

TECHNICAL APPENDIX 8.1

Kilgallioch Windfarm Extension

Habitats and National Vegetation

Classification Survey Report and Desk
Study



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Executive Summary

An “extended” version of a National Vegetation Classification survey was carried out in May 2019 for the proposed Kilgallioch Windfarm Extension site and wider study area. A previous habitat survey was completed at the Site in 2009, and so this report includes a “back-worked” habitat summary based on the NVC survey data and current ground conditions. Further consideration was also made of the vegetative communities across the Study Area and wider landscape to help assess the potential connectivity of the Site with the adjacent designated site. The survey revealed the presence of a relatively restricted range of vegetation types, culminating in 11 standard NVC communities and several other non-NVC categories within the Study Area, along with a range of further sub-communities. Of these, a relatively small number of communities account for most of the central Study Area, while commercial forestry contributes most of the wider survey buffer, beyond the development boundary. The northern boundary of the Site lies immediately adjacent to the Kirkcowan Flow Special Area of Conservation and Site of Special Scientific Interest, which is designated for its bog habitat, while much of the western and southern Site boundary is enclosed by the Tarf Water, a watercourse which forms part of the wider Bladnoch Special Area of Conservation and is designated for supporting Atlantic salmon.

The most common and dominant semi-natural community within the Study Area is M25 *Molinia caerulea*–*Potentilla erecta* mire. M15 *Scirpus cespitosus*-*Erica tetralix* wet heath makes up most of the northern parts of the Study Area in mosaic with M25 mire, while M23 *Juncus effusus/acuteiflorus*-*Galium palustre* rush pasture and M6 *Carex echinata*-*Sphagnum fallax/denticulatum* mire form threads along wetter channels in lower areas. Isolated areas of M17 *Scirpus cespitosus*-*Eriophorum vaginatum* blanket mire area spread throughout the Study Area, along with M19 *Calluna vulgaris*-*Eriophorum vaginatum* blanket mire. The remainder of the study area is made up of a small number of acid-grassland, bracken communities and commercial forestry woodland. The vegetation is often comprised of complex mosaics of two or more communities.

The vegetation communities have been heavily influenced by anthropogenic actions, with the single largest factor being the historical management of the sward for livestock grazing improvements, including drainage channels, drying and poaching effects.

Many of the communities are classed as potentially groundwater dependent but given the underlying geology and hydrogeology the Site is considered likely to be surface water-fed and, as such, are unlikely to be truly groundwater dependent.

1 Introduction

1.1 Background

- 1.1.1 ITPENERGISED was commissioned by ScottishPower Renewables (SPR) to carry out an “extended” version of a National Vegetation Classification (NVC) survey at the proposed Kilgallioch Windfarm Extension, located approximately 9.5 km to the north-west of Kirkcowan, Dumfries and Galloway (hereafter referred to as the ‘proposed Development’).
- 1.1.2 The aim of the NVC survey was to identify and map the plant communities within the application boundary (referred to hereafter as the “Site”) and wider study area in order to identify vegetation of nature conservation interest or areas with potential groundwater dependency. The survey was effectively extended to allow for an assessment of the potential connectivity with the adjacent designated site (see Section 1.2.4).
- 1.1.3 This report details the findings of the NVC survey together with an evaluation of the communities described. Further assessment is also completed to compare the results with earlier Phase 1 habitat mapping that was completed by Arcus Consultancy Services Ltd in 2009.

1.2 The Site and Study Area

- 1.2.1 The Site is located within open ground surrounded predominantly to the west and south by commercial forestry, and further open ground to the north and east. The operational Kilgallioch, Artfield Fell and Glenchamber Windfarms are located directly to the west and south of the application boundary, beyond the Tarf Water which bounds the western edge of the Site, while the Airies Windfarm is located to the east. At the time of writing, the proposed Development comprises two access options; an eastern access route via Airies Windfarm and 8.2km of unnamed road to the A75 southeast of the Site, and a second western route via the operational Kilgallioch Windfarm located further west-northwest. Elevations within the application boundary range from c.140m in the southeast to 196m at Ha’ Hill in the northwest of the site.
- 1.2.2 The Site is dominated by wet modified bog habitat, with pockets of blanket bog spread throughout and large stands of bracken (*Pteridium aquilinum*) and grassland dominated drier areas located on raised hills and hummocks. The abandoned farm buildings at High Eldrig lie within south-eastern corner of the Site and are still used to house supplies and hardware for managing the livestock (sheep and cattle) given over to the wider area for grazing. The historical management of the Site for improving ground conditions and flora for livestock grazing is evident from the drains and grips, many of which have filled in with vegetation, but also the remains of old sheep pens, drystone dykes as well as several areas marked as burnt mounds from historical habitation of the area. The Site is bounded to the west and south by the Tarf Water, with seven watercourses flowing north-south into the Tarf Water via a complex network of named and unnamed watercourses from within the application boundary. Eldrig Loch is located just east of the main proposed Development boundary, flowing into the Tarf Water via the Loch Strand watercourse, through the commercial forestry to the south of Eldrig Fell.
- 1.2.3 The NVC survey focussed on mapping the plant communities within the proposed Development boundary and a 250m survey buffer, with a 150m buffer for access tracks (hereafter referred to as the ‘Study Area’ – see **Figure TA_8.1.1**).
- 1.2.4 The Tarf Water forms part of the larger River Bladnoch Special Area of Conservation (SAC), designated for supporting populations of Atlantic salmon (*Salmo salar*), while the Kirkcowan Flow SAC and Site of Special Scientific Interest (SSSI) lies immediately adjacent to the northern border of the application boundary and is noted for its upland habitats (i.e. blanket bog and depressions on peat substrates). The wider Study Area buffer overlaps with both the Bladnoch SAC and Kirkcowan Flow SAC/SSSI nature conservation designations. The designated sites are also presented on **Figure TA_8.1.1**.

2 Methods

2.1 Data Capture and Analysis

Ecological Desk Study

Designated Sites

- 2.1.1 An ecological desk study was carried out using data provided by the South West Scotland Environmental Information Centre (SWSEIC, 2019) as well as a range of publicly available information sources to provide an understanding of the ecological context of the Site and wider area.
- 2.1.2 In terms of nature conservation designations, the desk study identified international and national statutory designations for terrestrial ecology qualifying features, such as SACs, SSSIs or National Nature Reserves (NNRs) within 5km of the Site boundary. Local Nature Reserves (LNRs), as well as non-statutory designations, such as Local Wildlife Sites (LWS), Sites of Interest for Nature Conservation (SINCs) or woodland areas included on the Ancient Woodland Inventory (AWI), were identified within a 2km distance from the Site boundary.

