SSE Renewables Developments UK Ltd

Achany Extension Wind Farm

Desk Study and Phase 1 Habitat Survey Report

Wood Environment & Infrastructure Solutions UK Limited – June 2021

Report for

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Document revisions

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1	Draft	February 2020
2	Draft - amended	April 2021
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1. Introduction

1.1.1 Wood Group UK Ltd (Wood) was commissioned by SSE Renewables Developments (UK) Limited (SSE) to provide ecological consultancy services in relation to the proposed Achany Extension Wind Farm, herein after referred to as 'the Proposed Development'.

1.1.2 This report provides the results of an ecological desk study and a Phase 1 habitat survey carried out during 2020. Details of the Site and Proposed Development are provided, followed by a description of methods employed to obtain desk study and field-based information, presentation of results, and a summary of findings.

1.1.3 The results of the desk study and Phase 1 habitat survey provide an update on the nature conservation interest of the Site and surroundings and may be used to inform the preparation of an Environmental Impact Assessment Report (EIAR).

1.2 Site Context

1.2.1 The Site is situated approximately 4.5 kilometres (km) north of the village of Rosehall, and approximately 11km west-north-west of Lairg, within The Highland Council (THC) area. It is positioned on the east side of Glen Cassley, approximately 1.5km from the River Cassley which runs parallel to the south-western part of Site. The river represents the lowest point within Glen Cassley, with steeply sloping land present to the east and west.

1.2.2 The elevation of the Site ranges from approximately 220 metres (m) Above Ordnance Datum (AOD) at Allt an Rāsail watercourse to 476m AOD at the summit of Beinn Sgeireach. Landscape within the Site is formed of open upland habitat. Several small hill lochs are present within the Site, which are drained by a network of watercourses that flow into the River Cassley catchment.

1.3 Site Design

1.3.1 The Proposed Development is a 20-turbine extension to the existing Achany Wind Farm; an operational 19-turbine wind farm situated to the south-east of the Site. The principle components of the Proposed Development include wind turbines and associate hard standings; access tracks; permanent LiDAR; interconnecting cables between turbines; and a welfare building and substation. Temporary development areas will also be required in order to facilitate a construction compound, concrete batching plant, and borrow pits.

1.3.2 The installed capacity and turbine dimensions will be dependent upon environmental and technical considerations; however, the maximum turbine tip height is up to 149.9m, delivering an installed capacity in excess of 80MW.

2. Methodology

2.1 Study Area

2.1.1 'The Site' includes all land inside the red-line boundary, as displayed in **Figure 8.1 (Volume 3)**.

2.1.2 The Phase 1 Habitat Survey Area ('Study Area Extent') includes the Site and a 250m buffer[1] surrounding the red-line Site boundary.

2.2 Desk Study

2.2.1 The desk study was carried out by Wood in March 2020, in line with the Chartered Institute of Ecology and Environmental Management (CIEEM) best practice guidelines[2]. In order to update potential ecological constraints against the Proposed Development, information was collected regarding statutory and non-statutory sites designated for nature conservation purposes (non-avian interest only), and protected or notable species, including those listed on the Scottish Biodiversity List (SBL)[3] and Sutherland Biodiversity Action Plan[4]. The desk study features of interest are summarised in Table 8.1.1 below.

Table 8.1.1 Statutory and Non-Statutory Sites of Nature Conservation Value, Protected and Notable Species

Designation	Description
Statutory nature conservation sites	Sites of international importance of relevance to this ecological study include designated Special Areas for Conservation (SAC)/Ramsar[5] sites. Sites of national importance are designated as National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSI) and local sites as Local Nature Reserves (LNRs). Special Areas of Conservation (SAC) – sites as defined by the Conservation (Natural Habitats, &c.) Regulations 1994, and the Conservation of Offshore Marine Habitats and Species Regulations 2017 are no longer part of the European Union's Natura 2000 network. Instead, they form a UK-wide network of protected sites, referred to in the 1994 Regulations as the UK site network, and retain the same protections. Sites of Special Scientific Interest (SSSI) – these sites have been re-notified under the Wildlife and Countryside Act 1981 (as amended in Scotland) and provide statutory protection for the best examples of the UK's flora and fauna;

[1] In places, not all of the 250m extent were surveyed due to access restrictions.
[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
[3] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL
[4] The Local Biodiversity Action Plan (LBAP) that covers Achany is the Sutherland Biodiversity Action Plan, available at https://www.caithness.org/atoz/sutherland/actionplan2003/contents.htm. This plan also forms part of the Highland Biodiversity Action Plan 2015-2020, available at https://www.highlandenvironmentforum.info/biodiversity/action-plan/.
[5] Ramsar sites are wetlands of international importance designated under the Ramsar Convention on wetlands: an intergovernmental treaty that aims to conserve wetlands through local and national action and international cooperation. While there is no dedicated legislation for the protection of Ramsar sites in the UK, all Scottish Ramsar sites are either Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Sites of Special Scientific Interest (SSSIs) and are protected under the relevant statutory regimes.

