboreal and riparian mammal survey methods and results.

11. This report does not include ornithological, bat, badger, fish or habitat survey results which are all contained within separate appendices.

12. The relevant legislation in relation to protected species relevant to the Site and Proposed Development is outlined within **Appendix A**.

2 Methods

2.1 Desk Study

13. A desk study was undertaken in April 2020 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. Freely downloadable datasets (available from NatureScot) were consulted for information regarding the presence of statutory and non-statutory designated sites and ancient woodland within 2km of the Initial Site Feasibility Study Area as illustrated in **Figure 7.1.1 Protected and Notable Species Desk Study Records (Excluding Squirrel Species)**. This search was extended to 10km for Natura 2000 sites (Special Areas of Conservation (SAC) and internationally designated Ramsar Sites; the purely ornithological desigation of Special Protection Area (SPA) is not included in this report.

14. For the purpose of the desk study exercise, protected species and notable species records were collated up to a distance of 5km from the Initial Site Feasibility Study Area. The protected species and notable species records focussed mainly on arboreal and riparian manmmal records, however additional species records for amphibians, reptiles, hares and European hedgehog *Erinaceus europaeus* were also received and have also been presented in this report.

15. This approach is consistent with current good practice guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2017). The desk study records are shown in **Figure 7.1.1 Protected and Notable Species Desk Study Records (Excluding Squirrel Species)** and **Figure 7.1.2 Red Squirrel and Grey Squirrel Desk Study Records**[2].

16. Information on the location of statutory and non-statutory designated sites, ancient woodland protected species records was provided by the South West Scotland Environmental Information Centre (SWSEIC) and Forestry and Land Scotland (FLS). SWSEIC also provided records from Scotland Transerv, iRecord, Glasgow Museum Biological Record Centre (GMBRC), British Trust for Ornithology (BTO) and Scottish Wildlife Trust (SWT): The Scottish Squirrel Database.

2.2 Field Surveys

2.2.1 Survey Areas

17. Prior to the dedicated protected species surveys, a protected species walkover was undertaken to highlight areas of habitat suitability for each species (hereafter referred to as the 'Habitat Suitability Assessment'). This was completed in tandem with Phase Peat Probing so only covered the points that required Phase 1 Peat Probing (refer

[2] These two figures are separated for presentational purposed and to allow easy interpretation, owing to the large number of squirrel records.

to **Chapter 6: Hydrology, Hydrogeology, Geology and Soils** for further detail on these locations) which covered key areas within the Initial Site Feasibility Study Area shown on **Figure 7.1.3: Ecology Survey Areas.**

18. The Survey Areas for dedicated arboreal and riparian mammals are shown on **Figure 7.1.3: Ecology Survey Areas;** named the 'Arboreal Mammal Survey Area' and 'Riparian Mammal Survey Area' respectively**.** They were initially determined in response to the Preliminary Infrastructure Layout (described as Design Iteration C (V3) in **Chapter 3: Site Selection and Design**). The Survey Areas evolved in response to design iterations (after two design workshops), to ensure minimum survey areas, as defined by guidance documents cited in the following sections, were covered from the Final Design (described as Design Iteration F) in **Chapter 3: Site Selection and Design**). Hence, in the following sections, Survey Areas are presented as 'a minimum distance' from the Final Design rather than a maximum distance or a range of distances. The cable route refers to underground electrical cabling to the operational Harestanes Windfarm substation. The scale and location of the Proposed Developments are described in **Chapter 4: Development Description** and Surveys Areas around proposed infrastructure was as follows:

- Turbine locations (including locations of turbine foundations, crane hardstandings, and transformer / switchgear housings adjacent to turbines), borrow pit search areas, access tracks (new and existing which are proposed to be upgraded), permanent control building and temporary construction compound plus a minimum buffer of 100m where suitable habitat was present for notable and protected species; this was increased to a minimum 200m for riparian mammals and fish walkover surveys upstream and downstream of watercourse crossing points.
- Underground electrical cabling to the operational Harestanes Windfarm substation plus a minimum buffer of 50m; this was increased to 100m for riparian mammals upstream and downstream of watercourse crossing points.

2.2.2 Habitat Suitability Assessment - Arboreal and Riparian Mammals

19. At each data collection point, all habitat visible from that point was assessed as either negligible, low, moderate or high for badger, bat, red squirrel, pine marten, water vole and otter. Habitat suitability for each species was based on potential for resting sites (such as burrows, holts, dens, dreys etc.), foraging suitability (such as abundance of prey, trees of age to bear cones or presence of vegetation preferred by water vole like soft rush *Juncus effusus*) and commuting suitability (such as vegetative cover, connection to other suitable habitats and connected watercourses). These three factors were combined to give an overall suitability of the habitat for each species at each point. A description of the habitat suitability categories is summarised in **Table 2.1** below.

Overall suitability	Description
Negligible	Negligible potential for resting sites (collectively reeferring to otter holts/couches, water vole burrows, pine marten dens, squirrel dreys), foraging resource or commuting habitat.
Low	Area with low abundance of foraging resources and no or low potential for resting sites. The species may utilise the habitat as part of a wider territory or for commuting.
Moderate	Habitat with low availability or suitability for resting sites but ample foraging resources and commuting potentail connecting to other suitable habitat.
High	Abundance of resting sites, foraging resources and commuting routes connecting to other suitable habitat.

Table 2.1 Habitat suitability categories

20. Throughout the surveys, surveyors remained vigilant for evidence of other protected or notable species including terrestrial invertebrates, amphibians, reptiles, deer, mountain hare *Lepus timidus* and brown hare *Lepus europaeus*. Evidence or sightings of protected or notable species was recorded with photographs taken where appropriate and grid reference noted.

2.2.3 Water Vole Survey

21. Following the habitat suitability assessment for water vole (**Table 2.1**), a dedicated field sign search was undertaken to each suitable watercourse within the Riparian Mammal Survey Area during the appropriate season for water vole survey (considered mid-May to mid-September for lowland Scotland). The survey followed methodology prescribed in Dean *et al*., (2016) and NatureScot guidance (NatureScot, 2020a). The survey involved walking the entire length of the water courses within the Riparian Mammal Survey Area to conduct a thorough visual inspection of the banks and immediate vicinity for water voles or their field signs. Field signs, as described in Strachan *et al*. (2011) included the following:

- Faeces: recognisable by their size, shape and content. If not too dried-out, these are also distinguishable from rat droppings by their smell.
- Latrines: faeces deposited at discrete locations.
- Feeding stations: food items are often brought to feeding stations along pathways and hauled onto platforms. Recognisable as neat piles of chewed vegetation up to 10cm long.
- Burrows: appear as a series of holes along the water's edge, distinguishable from rat burrows by size and position.
- Lawns: may appear grazed areas around land holes.
- Nests: where the water table is high above ground, woven nests may be found.
- Footprints: tracks may occur at the water's edge and lead into bankside vegetation. May be distinguishable from rat footprints by size.
- Runways in vegetation: low tunnels pushed through vegetation near the water's edge; these are less obvious than brown rat *Rattus norvegicus* runs.