External Data

- 2.1.3 External data sources were consulted for historical records for protected or otherwise notable species (e.g. Scottish Biodiversity List/Local Biodiversity Action Plan priority species) were identified within 2km of the Site boundary. Only records from within the last 10 years were considered relevant to the study. External data sources included the following online databases:
- National Biodiversity Network Atlas (NBN, 2019);
 - Scottish Natural Heritage SiteLink (SNH, 2019);
 - MAGIC: Nature on the Map (MAGIC, 2019); and
 - SNH Ancient Woodland Inventory (AWI) (SNH, 2010).
- 2.1.4 Additional records were obtained from the local biological records centre (which for the Study Area is the South West Scotland Environmental Information Centre [SWSEIC]).

NVC Survey

- 2.1.5 The survey was carried out on 16th and 21st May 2019 by experienced surveyors.
- 2.1.6 The vegetation was mapped and classified using the standard methodology (Rodwell 1991 *et seq.*, Rodwell 2006). It involved mapping polygons of apparently homogenous vegetation by eye and then sampling the vegetation within polygons. This was done using both quantitative (quadrats) and qualitative sampling.
- 2.1.7 Sampling involved recording the species present, together with their abundances and noting other relevant information, such as any evidence of grazing, drainage or trampling. The data were subsequently compared with the standard NVC tables and classified accordingly. Stands were classified to sub-community level where possible, although in some cases the vegetation was mapped to community level only, because vegetation patches were too small, species-poor, and/or exhibited characteristics of two or more sub-communities. Polygons with numerous small-scale changes in community type or transition zones between sub-communities, e.g. in response to underlying hydrological variation, soils or disturbance, were mapped as mosaics with an approximate percentage cover of each constituent NVC community or sub-community, where possible.
- 2.1.8 NVC communities were compared to described conservation priorities, as laid out on the Scottish Biodiversity List (SBL) (Scottish Government, 2013) and with habitat descriptions provided in Maddock (2011) and the Dumfries and Galloway Local Biodiversity Action Plan (LBAP) (Dumfries & Galloway Biodiversity Partnership, 2009). Potential groundwater dependence was identified by comparing the recorded communities with the list of potentially

moderately or highly groundwater dependent terrestrial ecosystems (GWDTEs) defined by the Scottish Environment Protection Agency (SEPA) (SEPA 2017).

2.1.9 Botanical nomenclature in this report follows that of Stace (2010) for vascular plants and Atherton *et al.* (2010) for bryophytes.

Survey Limitations

2.1.10 The NVC surveys were carried out during the optimal season for NVC survey, and in favourable conditions for survey. Some small sections of the Study Area were not accessible owing to the presence of grazing cattle with young calves. However, these constraints affected less than 10% of the Study Area and were applicable mostly within the wider survey buffer and so are not considered to significantly affect the validity of the survey results, or the conclusions reached in this report.

2.1.11 It should be noted that the NVC system does not cover all the semi-natural vegetation types found in Scotland. Since publication of the NVC classification in the 1990s, additional data capture has led to the identification of additional plant communities, some of which are described in Rodwell *et al.* (2000) and Averis *et al.* (2004). Where such communities are found and recorded, they are given a non-NVC community code and are described.

3 Results

3.1 Ecological Desk Study

Designated Sites

Kirkcowan Flow – SAC and SSSI

3.1.1 The Kirkcowan Flow site lies immediately adjacent to the northern application boundary for both the eastern access track as well as the proposed Development area and is designated as a SAC and as a SSSI primarily for supporting the Annex 1 habitat blanket bog but also for its depressions on peat substrates of the *Rhynchosporion*. The depressions on peat substrates of the *Rhynchosporion* feature is currently assessed as being in favourable maintained condition (last assessment cycle dated as 2013). However, the primary feature of the designation, blanket bog, is currently assessed as “unfavourable declining” with four recorded pressures, as follows:

- Invasive non-native species;
- Over grazing;
- Water management; and
- Other (unlisted).

3.1.2 According to the Scottish Natural Heritage (SNH) SiteLink website (SNH’s online database providing data and information in relation to Scotland’s protected areas), the Kirkcowan Flow SAC has management measures in place that should, over time, improve the feature condition and return it back to a Favourable condition. With regards to the current landowner, these relate to an Agri-Environment Climate Scheme which involves:

- 70 peat dams installed over an 8ha area;
- Summer grazing (four months) of 60 cattle;
- Clearing of Sitka spruce regen; and
- All stock removed from the SAC area between November-December.

River Bladnoch – SAC

3.1.3 The Tarf Water flows north-south along with western and part of the southern boundary of the Site and forms part of the wider River Bladnoch SAC. The River Bladnoch SAC is designated for supporting populations of Atlantic salmon and is currently assessed as being in an unfavourable recovering condition (last assessment cycle dated as

2011). Negative pressures on this SAC are noted as being agricultural operations, forestry operations and water quality.

Blood Moss – SSSI

3.1.4 The Blood Moss SSSI site is located approximately 2.8km to the northeast of the Site boundary and is designated for its blanket bog habitat. The habitat feature was last assessed, in terms of its condition, in 2013 and was noted as being in a favourable maintained condition.

3.1.5 No designations of local value such as LWS, SINCS or ancient woodland were identified within 2 km of the Site boundary.

Terrestrial Animals

3.1.6 Data obtained from the SWSEIC (2019) provided records of 11 protected or otherwise notable species within 2km of the Site boundary; see **Table TA_8.1.1**.

