Appendix 11B
NVC Report

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NVC Report

1. Introduction

1.1 Background and purpose of this report

RWE Renewables (RWE) is investigating the feasibility of extending the Enoch Hill Wind Farm to the south into Carsphairn Forest at an area called Monquhill and Amec Foster Wheeler was commissioned to undertake a suite of ecological baseline surveys in 2016-2017 in order to inform the assessment of potential effects of a four-turbine extension to Enoch Hill Wind Farm at Monquhill, herein called Monquhill Site. This report focuses on the vegetation baseline of the study area. An NVC survey was carried out in order to gather sufficient vegetative information to comply with Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage (SNH) Good Practice during Wind Farm Construction guidance[1], SEPA Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTEs)[2] and to identify habitats of statutory importance.

1.2 Objectives

The objectives of this report are to provide the following information:

- To provide the vegetation baseline of the study area (through the identification and mapping of vegetation communities, and sub-communities, where possible, in line with National Vegetation Classification guidance);
- To identify any rare/ uncommon plant, habitat or vegetation community occurring within the study area; and
- To identify the statutory vegetation conservation value of the vegetation communities present within the study area.

[1] Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, and Historic Environment Scotland (2015). *Good Practice during Wind Farm Construction. Version 3.* Available on: http://www.snh.gov.uk/docs/A1168678.pdf [Accessed January 2017]

[2] Scottish Environment Protection Agency. (2014). *LUPS-GU31 Land Use Planning System SEPA Guidance: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems Note 31. Version 1.* Available on : http://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 [Accessed November 2016]

2. Methods

2.1 Study area

Monquhill is located in New Cumnock, East Ayrshire, with a site centroid grid reference of approximately NS 58487 06467 (see inset map on **Figure 11B.1**). It is an upland site, the highest point of which is Strandlud Hill (531m), dominated by coniferous woodland plantation, with smaller stands of upland habitats including modified blanket bog, grassland, mires, flushes and heath occurring along forestry rides within the coniferous plantation and in the open area bordering the plantation.

Rationale

The study area is shown in **Figure 11B.1** and is defined by the site (red line boundary) with a 250m buffer around the site boundary. The vegetation survey extended to 250m around the site boundary in line with the SEPA guidance in relation to GWDTE[2] on proposed developments.

2.2 Desk study

The features of interest for the vegetation desk study are described in **Table 2.1**. These features also inform the vegetation conservation status of the study area which is further detailed in **Section 2.4** and **Table 2.3**.

Table 2.1 Features of interest for the vegetation desk study

Interest features	Interest features explanation	Sources of information and data (up to 2km of the site)
Statutory Nature Conservation Sites	SNH notifies specific designated sites that are of international importance for nature conservation as Sites of Special Scientific Interest (SSSI) and sites of international designations include Special Areas of Conservation (SAC), or Local Nature Reserves (LNR).	SNH's interactive map facility at Sitelink[3]; and Scotland's Environment website[4]
Non-Statutory Nature Conservation Sites	These include Local Wildlife Sites (LWS), Sites of Importance for Nature Conservation (SINC), Wildlife Trust (WT) Reserves and areas included under the Ancient Woodland Inventory (AWI)[5] and Native Woodland Survey for Scotland (NWSS). These sites, which are designated due to the presence of notable species or important habitats, broadly constitute the most important wildlife and geological sites that do not reach the criteria required for SSSI (i.e. statutory) designation. Non-statutory nature conservation sites also include Priority Woodlands for Red Squirrel.	SNH's interactive map facility at Sitelink[3]; and Scotland's Environment website[4]
Priority and Notable Habitats and Plant Species	These include habitats and species listed in Annex 1 and Annex 2 of the Habitats Directive, together with habitats and species which are listed on Scottish Biodiversity List (SBL) and Ayrshire Local Biodiversity Plan[6] (LBAP) and/or those which are of some	Habitats Directive, 1992[7]; Scottish Biodiversity List (SBL)[8]; Ayrshire Local Biodiversity Action Plan (LBAP)[9];

[3] SNH's interactive map facility at Sitelink. Available on: http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/sitelink/. [Accessed November 2016].
[4] Scotland's Environment website. Available on: http://map.environment.scotland.gov.uk/seweb/map.htm. [Accessed November 2016].
[5] AWI is a provisional guide to the location of ancient and long-established woodland in Scotland based on interpretations from historic maps. In Scotland, ancient woodland as defined by AWI is land that is currently wooded and has been continually wooded, since at least 1750. Whilst the NWSS is a national survey undertaken from 2006-2013 which identified locations and types of native woodlands in Scotland, where native is defined as woodland with >50% native species in the canopy. AWI and NWSS are categorised differently and these categories can be combined to provide a clearer picture of the condition of the woodland.

[7]The Habitats Directive: Council of the European Communities. (1992). *Council Directive 92/43/EEC of 21 May 1992 on the conservation of the habitats and wild fauna and flora*. (Habitats Directive). Available on: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:20070101:EN:PDF [Accessed October 2015].

Interest features	Interest features explanation	Sources of information and data (up to 2km of the site)
	other conservation interest based on their status nationally, regionally or locally. Plant species listed as being of conservation concern on the International Union for Conservation of Nature (IUCN) Red Data List and on the Red Data List for Great Britain. Plant species included on Schedule 8 of the Wildlife and Countryside Act 1981 (WCA) (as amended)[13]. Desk studies from previous vegetation surveys[14].	International Union for Conservation of Nature (IUCN) Red Data List[10]; The Vascular Plant Red Data List for Great Britain[11]; The Conservation (Natural habitats, &c.) Regulations 1994 (as amended in Scotland)[12]; Wildlife and Countryside Act 1981 (as amended)[13].; and EnviroCentre (2011). *Monquhill Wind Farm: Flora, Habitats and Vegetation*[14].