2.2.4 Otter Survey

22. The survey visits were undertaken at the same time as the water vole surveys, which is within the appropriate season for otter surveys (surveying possible all year round but weather and vegetation cover can be limiting factors). An otter survey was conducted following standard survey methods along the entire length of the watercourses within the Riparian Mammal Survey Area (Chanin, 2003, NatureScot, 2020b). The surveys involved conducting a thorough visual inspection of the banks and immediate vicinity for otters or their field signs. Field signs include:

- Resting sites: including temporary and permanent sites: these are referred to as couches (above ground, used temporarily), hovers (similar to a couch but with added shelter, such as tree roots, ledges or other structures); and holts (which extend via a burrow underground).
- Prints: characteristic foot prints often observed in soft ground and muddy areas.
- Spraints: otter faeces that may be used to mark territories, often observed on in-stream boulders. They can be present within or outside the entrances of resting sites. Spraints have a characteristic smell and often contain fish remains. Features with two or more spraints of mixed age are considered to be spraint sites, with signs of regular use.
- Anal jelly: like spraint often observed on prominent in-stream boulders.
- Feeding signs: 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: terrestrial routes that otters can take when moving between resting sites and watercourses, or at high flow conditions when they will travel along bank sides in preference to swimming.
- Slides and play areas: typically worn areas on steep slopes where otters slide on their front, often found between resting sites and watercourses. Play areas are used by juvenile otters and are often evident by trampled vegetation and the presence of slides. These are often in sheltered areas adjacent to natal holt.

23. Terminology used for resting sites is as follows:

- Resting Site - collective term for holts, hovers and couches.
- Potential resting site - a site considered to provide suitable resting habitat together with inconclusive signs of use or potential use.
- Holt - an underground, resting site, often underneath heather root matrices or within tree roots;
- Couch - an above ground resting site that can be used for sleeping or grooming.
- Hover' - a resting site that is partially above/below ground and provides temporary shelter to an otter but does not extend into a holt, e.g. under tree roots or a ledge. It differs from an otter 'couch', in that couches tend to be above-ground in more open areas, such as flattened areas of grass or rushes.
- Breeding site - a term used to identify an area of land in which otters breed, within which a natal holt (see below) is located.

- Natal holt - a discrete holt that is used by the female to birth the cubs and where they can remain for up to three months.
- Nursery area - an area within a breeding site with high levels of activity associated with cubs. Holts within these areas are considered unlikely to be the primary natal holts where cubs are born.

24. Additionally, any field signs or evidence relating to other relevant wildlife (for example American mink *Neovison vison* or brown rat) was recorded.

2.2.5 Red Squirrel Survey

25. Following the habitat suitability assessment (**Table 2.1**), habitat suitable to support red squirrel within the Arboreal Mammal Survey Area was surveyed. The survey was carried out following guidance outlined by Forestry Commission (Gurnell *et al*., 2009) and in accordance with survey guidance for initial non-intrusive visual surveys (Cresswell *et al*., 2012) and NatureScot guidance (NatureScot, 2020c). In addition to visual observations of the species, the woodland habitat was systematically searched for evidence of red squirrel, with field signs including:

- visual sightings;
- prints;
- foraging signs, including chewed or stripped cones with top section remaining untouched, which are often discarded on prominent features at feeding stations; and
- nest sites, also known as dreys, within trees (can be conifer or broadleaf species) and comprising of spherical collections (c. 0.3m) of twigs and leaves and usually located at least 3m up, in the fork of branches closes to the trunk.

26. The surveyors walked transects (approximately 10-15m apart) throughout woodland blocks and treelines, stopping every 50m to look up for signs of dreys and/or red squirrels. Incidental sightings of grey squirrel *Sciuris caroliensis* were also recorded.

2.2.6 Pine Marten Survey

27. Pine marten surveys were undertaken concurrently with red squirrel surveys. Following the habitat suitability assessment (**Table 2.1**), habitat suitable to support pine marten within the Arboreal Mammal Survey Area was surveyed. Surveys included a systematic search for signs of pine marten presence and potential den sites with reference to survey guidance (Cresswell *et al*., 2012, NatureScot, 2020d). This search involved looking for the following field signs:

- Visual sightings, particular incidental records gathered during night-time bat surveys.
- Den sites: such as elevated tree cavities, roof voids of buildings or barns, owl boxes, large raptor or corvid nests, squirrel dreys and rocky outcrops with elevated crevices. Current use may be indicated by the presence of scats beneath the entrance.
- Potential den sites: a feature considered to be a suitable denning site together with inconclusive signs of use or potential use.
- Scats: highly variable size and shape depending on their contents. Typically found on pathways, rides and tracks through woodland or rocky habitat.
- Prints: more likely to be present in snow as pine marten generally avoid mud.

28. Pine martens are elusive and largely nocturnal, which makes them difficult to see, but their scats are often quite distinctive (in structure, smell and content) and are the most commonly encountered field sign. Scats are most abundant during the period of June to August.

2.3 Dates of Survey and Personnel

29. The surveys were led by competent surveyors with extensive survey experience enabling compliance with CIEEM competencies for Species Survey (CIEEM, 2019); being either ‘Capable’ or ‘Accomplished’.

30. The Habitat Suitability Assessment was undertaken between 11 and 22 May 2020. The dedicated arboreal and riparian mammals field surveys were completed on the following dates:

- 15 to 17 July 2020;
- 20 to 24 July 2020;
- 10 to 11 September 2020; and
- 14 September 2020.

31. An additional survey was undertaken for protected species along the southern-most section of existing access track between the south eastern corner of the Forest of Ae and the A701, near Burrance on 09 November 2020.

2.4 Notes and Limitations

32. Areas of immature Sitka spruce plantation forest where the coverage was very dense and the visibility poor were not directly accessed during the surveys. Instead surveyors walked around the edge of these areas using binoculars where appropriate; and looked for paths or signs showing animals accessing the woodland. If such paths were found, the path was followed as far as was accessible.

33. Dense, continuous bracken *Pteridium aquilinum* was present on some steep slopes within the Survey Area which made it difficult to view all areas of the slopes. Dense bracken can mask evidence of protected and notable species. However, these areas were traversed on numerous occasions during the habitat suitability surveys when bracken had not been a limitation. Additionally, the edges of these bracken areas were surveyed to look for evidence of mammal paths.

34. Areas of clear fell can be difficult and dangerous to survey, with log piles and hidden ditches. Every effort was made to cover areas of clear fell where the habitat was considered suitable to support pine marten such as in large log piles.

35. Riparian surveys undertaken on the 22 July 2020 and 23 July 2020 were undertaken during periods of rain. The water levels were within the normal range experienced during previous surveys and field evidence of otter and water vole was still recorded during these surveys. Therefore, this limitation is not considered to affect the validity of the survey undertaken on these days.

3 Results

3.1 Desk Study

3.1.1 Designated Nature Conservation Sites

36. The desk study identified no statutory designated nature conservation sites (excluding ornithological sites) within the search areas; the nearest being Black Loch SSSI (notified for basic fen habitat), located 3.2km south of the Site.

37. Two non-statutory designated sites were recorded, one of which is located within the 2km search area and one of which is located 3.2km distant (Galloway and Southern Ayrshire Biosphere Reserve) but is included due to potential for connectivity with the Proposed Development and its International status as a non-statutory designated site. Several Ancient Woodland Inventory (AWI) areas were also recorded. These are summarised in **Table 3.1** showing designation, distance and orientation from Site and are illustrated on **EIA Report Figure 7.1: Nature Conservation Designations**.