Designation	Description
	National Nature Reserves (NNRs) – these are designated under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981 (as amended) and contain examples of the most important natural and semi-natural terrestrial and coastal ecosystems; and Local Nature Reserves (LNRs) – these are areas of natural heritage that are at least locally important. Local authorities select and designate LNRs under Section 21 of the National Parks and Access to the Countryside Act 1949 (as amended).
Non-statutory nature conservation sites	These include Local Nature Conservation Sites (LNCSs) such as: Listed Wildlife Sites (LWS); Sites of Importance for Nature Conservation (SINC); and Local Geodiversity Sites (LGS). Non-statutory conservation sites also include Scottish Wildlife Trust (SWT) reserves such as Provisional Wildlife Sites and areas included under the Ancient Woodland Inventory (AWI) or Semi Natural AWI (SNAWI). Priority Woodlands for Red Squirrel are also included as non-statutory conservation sites. These non-statutory sites, which are designated due to the presence of notable species or important habitats, broadly constitute the most important wildlife and geological sites that do not reach the criteria required for SSSI designation.
Protected species	Many species of animal and plant receive legal protection, which for the purposes of this study refers to: • European Protected Species as defined within the The Conservation (Natural Habitats, *&c.*) Regulations 1994 (as amended) (the Habitats Regulations); • Species included on Schedule 1, 5 and 8 of the Wildlife and Countryside Act 1981 (WCA) (as amended), excluding species that are only protected in relation to their sale; and • Badgers, which are protected under the Protection of Badgers Act 1992, as amended by the Nature Conservation (Scotland) Act 2004.
Priority and notable habitats and species	These include habitats and species listed in Annex I and Annex II of the Habitats Directive as referenced in The Conservation (Natural Habitats, &c) Regulations, 1994 – annexes in the Habitats Directive are correct as at 31/12/2020; thereafter any changes would need to be made/ agreed by the Scottish Government), together with habitats and species which are listed on the Scottish Biodiversity List, Local Biodiversity Action Plans, and/or those which are of some other conservation interest based on their status nationally, regionally or locally.

2.2.2 Where possible, data for the desk study were drawn from existing ecological records and Site information gathered to inform the 2012 Environmental Statement (ES)[6]. A suite of ecological assessments were carried out between years 2011 and 2012 to inform the 2012 ES, including:

- A desk-based ecological assessment;
- A Phase 1 Habitat and National Vegetation Classification (NVC) survey;
- Focused protected species surveys (including camera trap monitoring between June and October 2011); and
- A fish habitat survey and a freshwater pearl mussel survey.

2.2.3 In addition to ecological information available within the 2012 ES, the most recent report relating to the Achany Wind Farm Habitat Management Plan (HMP)[7] was also reviewed to understand the long-term HMP objectives associated with the operational wind farm.

[6] Environ (2012). Glencassley Wind Farm Environmental Statement – July 2012, Chapter 8: Ecology
[7] Applied Ecology (2020). Achany Wind Farm Habitat Management Plan – 10 year review.

2.2.4 In addition to the use of existing data, a web-based search for designated sites and legally protected/ notable species, was also carried out as follows:

- Information regarding statutory and non-statutory designated sites within an approximate 10km radius of the Site boundary was acquired using the NatureScot Sitelink web-based application[8];
- Commercially available records of protected and/or notable species within 2km of the Site boundary (extended to 10km for bats) recorded within the last ten years were searched within the National Biodiversity Atlas (NBN) database[9];
- A data request for records of protected and/or notable species within a 2km radius of the Site boundary (extended to 10km for bats) was submitted to the Highland Biological Records Group (HBRG). Analysis of species data focussed only on records made within the last ten years, as older records may give an inaccurate picture of the current ecological interest within the Site and the surrounding area;
- Information regarding non-statutory designated sites within an approximate 10km radius of the Site boundary was also requested from HBRG;
- Information relating to vascular plant species records within 3km of the Site[10] was requested from NatureScot; and
- Freshwater pearl mussel records were recorded from NatureScot.
- A search to determine the potential habitats and features of interest was conducted using aerial imagery (from Google Maps[11] and Google Earth websites[12]) and 1:25:000 scale Ordnance Survey maps[13].

2.3 Phase 1 Habitat Survey

2.3.1 The Phase 1 habitat survey was carried out by Wood Consultant Ecologist Hannah Rowding (BSc, MSc, ACIEEM) between 25 May and 19 June 2020. An additional visit to map Phase 1 habitats present along the length of the proposed access route was carried out on 05 November 2020.

2.3.2 The Phase 1 habitat survey is a standardised technique used for classifying and mapping the presence of semi-natural vegetation and wildlife habitat over specified areas of land. The survey was conducted in accordance with standard guidance (JNCC, 2010) to establish the presence and distribution of habitat types within the study area. During the survey, all distinct habitats within the study area were identified and recorded onto a 1: 10000 OS map using Phase 1 habitat codes. Descriptions of key habitats present within the study area, habitat communities that overlap as a mosaic/ transitional area, or habitat communities that were too small to map, were also recorded in the form of target notes (TN).

[8] https://sitelink.nature.scot/home
[9] https://nbnatlas.org
[10] A radius of 3km from central Ordnance Survey (OS) grid reference NC 45907 07752 was selected for the NatureScot data request relating to vascular plant species.
[11] www.maps.google.co.uk
[12] https://earth.google.com/web/
[13] www.ordnancesurvey.co.uk

3. Results

3.1.1 The scientific names of species identified during the desk study and Phase 1 habitat survey are presented in **Annex A**.

3.2 Desk Study

Review of Existing Ecological Data

Habitats

3.2.1 Field survey work conducted to inform the 2012 ES identified that the Study Area[14] was comprised predominantly of wet dwarf shrub heath (formed mainly of NVC community M15) and blanket bog habitat (made up of M17, M18, and M19 NVC communities), both of which are classified as Annex 1 habitat communities under the Habitats Directive.

3.2.2 The remainder of the study area contained a variety of dry dwarf shrub heath (NVC communities H10a and H17), marshy grassland (M25a), small patches of unimproved acid grassland (U4 and U5) and M6c acid flush habitat, and a network of small watercourses and lochans.

