Carnaig 400 kV Substation EIA Report: Volume 4

Technical Appendix 7.1: Habitat and Protected Species Survey Report

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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
BCT	Bat Conservation Trust
CEMP	Construction Environmental Management Plan
CIEEM	The Chartered Institute of Ecology and Environmental Management
DNA	Deoxyribonucleic acid
EIA(R)	Environmental Impact Assessment (Report)
ECoW	Ecological Clerk of Work
ERM	Environmental Resources Management Ltd
GEMPs	General Environmental Management Plans
GI	Ground Investigation
GWDTE	Ground Water Dependent Terrestrial Ecosystems
HMP	Habitat Management Plan
JNCC	Joint Nature Conservation Committee
kV	Kilovolt - One thousand volts of electricity
LUPS	Land Use Planning System
Km	Kilometer – One thousand meters
m	Meters
MW	Megawatts
NVC	National Vegetation Classification
OHL	Overhead Line
OS	Ordinance Survey
PMP	Peat Management Plan
PRF	Potential Roost Feature
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Area

Acronyms	Description
SPP(s)	Species Protection Plan(s)
SSSI	Site of Special Scientific Interest
SSEN Transmission	Scottish and Southern Electricity Networks Transmission
THC	The Highland Council
TN(s)	Target Note(s)
UGC	Underground Cable
UKHab	The UK Habitat Classification
UKTAG	United Kingdom Technical Advisory Group

1. INTRODUCTION

1.1 SCOPE

Environmental Resources Management Ltd (ERM) was commissioned by SSEN Transmission to undertake an ecological survey of the habitats and protected species for the Proposed Development to inform the Environmental Impact Assessment Report (EIAR). The survey area initially comprised the footprint of the Proposed Development, plus a 250 m buffer. This was later extended to include all areas within the Proposal of Application Notice (PAN) Boundary, due to a requirement for peat restoration to be undertaken on site.

Habitats present in the survey area were recorded and mapped using the alphanumeric UK Habitat Classification (UKHab). Habitats with the potential groundwater dependency were mapped and assigned a National Vegetation Classification (NVC) code. A survey for signs of protected species was conducted within the same area.

This report presents the findings of the habitat and protected species surveys undertaken by ERM within the survey area.

1.2 SITE LOCATION AND DESCRIPTION

The Proposed Development is located approximately 9.5 km north east of Bonar Bridge, adjacent to the existing 275 kV Loch Buidhe Substation, south of Loch Buidhe, approximately centered at Ordinance Survey (OS) Grid Reference NH 65112 97362.

The Proposed Development is located within the Strath Carnaig and Strath Fleet Moors Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI), which are designated for supporting 12 breeding pairs of hen harrier (*Circus cyaneus*). The main habitats of the SPA are extensive heather moors and upland acid grasslands. There are also areas of commercially planted conifer and semi-natural broadleaf woodland. However, the Proposed Development footprint is situated primarily within the commercial forestry plantation, comprising conifer woodland and areas of clear fell. Relevant designations are presented in **Annex A Figure 1 Designated Sites**.

2. METHODS

The following sections describe the survey methods, personnel, timing, and limitations.

2.1 UKHAB SURVEY

UK Habitat Classification (UKHab) surveys were undertaken by ERM within the survey area, as described in **Section 1.1**. Surveys were based on the methods described in the UK Habitat Classification User Manual[1] and the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey[2], as extended for use in Environmental Assessment[3]. UKHab Version 2.0[4] was used to assign the alphanumeric UKHab habitat classification codes which are presented in this report. Mapped habitats are presented in **Annex A Figure 2a**.

Plants and their frequency of occurrence were recorded using the subjective DAFOR[5] scale (dominant, abundant, frequent, occasional, or rare). The nomenclature of vascular plants occurring within the defined survey area follows Stace (2019)[(6)].

2.2 NVC FOR GWDTE SURVEY

A National Vegetation Classification (NVC) survey of habitats with the potential to support Groundwater Dependent Terrestrial Ecosystems (GWDTE) was undertaken by ERM within the survey area. The survey was based on the methods described in the Joint Nature Conservation Committee (JNCC) National Vegetation Classification: Users' handbook[7], with communities identified by eye. Mapped findings are presented in **Annex A Figure 2b**.

2.3 PROTECTED SPECIES SURVEY

A walkover survey for protected and priority species was undertaken during the habitats walkover survey, supplemented by observations from Ground Investigation (GI) supervision, which included a search for signs / sightings of species likely to occur in the locality and in those habitats which were present. Protected species are those deemed 'sensitive' and especially vulnerable to persecution or over-exploitation and are protected under legislation

[1] Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020) *UK Habitat Classification User Manual, Version 1.1*. UK Habitat Classification Working Group, Stockport. Available at: http://ecountability.co.uk/ukhabworkinggroup-ukhab.
[2] Joint Nature Conservation Committee (2010) *Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit*. With minor corrections addressed in 2016. JNCC, Peterborough. Available at: https://hub.jncc.gov.uk/assets/9578d07b-e018-4c66-9c1b-47110f14df2a
[3] Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment, Spon, London.
[4] UKHab Ltd (2023) *UK Habitat Classification 2.0*. UKHab Ltd, Stockport. Available at: https://www.ukhab.org
[5] The DAFOR scale is used for semi-quantitative sampling, to provide a quick estimate of the relative abundance of species (generally plants) in each area. Abundance (number of individuals) and cover (area coverage) are often used interchangeably in this type of surveying, although in fact they may have very different meanings.
[6] Stace, C. (2019). *New Flora of the British Isles. 4th edition*. UK. Cambridge University Press
[7] Joint Nature Conservation Committee (2006) National Vegetation Classification: Users' handbook. JNCC, Peterborough. Available at: https://hub.jncc.gov.uk/assets/a407ebfc-2859-49cf-9710-1bde9c8e28c7

such as the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)[8], Wildlife and Countryside Act 1981(9) and Protection of Badgers Act 1992(10). Other species of priority, such as those included on the Scottish Biodiversity List[11] (SBL) which are of particular importance for the conservation of biodiversity in Scotland, were also recorded if present.

The survey method for each species is detailed in **Sections 2.3.1** to **2.3.3**. Survey limitations are discussed in **Section 2.5**.

Survey findings are presented in **Annex A Figure 3 Protected Species**.

The results of ornithological surveys and ornithological observations are not reported within this report as they are presented in a separate ornithology survey report.

2.3.1 BATS

Habitats suitable for bats were identified and an assessment undertaken of their likely suitability to support foraging / commuting bats and bat roosts, taking account of guidance from the Bat Conservation Trust (BCT)[12] (**Table 2.1**). The assessment of the potential for bat roosts in the habitats was made based on ground observations throughout the survey area, with high-level assessments of both trees and buildings to support roosting bats undertaken. In areas of more mature dense conifers, assessment was restricted largely to the edges of the plantations along tracks / rides, as access into the plantation was not possible. Detailed inspections and climbing were not undertaken. Survey limitations are described in **Section 2.5**.