Site	Designation	Orientation and distance from the Site	Description
Non-statutory designated sites			
Priority area for grey squirrel control	Priority area for grey squirrel control	The Site is entirely within a priority area for grey squirrel control	Ae Forest was previously selected as a Red Squirrel Priority Woodland (RSPW) using the Reynolds and Bentley selection criteria (Reynolds and Bentley, 2004), however this designation has been superseded by Red Squirrel Strongholds (RSS), which does not include the Site. The Site is instead designated as a Priority area for grey squirrel control.
Galloway and Southern Ayrshire Biosphere Reserve	Biosphere Reserve	3.2km west	Galloway and Southern Ayrshire Biosphere Reserve is located 3km west of the Site. "*Galloway and Southern Ayrshire Biosphere Reserve is comprised of a major bio-geographic region represented by an upland massif centered on the Merrick and the rivers that flow from this upland down through forests and farmland to the sea. Landscape mosaics in the area comprise uplands, moorlands, mires, woodlands and forests, farmland, river valleys, coast and shoreline. The Biosphere Reserve is working to demonstrate the importance of landscapes and ecosystems for the future of sustainable development in a region which is undergoing change in traditional livelihoods*[3]". Surface area: 526,888 ha · Core area(s): 10,658 ha · Buffer zone(s): 84,523 ha · Transition area(s): 431,707 ha. The biosphere programme[4] identifies three main functions for the designated areas: · Conservation. · Development Logistical support.
Ancient Woodland			
Black Cleuch	AWI	Within the Site	Ancient woodland of Semi natural origin.
Unnamed woodland 1- adjacent to Glenkiln Burn	AWI	Within the Site	Ancient woodland of Semi natural origin
Unnamed woodland 2 – east of access track in south of Site	AWI	Within the Site	Ancient woodland of Semi natural origin
Unnamed woodland 3 - adjacent to entrance from A701	AWI	Within the Site	Ancient woodland of Semi natural origin
Several other ancient woodland parcels within 2km of the Site	AWI	All other ancient woodland parcels are either outside the Site and 1km from the nearest element of the Proposed Development.	Ancient woodland of Semi natural origin.

Table 3.1 Summary of designated nature conservation sites

38. There are no statutory designated nature conservation sites with protected mammals as a primary reason for selection or as a qualifying feature within the search area; therefore, statutory designated nature conservation sites are not considered further in the context of this report. The previous RSPW non-statutory designation has been superseded by RSS[5] which does not include the Site (Scottish Squirrel Group, 2015). The Site is instead designated as a priority area for grey squirrel control, which implies the importance of the Site for red squirrel. An area directly adjacent to the Forest of Ae has been identified as a priority area for grey squirrel control.

3.1.2 Protected and Notable Species Desk Study Results

39. The following protected and notable species desk study results were identified between 2010 and 2020 within 5km of the Site, these are summarised in **Table 3.2** and shown in **Figure 7.1.1 Protected and Notable Species Desk Study Records (Excluding Squirrel Species**) and **Figure 7.1.2 Red Squirrel and Grey Squirrel Desk Study Records**.

Species	Number of records	Sources of record(s)	Description
Water vole	No records	N/A	N/A
Otter	3	SWSEIC, FLS, Scotland Transerv	Two of the records were of dead otters, one found on Whiteknowe Head Burn east of the Site and the other was a road casualty on the A701 south of the Site. The third record was a large adult crossing the road at St Ann's Bridge.
Red squirrel	434	SWSEIC, iRecord, GMBRC, SWT: The Scottish Squirrel Database.	Large number of the records are from Edwardsrig Plantation north east of the Site. Other records included live sighting at Forest of Ae and crossing the road near St Ann's.
Pine marten	No records	N/A	N/A
Grey squirrel	152	SWSEIC, SWT: The Scottish Squirrel Database.	No details provided on records however records located within the Site, at Fox Wood, St Ann's and Gallows Hill.

[3] Taken from: http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/europe-north-america/united-kingdom-of-great-britain-and-northern-ireland/galloway-and-southern-ayrshire-biosphere/ [accessed 25/09/2020].

[4] Taken from: http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/main-characteristics/functions/ [accessed 25/09/2020].
5 Red Squirrel Strongholds is non-statutory scheme which is part of the Scottish Government's strategy to secure the future of the red squirrel in Scotland (Forestry Commission Scotland, 2012).

Species	Number of records	Sources of record(s)	Description
Brown hare	9	SWSEIC, iRecord, BTO: non-avian taxa	All records are outwith the Site, sightings of brown hare around Netherhill (south east of Site) and north east of the Site.
Mountain hare	5	SWSEIC, iRecord	Records located at Queensberry and Minnygap Height north of the Site, no records within the Site boundary.
European hedgehog	5	SWSEIC	No records within the Site, records located near residential areas in Ae, Kirkmichael and Johnstonebridge.
Amphibians	7	SWSEIC	Records include adult and frogspawn for common frog *Rana temporaria* and one adult smooth newt *Lissotriton vulgaris* sightings around Loch Ettrick and Forest of Ae.
Reptiles	6	SWSEIC	One record of common lizard *Zootoca vivipara* on Edgemoor, one adder *Vipera berus* at Duncow Common and four records of slow worm *Anguis fragilis* in Forest of Ae and Dalswinton Estate.

Table 3.2 Protected and notable species desk study results

3.2 Field Survey Results

3.2.1 Habitat Suitability Assessment - Arboreal and Riparian Mammals

40. Habitat Suitability Assessment findings are presented in the following figures and are discussed in the following sections:

- **Figure 7.1.4 Water Vole Habitat Suitability Assessment.**
- **Figure 7.1.5 Otter Habitat Suitability Assessment.**
- **Figure 7.1.6 Red Squirrel Habitat Suitability Assessment.**
- **Figure 7.1.7 Pine Marten Habitat Suitability Assessment.**

3.2.2 Water Vole Habitat Suitability Assessment and Survey

41. The Habitat Suitability Assessment highlighted one area as high suitability for water vole in the north east of the Site on a tributary of Glenkiln Burn. Other areas across the Site were considered moderate suitability including tributaries of Glenkiln Burn, Clachanbirnie Burn, Cat Cleuch and Black Linn. The results of this are shown within **Figure 7.1.4 Water Vole Habitat Suitability Assessment.**

42. Full details of the targeted survey results are shown in **Table 3.3** and **Figure 7.1.8 Protected and Notable Species Results**. The field survey found evidence of water vole including burrows, runs, latrines and feeding signs in the north east of the Site on the Glenkiln Burn (TN3-6) and on tributary of Garrell Water (TN1), additionally a nest in rush was present on Auchencaigroch Burn with feeding evidence below (TN2) directly adjacent to the existing track. No evidence of water vole was found elsewhere within the Riparian Mammal Survey Area.

Target Note	Grid Reference	Evidence
1	NY 0249093460	Runs and burrows as well as feeding signs and droppings primarily field vole but water vole present at lower density.
2	NY 0211594604	Small nest amongst rush with feeding evidence below with characteristic 45-degree angle. Droppings present but trampled so unable to identify species.
3	NY 0227093945	Burrows, feeding signs, droppings and runs into the water with both water vole evidence and field vole.
4	NY 0230693979	Feeding station with characteristic 45-degree angle on vegetation on either side of bank.
5	NY 02342 94056	Water vole droppings present along watercourse.
6	NY 02334 94101	Entire stretch of watercourse surveyed is lined with field vole activity however occasional water vole evidence including feeding stations and droppings.

Table 3.3 Water vole results from field survey

3.2.3 Otter Habitat Suitability Assessment and Survey

43. The habitat suitability assessment highlighted several burns across the Site as moderate and low suitability, no areas were recorded as high value otter habitat. Areas considered to provide moderate habitat including tributaries of Glenkiln Burn, Clachanbirnie Burn, Cat Cleuch and Black Linn. The results of this are shown within **Figure 7.1.5 Otter Habitat Suitability Assessment**.