2.3 National Vegetation Classification (NVC) survey

The NVC survey was carried out by Amec Foster Wheeler Consultant Ecologists Kristi Leyden and David Knox, both of whom are experienced botanists, between 6 September and 27 October 2016 (see **Table 2.2**). Kristi Leyden and David Knox are professionally recognised ecologists (members of the Chartered Institute of Ecology and Environmental Management).

Table 2.2 Phase 2 Vegetation Survey Details

Survey	Survey Personnel	Date
NVC survey	Kristi Leyden	6-8 September and 12-14 September 2017
NVC survey	Kristi Leyden and David Knox	15-16 September 2017
NVC survey	Kristi Leyden	26-27 October 2017

NVC field work

The survey methodology was carried out in line with the key reference *NVC: Users' Handbook*[15] whilst the survey was informed by the key references[16] [17] [18] [19] [20] [21] for the identification of vegetation communities present.

[8] The SBL is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. http://www.biodiversityscotland.gov.uk/advice-and-resources/scottish-biodiversity-list/ [Accessed March 2017].

[9] The most up to date Ayrshire LBAP document available is a draft report of The Conservation and Enhancement of Ayrshire's Biodiversity Ayrshire Biodiversity Action Plan. Available on: http://www.ayrshire-jsu.gov.uk/download/LBAP/Ayrshire%20Biodiversity%20Action%20Plan%20-%20Environmental%20Report.pdf [Accessed October 2016].

[10] IUCN Red Data List publications are listed on the Joint Nature Conservation Committee (JNCC) website at this location: http://jncc.defra.gov.uk/page-3352 and available for reference on Conservation Designations for UK Taxa spreadsheet (updated January 2011) at this location: http://jncc.defra.gov.uk/page-3408 Species are listed as follows: Regionally Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern according to IUCN (2001) criteria.

11Cheffings, C. and Farrell, L. (Ed). (2005). *Species Status No. 7: The Vascular Plant Red Data List for Great Britain. Revised in 2006.* Available on the JNCC website: http://jncc.defra.gov.uk/pdf/pub05_speciesstatusvpredlist3_web.pdf [Accessed March 2017].

[12] The Conservation (Natural habitats, &c.) Regulations 1994 (as amended in Scotland). Available on: http://www.legislation.gov.uk/uksi/1994/2716/contents/made [Accessed March 2017]

13Wildlife and Countryside Act 1981(as amended). Available on: http://www.legislation.gov.uk/ukpga/1981/69/contents [Accessed March 2017]

[14] EnviroCentre (2011). *Monquhill Wind Farm: Flora, Habitats and Vegetation.* A report produced for EC&R.

[15] Rodwell, J.S. (2006). *National Vegetation Classification: Users' Handbook.* Joint Nature Conservation Committee, Peterborough, U.K.

[16] Rodwell, J.S. ed., (1991a). *British Plant Communities Vol 1. Woodlands & Scrub.* Cambridge University Press, Cambridge, U.K.

17 Rodwell, J.S. ed., (1991b). *British Plant Communities Vol 2. Mires and Heaths*. Cambridge University Press, Cambridge, U.K.

The surveyor/s walked the study area to ascertain the homogenous vegetation stands present and to identify any particular features of interest. Homogenous stands of vegetation were identified and mapped onto 1:15,000 field maps, aided by the use of aerial photographs.

Quadrat data of representative samples of homogenous communities (or sub-communities where possible, referred to as community hereafter) were taken using a set number of quadrats. At least four quadrats were taken per community or more where homogenous stands of vegetation were not discernible. The number of quadrats taken per community was based on professional judgement as the *NVC: Users' Handbook*[15] does not provide a standardised number for use. Data from four (or greater) quadrats enables the surveyor to assign vegetation communities with a high level of confidence using the range and frequency columns on the quadrat data table. In certain cases, a community or sub-community did not support a large enough area in order to facilitate recording four quadrats. In other cases the vegetation community's assemblage varied too frequently to facilitate representative quadrats and in such cases detailed target notes were taken in place of quadrats.

In some cases, where two or more community types were present, but were comprised of communities where one or more component was too small to map as a separate polygon, the approximate percentage cover of each community was recorded and the communities were recorded as a mosaic. Where a community comprised only a minor component of the mosaic this is stated. The dominant community is listed first in the mosaic.

The quadrat sample sizes used, based on the *NVC: Users' Handbook* [15], were as follows: 2m by 2m for acid and neutral grassland; and 4m by 4m for marshy grassland/ mire, blanket bog, dry heath and wet heath. Species cover was recorded for the NVC survey quadrats using the Domin scale[22] in accordance with Rodwell[15]. The NVC survey was also supplemented where necessary with provisional NVC communities as described in Rodwell *et al. Review of coverage of the National Vegetation Classification*[21]. Furthermore, the NVC survey was supplemented with Phase 1 habitat information where necessary, for example there is no current code for coniferous plantation woodland within the NVC, so this report includes references to the JNCC's *Handbook for Phase 1 Habitat Survey* [23].

Target notes were taken of features of particular interest. Quadrat and target note positions were recorded using a hand-held GPS device. Photographs were taken of each quadrat recorded and of features of interest.

Confirmation and/or identification of unknown higher plants followed Rose *et al*. [24] and Rose[25] whilst confirmation and/or identification of unknown bryophytes followed Atherton *et al*.[26].

NVC post-field work

Data processing post field work converted the NVC survey data into NVC community tables, digitised text and digitised maps.

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18 Rodwell, J.S. ed., (1992). *British Plant Communities Vol 3. Grasslands and Montane Communities.* Cambridge University Press, Cambridge, U.K.

19 Rodwell, J.S. ed., (1995). British Plant Communities Vol 4. Aquatic Communities, Swamps and Tall-Herb Fens. Cambridge University Press, Cambridge, U.K.

21 Rodwell, JS, Dring, JC, Averis, ABG, Proctor, MCF, Malloch, AJC, Schaminée, JNJ, and Dargie TCD. (2000b). Review of coverage of the National Vegetation Classification. JNCC Report No. 302.