Rare or notable plant species

3.2.3 Five UK Biodiversity Action Plan (UKBAP) Priority species[15] were identified within the Study Area during field surveys, including: dwarf juniper, lesser butterfly orchid, alpine meadow rue, wild thyme, and lesser clubmoss. Of these species, only juniper and lesser butterfly orchid are listed within the SBL. Harebell, identified in areas of unimproved grassland on-site, is also listed within the SBL as a species of principle importance for conservation. Dwarf birch and alpine bearberry were also identified during Site surveys, which are both listed as a local priority species within the Sutherland LBAP.

Protected Species

3.2.4 A review of existing ecological records gathered to inform the 2012 ES identified the following:

- A single common pipistrelle was recorded within the Site during bat activity transect surveys carried out in August and September 2011. Echolocation calls relating to common and soprano pipistrelle were also detected in an area of suitable habitat (riparian woodland) positioned outside the Site boundary;
- While no evidence of otter was identified within the Site boundary, otter field signs (including spraint and a resting site) were however recorded along the Allt an Dubh Loch Bhig

[14] The Phase 1 habitat study area included the footprint of the original proposed wind turbines and associated access tracks plus a 500m buffer. The NVC study area was slightly smaller, incorporating the footprint of the proposed turbines and associated access tracks plus a 300m buffer.

[15] The UK Biodiversity Action Plan (UK BAP), produced in 1994 by the UK Government, was a national strategy for the conservation of biodiversity. The UKBAP has since been succeeded by the UK Post-2010 Biodiversity Framework (published in 2012) which is now implemented individually by each of the four UK countries. In Scotland, habitats and species that Scottish Ministers consider to be of principle importance for conservation are now defined within the Scottish Biodiversity List.

watercourse, located north-west of the Site, and Allt an Rasail watercourse, positioned to the south of the Site;

- Evidence of small water vole colonies were identified along several watercourses within the Site, including the Allt an Dubh Loch Bhig watercourse, Dubh Loch Mor unnamed outflow, Allt an Rasail watercourse, and the Allt an Leacach watercourse near the centre of Site; and
- No evidence of wildcat, badger, or pine marten were detected during ecological walkover surveys. Monitoring through use of camera traps recorded occasional sightings of badger and pine marten, however these sightings were located outside of the Site boundary;
- Fish habitat surveys identified good quality trout habitat within the Allt an Rasail watercourse, the Alltan Leacach watercourse, and Allt Dail Faid watercourse. Moderate quality fish habitat was identified within the Allt an Dubh Loch Mhoir, and an unnamed tributary within the Allt Langwell catchment, while poor habitat quality was identified in the Allt Langwell, Allt Dubh Loch Big, and Allt Bad an t-Sagairt watercourses. The main factor influencing the quality of fish habitat related primarily to natural barriers and steep gradients in the area; and
- Targeted aquatic surveys found no evidence of freshwater pearl mussels in watercourses on-Site or immediately downstream.

3.2.5 In addition to ecological information presented within the 2012 ES, water vole data relating to the existing Achany Wind Farm HMP was considered. HMP objectives included the implementation of water vole habitat enhancement works, which were carried out in two main areas of Achany Wind Farm. Post construction monitoring for water vole has subsequently been conducted between years 2008 and 2021.

3.2.6 Water vole activity within the habitat enhancement area adjacent to the lower reaches of Allt Sron nan larnachan/ start of Allt a' Bhadain was recorded consistently between 2010 and 2015, however this reduced to only intermittent field signs until late 2018/ early 2019. In contrast, water vole activity within the second habitat enhancement area (situated near the headwaters of the un-named tributaries of the Ghruididh Burn) was identified throughout the ten-year post-construction monitoring period, with all enhancement sites showing evidence of occupation or use as habitat corridors.

3.2.7 A review of the most recent 2021 survey records for Achany Wind Farm HMP identified the presence of seven discrete water vole colonies within the operational wind farm site boundary (Applied Ecology 2021). Water vole colonies were located along the following watercourses:

- The Allt a' Bhadain and Allt Sron nan larnachan - positioned within 20m of the existing wind farm access track at its closest point. The access track also crosses the Allt a' Bhadain near the site entrance;
- Three un-named tributaries of the Ghruididh Burn - positioned approximately 70m from an operational turbine and 470m from the main wind farm access track; and
- Adjacent to the headwaters of a further un-named tributary of the Ghruididh Burn, within the north-west of the wind farm site, approximately 100m from the existing wind farm access track.

Updated Desk Study Results

3.2.8 The results of the 2020 desk study are provided below. Note that information relating to statutory sites designated for ornithological conservation purposes and ornithological data records are not included within this report.

Statutory and Non-Statutory Sites

3.2.9 Results of the statutory and non-statutory site search are presented in Table 8.1.2. A map detailing the location of each site is presented in **Figure 8.1 (Volume 3)**.

Table 8.1.2 Statutory and Non-Statutory Sites within 10km of the Site boundary

Site	Designation	Grid reference	Area (ha)	Qualifying/ notifying features	Distance and orientation from Site
Statutory sites					
Caithness & Sutherlands Peatlands	SAC	NC 48118 11840	143561.47	Blanket bog; quaking bog; wet heath; acid peat stained lakes and ponds; clear water lochs with aquatic vegetation; marsh saxifrage; and otter	The SAC borders the eastern boundary of the Site
Grudie Peatlands (Component of Caithness & Southerland Peatlands)	SSSI	NC 48118 11840	4778.78	Blanket bog habitat	Borders the eastern boundary of the Site
Strath an Loin (Component of Caithness & Southerland Peatlands))	SSSI	-	2342.52	Blanket bog habitat	3 km north west of Site boundary
River Oykel	SAC	NH 52814 98976	921.46	Atlantic salmon; Freshwater pearl mussel	3.5km south of Site access point
Kyle of Sutherland Marshes	SSSI	NH 54991 98430	402.76	Flood plain fen; wet woodland; and Nationally important assemblage of plant species	4km south-west of Site access point
Ben Moore Assynt	SSSI	-	8835.90	Upland habitat assemblages; Geological interest	10km north-west of site boundary
Non-statutory sites					
Various	Ancient Woodland Inventory	-	-	In Scotland, Ancient Woodland is defined as land that is currently wooded and has been continually wooded since at least 1750. Its age means that it is important for biodiversity and cultural identity.	See **Figure 8.1**
Caithness and Sutherland Peatlands	Important Plant Area (IPA)	-	-	Blanket bog, vascular plant assemblage, marsh saxifrage	IPA overlaps with the eastern boundary of the Site

Legally Protected and Notable Species

3.2.10 The results of the data search obtained from HBRG and NBN Atlas for legally protected/ priority species within 2km of the Site boundary (extended to 10km for bats) are presented in Table 8.1.3.