44. Full details of the survey results are shown in **Table 3.4** and **Figure 7.1.8 Protected and Notable Species Results**. One holt (TN10) and one potential holt (TN8) was recorded on Glenkiln Burn as well as footprints on a run (TN9) and a spraint (TN11) recorded on a tributary. On Deer Burn potential couch habitat was recorded under the cable and track bridges with four spraints under the cable bridge and one under the track bridge (TN12). A spraint was also recorded on Yellowtree Grain Burn in the north east of the Site (TN7). Three otter hovers were identified along the Garrel Burn to the south east of the Site (TN14, 15 and 16) along with spraints at several locations along the surveyed reach of the burn.

Target Note	Grid Reference	Evidence
7	NY 0321793554	Spraint on dislodged vegetated area in bank in centre of watercourse. Spraint has oily appearance and obvious shells and scales including shore crab *Carcinus maenas*.
8	NY 0132792735	Single hole on the left hand bank. Bank covered in bracken and field wood rush *Luzula campestris*. Bank comprising mainly of cobbles and boulders within single entrance. Scratch marks present within burrow and bone fragments. A fetid odour is present. A prominent boulder is present in front but no spraint present.
9	NY 0098592146	Otter footprints and run.
10	NY 0101391982	Signs of old spraint found in holt identified during the desk study, previously recorded in 2008 by FLS.
11	NY 0095492558	Spraint on small boulder.
12	NY 0081896573	Four old spraints on rock under cable bridge and one more old spraint on rock under track bridge. No covered cavities suitable for holts in area if bridges, however couch potential on banks and boulders under bridges.
13	NY 0085496675	An area of good otter resting site habitat on southern bank under fallen mature trees however no evidence of otter recorded.
14	NY 0396890706	Hover located in bankside under overhanging tree root, with old spraint.
15	NY 0409190544	Hover located in bankside recess, with fresh spraint.
16	NY 0421690328	Hover located under roots of dead tree, with old spraint.

Table 3.4 Otter results from field survey

3.2.4 Red Squirrel Habitat Suitability Assessment and Survey

45. The habitat suitability assessment showed moderate to high suitability across a large portion of the Site. However, some areas were negligible or low suitability where trees were too immature, or the area had been clear felled. The results of this are shown within **Figure 7.1.6 Red Squirrel Habitat Suitability Assessment**.

46. Potential squirrel foraging field signs were recorded during the surveys in the Arboreal Mammal Survey Area which included piles of chewed cones and a drey, although none could be attributed to red squirrel. No direct sightings of

red squirrel were made during surveys of the Arboreal Mammal Survey Area. The full results are shown below in **Table 3.5** and in and **Figure 7.1.8 Protected and Notable Species Results**.

Target Note	Grid Reference	Evidence
17	NY 0008792685	Evidence of potential squirrel foraging on woodland edge.
18	NY 0249693434	Feeding station - collection of chewed cones collected on gap of dry-stone wall.
19	NY 0424990260	Squirrel drey (species unidentified)

Table 3.5 Red squirrel results from field survey

3.2.5 Pine Marten Habitat Suitability Assessment and Survey

47. The habitat suitability assessment found no areas had high suitability, but large portions of the west, north-east and access track in the south east were moderate suitability habitat. The majority of the rest of the habitat was considered low suitability. The results of this are shown within **Figure 7.1.7 Pine Marten Habitat Suitability Assessment.**

48. Full details are outlined within **Table 3.6** and shown in **Figure 7.1.8 Protected and Notable Species Results.** Five potential den sites (TN22, TN27, TN34-36) were recorded across the Arboreal Mammal Survey Area and 21 potential/confirmed pine marten scats.

49. In summary, pine marten has been confirmed to be present within the Site; however, whilst a number of scats (droppings) were found, no definite dens were identified. The habitat within the Site is considered to be generally sub-optimal due to the conifer plantation that provides limited den sites. This habitat also limits prey density, which is likely to be restricted to forest rides and other open areas such as the riparian zones alongside watercourses.

Target Note	Grid Reference	Evidence
20	NY 0046692573	Potential pine marten scat on forestry ride on raised moss area.
21	NY 0052292569	Pine marten scat on forestry ride on raised moss, appears relatively fresh.
22	NY 0066792407	Potential den located under old pile of logs. Two paths leading to entrance which then goes under the logs into an enclosed area. No scat present but also no scent (no smell of fox). No definitive sign of pine marten, potential for denning only.
23	NY 0082392432	Potential pine marten scat on forestry ride on moss.
24	NY 0083692453	Potential scat on ride nearby feeding remains (bird) however also fox scat present in open area.
25	NY 0081192615	Pine marten scat on moss covered cut tree (not fresh).
26	NY 0078193695	Potential pine marten scat in middle of track.
27	NY 0027492560	Pine marten scat near pile of boulders which could be possible den.
28	NY 0119491676	Potential pine marten scat.
29	NY 0119691671	Pine marten prints and scat.
30	NY 0121291425	Pine marten scat next to stone wall.
31	NY 0233894004	Pine marten scat on bank of river.
32	NY 0002492709	Pine marten scat on tree stump.
33	NY 0125991434	Potential pine marten scat.
34	NY 0128391433	Potential den site however no scat, however clear entrance and path under stones. No definitive sign of pine marten, potential for denning only.
35	NY 0137391483	Potential pine marten den site within long semi-buried stone wall with multiple cavities through ride scat noted in ride. No definitive sign of pine marten, potential for denning only.
36	NY 0109191546	Potential pine marten den site. Hole under felled tree stump scat in entrance with bird leg in scat and bedding. No definitive sign of pine marten, potential for denning only.
37	NY 0251493409	Pine marten scat next to deer dropping adjacent to river.
38	NY 0254093400	Pine marten scat.
39	NY 0321593555	Pine marten scat.
40	NY 0307893339	Potential fresh pine marten scat on road, black in appearance (confirmed not to be fox or badger). However, no form/shape to it or scent.
41	NY 0320593357	Potential fresh pine marten scat on road, black in appearance and no scent.
42	NY 0095896520	One pine marten scat within mature plantation, on top of an old defunct wall that was covered in moss.

Table 3.6 Pine marten results from field survey

3.2.6 Incidental Species Records

50. Throughout all surveys reported herein surveyors remained vigilant for other species such as brown hare and common lizards. Sightings and evidence of common species such as field vole, rabbit *Oryctolagus cuniculus* and deer species were observed during the surveys across the Ecology Survey Area. A summary of the incidental records is provided in **Table 3.7** and shown in and **Figure 7.1.8 Protected and Notable Species Results**.

Target Note	Grid Reference	Evidence
43	NY 0088392617	Common lizard sighting.
44	NY 0123594063	Brown hare flushed along the track before it turned right into plantation woodland.
45	NY 0212994639	Brown hare sighting.
46	NY 0022292757	Potential stoat *Mustela erminea* scat on dry stone dyke wall.
47	NY 0322693607	Common lizard sighting.
48	NY 02680 93423	Common lizard sighting in clear fell.
49	NY 03038 93639	Common lizard sighting in ride.
50	NY 03034 93654	Common lizard sighting in immature plantation.
51	NY 03165 93261	Common lizard sighting in ride.
52	NY0053592129	Dry stone wall on dge of forestry, beside track with potential for reptiles to bask and hibernate.
53	NY0042792191	Common lizard sighting.
54	NY0160692707	Dry stone wall in open area, ideal for reptiles for basking, foraging and hibernating.

Table 3.7 Incidental records from field surveys

4 Conclusion

51. The desk study identified no statutory designated nature conservation sites (excluding ornithological sites) within the search areas; the nearest being Black Loch SSSI (notified for basic fen habitat), located 3.2km south of the Site.