[22]Rodwell (2006) described the Domin scale as a measure of cover/ abundance, using vertical projection on the ground of the extent of the living parts of a plant species. The following reference scale is provided - <4% (few individuals), 2 - <4% (several individuals), 3 - <4% (many individuals), 4 - 4-10%, 5 – 11-25%, 6 – 26-33%, 7 – 34-50%, 8 – 51-75%, 9 – 76-90%, 10 – 91-100%.

[23]Joint Nature Conservation Council. (2010). *Handbook for Phase 1 Habitat Survey - A technique for environmental audit*. Reprint. JNCC, Peterborough, U.K.

24 Rose, F. & O' Reilly, C. (2006). The Wild Flower Key (Revised Edition) - How to identify wild plants, trees and shrubs in Britain and Ireland. Penguin Group, London, U.K.

25 Rose, F. (1989). Colour Identification Guide to the Grasses, Sedges, Rushes and Ferns of the British Isles and North Western Europe. Penguin Group, London, U.K.

26 Atherton, I., Bosanquet, S. & Lawley, M. (2010). Mosses and Liverworts of Britain and Ireland – A Field Guide. First Edition. British Bryological Society, U.K.

Recorded quadrat data are presented as NVC community tables with assigned vegetation communities, which were identified using the keys and vegetation community descriptions in Rodwell *et al.*[16 17 18 19 20 21]and Averis *et al.*[27] along with professional judgement. Text in **Annex 11A** describes the vegetation communities recorded. Habitats and/or communities that were identified without the aid of quadrats were assigned a NVC community using the keys and vegetation community descriptions in Rodwell *et al.*[16 17 18 19 20 21]. Phase 1 habitats were assigned using the JNCC's *Handbook for Phase 1 Habitat Survey*[23].

Hand drawn field maps were digitised into shapefiles which created NVC polygon using ArcGIS in order to produce digital maps. Target note positions and notes were also digitised into point features in order to be illustrated on the digitised maps.

Nomenclature for higher plant species follows Stace)[28] and nomenclature for bryophyte species follows Smith[29].

A species list (with vernacular and scientific names) of all plant species mentioned in this report is provided in **Annex 11D**.

Rare/ uncommon plants

The presence of **rare and/or uncommon plant species (see Table 2.1) was noted during the NVC survey. Target notes were used to record** the location and frequency of rare and/or uncommon plant species.

Non-native invasive plants

The presence of invasive non-native plant species[30] was noted during the NVC survey. Target notes were used to record the location and frequency of any non-native plant species present.

[27] Averis, A.M., Averis, A.B.G, Birks, H.J.B., Horsfield, D., Thompson, D.B.A. & Yeo, M.J.M. (2004). An Illustrated Guide to British Upland Vegetation. UK Joint Nature Conservation Committee.

28 Stace, C. (2010). New Flora of the British Isles. Third edition. Cambridge University Press, Cambridge.

29 Smith, A.J.E. (2004). The Moss Flora of Britain and Ireland. Cambridge University Press.

[30] In Scotland, Section 14 of the Wildlife and Countryside (WCA) Act 1981 (as amended) applies to non-native species, whilst the Wildlife and Natural Environment (Scotland) (WANE) Act 2011 strengthens this legislation through amendments to the 1981 Act. Guidance on good practise in implementing non-native species legislation was issued in 2012 by the Scottish government (under Section 14C of the WCA Act) through the *Code of Practice on Non-Native Species*. Under the WANE Act, it is an offense to plant or otherwise cause to grow a plant in the wild at a place outwith its native range. Under the *Code of Practice on Non-Native Species*, 'in the wild' refers to as all rural or urban areas excluding arable and horticultural land, improved pasture, settlements, private and public gardens and 'native range' refers to the locality to which the plant of that type is indigenous, and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person. Scottish Natural Heritage (SNH) the body responsible for advising on non-native species in most terrestrial and wetland habitats and species (Forestry Commission Scotland are responsible for woodland habitats and Scottish Environment Protection Agency are responsible for all freshwater), provide guidance that the native range of higher plants (SNH Guidance Notice: Native Range. Available on: http://www.snh.gov.uk/docs/A1464519.pdf [Accessed June 2017]) should be reviewed, on the Online Atlas of the British and Irish Flora

2.4 Vegetation Conservation Status

The vegetation conservation status of the vegetation communities present within the study area is informed by both the desk study and the field survey results. The sources that inform the assessment are provided in **Table 2.1**. Additionally, GWDTE have been added to this listing; GWDTE are not regarded as of botanical concern in themselves (although some GWDTE are of high botanical interest) rather specific communities indicate the potential presence of ground water[31].

Table 2.3 Sources that inform the vegetation conservation status of the study area

Statutory Sites	Statutory Nature Conservation Site; and Non-Statutory Nature Conservation Sites.
Priority Habitats	Annex 1 habitats of the Habitats Directive3233 Scottish Biodiversity List priority habitats8; and Ayrshire Local Biodiversity Action Plan6 priority habitats.
Protected/ notable species	Schedule 4 of The Habitats Regulations (1994)12 which transposes Annex II of the Habitats Directive (1992); IUCN red data list**Error! Bookmark not defined.**; Red data vascular plants for Great Britain11; Schedule 8 of the Wildlife and Countryside Act (1981) (as amended); Scottish Biodiversity List priority plant species8; and Ayrshire Local Biodiversity Action Plan6 plant species.
Potential ground water	The presence of Groundwater Dependent Terrestrial Ecosystems.

2.5 Surveying and Reporting Limitations

Much of the NVC survey was carried out in September; two days of surveying was undertaken in October which is outwith the peak NVC surveying months (May to September[34]). However due to the late growth of vegetation in autumn 2016 (a result of mild weather) it is not considered that this has affected the quality of the data gathered.