Table TA_8.1.1: Protected or Otherwise Notable Species

Common Name	Scientific Name	Protection	Records
Red Squirrel	<i>Sciurus vulgaris</i>	Wildlife and Countryside Act 1981 (as amended). Scottish Biodiversity List Dumfries and Galloway LBAP	Twenty records of red squirrel were identified within 2km of the Site boundary, the most recent was recorded in 2017.
Brown Hare	<i>Lepus europaeus</i>	Wildlife and Countryside Act 1981 (as amended). Scottish Biodiversity List Dumfries and Galloway LBAP	A sole record of brown hare was identified within 2km of the Site boundary recorded in 2016.
Pine Marten	<i>Martes martes</i>	Wildlife and Countryside Act 1981 (as amended). Certain methods of killing or taking pine martens are illegal under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Scottish Biodiversity List	A sole record of pine marten was identified within 2km of the Site boundary recorded in 2015.
Otter	<i>Lutra lutra</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	A sole record of otter was identified within 2km of the Site boundary recorded in 2013.
Whiskered/Brandt's Bat	<i>Myotis mystacinus/brandtii</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	A sole record of whiskered/Brandt's bat was identified in the data search in 2016.
Daubenton's Bat	<i>Myotis daubentonii</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	Three records of Daubenton's bat were identified in the data search, the most recent was recorded in 2016.
Natterer's Bat	<i>Myotis nattereri</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	Four records of Natterer's bat were identified in the data search, the most recent was recorded in 2016.
Lesser Noctule	<i>Nyctalus leisleri</i>	Conservation (Natural Habitats, &c.) Regulations 1994	Eighteen records of lesser noctule were identified in the data search, the most recent was recorded in 2016.
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	Eight records of common pipistrelle were identified in the data search, the most recent was recorded in 2016.
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	Eight records of soprano pipistrelle were identified in the data search, the most recent was recorded in 2016.

Common Name	Scientific Name	Protection	Records
Pipistrelle species	<i>Pipistrellus sp.</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Scottish Biodiversity List Dumfries and Galloway LBAP	Seven records of pipistrelle species were identified in the data search, the most recent was recorded in 2016.

3.1.7 The desk study identified three species of birds listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and three species listed within Annex 1. Of the bird species records returned by the desk study, a further 23 are BoCC Red-listed, 23 birds are Amber-listed, 29 of these species are listed in the SBL and 24 are listed in the Dumfries and Galloway LBAP. For more detail on the ornithological data please refer to the ornithology **Technical Appendix 9.1**

3.2 Survey Results

Overview

3.2.1 The survey results are displayed in **Figure TA_8.1.2**. The figure also shows the locations of Target Notes (TNs), which have been produced to illustrate particular stands of vegetation; TNs, and any accompanying plates, are provided in Appendix A. A list of plant species is provided in Appendix B.

3.2.2 With the exception of commercial plantation woodland and bare ground, categories of vegetation within the study area include the following 12 categories:

- Standing water: G1.3;
- Mires and flushes: M1, M2, M6, M17, M19, M23, M25;
- Wet heaths: M15; and
- Grasslands and Montane Communities: U4, U6, U20.

3.2.3 Some of the vegetation types recorded, such as areas of conifer plantation and open water with no aquatic vegetation, cannot be categorised in terms of NVC communities. These areas have been described in broad Phase 1 habitat survey terms and in ITP Energised (2019).

3.2.4 The following sections describe the flora, structure and habitat of these communities within the Study Area. The NVC communities within each broad habitat type (e.g. mires and flushes) are described in order of community number within the study area.

3.3 Standing Water

G1.3 Standing water - oligotrophic

3.3.1 Sub-communities recorded: N/a.

3.3.2 Eldrig Loch is the only standing waterbody within the Study Area, lying inside the boundary of the Kirkcowan Flow SAC to the north of the eastern access track application boundary. The majority of the loch lies within the wider survey buffer of the Study Area (i.e. 2.47 hectares (ha) of a total 2.56 ha). The water of Eldrig Loch consists of oligotrophic waters, clear waters of low alkalinity that is more commonly found in the Scottish Lowlands.

3.3.3 Oligotrophic waters are typically quite nutrient poor and sparse in terms of vegetation and invertebrates, although some stands of broad-leaved pondweed (*Potamogeton natans*) can be found along some of the waterbody fringes.

3.4 Mires and Flushes

M1 Sphagnum auriculatum bog pool community

3.4.1 Sub-communities recorded: No associated sub-communities.

3.4.2 Two areas of M1 were recorded, both of which are located to the south of the eastern track as it enters the Site and may have been associated with historical drain networks or ditches that have filled in with vegetation over time. The pools are not species-rich but are dominated by feathery bog-moss (*Sphagnum cuspidatum*), with abundant blunt-leaved bog-moss (*S. palustre*) and also included smaller stands of broad-leaved pondweed, bog bean (*Menyanthes trifoliata*) and bog myrtle (*Myrica gale*).

3.4.3 This community is typically found in pools with floating mats of Sphagnum mosses and occasional vascular plants emerging throughout is typically confined to pools and wetter hollows on ombrogenous and topogenous mires with base-poor and oligotrophic raw peat soils in more oceanic parts of Britain (Elkington *et al.* 2002). M1 is considered a widespread component of M17 blanket mire, as is the case with the two pools within the Site. M1 communities tend to be protected from limited grazing or burning pressure by the wetter, peaty soils on which they are found, although historical draining as part of agricultural improvements has reduced its presence on many sites (Elkington *et al.* 2002).

M2 Sphagnum cuspidatum/recurvum¹ bog pool community

3.4.4 Sub-communities recorded: The M2b *Sphagnum fallax* sub-community

3.4.5 An area of M2b was recorded to the north of the eastern access track as it enters the Site, where a pool was present within a depression within a wider area of M25 mire (see TN1). The pool was dominated by flat-topped bog-moss (*Sphagnum fallax*), but papillose bog-moss (*Sphagnum papillosum*) was also prevalent. Other vegetation was characterised by occasional common cottongrass (*Eriophorum angustifolium*), cross-leaved heath (*Erica tetralix*) and purple moor-grass (*Molinia caerulea*).

3.4.6 An area dominated by M2 was found to be forming a mosaic with M6 mire in the wet valley east of Ha' Hill Strand in the mid-west of the Site, where species included: sharp-flowered rush (*Juncus acutiflorus*), papillose bog-moss, common sedge (*Carex nigra*), bog myrtle, bog bean and common cottongrass.

3.4.7 This community is typically found in pools and lawns on the surface of very wet and base-poor peats on ombrogenous and topogenous mires in the less oceanic parts of Britain (Rodwell *et al.* 1991, Averis *et al.* 2004). This community has been reduced by widespread drainage and cutting of mires, so that often just small and modified fragments remain within predominantly agricultural landscapes. However, the community also readily colonises shallow flooded workings (Rodwell *et al.* 1991), and this is likely to be the origin within the Site, where it occurs within wetter depressions and where smaller watercourses have filled in with vegetation over time.