52. Two non-statutory designated sites were recorded, one of which is located within the 2km search area and one of which is located 3.2km distant (Galloway and Southern Ayrshire Biosphere Reserve transition zone) but is included due to potential for connectivity with the Proposed Development and its International status as a non-statutory designated site. Several AWI areas were also recorded.

53. Water vole presence was confirmed within the north east of the Riparian Mammal Survey Area and was likely absent throughout the rest of the Riparian Mammal Survey Area. One potential otter holt and one confirmed otter holt were recorded on Glenkiln Burn in the centre of the Site, no other holts were recorded within the Riparian Mammal Survey Area. One potential couch was recorded in the north on Deer Burn with five otter spraints and three hovers were recorded along the Garrel Burn in the south of the Site.

54. Based on the desk study information and field results both red squirrel and grey squirrel are present within the Forest of Ae and the wider area. As red squirrel and grey squirrel field signs are impossible to distinguish between both species, it is not possible to determine what species the field signs were from without visual sightings of animals or presence of hair. Forest of Ae is considered to be locally important for red squirrels.

55. Pine marten scat was abundant across the Arboreal Mammal Survey Area with several areas having potential denning locations. Without DNA testing pine marten scat and camera trapping any potential dens, these field signs cannot be verified; however, scats have been described as 'pine marten scat' where a distinctive smell or prey evidence were evident and 'potential pine marten scat' where such evidence was lacking, either due to age or consistency of the scat.

56. Other species incidentally recorded included brown hare and common lizards, which are likely present across the Site. European hedgehog and mountain hare may be present within the Site, but no evidence was found during the surveys reported herein.

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Appendix A Biodiversity Legislation and Planning Policy

1 Appendix A

1.1 Introduction

1. This Appendix presents biodiversity legislation and planning policy relevant to the Harestanes South Windfarm Extension. It should be read in conjunction with the **EIA Report** for full details of the Proposed Development.

2. Protected species known to occur naturally in Dumfries and Galloway are included in Table 1 to the rear of this Appendix. The legislation and planning policy relevant to their protection, and other natural resources in Scotland, is as follows.

1.2 Legislative Framework

1.2.1 Natural Heritage (Scotland) Act 1991

3. Establishes NatureScot as the main body responsible for securing and promoting the conservation of Scotland's natural scenery, flora and fauna.

1.2.2 Environment Act 1995

4. Under this Act, the Scottish Environmental Protection Agency (SEPA) and the Environment Agency are established as the regulatory bodies for contaminated land, control of pollution, conservation and enhancement of the environment and fisheries.

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

5. The Habitats Regulations 1994 (as amended in Scotland) provide the protection given to European protected species of animals and plants. For European protected species, it is an offence to deliberately or recklessly:

- capture, injure or kill such an animal;
- harass an animal or group of animals;
- disturb an animal while it is occupying a structure or place used for shelter or protection;
- disturb an animal while it is rearing or otherwise caring for its young;
- obstruct access to a breeding site or resting place, or otherwise deny an animal use of a breeding site or resting place;
- disturb an animal in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb an animal in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- disturb an animal while it is migrating or hibernating;
- take or destroy its eggs (in Scotland, this is relevant only to the great crested newt *Triturus cristatus* and natterjack toad *Epidalea calamita*);
- disturb any cetacean.

6. It is an offence of strict liability to damage or destroy a breeding site or resting place of such an animal. These sites and places are protected even when the animal isn't present.

7. All of the above offences apply to all stages of a wild animal's life. Animals bred and lawfully held in captivity are not protected.

8. Species listed on Annex II of the Habitats Regulations are attributed further protection which means that Special Areas of Conservation may be designated to internationally important sites for these species.

1.2.4 Wildlife and Countryside Act 1981 (as amended)

9. Protected birds, animals and plants are listed in Schedules 1, 5 and 8 respectively of the Wildlife and Countryside Act 1981 (amendment) (Scotland) Regulations 2001 (WCA).

1.2.4.1 Schedule 5

10. Within Schedule 5, species can either be fully protected or be partially protected under parts of Section 9, which makes it unlawful to intentionally:

- Part 1: kill, injure or take;
- Part 2: possess or control (live or dead animal, part or derivative);
- Part 4 (a): damage or destruct any structure used for shelter or protection;
- Part 4 (b): disturb them in a place of shelter or protection;
- Part 4 (c): obstruct access to place of shelter or protection;
- Part 5 (a): sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative);
- Part 5 (b): advertise for buying or selling.

1.2.4.2 Schedule 8

11. Schedule 8 of the WCA makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

1.2.4.3 Schedule 9

12. Invasive species listed under Schedule 9 are prohibited from release into the wild. The WCA prohibits planting or "causing to grow" in the wild of any plant species listed in Schedule 9. In Scotland, legislation pertaining to species listed under Schedule 9 has been amended by the Wildlife And Natural Environment Act (2011); see below.

1.2.5 Wildlife and Natural Environment Act (2011)

13. In Scotland, the Wildlife and Natural Environment (WANE) Act (2011) makes amendments to previous legislation including;

- The Protection of Badgers Act (1992).
- "Knowingly causes or permits" are added to further sections of the Protection of Badgers Act 1992 to cover offences relating to taking, injuring, killing, cruelty, sale, possession, marking and ringing.
- The 2011 Act also amends the available penalties for offences in the 1992 Act. Currently offences relating to digging for a badger can be dealt with by summary procedure or on indictment. The 2011 Act allows for other offences relating to taking, injuring, killing and possession to be dealt with by summary.
- Non-native species listed under Schedule 9 of the WCA 1981 (as amended)
- The Act adopts the internationally recognised approach to dealing with invasive non-native species. New offences are based on a general 'no-release' approach.
- It is an offence to release, allow to escape, or cause any animal to be outwith its native range.
- It is an offence to plant or cause to grow in the wild any plant outwith its native range.
- Scottish Ministers can also specify native animals that will be subject to these offences.
- Other offences relate to the keeping, notification and sale of invasive animals and plants.

- The Non-native Species: Code of Practice[6] is guidance on non-native species which came into effect on 2 July 2012

14. The WANE Act also provides a mechanism for licensing activities which would otherwise be an offence under the WCA, for the purposes of development.

1.2.6 Nature Conservation (Scotland) Act 2004

15. Certain habitats have protection under the Nature Conservation (Scotland) Act 2004. Under section 1 of the Act it is:

16. 'the duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions'

17. The Act requires Scottish Ministers to produce a Scottish Biodiversity Strategy, including providing a published list of habitats considered to be of principal importance for the conservation of biodiversity (referred to as the Scottish Biodiversity List). This list is to be used to assist public bodies to meet section 1 of the Act.

1.2.7 Environmental Liability (Scotland) Regulations 2009

18. Brings into force rules to force polluters to prevent and repair damage to water systems, land quality, species and their habitats and protected sites. The Regulations apply in relation to:

- damage to protected species and natural habitats if:
- it has significant adverse effects on reaching or maintaining the favourable conservation status of the protected species or natural habitat; and
- it is caused by an activity listed in Schedule 1 or by the fault or negligence of an operator whilst carrying on any other activity;
- water damage, caused by an activity listed in Schedule 1, which is any damage that significantly adversely affects any or all of the:
- ecological status;
- chemical status;
- quantitative status;
- ecological potential, of the waters concerned with the exception of adverse effects where Article 4(7) of Directive 2000/60/EC applies;
- land damage, caused by an activity listed in Schedule 1, which is any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in, on, or under land of substances, preparations, organisms or micro-organisms.