Table 8.1.3 Records of Legally Protected/ Notable Species within 2km and 10km (for bats) of the Site Boundary (2010-2020)

Species	Number of records	Year of most recent record	Details	Distance and orientation from Site	Conservation designation
Daubentons bat	1	2011	Recorded in flight (multiple passes) during static detector monitoring in Achany Glen	Approximately 3.6km south-east of the proposed Site entrance	HabRegs2, WCA5, SBL
Common pipistrelle bat	1	2011	Recorded in flight (multiple passes) during static detector monitoring in Achany Glen	Approximately 3.6km south-east of the proposed Site entrance	HabRegs2, WCA5
Soprano pipistrelle bat	1	2011	Recorded in flight (multiple passes) during static detector monitoring in Achany Glen	Approximately 3.6km south-east of the proposed Site entrance	HabRegs2, WCA5, SBL
Brown long-eared bat	1	2015	Found on the wall of a house in the hamlet of Gruids	Approximately 3.7km north-east of the proposed Site entrance	HabRegs2, WCA5, SBL

Notes: **HabRegs2** – Species listed within Schedule 2 of the Conservation (Natural Habitats & c) Regulations 1994; **WCA 5** – Species listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); **SBL** – Scottish Biodiversity List

3.2.11 In addition to records within the last ten years, a bat roost with a count of 100 *Pipistrellus* bat species was recorded within the roof space of a building in Grudie in years 2001, 2007, and 2009 (located approximately 3.7km north-east of the proposed Site entrance).

3.2.12 Commercially available records obtained from the Bat Conservation Trust identified a Daubenton's hibernation roost approximately 8km south of the Site entrance, of which has been recorded on multiple occasions between years 2011 and 2018 (BCT, 2020a). A *Pipistrellus* bat roost was also located approximately 8km north-east of the Site boundary, which has been recorded on several occasions between years 2010 and 2019 (BCT, 2020b).

Notable Plant Species

3.2.13 Vascular plant records obtained from NatureScot[16] identified several notable plant species within 3km of the Site, including juniper, lesser butterfly orchid, small white orchid, holly fern, and harebell (of which are listed within the SBL), with dwarf birch and alpine bearberry (listed within the Sutherland LBAP) also recorded.

[16] From the data obtained from NatureScot, vascular plant records from the year 1990 onwards (i.e. the last 30 years) were considered for this study.

3.3 Phase 1 Habitat Survey

3.3.1 The results of the 2020 Phase 1 habitat survey are displayed in **Figure 8.2 (Volume 3)**. Habitat types identified within the Study Area are displayed in Table 8.1.4 and described in detail below. The habitat descriptions that accompany this table should be read in conjunction with the corresponding results map and target notes (TN) located in **Annex B**. Representative photographs are provided in **Annex C**.

Table 8.1.4 Phase 1 Habitat Survey Results

Phase 1 Habitat Code	Description	Total within Study Area (Ha)	% of total Study Area
A1.2.2	Coniferous plantation woodland	60.73	3.10
A1.3.2	Mixed plantation woodland	27.14	1.39
A4.2	Recently felled woodland	0.62	0.03
B1.2	Semi-improved acid grassland	1.51	1.31
B5	Marsh/ marshy grassland	170.40	8.71
C1.1	Continuous bracken	0.45	0.02
D1.1	Dry dwarf shrub heath - acid	31.35	1.60
D2	Wet dwarf shrub heath	683.10	34.91
D5	Dry dwarf shrub heath/ acid grassland mosaic	7.99	0.41
E.1.6.1	Blanket bog	520.31	26.59
E1.7	Wet modified bog	1.12	0.06
E1.8	Dry modified bog	4.30	0.22
G1	Standing water	3.51	0.18
G2	Running water	-	-
J3.6	Buildings	0.07	0.00
J5	Other habitat	3.10	0.16
B1.2/B5	Acid grassland/ marshy grassland mosaic	25.62	1.31
B5/ E.16.1	Marshy grassland/ blanket bog mosaic	1.71	0.09
D1.1/ D2	Dry heath/ wet heath mosaic	9.56	0.49
D2/ B5	Wet heath/ marshy grassland mosaic	7.38	0.38
D2/ E.1.6.1	Wet heath/ blanket bog mosaic	370.56	18.94
E1.8/ B5	Dry modified bog/ marshy grassland mosaic	2.38	0.12
E1.8/ E1.6.1	Dry modified bog/ blanket bog mosaic	3.53	0.18
-	Hardstanding	9.65	0.49

Phase 1 Habitat Code	Description	Total within Study Area (Ha)	% of total Study Area
-	Not surveyed	10.45	0.53
	Total	1956.53	100

Coniferous Plantation Woodland

3.3.2 A stand of coniferous plantation woodland, comprised primarily of Sitka spruce, exists to south-east of the Study Area, on either side of the Proposed Development access track.