A small number of areas within the study area were not surveyed (see **Figure 11B.2a-11B.2d**) due to health and safety reasons (waterlogged ground and dense coniferous woodland plantation).

The vegetation composition of the study area has been subject to high levels of modification due primarily to the effects of afforestation and drainage systems and to a lesser extent deer browsing; assigning vegetation assemblages to definitive NVC communities was difficult, and in some cases, not possible.

These factors have all been taken into account in the results sections.

[31] As indicated by Scottish Environment Protection Agency. (2014)[2].

[32] Annex 1 habitats are habitats of European conservation importance as listed in Annex 1 of the Habitats Directive: Council of the European Communities. (1992). *Council Directive 92/43/EEC of 21 May 1992 on the conservation of the habitats and wild fauna and flora.* (Habitats Directive). Available on: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:20070101:EN:PDF [Accessed October 2016].

[33] European Commission. (2013). *Interpretation manual of European Union Habitats- EUR 28 European Commission DG Environment*. (EU habitats Interpretation Manual). Available at: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf [Accessed November 2016].

[34] As advised in Box 2 of the SEPA/ SNH Good Practice during Wind Farm Construction guidance[1]

3. Survey Results

3.1 Desk study

The results of the desk study are presented in **Table 3.1**.

Table 3.1 Botanical desk study results

Interest features	Desk study finding
Statutory Nature Conservation Sites	No statutory nature conservation site was identified within 2km of the study area.
Non-Statutory Nature Conservation Site	No non-statutory nature conservation site was identified within 2km of the study area.
Notable Habitats	The following notable habitats were identified within Monquhill Site in the EnviroCentre vegetation report[14]: Ayrshire Biodiversity Action Plan Priority Habitats: ▶ Blanket bog; and ▶ Planted conifers. Annex 1 habitats ▶ Blanket bog
Notable Plants	The following notable plants were identified from records within 10km of the study area using NBN Gateway[14]: Black-bindweed *Fallopia convolvulus* Bluebell *Hyacinthoides non-scripta* Bogbean *Menyanthes trifoliata* Cloudberry *Rubus chamaemorus* Eyebright *Euphrasia arctica* subsp. *borealis* Hairy Stonecrop *Sedum villosum* Heath Dog-violet *Viola canina* Little Kneeling Eyebright *Euphrasia confusa* Mossy Saxifrage *Saxifraga hypnoides* Oak Fern *Gymnocarpium dryopteris* Speedwell *Veronica serpyllifolia subsp. humifusa* Spignel *Meum athamanticum* Wood Bitter-vetch *Vicia orobus* Lesser Fringe-moss *Racomitrium affine*

3.2 Field survey

The NVC communities and the associated Phase 1 habitat types recorded within the study area are listed in **Table 3.1**. Mosaics have been categorised in Table 3.1 according to the dominant community type. The NVC survey map, supplemented with Phase 1 habitat data where necessary, is presented in **Figure 11B.2a-11B.2d**. Vegetation community descriptions are presented in **Annex 11A**. Quadrat data is presented in **Annex 11B** with target notes presented in **Annex 11C**. The NVC species list, including vernacular and scientific names, is presented in **Annex 11D** and NVC photographs are presented in **Annex 11E**. A summary of the vegetation communities present in the study areas is provided below.

Summary of the vegetation communities present

The study area is an upland site dominated by coniferous woodland plantation with small stands of young broadleaved plantation occurring along the coniferous forestry plantation in the east (for general study area views see Photo 1, 2, 3, **Annex 11E**). The forestry rides within the coniferous plantation are dominated by modified blanket bog, the majority of which is dry modified bog which grades in and out of a number of different habitats including acid grassland, acid flushes and rush-pasture. Agricultural land to the north of the coniferous woodland plantation is dominated by modified blanket bog, in mosaic with acid grassland, and mosaics supporting rush-pasture, acid flush and acid grassland.

Coniferous woodland plantation is the dominant habitat within the study area; the primary coniferous plantation is composed of densely planted young Sitka spruce *Picea sitchensis* trees approximately 10-15m high, occurring on former blanket bog. Very small stands of broadleaved trees occur within gaps in the coniferous woodland plantation in the east of the study area. Scattered scrub is widespread and local, scattered broadleaved trees occur rarely along the forestry tracks and scattered coniferous trees occur through but most prominently in the re-vegetating forestry tracks of the study area. A large stand of recently felled woodland occurs in the west of the study area.

Several communities and sub-communities of semi-improved acid grassland are present within the study area. U2 semi-improved acid grassland (*Deschampsia flexuosa* grassland) occurs as a minor to major community in mosaic with other communities in the north east and south of the study area. U2a semi-improved acid grassland (*Deschampsia flexuosa* grassland, *Festuca ovina – Agrostis capillaris* sub-community) occurs within a moderate sized mosaic on a steep hillside in the west and a small narrow mosaic in the south of the study area. U4 semi-improved acid grassland (*Festuca ovina – Agrostis capillaris – Galium saxatile* grassland) is the dominant acid grassland in the north of the study area occurring as small to moderate stands and in mosaics with other communities. A species-poor variant of U4, U4x, occurs within mosaics to the south west of the study area. U5 semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland) occurs as a moderate stand in the north east and within mosaics throughout the study area on drier sloping ground and along sections of the forestry rides. U5a semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, species-poor sub-community) occurs as a large stand on Strandlud Hill, occupying, along with wet modified blanket bog, much of open non-coniferous woodland plantation space available. U5b semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, *Agrostis canina – Polytrichum commune* sub-community) occurs as a small stand within a wider area of M25 mire on sloping ground in the north of the study area. U5c semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, *Carex panicea – Viola riviniana* sub-community), the most species-rich acid grassland occurring in the study area occurs in the west on a steep west-facing hill, in an intricate mosaic with U2a acid grassland and M23a rush-pasture. U6 semi-improved acid grassland (*Juncus squarrosus – Festuca ovina* grassland) occurs as a small stand in the north east; and in mosaics in the north and south predominantly as patchy vegetation on exposed, damaged peat and also in the east on shallow soil along forestry tracks that are becoming overgrown.