TABLE 2.1: SUITABILITY CATEGORIES OF POTENTIAL BAT HABITATS

Category	Roosting Habitat	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by the individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and / or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be	Habitat that could be used by small numbers of commuting bats such as fragmented hedgerows or an unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that

[8] UK Government Legislation (1994). The Conservation (Natural Habitats, &c.) Regulations 1994. Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents.
[9] UK Government Legislation (1981). Wildlife and Countryside Act 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents.
[10] UK Government Legislation (1992). Protection of Badgers Act 1992. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents.
[11] Scottish Biodiversity List (2005). Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.nature.scot%2Fsites%2Fdefault%2Ffiles%2F2022-04%2FScottish%2520Biodiversity%2520List.xls&wdOrigin=BROWSELINK
[12]Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines.3rd edition. The Bat Conservation Trust, London.

Category	Roosting Habitat	Commuting and Foraging Habitats
	suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.	could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting, such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

SOURCE: Collins (2016)

2.3.2 OTHER MAMMALS

Accessible areas of habitat suitable for the following terrestrial mammal species were surveyed for evidence of activity as detailed:

- **Eurasian Otter *Lutra lutra*:** spraints, slides, tracks, feeding remains, holts, couches, and resting up sites[13];
- **Water vole *Arvicola amphibious:*** droppings, latrines, feeding remains, nests, and burrows[14];
- **European Badger *Meles meles:*** sett entrances, bedding, scratch marks, paths, prints, guard hairs, latrines, droppings and signs of foraging[15];
- **Pine marten *Martes martes:*** dens, feeding signs and scat;
- **Red squirrel *Scirus vulgaris:*** dreys and feeding signs; and

[13] Chanin and Smith (2003). Monitoring the otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.
[14] Strachan, R. Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit (WildCRU), Oxon
[15] Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1.

- **Wildcat *Felis sylvestris:*** dens, scat and feeding signs.

2.3.3 OTHER FAUNA

The presence, or potential presence, of any other species of note (e.g., Scottish Biodiversity List species, Local Biodiversity Action Plan species, reptiles, amphibians, and invasive non-native species) were recorded.

2.4 SURVEY PERSONEL AND TIMINGS

The UKHab, NVC, GWDTE walkover survey of the Proposed Development plus a 250 m buffer was carried out by Heather Green (ERM Ecologist) who has 20 years' experience and Aaron Martin (ERM Ecologist) who has two years' experience. Weather conditions relating to survey are detailed within **Table 2.2**.

Additionally, protected species walkover was completed as part of the Ground Investigation (GI) works by Aaron Nugent (ERM Ecologist), who has two years' experience. A search for protected species, resting places and filed signs was completed within 30 m of each GI location. GI works occurred over a six-week programme between October 2023 and December 2023.

Further UKHab, NVC, GWDTE walkover survey within the PAN boundary was carried out by Ecologists from Direct Ecology Ltd., commissioned by ERM on behalf of SSEN Transmission, under the supervision of Beccy Osborn (Director and Principal Ecologist), who has over 20 years' experience.

TABLE 2.2: SURVEY TIMING AND WEATHER CONDITIONS

Date	Type of Survey	Start and End Time (24hrs)	Weather			
			Rain	Temp. (°C)	Wind Speed [16]	Cloud Cover [17]
29 September 2023	UKHAB, NVC for GWDTE, and Protected Species (Proposed Development + 250 m)	15:00 to 17:00	100%	13	5	2/8
30 September 2023	UKHAB, NVC for GWDTE, and Protected Species (Proposed Development + 250 m)	08:00 to 18:00	100%	13	4	8/8
W/C 03 June 2024	UKHAB, NVC for GWDTE, and Protected Species (PAN boundary)	09:00 - 17:00	Scattered showers	7-18	11-22 (mph)	Scattered clouds

NOTE: All timings and measurements are approximate

[16] Met Office Beaufort wind force scale. Available at https://www.metoffice.gov.uk/weather/guides/coast-and-sea/beaufort-scale

[17] The total amount of the sky covered by cloud is expressed in oktas (eighths). Royal Meteorological Society Weather Symbols and Synoptic Charts. Available at https://www.metlink.org/resource/student-charts

2.5 LIMITATIONS

Wet and boggy ground conditions were common throughout the survey area, occasionally preventing access to complete a thorough survey. Areas of tall-grown grassland habitats and areas of heathland made it difficult to find field signs e.g. scat and historical / inactive badger setts. It is possible that field signs of protected species could be present within the survey area but were not recorded if they were concealed by the environment.

Although all burns and drains within the survey area were assessed, it was not possible to safely access and survey their full extent for field signs of otter, water vole or badger setts. Reasons for this include the extent of dense vegetation, fast-flowing or deep water, and steep-sided margins.

Due to the density of some coniferous woodland plantations and the presence of areas of wind-blown trees, which made surveying them unsafe, in-depth protected species walkover surveys were not possible. In these circumstances, surveys were restricted to less dense woodland and areas where wind blow was not observed, further to this the periphery of any unsafe woodland blocks were surveyed for field signs and indications of use such as trails entering the area.

Survey coverage and access were generally good across the survey area, allowing for good characterisation of habitats and likely species present. Therefore, these limitations, individually and in combination, are not considered significant. However, it should be noted that the absence of evidence does not confirm the absence of target species, particularly mobile or cryptic species. There is potential for species not recorded through the desk-based study and survey to occur within the Proposed Development e.g., those colonising the survey area following the survey or post consent.

3. SURVEY RESULTS

3.1 UKHAB SURVEY

UKHab habitat classifications recorded within the survey area are presented in **Table 3.1**. They are listed by classification grouping as set out in the UK Habitat Classification User Manual (2023), not in order of ecological value.

TABLE 3.1: UKHAB CLASSIFICATIONS RECORDED WITHIN THE SURVEY AREA.

Broad Habitat Type	UKHab Code	Habitat Name
Grassland	g1b	Upland acid grassland
	g3c	Other neutral grassland
	g3c8	Holcus-Juncus neutral grassland
Woodland and forest	w1h	Other woodland; mixed
	w1h6	Other woodland; mixed; mainly conifer
	w2c	Other coniferous woodland
Heathland and shrub	h1b5	Dry heaths; upland (H4030)
	h1b6	Wetland heath with cross-leaved heath; upland (H4010)
	h3h	Mixed scrub
Wetland	f1a	Blanket bog
	f1a6	Degraded blanket bog
	f2b	Purple moor grass and rush pastures
	f2c	Upland flushes, fens and swamps
Urban	u1b	Developed land; sealed surface
	u1c	Artificially unvegetated, unsealed surface
Rivers and Streams	rg1	Other standing water
	r2b	Other rivers and streams

These habitats are described in **Section 3.1.1** to **3.1.6**. The mapped findings of the UKHab survey are presented in **Annex A Figure 2a**.