M6 Carex echinata–Sphagnum recurvum/denticulatum mire

3.4.8 Sub-communities recorded: The M6a *Carex echinata* sub-community, the M6c *Juncus effusus* sub-community and the M6d *Juncus acutiflorus* sub-community.

3.4.9 M6 mire is found mostly threading throughout the lower lying depressions and valleys within middle, east and southern parts of the Site, with two other areas found in the southeast (to the south of the access track route) and northwest corner of the application boundary. It is represented by both the sedge-dominated M6a as well as the two rush-dominated sub-communities, characterised by soft-rush (*Juncus effusus*) (see TN2 for an example) or sharp-flowered rush, or sometimes both, with a dense layer of bog-mosses (Sphagna) and locally abundant purple moor-grass and common haircap (*Polytrichum commune*). Other species are infrequent, varied across stands and present at low abundance but include tormentil (*Potentilla erecta*), marsh violet (*Viola palustre*), marsh willowherb (*Epilobium palustre*), common marsh bedstraw (*Galium palustre*) and heath bedstraw (*Galium saxatile*), as well as

¹ Now known as *Sphagnum fallax*

the bryophytes blunt-leaved bog-moss (*Sphagnum palustre*), acute-leaved/red bog-moss (*Sphagnum capillifolium*), spiky bog-moss (*Sphagnum squarrosum*) and springy turf-moss (*Rhytidiadelphus squarrosus*).

- 3.4.10 M6 mire is essentially a poor-fen with dominant small sedges or rushes over a carpet of oligotrophic and base-intolerant bog-mosses (Rodwell *et al.* 1991). It is the major soligenous community of peats and peaty gleys irrigated by base poor waters in the sub-montane zone of northern and western Britain and occurs in wet hollows, seepage lines, flushes, shallow gullies cutting down hillsides, and along the margins of streams within expanses of blanket mire, dwarf shrub heath or acid grassland (Averis *et al.* 2004). It is commonly found in tracts of unenclosed pasture on upland fringes, particularly between 200m and 400m (Rodwell *et al.* 1991). M6 mires do not have a rich flora and are not the home of many rare plant species, although they do contribute to the diversity of the vegetation of the upland margins (Averis *et al.* 2004).

M17 *Scirpus cespitosus*²–*Eriophorum vaginatum* blanket mire

- 3.4.11 Sub-communities recorded: The M17a *Drosera rotundifolia*-*Sphagnum* spp. sub-community (poor fit) and the M17b *Cladonia* spp. sub-community.
- 3.4.12 M17 blanket mire was recorded across many locations within the Study Area as larger expanses of habitat as well as in smaller pockets and transitional mosaics (with both M23 rush pasture and M25 mire). Areas of M17 can be found to both the south and north (within the SAC boundary) of the eastern access track, as well as larger expanses within the middle and more southern parts of the application boundary (TN3). The vegetation is dominated by hare's-tail cottongrass (*Eriophorum vaginatum*), deergrass (*Trichophorum germanicum*), with purple moor-grass and heather (*Calluna vulgaris*) being locally frequent. Associated species included wavy hair-grass (*Deschampsia flexuosa*), bog asphodel (*Narthecium ossifragum*), cross-leaved heath, heath rush (*Juncus squarrosus*), blaeberry (*Vaccinium myrtillus*) and cross-leaved heath, as well as acute-leaved/red bog-moss and papillose bog-moss.
- 3.4.13 M17 blanket mire is the characteristic blanket bog vegetation of the more oceanic parts of Britain and is typically found on peat deposits that are maintained in a permanently waterlogged state by a high and generally stagnant water-table (Rodwell *et al.* 1991). The highwater table associated with M17 also allows for deeper depressions between hummocks and rises to form smaller patches of M1 and M2 bog pools (Averis *et al.* 2004). Several of the areas classified as M17 have been noted as a poor fit within this community. However, this may reflect the highly modified nature and historical grazing and associated management pressures (such as the introduction of field drains) of the Site.

M19 *Calluna vulgaris*–*Eriophorum vaginatum* blanket mire

- 3.4.14 Sub-communities recorded: The M19a *Erica tetralix* sub-community and M19c *Vaccinium vitis-idaea*-*Hylocomium splendens* sub-community.
- 3.4.15 M19 blanket mire was recorded in areas mostly to the north of the Site boundary (within the Kirkcowan Flow SAC, see TN4) as well as stands in the southeast, northeast and northwest corners of the Site. One area, just west of Ha' Hill, was classified as mosaic transitioning with the wider M25 mire-dominant community. M19 vegetation is characterised by heather, hare's-tail cottongrass, and the mosses red-stemmed feathermoss (*Pleurozium schreberi*), acute-leaved/red bog-moss and flat-topped bog-moss. Associates present at lower abundance include wavy hair-grass, purple moor-grass, tormentil, bog asphodel, springy-turf moss and bog groove-moss (*Aulacomnium palustre*). The extent of M19 community was relatively small, in relation to the Study Area, but its condition was relatively good in parts, despite evidence of historical drainage and grazing pressures.
- 3.4.16 M19 is the typical blanket bog vegetation of high-altitude ombrogenous peats in the wet and cold climate of the uplands of northern Britain. In particular, it occurs on high-level plateaux and broad watersheds, usually above 300m (i.e. at higher altitudes than the proposed Development), and is confined to deeper peats on flat or gently-sloping ground (Rodwell *et al.* 1991). It is typically found on drier peats than M17 blanket mire (Averis *et al.* 2004), corresponding with areas found on slightly higher rises and hillocks within the Study Area.