Mixed Plantation Woodland

3.3.3 Recently planted, native mixed woodland, of which is bordered by deer fencing, is present to the north-west of the Study Area (TN7). Species within this young plantation include willow, birch, Scots pine, and rowan. The vegetative ground layer within this area is comprised primarily of wet heath, with linear stretches of marshy grassland that follow the movement of water downslope.

Semi-Improved Acid Grassland

3.3.4 A small patch of semi-improved acid grassland exists within the south-east of the Study Area, adjacent to the Proposed Development access route. This habitat has developed on previously disturbed ground which borders a hardstanding area - of which is used as an emergency muster point. The abundance of species within this area was relatively sparse, with bent grass being the most frequently occurring vegetation type.

3.3.5 Semi-improved acid grassland was also found to occur in mosaic with marshy grassland habitat. This mosaic was recorded in damp fields used for livestock grazing near the start of the proposed access route, to the south-east of the Study Area.

Marshy Grassland

3.3.6 Marshy grassland habitat was common throughout the Study Area. It was found adjacent to watercourses, within damp areas, and stretches across hillslopes in linear bands following the pattern of water movement downslope. Species within this habitat were generally dominated by either soft rush (with frequent marsh violet, marsh bedstraw, and tormentil) or purple moor grass (with frequent bog asphodel and tormentil, with cross leaved heath, deer grass, and heath milkwort as occasional associates).

Continuous Bracken

3.3.7 A small stand of continuous bracken is present along the south-western edge of the Allt a Bhadain watercourse within the south-east of the Study Area.

Heath

Dry Dwarf Shrub Heath

3.3.8 Dry dwarf shrub heath exists in small patches throughout the Study Area – typically located in areas of shallower peat with improved drainage capacity, and on steep, rocky outcrops. This habitat community was characterised by a dominance of ling heather, frequent heath rush and bell heather,

and occasional to frequent bilberry. The bryophyte layer was comprised primarily of hypnoid moss species, such as heath-plait moss, glittering wood moss, and red-stemmed feather moss. To the north-west of the Study Area, wild thyme was found to be present within the dry heath habitat (TN33).

3.3.9 On more exposed, higher altitude hillslopes, heath habitat was formed of primarily of prostrate heather, deer grass, woolly fringe moss, fir clubmoss, and a variety of lichen species. Dwarf juniper was also recorded on some hilltops (TN34).

Wet Dwarf Shrub Heath

3.3.10 This community is the most widely distributed habitat within the Study Area, covering 34.91% of land surveyed. In some areas, ling heather tended to dominate, with abundant cross-leaved heath and deer grass, and frequent common cotton grass, *Cladonia* lichen, purple moor grass, bog asphodel, and purple spoonwort. Occasional associates included lousewort, *Sphagnum capillifolium*, and glittering wood moss (e.g. TN1).

3.3.11 In other areas, wet heath was characterised by a dominance of deer grass, with an abundance of *Cladonia* lichen species and prostrate heather. Heath rush, purple moor grass, woolly fringe moss, and fir club moss were also frequently occurring species, with *Sphagnum capillifolium* as an occasional associate (e.g. TN18 and TN29).

Dry Dwarf Shrub Heath/ Acid Grassland Mosaic

3.3.12 Small patches of dry heath/ acid grassland mosaic were identified in areas of steeper slope with more freely draining soils (e.g. TN3). A variety of species are present within this mosaic habitat, including an abundance of ling heather, sweet vernal grass, and heath bedstraw, with frequent wavy hair grass, bent grass, tormentil, heath milkwort, yarrow, and glittering wood moss.

Mire

Blanket Bog

3.3.13 Blanket bog contributes a large proportion of habitat within the Study Area (26.59%). Pockets of blanket bog habitat are scattered across the north-west of the Study Area, with more extensive bands spread across the lower slopes of Carn nam Bo Maola to Loch Sgeireach. Blanket bog habitat is also present throughout the south-east of the Study Area.

3.3.14 Variations in the abundance and distribution of typical mire species were recorded within blanket bog habitat throughout the Study Area. For example, in some areas, hares tail cotton grass and ling heather were abundant, with frequent bilberry, cloudberry, glittering wood moss, red-stemmed feather moss, and occasional crowberry and *Sphagnum capillifolium* (e.g. TN15 and TN19). While in other areas, a dominance of deer grass and *Sphagnum* moss species were recorded, with frequent ling heather, *Cladonia* lichen, and cross-leaved heath (e.g. TN20).

3.3.15 Within the south-east of the Study Area, much of the blanket bog habitat was noted to contain linear drainage channels, of which may be contributing to dewatering of surrounding bog habitat (e.g. TN 4). Some of the drainage channel sides were comprised of pare peat with water flowing freely downgradient, while other drainage channels were noted to contain slow flowing water and were subject to a degree of occlusion by *Sphagnum* moss species.

Dry Modified Bog

3.3.16 Small patches of dry modified bog were identified adjacent to minor watercourses/ drainage channels within the Study Area (e.g. TN12). This habitat type was characterised by dense hummocks of hares tail cotton grass and glittering wood moss, with frequent ling heather, heath bedstraw, bilberry, tormentil, and occasional patches of *Sphagnum capillifolium* scattered throughout. The presence of dry modified bog is likely to be related to dewatering of blanket bog habitat immediately adjacent to drainage channels, resulting in a reduction in mire species associated with more waterlogged conditions (such as *Sphagnum* moss species) and an increased presence of species that are tolerant of drier conditions (such as hypnoid mosses).

Waterbodies

Standing Water

3.3.17 Several small lochans are present within the Study Area, including Loch Sgeireach and Loch an Rasail.

Running Water

3.3.18 Several watercourses and associated minor tributaries intersect the Study Area. To the north-west, the Allt an Leacach borders the Site boundary, while the Allt Bad na t-Sagairt flows between the slopes of Beinn Sgeireach and Cārn nam Bō Maola. Further to the south-east lies the Allt an Rāsail. These watercourses were generally around 2-3m wide, with a stony/ peaty base. Tributaries associated with these watercourses were narrow (up to 1m wide), and often bordered by marshy grassland habitat.