Two communities of semi-improved neutral grassland occur within the study area. A species-poor MG9 semi-improved neutral grassland (*Holcus lanatus - Deschampsia cespitosa* grassland) occurs in a large flushed mosaic with rush-pasture and acid flush in the north, and as a flushed narrow linear mosaic with M23b rush-pasture in the north east of the study area. A species-poor semi-improved grassland in the study area which does not fit within the NVC classification system is best described as the provisional grassland (PG) occurs as a small stand and as small to moderate within mosaics in the north east of the study area.

M23 rush-pasture (*Juncus effusus*/ *acutiflorus* – *Galium palustre* rush-pasture), is widespread in the study area; occurring as small stands in a forestry ride in the north east and a steep hillside to the west and predominately in mosaic with a range of vegetation communities/ habitats. M23a rush-pasture (*Juncus effusus*/ *acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community) is widespread throughout the study area occurring as small to moderate stands in the north east, north west and east in association with moving water and forestry rides and is widespread within mosaics with other vegetation communities. M23b rush-pasture (*Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community) is widespread in the study area occurring as small to moderate stands in the north east associated with the movement of water and is widespread in mosaics with a range of vegetation communities.

M4x mire (*Carex rostrata* – *Sphagnum recurvum* mire, variant) occurs in a small number of stands (too small to map) in forestry rides and at the edge of the coniferous woodland plantation in the north west and east of the study area where water has pooled and also within seepage flushes. M25 mire (M*olinia caerulea* – *Potentilla erecta* mire) occurs locally as small to moderate stands in sloping ground in the east of the study area and within mosaics with a range vegetation communities. Small stands of M25b mire (M*olinia caerulea* – *Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community), too small to map, occur upon a small number of hillocks to the north east of the study area within a wider area of mire.

Small stands of U16 tall-herb (*Luzula sylvatica* –*Vaccinium myrtillus* tall-herb), too small to map, occur occasionally within the study area between forestry tracks and coniferous woodland plantation.

H12 dry heath (*Calluna vulgaris* – *Vaccinium myrtillus* heath) occurs on shallow soil, some of which occurs on former hardstanding, as a small narrow stand in the north east adjacent to a forestry track and as a small intricate mosaic with M6d acid flush and a minor quantity of self-sown scattered coniferous trees.

The wet heath that occurs in the study area is best described as M15 wet heath (*Trichophorum cespitosum* – *Erica tetralix* wet heath); it occurs as small stands (often too small to map) throughout the study area.

One small stand of M19 wet modified blanket bog (*Calluna vulgaris* – *Eriophorum vaginatum* blanket mire) occurs on low lying ground in the east of the study area. M20 dry modified blanket bog (*Eriophorum vaginatum* blanket mire*)* is an important community within the study area occupying the second largest extent of area, following coniferous woodland plantation. The modified dry blanket bog occurs as large stands within the forestry rides and as a significant proportion of Strandlud Hill and also in mosaic with a large range of vegetation communities along the forestry rides. M20i dry modified blanket bog (*Eriophorum vaginatum* blanket mire, variant*)* supports a greater diversity of plant species and a greater quantity of (browsed) dwarf shrubs and *Sphagnum* than the other variants of the M20 occurring within the study area; it occurs primarily within the middle of the study area particularly within and adjacent Strandlud Hill. M20ii dry modified blanket bog (*Eriophorum vaginatum* blanket mire, variant*)* occurs, with frequency, along the forestry rides upon peat which ranges from 0.75-1m in depth.

Small to moderate stands of bare peat are widespread throughout the study area, occurring with a higher frequency in the south.

M6 acid flush (*Carex echinata* – *Sphagnum recurvum/ auriculatum* mire) is widespread within the study area occurring as narrow linear stands within drainage ditches, including within the coniferous woodland plantation and within small to large mosaics. M6b acid flush (*Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community) is the best fit for a widespread vegetation sub-community occurring upon the damaged, drained peat along the forestry rides. M6d acid flush (*Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community) occurs in small stands throughout the study area, with the largest stand flushing into the Carcow Burn in the north east.

Three small stands of standing water are present within the study area, one of these ponds is present upon Strandlud Hill in the middle, whilst the other two ponds occur in the east of the study area.

M2 bog pool (*Sphagnum cuspidatum* / *recurvum* bog pool) is the best fit for a small species poor bog pool present in the north of Strandlud Hill (see TN 19; **Figure 11B.2d**) which is bordered by M20 wet modified blanket bog.

Table 3.1 NVC communities and corresponding Phase 1 habitats recorded within Monquhill

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
Woodland	A1.1.2 Broadleaved woodland plantation	-		
	A1.2.2 Coniferous woodland plantation	-		
Scrub	A2.2.2 Scattered scrub	-		
Scattered trees	A.3.1 Scattered broadleaved trees	-		
	A3.2 Scattered coniferous trees	-		
Felled woodland	A4 Recently felled woodland	-		
Grassland	B1.2 Semi-improved acid grassland	U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland		0.62
	B1.2 Semi-improved acid grassland	U4x *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, species-poor variant		N/A
	B1.2 Semi-improved acid grassland	U5 *Nardus stricta – Galium saxatile* grassland		0.43
	B1.2 Semi-improved acid grassland	U5a *Nardus stricta – Galium saxatile* grassland, species-poor sub-community		5.39
	B1.2 Semi-improved acid grassland	U5b *Nardus stricta – Galium saxatile* grassland, *Agrostis canina – Polytrichum commune* sub-community		0.03
	B1.2 Semi-improved acid grassland	U6 *Juncus squarrosus – Festuca ovina* grassland		0.08
	B2.2 Semi-improved neutral grassland	Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland		0.32
		U2X *Deschampsia flexuosa* grassland, *Festuca ovina* – minor U6 *Juncus squarrosus – Festuca ovina* grassland – U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland – *rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	87/5/5/3	0.23
		U2x *Deschampsia flexuosa* grassland, *Festuca ovina* – minor U5 *Nardus stricta – Galium saxatile* grassland	95/5	0.41
		Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland – minor M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	90/10	0.35