19. The significance of any damage must be assessed by reference to certain criteria set out in the Regulations and the significance of any effects has to be assessed with reference to the baseline condition with significant adverse changes thereto being determined by means of measurable data; in accordance with criteria set out in the Regulations.

1.3 Planning Policy

Scottish Planning Policy 2014 (SPP 14)

20. SPP 14[7] sets out national planning policy considerations in relation to Scotland's natural heritage. It summarises the main statutory obligations on the conservation of natural heritage and explains, as part of a wider framework for conservation and development, how natural heritage objectives should be reflected in development plans. SPP 14 describes the role of the planning system in safeguarding sites of national and international importance, provides guidance on the approach to be adopted in relation to local and non-statutory designations and draws attention to the importance of safeguarding and enhancing natural heritage beyond the confines of designated areas.

Dumfries and Galloway Local Development Plan 2 (2019)

21. The following Natural Environment Policies are of relevance:

- Policy NE4: Sites of International Importance for Biodiversity.
- Policy NE5: Species of International Importance.
- Policy NE6: Sites of National Importance for Biodiversity and Geodiversity.
- Policy NE7: Forestry and Woodland.
- Policy NE8: Trees and Development.
- Policy NE11: Supporting the Water Environment.

Scottish Biodiversity Strategy (SBS)

22. The SBS was originally published in 2004 ('Scotland's Biodiversity: It's in Your Hands (Scottish Government, 2004[8]); and supplemented by an update in 2013 ('2020 Challenge for Scotland's Biodiversity' (Scottish Government, 2013[9])). Together the two documents form Scotland's biodiversity strategy in response to the Aichi targets[10]. The aims of the 2020 challenge are to:

- Protect and restore biodiversity on land and in our seas, and to support healthy ecosystems;
- Connect people with the natural world, for their health and well-being, and to involve them more in decision making; and
- Maximise the benefits for Scotland of a diverse natural environment and the services it provides, contributing to sustainable economic growth.

23. NatureScot is tasked by the Scottish Government with leading the delivery of 'Scotland's Biodiversity: A Route Map to 2020' and the SBS working groups. Each working group is entrusted with a specific aspect of biodiversity conservation.

Scottish Biodiversity List (SBL)

24. The SBL[11] is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. By identifying the species and habitats that are of the highest priority for biodiversity conservation, the list helps public bodies carry out their biodiversity duty, including implementation of the SBS.

Dumfries and Galloway Local Biodiversity Action Plan (LBAP)

25. This LBAP[12] aims to ensure that biodiversity issues are given a high priority and identifies important habitats and species relevant to the region that need to be conserved or enhanced and suggests actions that could be undertaken. The LBAP includes a Local Priority Species List, which includes the following mammals confirmed to be or potentially associated with the Proposed Development: otter *Lutra lutra*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, Natterer's bat *Myotis nattereri*, Daubenton's bat *Myotis daubentoni*, Leisler's bat *Nyctalus leisleri*, noctule bat *Nyctalus noctula*, water vole *Arvicola terrestris*, red squirrel *Sciurus vulgaris*, brown hare *Lepus europaeus* and mountain hare *Lepus timidus* (amongst others). The Local Priority Species List also includes 54 birds, 16 fish including Atlantic salmon *Salmo*

[6] Scottish Government (2012). Non-native species: code of practice [online]. Available at: https://www.gov.scot/publications/non-native-species-code-practice/
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[10] The intention is for this to be updated in 2021.
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[12] Dumfries and Galloway Biodiversity Partnership (2009). Available: https://swseic.org.uk/resource/dglbap-part1/

salar and lamprey species, two amphibians, two reptiles, 164 invertebrates including freshwater pearl mussel *Margaritifera margaritifera*, and numerous plants, fungi and lichen; and can be viewed online in full.

Taxon	Current taxon name	Common name	Legislation giving protection	Schedule or Annex listing
Reptile	*Vipera berus*	Adder	WCA 1981	Schedule 5 [1, 4]
Fish	*Alosa alosa*	Allis shad	HR 1994	Schedule 3
Fish	*Alosa alosa*	Allis shad	WCA 1981	Schedule 5 [1,2,3a]
Vascular Plant	*Lychnis alpina*	Alpine catchfly	WCA 1981	Schedule 8
Moss	*Mielichhoferia mielichhoferi*	Alpine copper-moss	WCA 1981	Schedule 8
Vascular Plant	*Erigeron borealis*	Alpine fleabane	WCA 1981	Schedule 8
Vascular Plant	*Gentiana nivalis*	Alpine gentian	WCA 1981	Schedule 8
Lichen	*Pertusaria bryontha*	Alpine moss-pertusaria	WCA 1981	Schedule 8
Vascular Plant	*Arabis alpina*	Alpine rock-cress	WCA 1981	Schedule 8
Vascular Plant	*Cicerbita alpina*	Alpine sow-thistle	WCA 1981	Schedule 8
Lichen	*Alectoria ochroleuca*	Alpine sulphur-tresses	WCA 1981	Schedule 8
Vascular Plant	*Woodsia alpina*	Alpine woodsia	WCA 1981	Schedule 8
Lichen	*Nephroma arcticum*	Arctic kidney-lichen	WCA 1981	Schedule 8
Fish	*Salmo salar (only in fresh water)*	Atlantic salmon	HR 1994	Schedule 3
Crustacean	*Austropotamobius pallipes*	Atlantic stream (white-clawed) crayfish	WCA 1981	Schedule 5 [2, 4]
Mammal	*Meles meles*	Badger	PBA 1992	not applicable
Mammal	*Meles meles*	Badger	WCA 1981	Schedule 6
Moss	*Sphagnum balticum*	Baltic bog-moss	WCA 1981	Schedule 8
Fish	*Barbus barbus*	Barbel	HR 1994	Schedule 3
Mammal	*Plecotus auritus*	Bat - Brown long-eared	HR 1994	Schedule 2: European protected species
Mammal	*Pipistrellus pipistrellus*	Bat - Common pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	*Myotis daubentonii*	Bat - Daubenton's	HR 1994	Schedule 2: European protected species
Mammal	*Nyctalus leisleri*	Bat - Leisler's	HR 1994	Schedule 2: European protected species
Mammal	*Pipistrellus nathusii*	Bat - Nathsius' pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	*Myotis nattereri*	Bat - Natterer's	HR 1994	Schedule 2: European protected species
Mammal	*Nyctalus noctula*	Bat - Noctule	HR 1994	Schedule 2: European protected species
Mammal	*Pipistrellus pygmaeus*	Bat - Soprano pipistrelle	HR 1994	Schedule 2: European protected species
Mammal	*Myotis mystacinus*	Bat - Whiskered	HR 1994	Schedule 2: European protected species
Mammal	*Vespertilionidae spp*	Bats - All typical species	HR 1994	Schedule 2: European protected species
Moss	*Saelania glaucescens*	Blue dew-moss	WCA 1981	Schedule 8
Vascular Plant	*Phyllodoce caerulea*	Blue heath	WCA 1981	Schedule 8
Vascular Plant	*Hyacinthoides non-scripta*	Bluebell	WCA 1981	Schedule 8 [4]
Moss	*Orthotrichum obtusifolium*	Blunt-leaved bristle-moss	WCA 1981	Schedule 8
Moss	*Grimmia unicolor*	Blunt-leaved grimmia	WCA 1981	Schedule 8
Bird	*Fringilla montifringilla*	Brambling	WCA 1981	Schedule 1 (Part I); Schedule 3 (Part I)
Moss	*Cyclodictyon laetevirens*	Bright-green cave-moss	WCA 1981	Schedule 8
Lichen	*Fuscopannaria ignobilis*	Caledonian pannaria	WCA 1981	Schedule 8
Butterfly	*Carterocephalus palaemon*	Chequered skipper	WCA 1981	Schedule 5 [4]
Lichen	*Lecanactis hemisphaerica*	Churchyard lecanactis	WCA 1981	Schedule 8
Lichen	*Heterodermia propagulifera*	Collaroid rosette-lichen	WCA 1981	Schedule 8
Amphibian	*Rana temporaria*	Common frog	WCA 1981	Schedule 5 [4]
Amphibian	*Bufo bufo*	Common toad	WCA 1981	Schedule 5 [4]
Vascular Plant	*Diapensia lapponica*	Diapensia	WCA 1981	Schedule 8
Vascular Plant	*Cystopteris dickieana*	Dickie's bladder fern	WCA 1981	Schedule 8
Vascular Plant	*Saxifraga cernua*	Drooping saxifrage	WCA 1981	Schedule 8
Butterfly	*Hamearis lucina*	Duke of Burgundy fritillary	WCA 1981	Schedule 5 [4]
Vascular Plant	*Gentianella uliginosa*	Dune gentian	WCA 1981	Schedule 8
Vascular Plant	*Eleocharis parvula*	Dwarf spike-rush	WCA 1981	Schedule 8
Lichen	*Peltigera lepidophora*	Ear-lobed dog-lichen	WCA 1981	Schedule 8
Lichen	*Gyalecta ulmi*	Elm gyalecta	WCA 1981	Schedule 8
Mollusc	*Atrina fragilis*	Fan mussel	WCA 1981	Schedule 5 [1, 2, 4, 5]
Vascular Plant	*Melampyrum arvense*	Field cow-wheat	WCA 1981	Schedule 8
Lichen	*Bryoria furcellata*	Forked hair-lichen	WCA 1981	Schedule 8
Stonewort	*Lamprothamnium papulosum*	Foxtail stonewort	WCA 1981	Schedule 8
Mollusc	*Margaritifera margaritifera*	Freshwater pearl mussel	WCA 1981	Schedule 5
Lichen	*Catolechia wahlenbergii*	Goblin lights	WCA 1981	Schedule 8