Buildings

3.3.19 The existing Achany Wind Farm substation represents the only building within the Study Area.

Other Habitat

3.3.20 The term 'other habitat' has been applied to an area of land to the south-east of the Study Area, of which may have been excavated as a borrow pit for the existing Achany Wind Farm and is now recolonising with a range of species (TN 25). Around the edge of the pit is very short vegetation that has been subject to browsing. Species present include abundant tufts of soft rush, with bent grass, common haircap moss, glittering wood moss and heavily grazed ling heather throughout. Within the damp hollow at the base of the pit, hares tail cotton grass, soft rush, and star sedge are common.

Hardstanding

3.3.21 To the far south-east of the Study Area is an area of hardstanding, with access tracks and turbine infrastructure associated with the existing Achany Wind Farm.

4. Summary of Nature Conservation Interest

4.1 Desk Study

4.1.1 The desk-based ecological study was carried out to identify any potential ecological constraints to the Proposed Development. A summary of the assessment findings is provided below:

- Several statutory sites designated for the purpose of nature conservation have been identified within 10km of the Site boundary. Those with potential connectivity to the Site include;
  - River Oykel SAC, designated primarily due to the presence of freshwater pearl mussel, with Atlantic salmon also a qualifying feature; and
  - Caithness and Sutherland Peatland SAC and its two component SSSIs (Strath an Loin SSSI and Grudie Peatlands SSSI), designated for peatlands (including blanket bog) and otter.
- Non-statutory sites comprise woodland habitat classified within the Ancient Woodland Inventory. No further information relating to non-statutory designated sites was obtained from HBRG.
- Data records form the last ten years show three species of bat (common pipistrelle, soprano pipistrelle, and Daubentons bat) recorded in flight within 10km of the Site boundary. Records indicating the presence of roosting bats (common pipistrelle, Daubenton's bat, and brown long eared bat) between 3.7 and 8.5km of the Site boundary also exist.
- Habitats within the Site are comprised primarily of wet heath and blanket bog (Habitats Directive Annex I habitat type), with smaller areas of dry dwarf shrub heath, unimproved acid grassland, and acid flush habitat also present. Several plant species of principle importance for nature conservation (e.g. listed within the SBL) were also identified during Phase 1 habitat and NVC surveys.
- Based on existing baseline information, potential exists for otter to utilise the Site for foraging, commuting and sheltering purposes.
- Small water vole colonies have previously been recorded within the Site. In addition, six water vole colonies have been identified within the adjacent operational Achany Wind Farm site boundary. Therefore, potential exists for their continued presence within the Study Area.
- Two species of bat (common and soprano pipistrelle) were recorded within, or adjacent to, the Site during activity surveys in 2011. Potential therefore exists for these species to utilise the Site for commuting and foraging purposes.

4.2 Phase 1 Habitat Survey

4.2.1 Habitats within the Study Area are comprised primarily of wet heath, with large areas of blanket bog habitat and marshy grassland scattered throughout. Several watercourses and small waterbodies also intersect the Study Area. The distribution of habitat communities tends to reflect the acidity and drainage of underlying soils, variations in gradient, and likely differences in peat depth across the Study Area.

4.2.2 While some habitats present within the Study Area are generally considered to be of low ecological importance (such as coniferous plantation forestry, semi-improved acid grassland, and bracken) habitats of higher nature conservation value were also recorded, which are discussed below.

Species of interest

4.2.3 A number of species that are listed within the SBL and Sutherland LBAP were recorded within the Study Area. Those defined within the SBL, and thus of principle importance for biodiversity conservation include:

- Dwarf juniper

4.2.4 Those listed within the Sutherland LBAP, and therefore of local importance for biodiversity conservation, include:

- Dwarf birch; and
- Alpine bearberry

Habitats of interest

4.2.5 Several habitats of importance for nature conservation were recorded during the survey and have been subject to further survey as part of the National Vegetation Classification, Peatland Condition Assessment and GWDTE Report (**Technical Appendix 8.2A**), and have been considered as part of the design phase:

Annex 1 habitat

4.2.6 Blanket bog and dry and wet dwarf shrub heath are listed under Annex 1 of the Council Directive 92/43/EEC on the conservation of natural habitats of wild fauna and flora (the Habitats Directive). These habitats are also listed within the SBL and Sutherland LBAP. As such, they are considered as habitats of principle importance for biodiversity conservation.

Waterbodies

4.2.7 A series of watercourses, bog pool areas, and lochans are present within the Study Area. Rivers and lochs are listed within the SBL and Sutherland LBAP and are therefore a priority habitat for conservation.

Ground Water Dependant Terrestrial Ecosystems

4.2.8 Groundwater Dependant Terrestrial Ecosystems (GWDTEs) are wetland habitats that depend on groundwater flows or chemistries. Potential for the presence of GWDTEs exists within habitats identified throughout the Study Area. In accordance with SEPA (2017) guidelines, a detailed NVC survey and GWDTE assessment has been undertaken (**Technical Appendix 8.2A**; and **Chapter 10: Hydrology and Hydrogeology**) to further inform the potential for GWDTEs, and thus assess the potential risk to these habitats as a result of construction operations.

References

Applied Ecology (2020). Achany Wind Farm Habitat Management Plan – 10 year review.

Bat Conservation Trust (2020a) National Bat Monitoring Programme - Hibernation Survey.

Bat Conservation Trust (2020b). National Bat Monitoring Programme Roost Count.