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

- 3.4.17 Sub-communities recorded: None
- 3.4.18 M23 rush-pasture is widespread across the Study Area (TN5) although mainly associated with the lower-lying areas, where it notably occurs along the depressions and creases of former watercourses that have now filled in, as well as along existing watercourses and in the rides and other open areas within forestry across the Tarf Water to the south and west of the Site. M23 rush-pasture was also found as a mosaic with M6 mire, M17 blanket mire, M25 mire and U4 grassland, all along watercourse embankments and gentler slopes with the Study Area. The rushes, notably soft-rush but in some places sharp-flowered rush, typically dominate the vegetation, whereas abundant associates varied between stands but often include one or more of purple moor-grass, tufted hair-grass, sweet vernal-grass (*Anthoxanthum odoratum*), marsh thistle (*Cirsium palustre*) and springy turf-moss. Associated species present at lower abundance include bent grasses, creeping buttercup (*Ranunculus repens*), meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), common marsh bedstraw, broadleaved dock (*Rumex obtusifolius*) and marsh ragwort (*Senecio aquaticus*).
- 3.4.19 M23 rush-pasture is a community of gently-sloping ground in and around the margins of soligenous flushes, as a zone around topogenous mires and wet heaths, and in poorly drained, comparatively unimproved or reverted pasture (Rodwell *et al.* 1991). It can be found on a variety of moderately acid to neutral soils that are kept moist to wet for most of the year.

M25 *Molinia caerulea*–*Potentilla erecta* mire

- 3.4.20 Sub-communities recorded: The M25a *Erica tetralix* sub-community.
- 3.4.21 M25 mire is the primary and, overall, most prevalent community within the Study Area, often found in large open stands but also in mosaics with other communities (i.e. with M6 mire, M15 wet heath, M17 blanket mire, M23 rush-pasture, U4 grassland and U20 bracken), where it is characterised by the dominance of purple moor-grass (see TN6). Associated species are generally low in abundance, but include blaeberry, soft-rush, red fescue (*Festuca rubra*), tormentil, marsh bedstraw, flat-topped bog-moss, heath plait-moss and common haircap. Some areas, particularly adjacent to the now felled forestry along the north-western corner of the Study Area, were found to support Sitka spruce (*Picea sitchensis*) regeneration. The areas of M25 mire were found to have varying degrees of grazing pressure from cattle with some areas found to have been relatively closely cropped, while other stands having developed into substantial expanses of more mature purple moor-grass having developed into large purple moor-grass tussocks that smother lower level vegetation, restricting the development of basal vegetation.
- 3.4.22 M25 mire is a community of moist, but usually well aerated, acid to neutral peats and peaty soils (Rodwell *et al.* 1991). It occurs over gently-sloping ground, marking out seepage zones and flushed margins of topogenous mires, but also extends onto the fringes of ombrogenous mires (Rodwell *et al.* 1991, Averis *et al.* 2004). Frequent burning and grazing can convert wet heath and blanket bog to M25 mire, especially when these treatments are combined with artificial drainage (Averis *et al.* 2004).

3.5 Wet Heaths

M15 *Trichophorum cespitosum*–*Erica tetralix* wet heath

- 3.5.1 Sub-communities recorded: The M15d *Vaccinium myrtillus* sub-community.
- 3.5.2 M15 wet heath occurs in distinct stands along the northern-most reach of the Study Area and, along with mosaic with M25, constitutes almost the entirety of the northern Site boundary including the wider survey buffer that extends into the Kirkcowan Flow SAC. The species composition varies but most stands not forming a mosaic with M25 align to the M15d *Vaccinium myrtillus* sub-community and, as such, can be regarded as the drier associate of the more extensive areas of blaeberry-dominated areas. The M15d *Vaccinium myrtillus* sub-community occurs in distinct areas in this part of the Study Area where the ground conditions appear less wet and species such as

² Now known as *Trichophorum germanicum*

blaeberry, deergrass, wavy hair-grass and heath rush become more prevalent (TN7). The main characteristic species include heather, blaeberry, purple moor-grass and mosses, such as acute-leaved/red bog-moss and heath plait-moss, with some stands tending to have a lower presence of species such as wavy hair-grass, tormentil, and cross-leaved heath, although more deergrass was also apparent in such areas. Additional associates locally include heath rush, soft-rush, bog asphodel, heath bedstraw, crowberry (*Empetrum nigrum*), red-stemmed feather-moss and blunt-leaved bog-moss.

- 3.5.3 M15 wet heath is a community of shallow, wet or intermittently waterlogged, acid peat or peaty mineral soils on hillsides, over moraines, and within tracts of blanket mire. It also extends on to deep peat where the original bog vegetation has been damaged or modified by burning, grazing, drainage and peat cutting (Averis *et al.* 2004).

3.6 Grassland Communities

U4 Festuca ovina-Agrostis capillaris-Galium saxatile grassland

- 3.6.1 Sub-communities recorded: The U4a typical sub-community and the U4d *Luzula multiflora-Rhytiadelphus loreus* sub-community.
- 3.6.2 U4 grassland occurs in areas within the Study Area that have undergone long-term, historical agricultural improvement measures (as found immediately surrounding the more obvious farming landscape at High Eldrig in the east of the Site) as well as having become more readily established on the mounds of glacial till deposits forming the hills and hummocks between the wider expanses of M25 mire across the remainder of the Site. Adjacent to High Eldrig, in particular, it appears that soil improvement measures have been incorporated at some point in the past, with areas of bluebell (*Hyacinthoides non-scripta*) potentially indicating that this part of the Site may have been associated with native woodland prior to clearing and seeding for grazing purposes. The vegetation was dominated by sweet vernal-grass and mats of springy turf-moss and its close relative big shaggy moss (*Rhytiadelphus triquetrus*) although tormentil, heath woodrush and common bent (*Agrostis capillaris*) were all found to be frequent. Deergrass, white clover (*Trifolium repens*), yarrow (*Achillea millefolium*), marsh violet, Yorkshire fog (*Holcus lanatus*) and crested dog's tail (*Cynosurus cristatus*) were found to be rare.
- 3.6.3 In terms of nature conservation interest, most forms of U4 grassland are considered to be of little interest unless grazing pressures are eliminated and they are allowed to go to flower, developing a more herb-rich form which can in turn develop further species interest (Averis *et al.* 2004). This is potentially what has occurred at some point in the past at the Site, thus explaining the distinct stands and variety of U4 grassland-associated communities spread across the wider Study Area until increased grazing pressure was introduced, and the sward maintained as a closer cropped feeding pasture.