3.1.1 GRASSLAND

g1b Upland acid grassland

Areas of upland acid grassland occurred in drier, more open areas in the north and south of the survey area, characterised by abundant wavy hair grass *Avellana flexuosa,* common cotton-grass *Eriophorum angustifolium*, and common haircap moss *Polytrichum commune*. With frequent tufted hair grass *Deschampsia cespitosa,* common bent *Agrostis capilaris*, bell heather *Erica cinerea*, soft rush *Juncus effusis*, and heath plait-moss *Hypnum jutlandicum*. Occasional species comprised cross-leaved heath *Erica tetralix, c*oltsfoot *Tussilago farfara*. Bog mosses

Sphagnum sp., and common striated feather moss *Eurhynchium striatum*. Scattered self-seeded trees were also present.

g3c other neutral grassland

Other neutral grassland occurred in three locations: immediately north of the existing Loch Buidhe Substation; south of Loch Buidhe; and north west of the existing substation. Compact rush *Juncus conglomoroatus*, birch *Betula sp*., spear thistle *Cirsium vulgare*, Foxglove *Digitalis purpurea,* and broadleaved plantain *Plantago major* were frequent. Occasional species included broadleaved dock *Rumex obtusifolius* and hard rush *Juncus inflexus*.

g3c8 Holcus-Juncus neutral grassland

Two small areas occurred west of the existing Loch Buidhe substation. Soft rush, and pointed spear moss *Calliergonella cuspidata* were abundant, with occasional male fern *Dryopteris filix-mas*, marsh thistle *Cirsium palustre,* broadleaved sorrel *Rumex acetosa*, tufted hair grass, and common marsh bedstraw *Galium palustre.*

3.1.2 WOODLAND AND FOREST

w1h Other woodland; mixed

Other woodland; mixed habitat occurred east of the existing Loch Buidhe Substation and had a very young age structure. Frequent species included Sitka spruce *Picea sitchensis*, rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*, birch *Betula* sp., willow *Salix* sp., larch *Larix* sp., and pine *Pinus sp*. Occasional species included rosebay, haircap mosses, broom *Cytisus scoparius* and gorse *Ulex europaea*.

w1h6 Other woodland; mixed; mainly Conifer

This habitat occurred to the east of the existing Loch Buidhe substation. Larch was abundant, with frequent birch, gorse, hare's-tail cotton-grass *Eriophorum vaginatum*, and hard rush.

w2c Other coniferous woodland

Other coniferous woodland is the main habitat within the survey area. Frequent species included Norway spruce *Picea abies*, Sitka spruce, and lodgepole pine *Pinus contorta*. The ground flora was dominated by *Sphagnum* mosses, occurring as a carpet.

3.1.3 HEATHLAND AND SHRUB

h1b5 Dry heaths; upland (H4030)

Upland dry heath was present in the west of the survey area, occurring in mosaic with blanket bog habitat and associated with drier, more sloping or raised areas. Abundant common heather *Calluna vulgaris*, tormentil, heath bedstraw *Galium saxatile,* and purple moor-grass *Molinia cerulea* occurred throughout. Frequent species included nodding-head moss *Pohila nutans,* male fern, soft rush, and ostrich-plume feather-moss *Ptilium crista-castrensis*. Bell heather *Erica cinerea*, sweet vernal grass *Anthoxanthum odoratum,* field wood rush *Luzula campestris*, and wavy hair grass were occasional.

h1b6 Wet heathland with cross-leaved heath; upland (H4010)

Small areas of wet heathland occurred adjacent to the unclassified Lochbuidhe road and a discrete area at the south eastern PAN boundary. Species composition was similar across the areas, with abundant cross-leaved heath, frequent hare's-tail cotton grass, tormentil, deergrass *Trichophorum cespitosum*, and heath bedstraw. Devil's bit scabious *Succisa pratensis,* compact rush *Juncus conglomeratus* and bog myrtle *Myrica gale* were recorded as rare in abundance.

h3h Mixed scrub

Small stands of mixed scrub occurred in the west of the survey area. Dominant species were broom, and bramble *Rubus fruticosus*, with abundant rosebay willow herb. Bell heather, and hawkbit species *Leontodon sp*. were frequent within the understory.

3.1.4 WETLAND

f1a Blanket bog

Blanket bog does not occur within the survey area but was present along the northern and western edges of the PAN Boundary, south of Loch Buidhe and extending west of the unclassified Lochbuidhe road. Species recorded include cow-horn bog-moss *Sphagnum denticulatum*, flat-topped bog-moss *Sphagnum fallax* and marsh cranesbill *Geranium palustre.*

f1a6 Degraded blanket bog

Degraded blanket bog was present throughout the survey area, primarily occurring within plantation forestry rides and firebreaks. A larger extent of degraded blanket bog is also present within an area of open ground, immediately to the south of Loch Buidhe. Species recorded include abundant red bog moss *Sphagnum capillifolium,* and marsh thistle *Cirsium palustre*, frequent hare's-tail cottongrass *Eriophorum vaginatum,* and feather moss *Eurhynchium striatum*, with occasional cross-leaved heath *Erica tetralix* and tormentil *Potentilla erecta*.

f2b Purple moor-grass and rush pastures

One small area occurs in the north of the survey area, to the south of the unclassified Lochbuidhe road. Soft rush was dominant, with abundant sorrel *Rumex* sp. Frequent marsh thistle *Cirsium palustre*, glittering wood-moss *Hylocomium splendens* occured*,* with locally frequent marsh marigold *Caltha palustre*, marsh cinquefoil *Comarum palustre*, and germander speedwell *Veronica chaemaedrys*. Occasional species included cuckoo flower *Cardamine praetensis*, and creeping buttercup *Ranunculus repens*, *Sphagnum* denticulatum*, S. cuspidatum*, common sedge *Carex nigra*, glaucus sedge *Carex glauca*, hare's-tail cotton-grass, and red fescue *Festuca rubra*.

f2c Upland flushes, fens and swamps

Two areas of fen marsh and swamp, occurred in the north of the survey area, to the north and north east of the existing substation. Hard rush *Juncus inflexus* and common bent *Agrostis capillaris* were dominant, with occasional self-seeded tree species including alder *Alnus glutinosa*, willow *Salix sp.* and Douglas fir *Pseudotsuga menziesii.* Common gorse *Ulex europaeus* also occurred occasionally.

3.1.5 URBAN

u1b Developed land; sealed surface

Impermeable habitats comprised the unclassified Lochbuidhe road, constructed from tarmac and running through the north of the survey area.

u1c Artificial unvegetated; unsealed surface

Areas of this habitat included the existing Loch Buidhe substation, and forestry access roads within the survey area, comprising a predominantly gravel substrate, with little-to-no vegetation associated. Rarely occurring species included purple moor grass, and common heather, generally present in the margins or track verges.

3.1.6 RIVERS AND STREAMS

r1g Other standing water

A small water body measuring approximately 0.314 ha was recorded north of the existing Loch Buidhe substation. This is likely an attenuation pond associated with the substation drainage system. No submerged aquatic or emergent vegetation was observed during the survey.

r2b Other rivers and streams

Running freshwater is present throughout the survey area as minor watercourses and drainage ditches, presented in **Annex A Figure 2a**. There are also many unmapped small drainage ditches associated with the plantation woodland.