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland – M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor M23 *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture	70/20/10	0.14
		Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland – M25 M*olinia caerulea – Potentilla erecta* mire – M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community	50/30/20	0.35
		U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland – M23 *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture – minor M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire	60/30/10	4.73
		U5c *Nardus stricta – Galium saxatile* grassland, *Carex panicea – Viola riviniana* sub-community – U2a – *Deschampsia flexuosa* grassland, *Festuca ovina – Agrostis capillaris* sub-community – M23a *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	N/A	1.52
		U5 *Nardus stricta – Galium saxatile* grassland – M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community	N/A	0.75
		U5 *Nardus stricta – Galium saxatile* grassland – M20 *Eriophorum vaginatum blanket mire* – minor M25 M*olinia caerulea – Potentilla erecta* mire	60/30/10	0.55
		U5 *Nardus stricta – Galium saxatile* grassland – M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community	70/30	1.13
		U5 *Nardus stricta – Galium saxatile* grassland – M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community – minor M20 *Eriophorum vaginatum blanket mire* – M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community	70/20/5/5	0.17
		U6 *Juncus squarrosus – Festuca ovina* grassland – scattered coniferous trees	80/20	0.79
		U6 *Juncus squarrosus – Festuca ovina* grassland – M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community - Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	50/30/20	0.24
Marshy grassland	B5 Marsh/ marshy grassland	M23 *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture		0.75

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community		2.10
		M23b *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community		1.56
		M23 *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture – minor M20a *Eriophorum vaginatum blanket mire species poor sub-community* – E4 Bare peat	80/10	0.18
		M23 *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture – minor - Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland - M15x *Trichophorum cespitosum* – *Erica tetralix* wet heath, variant – minor M25 M*olinia caerulea* – *Potentilla erecta* mire	N/A	0.91
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – M20 *Eriophorum vaginatum blanket mire*	50/50	0.54
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – M6d *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	70/30	2.30
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – M6d *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community – M23b - *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community minor MG9 *Holcus lanatus - Deschampsia cespitosa* grassland	50/30/15/5	9.62
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – M25 M*olinia caerulea* – *Potentilla erecta* mire – minor Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	70/20/10	0.50
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor U5 *Nardus stricta* – *Galium saxatile* grassland	95/5	0.31
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor M6 *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire	90/10	1.77
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor M15x *Trichophorum cespitosum* – *Erica tetralix* wet heath, variant - Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland – U5 *Nardus stricta* – *Galium saxatile* grassland	85/5/5/5	0.11

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – minor U2 *Deschampsia flexuosa* grassland, *Festuca ovina* – *Agrostis capillaris* – U5 *Nardus stricta* – *Galium saxatile* grassland – M6d *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	75/10/10/5	0.44
		M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community - - Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	80/20	0.14
		M23b *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community – MG9 *Holcus lanatus - Deschampsia cespitosa* grassland	70/30	0.59
		M23b *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community - Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	50/50	2.37
		M23b *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community - U2 *Deschampsia flexuosa* grassland, *Festuca ovina* – *Agrostis capillaris* – minor M6 *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire	70/20/10	0.26
Mire	B5 Marsh/ marshy grassland	M25 M*olinia caerulea* – *Potentilla erecta* mire		0.76
		M25 M*olinia caerulea* – *Potentilla erecta* mire – minor M6 *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire	95/5	0.73
		M25a M*olinia caerulea* – *Potentilla erecta mire, Erica tertralix* sub-community = U6 *Juncus squarrosus* – *Festuca ovina* grassland – minor M23a *Juncus effusus/ acutiflorus* – *Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	50/40/30, 60/30/10	0.23
		M25 M*olinia caerulea* – *Potentilla erecta* mire – minor U5 *Nardus stricta* – *Galium saxatile* grassland	95/5	0.33
Tall herbs	C3.2 Tall herb and fern – non-ruderal	U16 *Luzula sylvatica* –*Vaccinium myrtillus* tall-herb		
Dry heath	D1.1 Dry dwarf shrub heath	H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath		0.10
Damp heath	D2 Wet dwarf shrub heath	M15 *Trichophorum cespitosum* – *Erica tetralix* wet heath, variant		0.18
		M15x - *Trichophorum cespitosum* – *Erica tetralix* wet heath, variant – M6d *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus*	40/30/30	0.83

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		sub-community – U5 *Nardus stricta – Galium saxatile* grassland		
		M15x *Trichophorum cespitosum – Erica tetralix* wet heath, variant - U5 *Nardus stricta – Galium saxatile* grassland – minor M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	50/40/10	1.97
Blanket bog	E1.7 Wet modified blanket bog	M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire		0.39
	E1.7 Wet modified blanket bog	M20i *Eriophorum vaginatum blanket mire* variant		6.88
	E1.7 Wet modified blanket bog	M20ii *Eriophorum vaginatum blanket mire* variant		Included in M20i
		M20 *Eriophorum vaginatum blanket mire* – minor M15 *Trichophorum cespitosum – Erica tetralix* wet heath	80/20	5.01
		M20 *Eriophorum vaginatum blanket mire* – U6 *Juncus squarrosus – Festuca ovina* grassland	80/20	23.90
		M20 *Eriophorum vaginatum blanket mire* – U6 *Juncus squarrosus – Festuca ovina* grassland - M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire	40/40/20	0.43
		M20 *Eriophorum vaginatum blanket mire* – minor M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire – M15x *Trichophorum cespitosum – Erica tetralix* wet heath, variant – U5 *Nardus stricta – Galium saxatile* grassland	75/10/10/5	0.57
		M20 *Eriophorum vaginatum blanket mire* - M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – minor U5 *Nardus stricta – Galium saxatile* grassland	50/30/20	0.78
		M20 *Eriophorum vaginatum blanket mire* – minor M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community	50/50, 60/40, 50/50, 70/30	2.81
		M20 *Eriophorum vaginatum blanket mire* – M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – minor U5 - *Nardus stricta – Galium saxatile* grassland	50/30/20	0.12
		M20 *Eriophorum vaginatum blanket mire* – M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	60/40	0.25
		M20 *Eriophorum vaginatum blanket mire* – M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community- minor U5 *Nardus stricta – Galium saxatile* grassland	N/A	0.94
		M20 *Eriophorum vaginatum blanket mire* – minor M6d *Carex echinata –*	N/A	0.27