Environ (2012). Glencassley Wind Farm Environmental Statement – July 2012, Chapter 8: Ecology

JNCC, 2010. Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7

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

Annex A
Scientific Species Names

Common name	Scientific name
Alpine bearberry	*Arctostaphylos alpina*
Alpine meadow rue	*Thalictrum alpinum*
Atlantic salmon	*Salmo salar*
Badger	*Meles meles*
Bell heather	*Erica cinerea*
Bent grass species	*Agrostis sp.*
Birch	*Betula sp.*
Bilberry	*Vaccinium myrtillus*
Bog asphodel	*Narthecium ossifragum*
Bracken	*Pteridium sp.*
Brown long-eared bat	*Plecotus auritus*
***Cladonia* lichen**	*Cladonia sp.*
Common cotton grass	*Eriophorum angustifolium*
Common haircap moss	*Polytrichum commune*
Common pipistrelle bat	*Pipistrellus pipistrellus*
Cross leaved heath	*Erica tetralix*
Daubenton's bat	*Myotis daubentonii*
Deer grass	*Trichophorum germanicum*
Dwarf birch	*Betula nana*
Dwarf juniper	*Juniperus communis*
Fir clubmoss	*Huperzia selago*
Freshwater pearl mussel	*Margaritafera margaritafera*
Glittering wood moss	*Hylocomium splendens*
Harebell	*Campanula rotundifolia*
Hares tail cotton grass	*Eriophorum vaginatum*
Heath bedstraw	*Galium saxatile*
Heath milkwort	*Polygala serpyllifolia*

Common name	Scientific name
Heath plait moss	*Hypnum jutlandicum*
Heath rush	*Juncus squarrosus*
Holly fern	*Polystichum lonchitis*
Lesser butterfly orchid	*Platanthera biofolia*
Lesser clubmoss	*Selaginella selaginoides*
Ling heather	*Calluna vulgaris*
Lousewort species	*Pedicularis sp.*
Marsh bedstraw	*Galium palustre*
Marsh violet	*Viola palustris*
Otter	*Lutra lutra*
Pine marten	*Martes martes*
Purple moor grass	*Moliniea caerulea*
Purple spoonwort	*Pleurozia purpurea*
Red stemmed feather moss	*Pleurozium schreberi*
Rowan	*Sorbus aucuparia*
Scots pine	*Pinus sylvestris*
Sitka spruce	*Picea sitchensis*
Small white orchid	*Pseudorchis albida*
Soft rush	*Juncus effusus*
Soprano pipistrelle bat	*Pipistrellus pygmaeus*
Sphagnum capillifolium	*Sphagnum capillifolium*
Star sedge	*Carex echinata*
Sweet vernal grass	*Anthoxanthum odouratum*
Tormentil	*Potentilla erecta*
Water vole	*Arvicola amphibius*
Wavy hair grass	*Deschampsia flexuosa*
Wildcat	*Felis sylvestris*
Wild thyme	*Thymus polytrichus*
Willow	*Salix sp.*

Common name	Scientific name
Woolly fringe moss	*Racomitrium lanuginosum*
Yarrow	*Achillea millefolium*

Annex B
Phase 1 Habitat Survey Target Notes

TN	Grid reference	Description
1	NC 46320 06689	Wet heath habitat on shallow peaty soil. In some areas vegetation is rather sparse, with bare peat showing. Ling heather is dominant, with abundant deer grass and crossed leaved heath, with frequent common cotton grass, *Cladonia* lichen, purple moor grass, bog asphodel, and hares tail cotton grass. Lousewort species and *Sphagnum capillifolium* were occasional associates.
2	NC 46613 06868	Patch of rather dry bog habitat on hillside. Characterised by hummocks of hares tail cotton grass glittering wood moss and red stemmed feather moss, with frequent purple moor grass and cross leaved heath, and patchy *Sphagnum* moss in hollows.
3	NC 46428 06956	Small hillock of dry heath-acid grassland mosaic, with sweet vernal grass, tormentil, bent grass, yarrow, heath bedstraw, ling heather, and glittering wood moss.
4	NC 46333 07360	Many drainage ditches in this area – some of which have water moving downgradient and sides of bare peat, while others have slow flowing water and some degree of occlusion by *Sphagnum* moss.
5	NC 46972 07037	Patch of shallower peat here with less hares tail cotton grass and increased coverage of common cotton grass, deer grass, and woolly fringe moss. Ling heather is also frequent, and bare patches of peat are visible.
6	NC 46863 06680	Dry modified bog habitat to the west of proposed Tower 17. Pronounced hummock and hollow landscape. Hares tail cotton grass and hypnoid moss dominate hummocks, with heath bedstraw, bilberry, tormentil, ling heather and patchy *Sphagnum capillifolium* also frequent.
7	NC 44114 10497	Young mixed native woodland plantation comprising willow, birch, Scots pine, and rowan.
8	NC 44219 10733	Patches of dry heath habitat amongst purple moor grass mire and wet heath. Vegetation within dry heath is dominated by ling heather, with abundant heath plait moss and frequent heath rush, deer grass, bilberry, bell heather, red-stemmed feather moss and glittering wood moss.
9	NC 43989 11931	Area previously marked as marshy grassland, however have classified as blanket bog due to the dominance of hares tail cotton grass, abundance of *Sphagnum* moss, and frequent occurrence of purple moor grass, cross-leaved heath, deer grass, heath milkwort, and ling heather.
10	NC 46619 06503	Area of wet heath/ purple moor grass mire with abundant deer grass, bog myrtle and purple moor grass, with frequent heath milkwort, cross-leaved heath, tormentil, and occasional bog asphodel, *Sphagnum papillosum*, star sedge, and ling heather.
11	NC 46773 06397	Area marked as marshy grassland due to the high cover of purple moor grass. However there is a relatively diverse range of species in the sward, including abundant cross-leaved heath and tormentil, with frequent bog myrtle, scabious species, and deer grass.
12	NC 47046 06182	Dry modified bog habitat - hares tail cotton grass and wavy hair grass dominate, with abundant heath bedstraw and hypnoid moss species. Sprigs of dried out ling heather present, with frequent tormentil, bilberry, purple moor grass, and occasional deer grass.
13	NC 47344 06482	Drainage ditches present throughout bog habitat, with water flowing downgradient.
14	NC 47403 06332	Watercourse measures approximately 0.3-0.75m wide, with a channel depth of 0.5-0.75m.
15	NC 47280 06243	Area adjacent to watercourse is comprised predominantly of bog habitat with hummocks of hares tail cotton grass and wavy hair grass, with crowberry, bilberry, hypnoid moss, and *Sphagnum fallax* and *Sphagnum capillifolium* in hollows. A linear marshy grassland feature is also present, of which is