U6 Juncus squarrosus-Festuca ovina grassland

- 3.6.4 Sub-communities recorded: The U6d *Agrostis capillaris-Luzula multiflora* sub-community.
- 3.6.5 U6 vegetation was recorded in the field approximately 100m to the west of the old farm buildings at High Eldrig, to the access track in the southern part of the Study Area. The species assemblage here was similar in nature to the wider areas of U4d grassland in this corner of the Site, except by also including more abundant rushes, heath woodrush, mat-grass (*Nardus stricta*), broom fork-moss (*Dicranum scoparium*) and common hair-cap moss.
- 3.6.6 Most stands of *Juncus-Festuca* grassland, like some other acid grasslands, are considered to be anthropogenic in origin (Rodwell, 1992). U6 vegetation is often seen as a problem by nature conservationists and farmers; however, these species-poor swards are considered to be unique to the UK where they owe their existence to the combination of an oceanic climate and a long history of burning and grazing (Averis *et al.* 2004).

U20 Pteridium aquilinum-Galium saxatile community

- 3.6.7 Sub-communities recorded: The U20a *Anthoxanthum odoratum* sub-community.
- 3.6.8 U20 vegetation dominated by bracken was recorded sporadically throughout the Study Area along more pronounced mounds and on areas of noticeably rockier, more mineral substrate deposits. In some areas the

bracken appeared denser and featured few associates. However, elsewhere other species present at lower abundance included Yorkshire fog, wavy hair-grass, common bent, heath woodrush, heath bedstraw, tormentil and occasionally small stands of heather. Mosses include red-stemmed feathermoss and common haircap moss. Much of the stands of U20 were found to be forming mosaics, most often with U4 grassland although also with the other rush-pasture and mire communities found across the Study Area.

- 3.6.9 U20 is typical of the zone where the farmed lowlands adjoin the unenclosed uplands. It is most common on lower hill slopes and on marginal ground, including abandoned fields, where it forms mosaics with heaths, grasslands and woodlands. The community covers fairly deep, well-drained but moist, base-poor and infertile soils (Averis *et al.* 2004).

3.7 Non-NVC Communities

Overview

- 3.7.1 During the NVC survey, a number of non-NVC vegetation types (in addition to the G1.3 oligotrophic water noted above) were recorded across the wider Study Area. They included the following Phase 1 habitats (JNCC, 2010):
- A1.1.1: Broadleaved woodland - semi-natural;
 - A1.2.2: Coniferous woodland - plantation;
 - A4.2: Coniferous woodland - recently felled; and
 - J4: Bare ground.
- 3.7.2 All of these non-NVC categories relate to the wider survey buffer of the Study Area. The coniferous woodland here consists predominantly of Sitka spruce plantation at various stages of growth; from newly planted, pre-thicket, thicket up to mature and areas of recently felled woodland. These areas are considered to be botanically limited as the intense, monoculture crop associated with commercial forestry limits the development of ground flora through shade, drying impacts and needles blanketing the ground.
- 3.7.3 An area of bare ground was also noted at the base of a turbine in the adjacent Artfield Fell Windfarm as result of disturbance to the ground during construction and early stages of operation.

3.8 Invasive Non-Native Species

- 3.8.1 No invasive non-native species were recorded during the survey; however no dedicated invasive non-native species survey was undertaken. We would expect any invasive species to have been noted during the botanical survey.

3.9 Notable Plant Species

- 3.9.1 No notable or rare species were recorded during the habitat surveys; however, this does not confirm that they are not present within the Study Area although we would expect any notable species to have been recorded during the botanical survey.

3.10 Corresponding Phase 1 Habitats

- 3.10.1 For each of the above-described vegetation and habitats types found in this survey, with the exception of those already described as non-NVC communities above, **Table TA_8.1.2** presents the equivalent habitats according to the Phase 1 habitat classification system (JNCC, 2010). As NVC communities are not always immediately comparable to Phase 1 habitat categories, the comparisons made here take into account species composition, peat depth and habitat quality recorded during the fieldwork. Also, some NVC communities may have more than one Phase 1 habitat category, depending on ground conditions. For instance, M25 mire aligns with B5 marshy grassland on shallow peat but may be better classified as E1.7 wet modified bog on deep peat.
- 3.10.2 The Phase 1 results are shown on **Figure TA_8.1.3** and have been effectively reverse interpreted from field notes, peat mapping data, and the NVC data and using the equivalent codes as presented in **Table TA_8.1.2**. When NVC

polygons were found to consist of mosaic NVC communities, these areas have been assigned a single Phase 1 classification based on the more dominant NVC-type.

- 3.10.3 As such, it is recommended that **Figure TA_ 8.1.3** is interpreted as a broad, lower-level habitat description while the NVC communities map (**Figure TA_ 8.1.2**) should be referred to for more detail on the plant communities within the Study Area.

Table TA_ 8.1.2: Phase 1/NVC Community Equivalents

Phase 1 Equivalent	NVC Communities Recorded
Grassland and marsh: B1.1/B1.2 Acid grassland – improved/semi-improved	U4, U6
Grassland and Marsh: B5 Marsh/marshy grassland	M23, M25
Tall herb and fern: C1.1/C1.2 Bracken: continuous/scattered	U20
Heathland: D2 Wet dwarf shrub heath	M15
Mire: E1.6.1 Blanket bog	M17, M19
Mire: E1.7 Wet modified bog	M1, M2, M15, M17, M25
Mire: E1.8 Dry modified bog	M19
Mire: E2.1 Flush and spring – acid and neutral	M6
Mire: E3.2 Fen – basin mire	M2/M6

4 Evaluation

4.1 Reference lists

- 4.1.1 In the following section the NVC communities recorded in the Study Area are compared to a number of published lists to assess their potential nature conservation interest or potential groundwater dependency. The following lists of international, national or council area importance have been used:

- Potential nature conservation interest:
 - Annex I habitats on Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) (the ‘Habitats Directive’) as summarised for the UK on the Joint Nature Conservation Committee (JNCC) website (JNCC, no date);
 - Priority habitats on the Scottish Biodiversity List (SBL) (Scottish Government 2013). The SBL was published in 2005 to satisfy the requirement under Section 2(4) of The Nature Conservation (Scotland) Act 2004, and it effectively supersedes the former UK Biodiversity Action Plan (BAP); however, habitat descriptions in the UK BAP, as provided in Maddock (2011), remain valid; and
 - Priority habitats on the Dumfries and Galloway Local BAP (Dumfries and Galloway Local Biodiversity Partnership, 2009) – for regionally important and priority habitats within Dumfries and Galloway.
- Potential groundwater dependency:
 - Potentially groundwater dependent terrestrial ecosystems (GWDTEs) as defined by the Scottish Environment Protection Agency (SEPA) (SEPA, 2017).