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		Sphagnum recurvum/ auriculatum mire, *Juncus acutiflorus* sub-community – U5 *Nardus stricta – Galium saxatile* grassland		
		M20 *Eriophorum vaginatum blanket mire* – minor M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire – M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – M23 *Juncus effuses/acutiflorus-Galium palustre* rush-pasture	75/10/10/5	0.72
		M20 *Eriophorum vaginatum blanket mire* – U6 *Juncus squarrosus – Festuca ovina* grassland – U5 *Nardus stricta – Galium saxatile* grassland	85/10/5	0.49
		M20 *Eriophorum vaginatum blanket mire* – U2x *Deschampsia flexuosa* grassland, *Festuca ovina Agrostis capillaris*	80/20	0.23
	E4 Bare peat	-		
	E2.1 Acid flush	M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community		1.23
		M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire – M20 - *Eriophorum vaginatum blanket mire* M6b - *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community	45/40/5	0.08
		M6 *Carex echinata – Sphagnum recurvum/ auriculatum* mire – minor M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	70/30	1.60
		M6a *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex echinata* - M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community – minor M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	60/30/10	0.06
		M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – M20 *Eriophorum vaginatum blanket mire*	90/10	0.32
		M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community - M23b - *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community – minor U5 *Nardus stricta – Galium saxatile* grassland	50/30/27/3	0.11
		M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – U5 *Nardus stricta – Galium saxatile* grassland – minor M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community – U6 *Juncus squarrosus – Festuca ovina* grassland – M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus*	65/20/7/5/3	0.29

Habitat Description	Phase 1 Habitat	Associated NVC Community	Mosaic Ratio	Area (ha)
		acutiflorus sub-community		
		M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community – U6 *Juncus squarrosus – Festuca ovina* grassland – minor U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	60/30/10	0.39
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community M23 *Juncus effuses/acutiflorus-Galium palustre* rush-pasture	60/40	1.80
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community- U5 *Nardus stricta – Galium saxatile* grassland – minor	70/30	0.08
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community- U5 *Nardus stricta – Galium saxatile* grassland – minor M15x - *Trichophorum cespitosum – Erica tetralix* wet heath, variant	60/30/10	0.57
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community – H12 *Calluna vulgaris – Vaccinium myrtillus* heath – Minor scattered coniferous trees.	70/15/15	0.18
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community - M20 *Eriophorum vaginatum blanket mire*	70/30	0.28
		M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community - M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	80/20	0.26
Open water	G1 Standing water	-		
	G1.4 Dystrophic standing water	M2 *Sphagnum cuspidatum* / *recurvum* bog pool		N/A

3.3 Rare/uncommon plants

No rare or uncommon plant species were recorded.

3.4 Non-native invasive plants

No non-native invasive plant species were recorded.

3.5 Vegetation Conservation Status

Table 3.2 indicates whether the NVC communities (including provisional NVC communities) or Phase 1 habitat recorded qualify as Annex 1 habitats, Scottish Biodiversity List priority habitats, and/ or Ayrshire priority habitats; this is informed by both the desk study and field survey results. Additionally the presence of potentially[35] groundwater dependent communities[31] have been identified, in line with SEPA guidance.

Table 3.2 Monquhill Vegetation Conservation Status*

NVC community (in bold below)/ Phase 1 habitat	Annex 1 habitat (* when a Priority habitat)	Scottish Biodiversity List Habitats (in bold below); categories for action	Ayrshire Local Biodiversity Action Plan Priority Habitat (in bold below); reason for selection	Groundwater dependency potential**
A1.1.1 Broadleaved woodland plantation	-	-	-	-
A1.2.2 Coniferous woodland plantation	-	-	**Planted conifers; habitat needs active conservation management**	-
A2.2.2 Scattered scrub	-	-	-	-
A.3.1 Scattered broadleaved trees	-	-		-
A3.2 Scattered coniferous trees	-	-	-	-
U2a *Deschampsia flexuosa* grassland, *Festuca ovina – Agrostis capillaris* sub-community	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	-	-	-
U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	-	-	-
U4x *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, species-poor variant	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	-	-	-
U5 *Nardus stricta – Galium*	This community is not	***Nardus stricta-Galium***	-	-

[35] Hydrological assessments are necessary to understand the actual level of groundwater dependency and this is outside the remit of this report.