3.2 NOTABLE FLORA

No flora species of significant conservation value (e.g. Priority or SBL species) were identified during the surveys. A full botanical species list for the survey can be found in **Annex B**.

3.3 INVASIVE AND NON-NATIVE SPECIES

No invasive non-native fauna or flora species were recorded in the survey area at the time of survey.

3.4 NVC FOR GWDTE SURVEY

The sensitivity of each of the GWDTE receptors identified has been based on classifications provided within Scottish Environment Protection Agency (SEPA) Land Use Planning System (LUPS) – Guidance Note 31 [18]. The SEPA classification is modified from the United Kingdom Technical Advisory Group (UKTAG) list of NVC communities[19], which provides the full list for all

[18] Scottish Environment Protection Agency (SEPA), 2014. Land Use Planning System Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf.

[19] UK Technical Advisory Group on the Water Framework Directive, 2004. Guidance on the identification and risk assessment of groundwater dependent terrestrial

communities. This system scores each NVC community by its dependency on groundwater, i.e. 3=low, 2=moderate, or 1=high.

NVC habitats classified as moderate or high GWDTE that were recorded within the 250 m buffer survey area during the habitat walkover are presented in **Table 3.2**.

The mapped results of the NVC survey are presented by groundwater dependency in **Annex A Figure 2b**.

TABLE 3.2: POTENTIALLY GROUNDWATER DEPENDENT NVC COMMUNITIES IDENTIFIED

NVC Code	NVC Community Name	Groundwater Dependency
M15	*Tricophorum cespitosum – Erica tetralix* wet heath	Moderate - High
M16	*Erica tetralix – Sphagnum compactum* wet heath	Moderate
M23	*Juncus effusus / acutiflorus – Galium palustre* rush-pasture	Moderate
MG10	*Holcus lanatus – Juncus effusus* rush-pasture	Moderate

These habitat types are described in the following sections. Communities are listed in alphanumeric order as recorded in the classification, not in order of ecological value.

M15 *Trichophorum cespitosum – Erica tetralix* wet heath

M15 occurs within wet heathland and degraded blanket bog habitats located within the site and to the west. This community is considered to have moderate - high potential to be ground water dependent.

M16 *Erica tetralix – Sphagnum compactum* wet heath

M16 occurs within wet heath habitat to the west of the site. This community is considered to have moderate potential to be ground water dependent.

M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture

One area includes M23, comprising neutral grassland adjacent to a watercourse, and is considered to have moderate potential to be ground water dependent.

MG10 *Holcus lanatus – Juncus effusus* rush-pasture

This community occurs to the north of the survey area and is considered to have moderate potential to be ground water dependent.

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ecosystems. Available at: https://www.wfduk.org/resources%20/risk-assessment-groundwater-dependent-terrestrial-ecosystems.

3.5 PROTECTED SPECIES SURVEYS

3.5.1 BATS

Bat Roost Potential

No potential roost features were identified during surveys. Most of the survey area was composed of open habitat or commercial conifer plantation; comprising blocks of a similar age / stage or felled plantation composed of brash and stumps.

Within the coniferous plantations included in the survey area, most trees offered negligible bat roost potential, standing straight and unbroken with no sheltered crevices visible, including within the standing deadwood. Woodland blocks were composed of a limited number of tree species of a similar age / stage, with blocks of trees assessed rather than individual trees.

The existing Loch Buidhe Substation building was not subject to survey as it is located in excess of 30 m from the Proposed Development. Disturbance of roosting bats from the construction or operation of the Proposed Development is considered unlikely at this distance.

Bat Habitat Assessment

Areas of woodland, standing, and running water within the survey area offer low foraging and commuting potential for bats. This is due to vegetation along watercourses being limited in suitability for supporting large numbers of insects, and the relative isolation of the survey area from more suitable habitat.

3.5.2 OTTER

A single otter spraint was found during the survey, located on an unnamed watercourse east of the Allt Clach-bhuaile, where the watercourse meets Loch Buidhe. No holts or resting places were observed during surveys.

Watercourses within the survey area were considered sub-optimal for otters, primarily due to limited foraging opportunities. However, they may be used by otters commuting between nearby, higher quality foraging habitat, e.g. Loch Buidhe and Loch an Lagain.

The main terrestrial habitat was coniferous woodland, which is considered sub-optimal for otters due to the drainage required for tree growth and limited foraging opportunities. Upland habitats including blanket bog and heathland also likely provide limited foraging opportunities for otters. However, terrestrial habitats may support commuting otters in low numbers.

3.5.3 WATER VOLE

Surveys identified a range of water vole field signs within the survey area. All field signs found were restricted to the north east of the survey area with burrows, droppings, runs and foraging signs identified along the Allt Clach-bhuaile and the adjacent unnamed watercourse to the east. Most other watercourses across the survey area were deemed unsuitable to support water vole due to their lack of steep bankside, shallow water depth, likely variation in water flows, unsuitable bank soil, watercourse width and limited plant diversity.

Terrestrial habitats were largely considered to be sub-optimal to support water voles. The main habitat present was coniferous woodland plantation, which has limited suitability due to the associated drainage required for tree growth, and the limited plant diversity associated with plantation understory and recent clear fell. Upland habitats including blanket bog and heathland are also sub-optimal for water vole.

3.5.4 BADGER

The surveys identified a single badger footprint located at approximately OS grid reference NH 64781 97492. A second print and claw marks indicating possible exploratory digging were recorded at NH 65155 97061. No other signs of badger were recorded in the survey area. Coniferous woodland can support badgers, however, the underlying habitats within the survey area are wet and boggy and are considered unlikely to be suitable for the creation of setts. Use of suitable habitat by badgers, if present, is likely to be limited to foraging and commuting.

3.5.5 PINE MARTIN

Areas of coniferous woodland habitat suitable for pine marten are present within the survey area. Two potential pine marten shelters were identified within the survey area, one located at NH 65066 97735, appeared old with spiders' webs across the entrance and a predated bird's egg inside it. The second potential shelter located approximately NH 65066 97720, was more exposed but had a scat within it. Further potential pine marten scats were found at NH 65270 97260, NH 65161 97554, NH 65047 97795 and NH 65543 97299, in prominent locations along woodland rides / edges, a characteristic of both pine marten and fox behaviour. Due to the difficulty and proven inaccuracy of pine marten scat identification in the field[20], samples of scat were sent off for deoxyribonucleic acid (DNA) analysis. Results of the scat DNA analysis were returned not successful, likely due to the age of the samples and associated degradation of the DNA or contamination of the sample(s) with an inhibiting agent. Due to the prevalence of pine marten in the north of Scotland[21], the scats and shelters are assumed to be pine marten, and pine marten are assumed to be resident within / around the survey area.