4.2 Evaluation

- 4.2.1 The Study Area has experienced significant historical modification from agricultural enhancement with respect to grazing conditions for livestock management, and most of the NVC communities recorded in the study are likely to be influenced by livestock pressures as well as hydrology (both in terms of drains channelling flows [TN8] and in terms of localised livestock poaching impacts as a result of trampling). Although some areas show signs of livestock and management pressures, some areas located on deeper peat exhibit better examples of blanket bog habitat. These areas are therefore likely to represent the least disturbed examples of semi-natural vegetation in the Study Area. Notable amongst these are the pockets of M17 located throughout the Study Area, as well as the M15 wet heath and M15/M25 mosaic in the north of the Study Area.
- 4.2.2 Elsewhere, the historical watercourses and small burns that threaded the Site appear to have had their flow stemmed (perhaps following the drainage channels networking the Study Area dewatering the substrate) facilitating the spread of wider vegetation establishing into what was a watercourse channel previously. While some of the watercourses do still maintain hydrological flow, many appear to have had this flow stemmed and these areas are reminiscent of flush/wet mire habitats. Such areas often present vegetation comprised of tall-rush dominated vegetation, representing the M23 and M6 communities, depending on whether bog-mosses are absent or present. These communities are often species poor and of limited nature conservation interest.
- 4.2.3 Areas where the topography rises often present rockier outcrops, or shallower substrate, that have taken well to historical improvements to grazing pasture for livestock. Such areas of more drained soils have formed into U4 grassland and appear to have spread to suitable areas throughout the Study Area, along with large stands of bracken (U20). The historical drainage channels typically result in areas of wetter shallows, or threads, which meander throughout the lower levels of the Study Area and tend to support communities indicative of potentially high groundwater dependence (i.e. M6 mire and M23 rush-pasture), with the general ground conditions across the vast majority of the Site being wet enough to support other communities with the potential to be moderately groundwater fed (M15 wet heath, M25 mire and U6 grassland).
- 4.2.4 Potential groundwater dependency is shown on **Figure TA_ 8.1.4**, although the catchment is considered likely to be predominantly surface water or rain fed, partly due to the wider network of blanket bog habitats (which by definition are fed by precipitation) as well as the underlying geology being inconducive to groundwater flow: Hydrogeology mapping data from the British Geological Society shows the bedrock beneath the Study Area to comprise a low productivity aquifer in which flow is virtually all through fractures and other discontinuities. Also, till, where present, is anticipated to have relatively low permeability, thus inhibiting groundwater flow.
- 4.2.5 Overall, however, the predominant NVC community is M25 mire (or associated sub-community and complimentary mosaics) with 45% of the total Study Area (i.e. 4,162.3ha of a total 7,640.3ha) consisting of M25-derived communities.
- 4.2.6 **Table TA_ 8.1.3** summarises the nature conservation interest and potential groundwater dependency of each NVC category recorded.

Table TA_8.1.3: Evaluations

NVC Community	Annex I Habitat	SBL Priority Habitat	Dumfries and Galloway Local BAP	Potential GWDTE Status
G1.3 Standing Water – oligotrophic	Not listed	Oligotrophic lakes are listed only as habitats on which negative impacts should be avoided	Oligotrophic Lochs	Not listed
M1 <i>Sphagnum auriculatum</i> bog pool community	M1 is included in the priority habitat description for 7130 Blanket bogs	M1 is included in the priority habitat description for blanket mire (Maddock 2011)	Blanket Bogs	Not listed
M2 <i>Sphagnum cuspidatum/fallax</i> bog pool community	M2 is included in the priority habitat description for 7130 Blanket bogs	M2 is included in the priority habitat description for blanket mire (Maddock 2011)	Blanket Bogs	Not listed
M6 <i>Carex echinata–Sphagnum recurvum/denticulatum</i> mire	Not listed	Upland flushes, fens and swamps are listed with a watching brief only	Upland springs and flushes	Potentially highly groundwater dependent
M17 <i>Scirpus cespitosus–Eriophorum vaginatum</i> blanket mire	7130 Blanket bogs	Blanket mire	Blanket Bogs	Not listed
M19 <i>Calluna vulgaris–Eriophorum vaginatum</i> blanket mire	7130 Blanket bogs	Blanket mire	Blanket Bogs	Not listed
M23 <i>Juncus effusus/acutiflorus–Galium palustre</i> rush-pasture	Not listed	M23a is listed in the description for upland flushes, fens and swamps (Maddock 2011), which are listed with a watching brief only Purple moor-grass and rush-pastures are priority habitats, although it is the richer M23a vegetation, which is described	Purple moor-grass and rush-pastures are priority habitats, although it is the richer M23a vegetation, which is described	Potentially highly groundwater dependent
M25 <i>Molinia caerulea–Potentilla erecta</i> mire	7130 Blanket bogs (on peat deeper than 0.5 m)	M25 is included in the priority habitat description for blanket mire (Maddock 2011)	Purple moor-grass and rush-pastures	Potentially moderately groundwater dependent
M15 <i>Trichophorum cespitosum–Erica tetralix</i> wet heath	4010 Northern Atlantic wet heaths with Erica tetralix	M15 is included in the priority habitat description for both blanket mire and upland heathland (Maddock 2011)	Upland heaths	Potentially moderately groundwater dependent
U4 <i>Festuca ovina-Agrostis capillaris-Galium saxatile</i> grassland	Not listed	Listed in the priority habitat description for lowland (to 300 m) dry acid grassland (Maddock 2011)	Acid grassland	Not listed
U6 <i>Juncus squarrosus-Festuca ovina</i> grassland	Not listed	Juncus squarrosus-Festuca ovina grassland listed with a watching brief only	Acid grassland	Potentially moderately groundwater dependent
U20 <i>Pteridium aquilinum–Galium saxatile</i> community	Not listed	Not listed	Not listed	Not listed