Taxon	Current taxon name	Common name	Legislation giving protection	Schedule or Annex listing
Lichen	*Teloschistes flavicans*	Golden hair-lichen	WCA 1981	Schedule 8
Vascular Plant	*Lythrum hyssopifolia*	Grass-poly	WCA 1981	Schedule 8
Fish	*Thymallus thymallus*	Grayling	HR 1994	Schedule 3
Amphibian	*Triturus cristatus*	Great crested newt	HR 1994	Schedule 2: European protected species
Vascular Plant	*Rhinanthus angustifolius*	Greater yellow-rattle	WCA 1981	Schedule 8
Moss	*Buxbaumia viridis*	Green shield-moss	WCA 1981	Schedule 8
Reptile	*Chelonia mydas*	Green turtle	HR 1994	Schedule 2: European protected species
Mammal	*Halichoerus grypus*	Grey seal	HR 1994	Schedule 3
Mammal	*Phoca groenlandica (otherwise known as Pagophilus groenlandicus)*	Harp seal	HR 1994	Schedule 3
Reptile	*Eretmochelys imbricata*	Hawksbill turtle	HR 1994	Schedule 2: European protected species
Mammal	*Erinaceus europaeus*	Hedgehog	WCA 1981	Schedule 6
Vascular Plant	*Trichomanes speciosum*	Killarney fern	HR 1994	Schedule 4: European protected species
Vascular Plant	*Dactylorhiza traunsteineroides ssp lapponica*	Lapland marsh-orchid	WCA 1981	Schedule 8
Butterfly	*Coenonympha tullia*	Large heath	WCA 1981	Schedule 5 [4]
Moss	*Scorpidium turgescens*	Large yellow feather-moss	WCA 1981	Schedule 8
Reptile	*Dermochelys coriacea*	Leatherback turtle	HR 1994	Schedule 2: European protected species
Liverwort	*Adelanthus lindenbergianus*	Lindenberg's leafy liverwort	WCA 1981	Schedule 8
Reptile	*Caretta caretta*	Loggerhead turtle	HR 1994	Schedule 2: European protected species
Moss	*Anomodon longifolius*	Long-leaved anomodon	WCA 1981	Schedule 8
Moss	*Bryum neodamense*	Long-leaved thread-moss	WCA 1981	Schedule 8
Liverwort	*Jamesoniella undulifolia*	Marsh earwort	WCA 1981	Schedule 8
Butterfly	*Euphydryas aurinia*	Marsh fritillary	WCA 1981	Schedule 5
Annelid worm	*Hirudo medicinalis*	Medicinal leech	WCA 1981	Schedule 5
Mammal	*Lepus timidus*	Mountain hare	HR 1994	Schedule 3
Butterfly	*Erebia epiphron*	Mountain ringlet	WCA 1981	Schedule 5 [4]
Liverwort	*Leiocolea rutheana*	Norfolk flapwort	WCA 1981	Schedule 8
Butterfly	*Aricia artaxerxes*	Northern brown argus	WCA 1981	Schedule 5 [4]
Mollusc	*Thyasira gouldi*	Northern hatchet-shell	WCA 1981	Schedule 5
Vascular Plant	*Hieracium northroense*	Northroe hawkweed	WCA 1981	Schedule 8
Vascular Plant	*Arenaria norvegica*	Norwegian sandwort	WCA 1981	Schedule 8
Fungi	*Piptoporus quercinus*	Oak polypore	WCA 1981	Schedule 8
Vascular Plant	*Woodsia ilvensis*	Oblong woodsia	WCA 1981	Schedule 8
Lichen	*Parmentaria chilensis*	Oil-stain parmentaria	WCA 1981	Schedule 8
Lichen	*Caloplaca luteoalba*	Orange-fruited elm-lichen	WCA 1981	Schedule 8
Mammal	*Lutra lutra*	Otter	HR 1994	Schedule 2: European protected species
Amphibian	*Triturus helveticus*	Palmate newt	WCA 1981	Schedule 5 [4]
Butterfly	*Boloria euphrosyne*	Pearl-bordered fritillary	WCA 1981	Schedule 5 [4]
Bird	*Falco perigrinus*	Peregrine falcon	WCA 1981	Schedule 1 (Part I); Schedule 4
Liverwort	*Petalophyllum ralfsii*	Petalwort	WCA 1981	Schedule 8
Vascular Plant	*Crassula aquatica*	Pigmyweed	WCA 1981	Schedule 8
Mammal	*Martes martes*	Pine marten	HR 1994	Schedule 3
Mammal	*Martes martes*	Pine marten	WCA 1981	Schedule 5
Liverwort	*Gymnomitrion apiculatum*	Pointed frostwort	WCA 1981	Schedule 8
Moss	*Hygrohypnum polare*	Polar feather-moss	WCA 1981	Schedule 8
Mammal	*Mustela putorius (otherwise known as Putorius putorius)*	Polecat	HR 1994	Schedule 3
Vascular Plant	*Homogyne alpina*	Purple colts-foot	WCA 1981	Schedule 8
Lichen	*Pseudocyphellaria lacerata*	Ragged pseudocyphellaria	WCA 1981	Schedule 8
Mammal	*Sciurus vulgaris*	Red squirrel	WCA 1981	Schedule 5; Schedule 6
Lichen	*Collema dichotomum*	River jelly-lichen	WCA 1981	Schedule 8
Fish	*Lampetra fluviatilis*	River lamprey	HR 1994	Schedule 3
Vascular Plant	*Potentilla rupestris*	Rock cinquefoil	WCA 1981	Schedule 8
Vascular Plant	*Althaea hirsuta*	Rough marsh-mallow	WCA 1981	Schedule 8
Lichen	*Psora rubiformis*	Rusty alpine spora	WCA 1981	Schedule 8
Moss	*Bryum schleicheri*	Schleicher's thread-moss	WCA 1981	Schedule 8
Mammal	*Sorex spp*	Shrews (all species)	WCA 1981	Schedule 6
Moss	*Hamatocaulis (Drepanocladus) vernicosus*	Slender green feather-moss	WCA 1981	Schedule 8
Vascular Plant	*Najas flexilis*	Slender naiad	HR 1994	Schedule 4: European protected species
Reptile	*Anguis fragilis*	Slow worm	WCA 1981	Schedule 5 [1, 4]