3.5.6 RED SQUIRREL

A single drey was found during the survey located at approximate OS grid reference NH 65362 97369. No other signs of red squirrel were identified within the survey area. Coniferous woodland is suitable for red squirrel and does provide suitable breeding and foraging habitat. Due to the location of the survey area in northern Scotland it is unlikely that grey squirrels (*Sciurus carolinensis*) would be present[22]. Incidental records of red squirrel dreys were made known to surveyors, however, no locations were provided and as such their presence on site could not be verified; these records are hence not included further within this survey report.

3.5.7 WILDCAT

No signs of wildcat were observed during the survey and no potential wildcat shelters were identified within the survey area. Conifer plantations have potential to support breeding, sheltering and foraging wildcat. However, habitats present within the survey area are

[20] On the origin of faeces: morphological versus molecular methods for surveying rare carnivores from their scats. https://www.vwt.org.uk/wp-content/uploads/2015/04/davison-a-et-al-2002-on-the-origin-of-faeces-morphological-versus-molecular-methods-for-surveying-rare-carnivores-from-their-scats.pdf Accessed 03.07.24

[21] Croose, E., Birks, J.D.S., Schofield, H.W. & O'Reilly, C. 2014. Distribution of the pine marten (Martes martes) in southern Scotland in 2013. Scottish Natural Heritage Commissioned Report No. 740.

[22] https://scottishsquirrels.org.uk/squirrel-sightings/ Accessed 03.07.24

predominantly wet and boggy so may be considered sub-optimal to support breeding or sheltering wildcat. The survey area is not located within a wildcat priority area, the closest being at Strathpeffer approximately 40 km to the south west.

3.5.8 OTHER FAUNA

3.5.8.1 AMPHIBIANS AND REPTILES

A single common toad was recorded, located within the Proposed Development. There are areas of habitat suitable within the survey area to support breeding amphibian species including damp parts of upland acid grassland, coniferous woodland plantation, degraded blanket bog and standing water in the form of lochs and ditches.

No reptiles were recorded during the survey. Suitable reptile habitat was present within the survey area and capable of supporting basking and foraging behaviour, brash piles associated with forestry works provide suitable sheltering opportunities for reptiles. Other suitable habitat within the survey area includes scrub and tussocky grassland.

3.5.8.2 OTHER MAMMALS

No signs of further SBL species were identified during the surveys.

Deer control is known to be practiced within the survey area as part of the forestry management.

4. SUMMARY AND RECOMMENDATIONS

4.1 SUMMARY

Coniferous woodland is the main habitat type identified within the survey area.

Four GWDTEs (high and moderate water dependency) were recorded within the survey area; M15 *Tricophorum cespitosum – Erica tetralix* wet heath, M16 *Erica tetralix – Sphagnum compactum* wet heath, M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture and MG10 *Holcus lanatus – Juncus effusus* rush-pasture.

No bat roost potential was identified in trees or woodland blocks within the survey area. Habitats present are considered to have low suitability for foraging and commuting. The existing Loch Buidhe Substation building was not surveyed for bat roost potential, as it is will be beyond the minimum disturbance distance from the Proposed Development.

A single otter spraint was identified on an unnamed watercourse to the north east of the survey area close to the banks of Loch Buidhe.

Water vole signs were recorded on two watercourses to the north east of the survey area, on the Allt Clach-bhuaile, and the adjacent unnamed watercourse. Field signs included burrows, runs, droppings and feeding remains.

Five potential pine marten scats and two potential shelters were observed within the footprint of the Proposed Development. Although DNA analysis was not successful, pine marten are known to occur within the survey area, suitable habitats are present, and it is therefore assumed that they are resident within the survey area.

A single badger footprint was identified to the west of the survey area, adjacent to the Proposed Development.

One red squirrel drey was identified within the survey area. Red squirrels are known to be active in the wider landscape, however no other signs were observed during surveys.

No evidence of wildcat was recorded during the survey and no potential wildcat shelters were identified. The habitat present within the survey area may support this species and they may use the site for occasional foraging purposes.

Suitable habitat exists within the survey area to support amphibians and reptiles, whilst a single common toad was found, no reptiles were observed.

4.2 RECOMMENDATIONS

Following the completion of the UKHab, NVC, GWDTE surveys, no further habitat / flora surveys are considered necessary to inform the Environmental Impact Assessment (EIA).

However, due to the presence of moderate and high GWDTE habitats, construction methods should be implemented to offer protection to these sensitive habitats as follows:

- SSEN's General Environmental Management Plans (GEMPs) should be applied as relevant, to include but not limited to Soil Management, Working in Sensitive Habitats, Working Near Water, Oil Storage and Refuelling. Details should be specified in the Construction Environmental Management Plan (CEMP).

- Work within habitats sensitive to disturbance, including blanket bog, heathland, and peatland habitats, should be undertaken by an experienced contractor and supervised by a suitably qualified Ecological Clerk of Work (ECoW). The mitigation hierarchy (avoid, minimize, compensate) should be applied to reinstatement should take place at the earliest opportunity, during or on completion of the works, and be assessed by the ECoW.
- Excavation of large volumes of peat is anticipated, and any excavated material is predicted to be restored or re-used on site. However, this should continue to be assessed as the work is planned to inform the requirement for a Peat Management Plan (PMP) to be implemented. If required, this should be implemented by the CEMP by a suitably qualified ECoW.
- If tracks cross wetland / bog habitats during the construction phase, conserving the flow of water (including groundwater) needs to be ensured. As such, cross drainage across infrastructure or constructed tracks should be provided. This can be achieved through closely spaced drainage pipes, or a drainage layer within the track.
- A Habitat Management Plan (HMP) will detail outline measures to reinstate and restore GWDTE habitat types likely to be directly implemented by the Proposed Works. Monitoring will be required to ensure that identified wetland areas are being protected throughout the duration of the works. This will ensure mitigation and protection measures implemented are effective. This will be detailed in the HMP.
- Following completion of the works, a post-construction monitoring assessment should be undertaken. This would ensure that restoration and recovery of affected habitat has been successful.

For protected species, the following recommendations are advised:

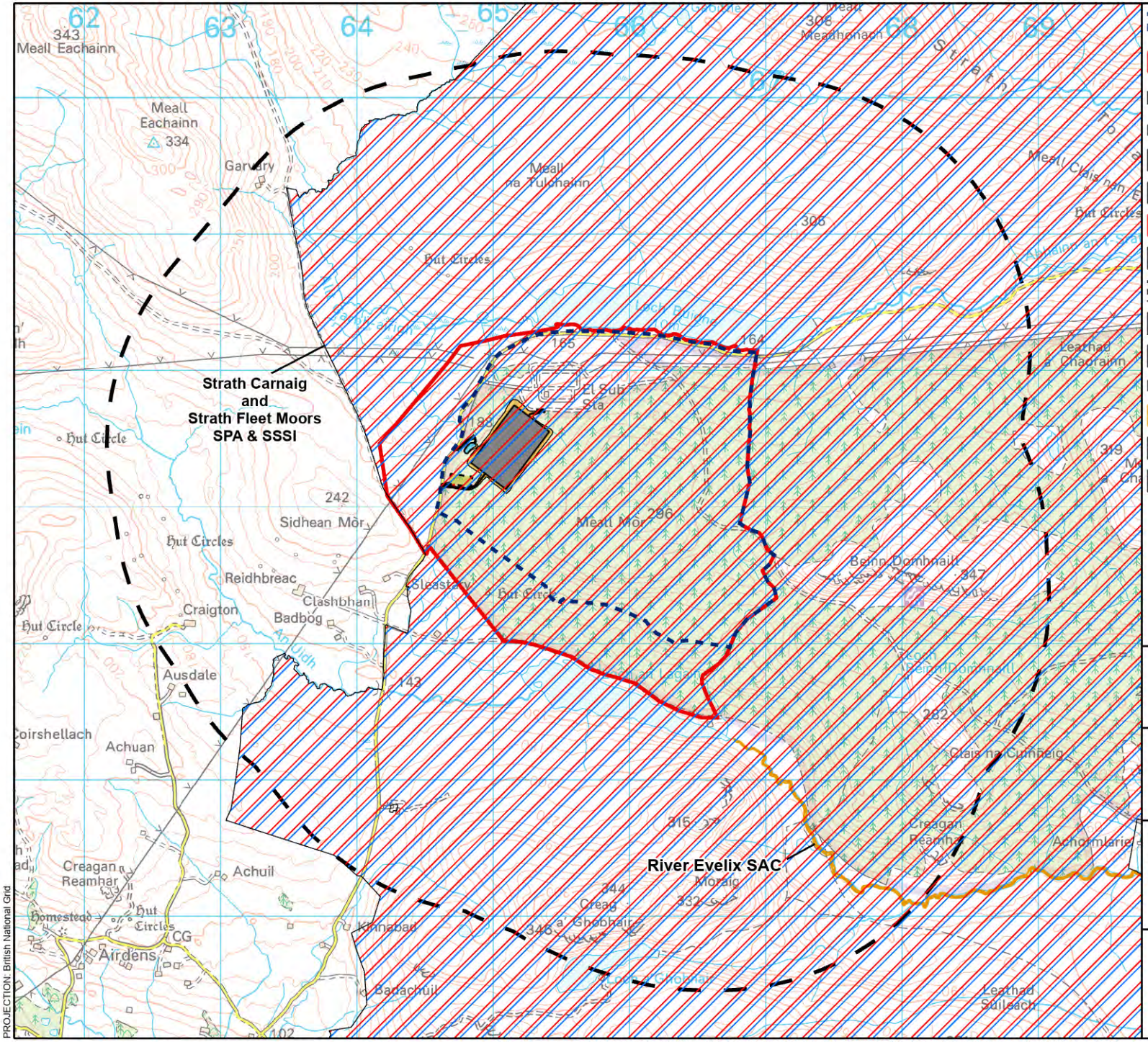
- SSEN Transmission's Species Protection Plans (SPPs) should be applied as appropriate, including but not limited to bats, badger, otter, water vole, pine marten, red squirrel and wildcat. Pertinent protection measures should be specified in the CEMP and applied during construction.
- Pre-construction walkover survey(s) by a suitable qualified ECoW / ecologist should be undertaken within the Proposed Development footprint and appropriate buffer, to confirm no change to the baseline conditions, inform any requirement for protected species licensing and confirm no new constraints have materialized immediately before construction or enabling works e.g. felling. Surveys shall include assessment of trees to be felled for bat and red squirrel shelters as well as other protected species shelters at risk of destruction or disturbance through felling or the wider works program. Works shall be undertaken in line with best practice guidance.
- Staged vegetation removal should be completed under the guidance of an ECoW to confirm the absence of amphibians and reptiles and minimize the risk of accidental killing, prior to construction related activities and in areas suitable for these species.
- The Proposed Development is situated within a European protected site, the Strath Carnaig and Strath Fleet Moors SPA, designated due to the known population of breeding hen

harrier[23]. It is recommended that a Habitat Regulation Appraisal is completed to determine the risk of any Likely Significant Effects on the Strath Carnaig and Strath Fleet Moors SPA from the Proposed Development.

[23] SiteLink - Strath Carnaig and Strath Fleet Moors SPA (nature.scot)

ANNEX A FIGURES

ANNEX A CONTENTS LIST



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SIZE: A4	DRAWN: CR
PROJECT: 0699566	CHECKED: DN
DATE: 01/11/2024	APPROVED: SC

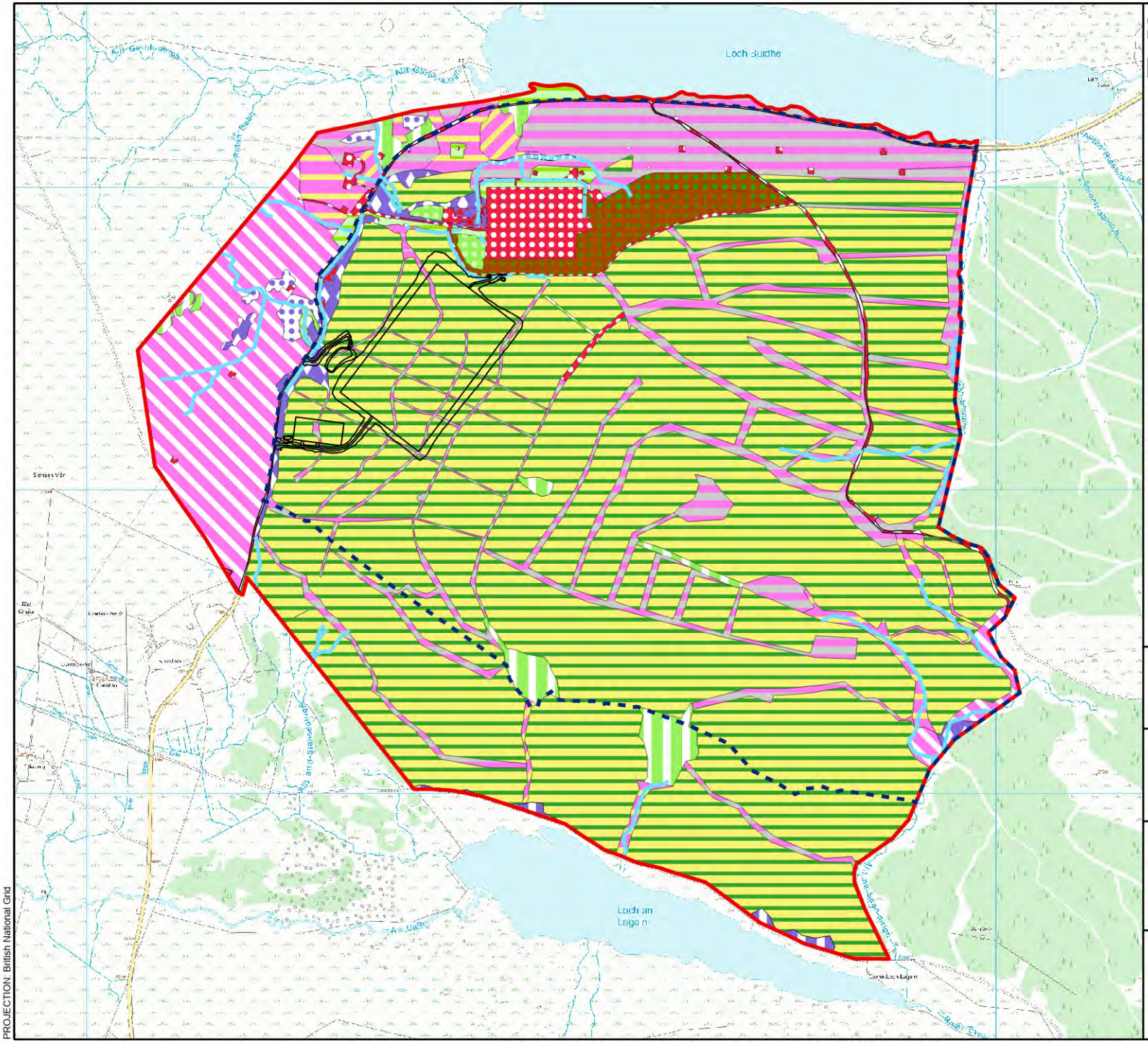
Figure 1
Designated Sites within a 2 km Buffer of the PAN Boundary