5 References

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Annex A: Target Notes

Target Note	Description
1	 <p data-bbox="403 926 1418 1003">M2 <i>Sphagnum cuspidatum/fallax</i> bog pool community to the north of the eastern access track where it enters the Site. The pool is dominated by flat-topped bog-moss, as well as papilose bog-moss, common cottongrass and cross-leaved heath.</p>
2	 <p data-bbox="403 1703 1418 1745">M6 <i>Carex echinata-Sphagnum recurvum/denticulatum</i> mire. The vegetation comprises mostly acute-leaved/red bog-moss, but included purple moor-grass, sheep's fescue, soft rush and bottle sedge.</p>

Target Note	Description
3	 <p data-bbox="1754 1031 2769 1136">View of an area of M17b <i>Scirpus cespitosus-Eriophorum vaginatum</i> blanket mire, <i>Cladonia</i> spp. sub-community. The vegetation is dominated by hare's-tail cottongrass and deergrass with purple moor-grass and heather being frequent. Wavy hair-grass, bog asphodel, cross-leaved heath, heath rush and blaeberry are also present.</p>
4	 <p data-bbox="1754 1778 2769 1824">View of an area of M19 <i>Calluna vulgaris-Eriophorum vaginatum</i> blanket mire. Characterised heather, hare's-tail cottongrass, red-stemmed feathermoss and acute-leaved/red bog-moss.</p>

Target Note	Description
5	 <p data-bbox="403 846 1285 869">M23 <i>Juncus effusus/acuteiflorus</i>–<i>Galium palustre</i> rush-pasture in the northeast of the Study Area.</p>
6	 <p data-bbox="403 1518 1389 1589">M25 <i>Molinia caerulea</i>–<i>Potentilla erecta</i> mire is the most prevalent of all NVC communities within the Study Area. Large, uniform areas of M25 exist within the Site, although It forms many mosaics, primarily with M6, M15, M17, M23 and U4 communities as well.</p>

Target Note	Description
7	 <p data-bbox="1742 846 2757 898">M15d <i>Trichophorum cespitosum</i>–<i>Erica tetralix</i> wet heath, <i>Vaccinium myrtillus</i> sub-community, in the north of the Study Area.</p>
8	 <p data-bbox="1742 1675 2703 1726">View of historical drain channel from the southern reach of the Study Area looking east towards the old buildings at High Eldrig .</p>

Annex B: Species List

Common name	Scientific Name
Acute-leaved/red bog-moss	<i>Sphagnum capillifolium</i>
Angelica	<i>Angelica sylvestris</i>
Bent grasses	<i>Agrostis spp.</i>
Blaeberry	<i>Vaccinium myrtillus</i>
Blunt-leaved bog-moss	<i>Sphagnum palustre</i>
Bog asphodel	<i>Narthecium ossifragum</i>
Bog myrtle	<i>Myrica gale</i>
Bog stitchwort	<i>Stellaria alsine</i>
Bracken	<i>Pteridium aquilinum</i>
Bramble	<i>Rubus fruticosus</i>
Broadleaved dock	<i>Rumex obtusifolius</i>
Broad-leaved pondweed	<i>Potamogeton natans</i>
Common bent	<i>Agrostis capillaris</i>
Common haircap	<i>Polytrichum commune</i>
Common marsh bedstraw	<i>Galium palustre</i>
Common sedge	<i>Carex nigra</i>
Common sorrel	<i>Rumex acetosa</i>
Creeping bent	<i>Agrostis stolonifera</i>
Creeping buttercup	<i>Ranunculus repens</i>
Cross-leaved heath	<i>Erica tetralix</i>
Crowberry	<i>Empetrum nigrum</i>
Deergrass	<i>Trichophorum germanicum</i>
Downy birch	<i>Betula pubescens</i>
False oat-grass	<i>Arrhenatherum elatius</i>
Feathery bog-moss	<i>Sphagnum cuspidatum</i>
Fir clubmoss	<i>Huperzia selago</i>
Flat-topped bog-moss	<i>Sphagnum fallax</i>
Foxglove	<i>Digitalis purpurea</i>
Glittering wood-moss	<i>Hylocomium splendens</i>
Greater woodrush	<i>Luzula sylvatica</i>
Grey willow	<i>Salix cinerea</i>
Hard rush	<i>Juncus inflexus</i>
Hare's-tail cottongrass	<i>Eriophorum vaginatum</i>
Harebell	<i>Campanula rotundifolia</i>
Heath bedstraw	<i>Galium saxatile</i>
Heath plait-moss	<i>Hypnum jutlandicum</i>
Heath rush	<i>Juncus squarrosus</i>
Heath spotted-orchid	<i>Dactylorhiza maculata</i>
Heath woodrush	<i>Luzula multiflora</i>
Heather	<i>Calluna vulgaris</i>
Heath-grass	<i>Danthonia decumbens</i>
Little shaggy-moss	<i>Rhytidiadelphus loreus</i>
Marsh ragwort	<i>Senecio aquaticus</i>
Marsh thistle	<i>Cirsium palustre</i>
Marsh violet	<i>Viola palustris</i>
Mat-grass	<i>Nardus stricta</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Papillose bog-moss	<i>Sphagnum papillosum</i>
Pointed spear-moss	<i>Calliergonella cuspidata</i>
Purple moor-grass	<i>Molinia caerulea</i>
Red fescue	<i>Festuca rubra</i>
Red-stemmed feathermoss	<i>Pleurozium schreberi</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Rosebay willowherb	<i>Chamerion angustifolium</i>
Rusty swam-neck moss	<i>Campylopus flexuosus</i>
Sharp-flowered rush	<i>Juncus acutiflorus</i>

Common name	Scientific Name
Sheep's fescue	<i>Festuca ovina</i>
Silver birch	<i>Betula pendula</i>
Sitka spruce	<i>Picea sitchensis</i>
Soft-rush	<i>Juncus effusus</i>
Springy turf-moss	<i>Rhytidiadelphus squarrosus</i>
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>
Tormentil	<i>Potentilla erecta</i>
Tufted hair-grass	<i>Deschampsia cespitosa</i>
Velvet bent	<i>Agrostis canina</i>
Water horsetail	<i>Equisetum fluviatile</i>
Waved silk-moss	<i>Plagiothecium undulatum</i>
Wavy hair-grass	<i>Deschampsia flexuosa</i>
White clover	<i>Trifolium repens</i>
Wild thyme	<i>Thymus polytrichus</i>
Wood sage	<i>Teucrium scorodonia</i>
Yorkshire fog	<i>Holcus lanatus</i>



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