Taxon	Current taxon name	Common name	Legislation giving protection	Schedule or Annex listing
Vascular Plant	*Alyssum alyssoides*	Small Alison	WCA 1981	Schedule 8
Butterfly	*Cupido minimus*	Small blue	WCA 1981	Schedule 5 [4]
Vascular Plant	*Pulicaria vulgaris*	Small fleabane	WCA 1981	Schedule 8
Vascular Plant	*Ononis reclinata*	Small restharrow	WCA 1981	Schedule 8
Amphibian	*Triturus vulgaris*	Smooth newt	WCA 1981	Schedule 5 [4]
Lichen	*Caloplaca nivalis*	Snow caloplaca	WCA 1981	Schedule 8
Vascular Plant	*Chenopodium vulvaria*	Stinking goosefoot	WCA 1981	Schedule 8
Fish	*Acipenser sturio*	Sturgeon	HR 1994	Schedule 2: European protected species
Crustacean	*Triops cancriformis*	Tadpole shrimp/Apus	WCA 1981	Schedule 5
Lichen	*Lecanora achariana*	Tarn lecanora	WCA 1981	Schedule 8
Lichen	*Catapyrenium psoromoides*	Tree catapyrenium	WCA 1981	Schedule 8
Vascular Plant	*Saxifraga cespitosa*	Tufted saxifrage	WCA 1981	Schedule 8
Liverwort	*Geocalyx graveolens*	Turpswort	WCA 1981	Schedule 8
Fish	*Alosa fallax*	Twaite shad	HR 1994	Schedule 3
Fish	*Alosa fallax*	Twaite shad	WCA 1981	Schedule 5 [3a]
Lichen	*Cladonia trassii*	Upright mountain-cladonia	WCA 1981	Schedule 8
Moss	*Hypnum vaucheri*	Vaucher's feather-moss	WCA 1981	Schedule 8
Fish	*Coregonus albula*	Vendace	HR 1994	Schedule 3
Fish	*Coregonus albula*	Vendace	WCA 1981	Schedule 5
Reptile	*Zootoca vivipara*	Viviparous lizard	WCA 1981	Schedule 5 [1, 4]
Mammal	*Arvicola terrestris*	Water vole	WCA 1981	Schedule 5 [3]
Vascular Plant	*Hieracium attenuatifolium*	Weak-leaved hawkweed	WCA 1981	Schedule 8
Fish	*Coregonus lavaretus*	Whitefish	HR 1994	Schedule 3
Fish	*Coregonus lavaretus*	Whitefish	WCA 1981	Schedule 5
Vascular Plant	*Polygonatum verticillatum*	Whorled Solomon's-seal	WCA 1981	Schedule 8
Vascular Plant	*Saxifraga hirculus*	Yellow marsh saxifrage	HR 1994	Schedule 4: European protected species
Vascular Plant	*Epipactis youngiana*	Young's helleborine	WCA 1981	Schedule 8

Key

WCA 1981 Wildlife & Countryside Act 1981 (as amended in Scotland)
Schedule 1 (Part I) Birds protected by special penalties
Schedule 1 (Part II) Birds protected by special penalties during the closed season
Schedule 1A Birds that may not be intentionally or recklessly harassed at any time
Schedule A1 Birds whose habitually used nests may not be intentionally or recklessly taken, damaged, destroyed or otherwise interfered with when not in use
Schedule 2 Birds which may be killed or taken outside the closed season
Schedule 3 (Part I) Birds which may be sold at all times if ringed and kept in captivity
Schedule 3 (Part II) Birds that may be sold dead at all times
Schedule 3 (Part III) Birds that may be sold dead from 1 September to 28 February
Schedule 4 Birds that must be registered and ringed if kept in captivity
Schedule 5 Protected animals
Schedule 6 Animals protected from prohibited methods of capture
Schedule 8 Protected plants

HR 1994 Habitats Regulations 1994 (as amended in Scotland)
PBA 1992 Protection of Badgers Act 1992

[1] Protected against intentional killing and injuring
[2] Protected against intentional or reckless taking
[3] Protected against intentional or reckless damage to, destruction of, obstruction of access to any structure or place used for shelter or protection and disturbance to animal whilst occupying such structures
[3a] Protected against intentional or reckless damage to, destruction of, obstruction of access to any structure or place used for shelter or protection
[4] Protected against selling, offering or advertising for sale, possessing or transporting for the purpose of sale
[5] Protected against possession or control (live or dead animal, part or derivative)
[#] Protected in England & Wales only (a species believed to have been introduced to Scotland)

Table 1 Protected species (excluding birds) known to occur naturally in Dumfries and Galloway and their Protection

290000 300000 310000

600000

590000

N

Legend

- Application Boundary
- Initial Site Feasibility Study Area
- Desk Study Search Area

Records

- Adder
- Brown Hare
- Common Frog
- Common Lizard
- Mountain Hare
- Otter
- Slow-worm
- Smooth Newt
- West European Hedgehog

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0 2 4 Km

Rev	Date	By	Comment
A	02/10/2020	PM	First Issue.

SCOTTISHPOWER RENEWABLES

Harestanes South Windfarm Extension

Figure 7.1.1: Protected and Notable Species Desk Study Records (Excluding Squirrel Species)

Drg No	HARESTANES_WSP_I_147
Rev	A
Date	16/11/2020
Scale	1:75,000 @ A3

290000 300000 310000

600000

590000

N

Legend

- Application Boundary
- Initial Site Feasibility Study Area
- Desk Study Search Area

Squirrel Desk study Records

- Eastern Grey Squirrel
- Eurasian Red Squirrel

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0 2 4 Km

Rev	Date	By	Comment
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SCOTTISHPOWER RENEWABLES

Harestanes South Windfarm Extension

Figure 7.1.2: Red Squirrel and Grey Squirrel Desk Study Records

Drg No	HARESTANES_WSP_I_149
Rev	A
Date	16/11/2020
Scale	1:75,000 @ A3

300000

590000

300000

N

T01
T02
T03
T04
T05
T06
T07
T08

Legend

- Application Boundary
- Proposed Turbine
- Initial Site Feasibility Study Area

Ecology Survey Areas

- Arboreal Mammal Survey Area
- Riparian Mammal Survey Area

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0 0.5 1 Km

Rev	Date	By	Comment
B	16/11/2020	VK	Second Issue.
A	02/10/2020	PM	First Issue.

SCOTTISHPOWER RENEWABLES

Harestanes South Windfarm Extension

Figure 7.1.3: Ecology Survey Areas

Drg No	HARESTANES_WSP_I_144
Rev	B
Date	16/11/2020
Scale	1:30,000 @ A3