TN	Grid reference	Description
		dominated by soft rush, with frequent marsh violet, tormentil, common haircap moss, common sorrel, marsh bedstraw, and occasional meadow buttercup.
16	NC 48041 05980	Habitat on hilltop is comprised of relatively shallow peat (up to 50cm deep), however vegetation is more typical of blanket bog - dominated by hares tail cotton grass, with abundant deer grass, *Cladonia* lichen species, woolly fringe moss, and prostrate heather, and frequent crossed leaved heath and *Sphagnum capillilfolium*.
17	NC 49487 04778	Previously felled area with scattered lodgepole pine regeneration and plant species such as wavy hair grass, purple moor grass, ling heather, deer grass, hypnoid moss species, and occasional hares tail cotton grass.
18	NC 49789 04589	Heath habitat in which deer grass is dominant, with abundant *Cladonia* lichen species and prostrate heather, and frequent heath rush, purple moor grass, and woolly fringe moss. Dwarf birch is also frequent in this location.
19	NC 49966 04485	Blanket bog habitat in which hares tail cotton grass, ling heather, *Cladoina* lichen species, and *Sphagnum capillifolium* are abundant, with frequent cross-leaved heath, woolly fringe moss, and occasional common cotton grass.
20	NC 50017 04527	Blanket bog near base of slope more typical of M17 mire community – vegetation dominated by deer grass, with abundant *Sphagnum* moss species and *Cladonia* lichen species, with frequent ling heather and cross leaved heath.
21	NC 50051 04559	Alpine bearberry abundant within transitional bog habitat near the base of the slope.
22	NC 50379 04759	Hilltop has been classified as wet heath/ blanket bog mosaic as there are patches of wet heath dominated by deer grass and also transitional vegetation with hares tail cotton grass. On the steep north-east side of the slope, vegetation is comprised of abundant hares tail cotton grass, ling heather, hypnoid moss species, and crowberry, with frequent *Cladonia* lichen species and alpine bearberry.
23	NC 50815 04045	Vegetation surrounding peat is a mixture of species that have colonised first. For example – dry heath species on stony shallow soils, scattered patches of common cotton grass, and areas of dense purple moor grass and frequent tufts of hares tail cotton grass.
24	NC 52511 03734	Hardstanding area with made up ground surrounding it, in which acid grassland species have began to develop. Vegetation is very short due to browsing pressure.
25	NC 52714 03583	Old borrow pit with reclaimed ground surrounding the perimeter. Around the edge is very short vegetation due to browsing, with abundant tufts of soft rush throughout. Species present include bent grass, common haircap moss, glittering wood moss, and heavily grazed ling heather. Within damp hollow at base of the pit, hares tail cotton grass, soft rush, and star sedge are common.
26	NC 53028 02955	Watercourse measures approximately 1m wide by 30cm deep. Good otter commuting and foraging potential.
27	NC 53476 02468	Open habitat near base of access track with purple moos grass, tufted hair grass and soft rush. This habitat is suitable for water vole, and also has otter commuting and foraging potential.
28	NC 445992 10997	Area of heavily eroded peat and bare ground
29	NC 46272 10054	Area of heath on top of hill, in which deer grass is dominant, while woolly fringe moss, *Cladonia* lichen species, purple spoonwort and prostrate heather are all frequent.
30	NC 44603 11155	Bog pool - measuring approximately 12x6m
31	NC 44089 10973	Land north and west of the met mast if formed of a mosaic of blanket bog and wet heath habitat.

TN	Grid reference	Description
32	NC 44445 11691	Strip of dry heath – acid grassland habitat with abundant ling heather, sweet vernal grass, and heath bedstraw, with frequent wavy hair grass, bent grass species, tormentil, heath milkwort, and yarrow.
33	NC 44529 12131	Dry heath habitat in which wild thyme is frequent throughout.
34	NC 45303 11917	Top of Beinn Sgeireach is dominated by heath among rocky outcrops. Within this area, deer grass dominates, with abundant *Cladonia* lichen species, frequent purple spoonwort, heath rush, and woolly fringe moss, and occasional fir clubmoss. Dwarf juniper was also observed at NC 45303 11914.
35	NC 45419 11746	Patch of blanket bog within a hummock on east side of hill, in which hares tail cotton grass and ling heather are abundant, with frequent bilberry and cloudberry, and occasional occurrence of crowberry and *Sphagnum capillifolium*.

Annex C
Representative photographs

Photo 1: Marshy grassland habitat adjacent to watercourse

Photo 2: Dry heath- acid grassland mosaic

Photo 3: Dry modified bog habitat

Photo 4: Example of historic drainage ditch intersecting blanket bog habitat

Photo 5: Dwarf juniper on hill top

Photo 6: Wild thyme within dry heath habitat