ERM

Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\London\Projects\0699566 - SSE Carnaig Substation\MAPS\0699566 - SSE Carnaig Substation - Final\0699566 - SSE Carnaig Substation - Final.aprx\0699566 - CS - Fig 7.1 - ECoW - Designated Sites (2 km) - A011



Planning Application Boundary

Proposed Infrastructure

Proposal of Application Notice (PAN) Boundary

UK Habitat

- f1a - blanket bog
- f1a5 - Blanket bog (H7130)
- f1a6 - Degraded blanket bog
- f2b - Purple moor-grass and rush pastures
- f2c - Upland flushes, fens and swamps
- g1b - upland acid grassland
- g3c - other neutral grassland
- g3c8 - *Holcus-Juncus* neutral grassland
- h1b - upland heathland
- h1b5 - dry heaths, upland (H4030)
- h1b6 - wet heathland with cross-leaved heath, upland (H4010)
- h3h - Mixed scrub
- u1b - developed land, sealed surface
- u1c - artificial unvegetated unsealed surface
- w1h - other woodland, mixed
- w1h6 - other woodland, mixed, mainly conifer
- w2c - other coniferous woodland
- r1g - other standing water
- r2b - other rivers and streams

0.0 0.3 0.5 0.8 1.0

Kilometres

N

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Figure 2a
UK Habitat Classification within the PAN Boundary

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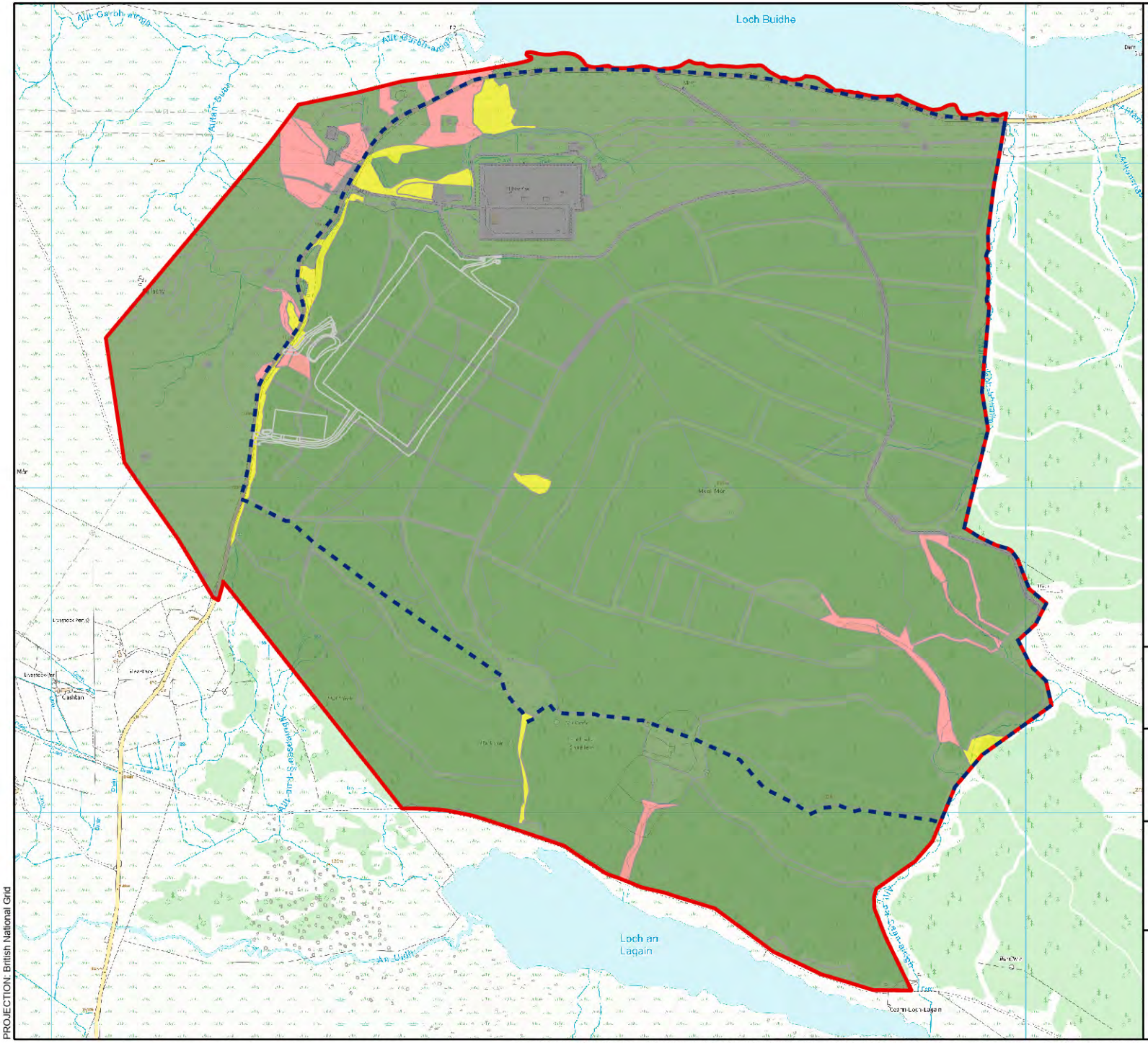
PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\London\Projects\0699566 - SSE Carnaig Substation\MAPS\0699566 - SSE Carnaig Substation - Final\0699566 - SSE Carnaig Substation - Final.aprx\0699566 - CS - Fig 7.2a - ECoW - UK Habitat Classification - A02



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PROJECT: 0699566	CHECKED: DN
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Figure 2b
UK Habitat Groundwater Dependent Terrestrial Ecosystems (GWDTE)

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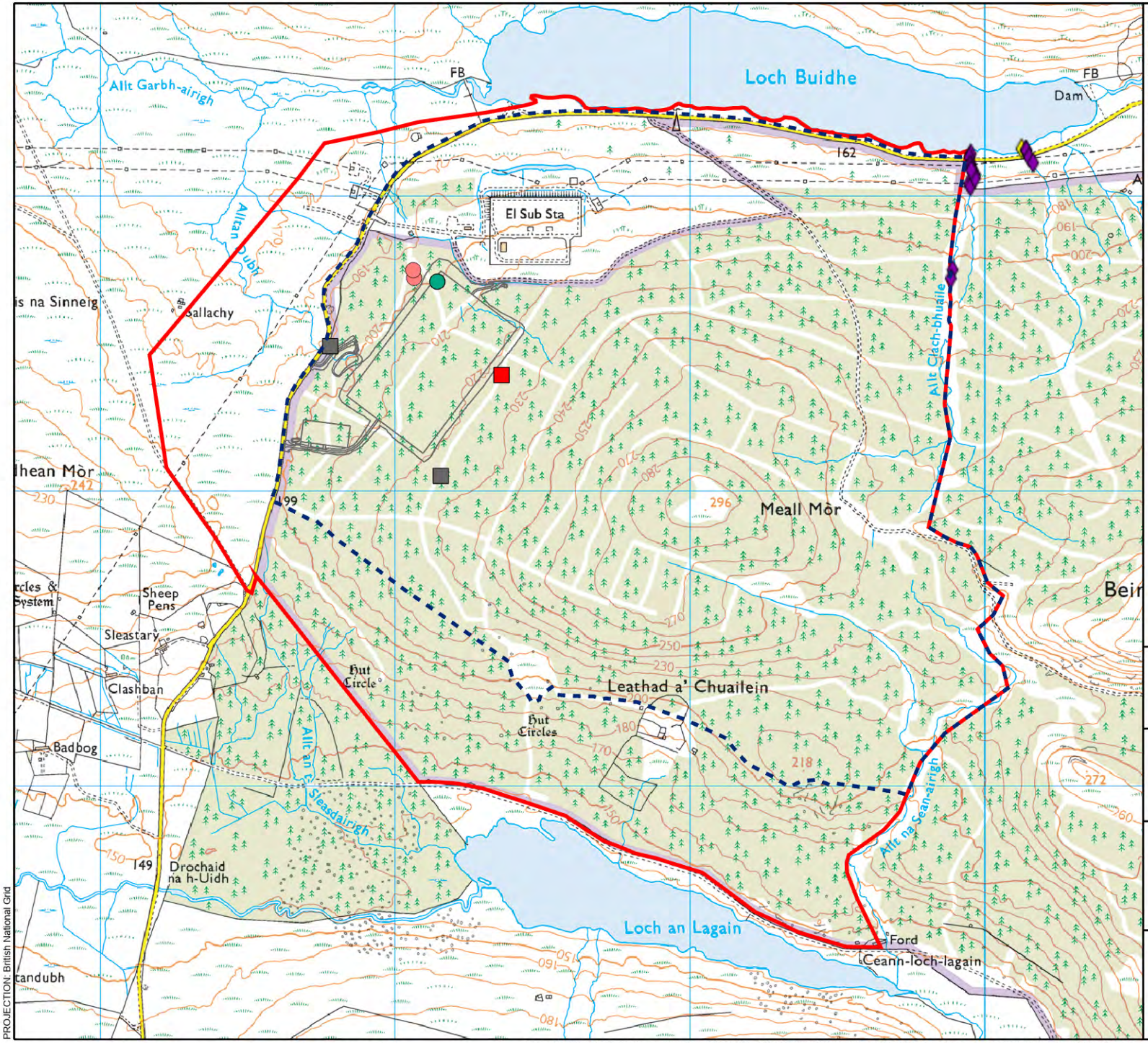
Path: \\uksprdgisfs01\Data\London\Projects\0699566 - SSE Carnaig Substation\MAPS\0699566 - SSE Carnaig Substation - Final\0699566 - SSE Carnaig Substation - Final.aprx\0699566 - CS - Fig 7.2b - ECoW - UK Habitat GWDTE - A02



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SIZE: A4	DRAWN: CR
PROJECT: 0699566	CHECKED: DN
DATE: 01/11/2024	APPROVED: SC

Figure 3
Protected Species

PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\London\Projects\0699566 - SSE Carnaig Substation\MAPS\0699566 - SSE Carnaig Substation - Final\0699566 - SSE Carnaig Substation - Final.aprx\0699566 - CS - Fig 7.3 - ECoW - Protected Species - A02

ANNEX B BOTANICAL SPECIES LIST

Common Names	Scientific Name
alder	*Alnus glutinosa*
bell heather	*Erica cinerea*
bog myrtle	*Myrica gale*
bramble	*Rubus fruticosus*
broadleaved dock	*Rumex obtusifolius*
broadleaved plantain	*Plantago major*
broadleaved sorrel	*Rumex acetosa*
broom	*Cytisus scoparius*
coltsfoot	*Tussilago farfara*
common bent	*Agrostis capillaris*
common bent	*Agrostis capillaris*
common gorse	*Ulex europaeus*
common heather	*Calluna vulgaris*
common marsh bedstraw	*Galium palustre*
common striated feather moss	*Eurhynchium striatum*
compact rush	*Juncus conglomeratus*
cotton grass	*Eriophorum angustifolium*
cow-horn bog-moss	*Sphagnum denticulatum*
cross-leaved heath	*Erica tetralix*
deergrass	*Trichophorum cespitosum*
Devil's bit scabious	*Succisa pratensis*
Douglas fir	*Pseudotsuga menziesii*
field wood rush	*Luzula campestris*
flat-topped bog-moss	*Sphagnum fallax*
foxglove	*Digitalis purpurea*
hard rush	*Juncus inflexus*
hares cotton grass	*Eriophorum vaginatum*

Common Names	Scientific Name
hares tail grass	*Lagurus Ovatus*
hawthorn	*Crataegus monogyna*
heath bedstraw	*Galium saxatile*
heath plait-moss	*Hypnum jutlandicum*
lodgepole pine	*Pinus contorta*
male fern	*Dryopteris filix-mas*
marsh cranesbill	*Geranium palustre*
marsh thistle	*Cirsium palustre*
marsh thistle	*Cirsium palustre*
nodding-head moss	*Pohila nutans*
Norway pine	*Pinus resinosa*
ostrich plume-moss	*Ptilium crista-castrensis*
pointed spear moss	*Calliergonella cuspidata*
purple moor-grass	*Molinia caerulea*
red bog moss	*Sphagnum capillifolium*
rosebay willowherb	*Chamaenerion angustifolium*
rowan	*Sorbus aucuparia*
Sitka spruce	*Picea sitchensis*
soft rush	*Juncus effusus*
spear thistle	*Cirsium vulgare*
sweet vernal grass	*Anthoxanthum odoratum*
tormentil	*Potentilla erecta*
wavy hair grass	*Avanella flexuosa*

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