NVC community (in bold below)/ Phase 1 habitat	Annex 1 habitat (* when a Priority habitat)	Scottish Biodiversity List Habitats (in bold below); categories for action	Ayrshire Local Biodiversity Action Plan Priority Habitat (in bold below); reason for selection	Groundwater dependency potential**
***saxatile* grassland**	a species-rich example and therefore is not considered Annex 1 habitat quality.	***saxatile* grassland; watching brief**		
U5a *Nardus stricta – Galium saxatile* grassland, species-poor sub-community	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	***Nardus stricta-Galium saxatile* grassland; watching brief**	-	-
U5b *Nardus stricta – Galium saxatile* grassland, *Agrostis canina – Polytrichum commune* sub-community	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	***Nardus stricta-Galium saxatile* grassland; watching brief**	-	-
U5c *Nardus stricta – Galium saxatile* grassland, *Carex panicea – Viola riviniana* sub-community	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	***Nardus stricta-Galium saxatile* grassland; watching brief**	-	-
U6 *Juncus squarrosus – Festuca ovina* grassland	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	This community is not an example of a flushed lowland nor a montane *Juncus squarrosus-Festuca ovina* grassland and is therefore not included.	-	Moderately groundwater dependent
MG9 *Holcus lanatus - Deschampsia cespitosa* grassland	-	-	-	Moderately groundwater dependent
PG (provisional grassland) *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	-	-	-	-
M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	-	**Purple moor grass and rush-pastures; conservation action needed.**	This community is not a species-rich example and therefore does not fit within the Ayrshire LBAP habitat description.	Highly groundwater dependent
M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community	-	**Purple moor grass and rush-pastures; conservation action needed.**	This community is not a species-rich example and therefore does not fit within the Ayrshire LBAP habitat description.	Highly groundwater dependent
M4x *Carex rostrata - Sphagnum recurvum* mire variant	-	-	-	-
M25 M*olinia caerulea – Potentilla erecta* mire	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	**Purple moor grass and rush-pastures; conservation action needed.**	This community is not a species-rich example and therefore does not fit within the Ayrshire	Moderately groundwater dependent

NVC community (in bold below)/ Phase 1 habitat	Annex 1 habitat (* when a Priority habitat)	Scottish Biodiversity List Habitats (in bold below); categories for action	Ayrshire Local Biodiversity Action Plan Priority Habitat (in bold below); reason for selection	Groundwater dependency potential**
			LBAP habitat description.	
M25b M*olinia caerulea* – *Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community	This community is not a species-rich example and therefore is not considered Annex 1 habitat quality.	**Purple moor grass and rush pastures; conservation action needed.**	This community is not a species-rich example and therefore does not fit within the Ayrshire LBAP habitat description.	Moderately groundwater dependent
U16 *Luzula sylvatica* – *Vaccinium myrtillus* tall-herb	-	-	-	Highly groundwater dependent
H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath	**H4030 Dry heath (very small stands)**	**Upland heathland (very small stands); conservation action needed and avoid negative impacts.**	**Upland heathland (very small stands); ; habitat needs active conservation management.**	-
M15 *Trichophorum cespitosum* – *Erica tetralix* wet heath, variant	**H4010 Northern Atlantic wet heaths with *Ericia tetralix* (small stands present with limited presence of cross-leaved heath *Ericia tetralix).***	**Upland heathland (small stands) and some of the M15 wet community occurs on the SBL Priority Habitat Blanket Bog (on peat greater than 0.50m); conservation action needed and avoid negative impacts.**	**Upland heathland(small stands); habitat needs active conservation management.**	Moderately groundwater dependent
M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire	**H7130Blanket bog* (small stand)**	**Blanket bog; conservation action needed and avoid negative impacts.**	**Blanket bog (small stand); Ayrshire has a significant proportion of the Scottish resource and the habitat is locally distinct and under threat.**	-
M20i *Eriophorum vaginatum blanket mire* variant	**H7130 Blanket bog* (only applicable to small stands of active M20 blanket bog within the middle of the study area).**	**Blanket bog (only some of which is active); conservation action needed and avoid negative impacts.**	**Blanket bog (only applicable to small stands of active M20i blanket bog within the middle of the study area); Ayrshire has a significant proportion of the Scottish resource and the habitat is locally distinct and under threat.**	-
M20ii *Eriophorum vaginatum blanket mire* variant	This blanket bog sub-community variant is not active and is therefore not included.	The majority of the M20ii sub-community variant is not active Blanket bog and is therefore not included.	Most of the M20ii sub-community variant is not active blanket bog and therefore does not fit within the Ayrshire LBAP habitat description.	-

NVC community (in bold below)/ Phase 1 habitat	Annex 1 habitat (* when a Priority habitat)	Scottish Biodiversity List Habitats (in bold below); categories for action	Ayrshire Local Biodiversity Action Plan Priority Habitat (in bold below); reason for selection	Groundwater dependency potential**
E4 Bare peat	-	-	-	-
M6 *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire	-	**Upland flushes, fens and swamps (the criteria for M6 acid flush communities in the SBL is for unenclosed upland examples. Both enclosed and unenclosed areas examples of M6 acid flush are present in the survey area, it is considered appropriate to include both); watching brief only.**	-	Highly groundwater dependent
M6a *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Carex echinata*	-	**Upland flushes, fens and swamps (the criteria for M6 acid flush communities in the SBL is for unenclosed upland examples. Both enclosed and unenclosed areas examples of M6 acid flush are present in the survey area, it is considered appropriate to include both); watching brief only.**	-	Highly groundwater dependent
M6b *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community	-	**Upland flushes, fens and swamps (the criteria for M6 acid flush communities in the SBL is for unenclosed upland examples. Both enclosed and unenclosed areas examples of M6 acid flush are present in the survey area, it is considered appropriate to include both); watching brief only.**	-	Highly groundwater dependent
M6d *Carex echinata* – *Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community	-	**Upland flushes, fens and swamps (the criteria for M6 acid flush communities in the SBL is for unenclosed upland examples. Both enclosed and unenclosed areas examples of M6 acid flush are present in the survey area, it is considered.**	-	Highly groundwater dependent

NVC community (in bold below)/ Phase 1 habitat	Annex 1 habitat (* when a Priority habitat)	Scottish Biodiversity List Habitats (in bold below); categories for action	Ayrshire Local Biodiversity Action Plan Priority Habitat (in bold below); reason for selection	Groundwater dependency potential**
		appropriate to include both); watching brief only.		
G1 Standing water	-	The ponds present do not fit within the criteria set out for Ponds priority habitat.		-
M2 *Sphagnum cuspidatum* / *recurvum* bog pool	Included as part of M20i blanket bog community variant in which this bog pool community occurs.	Included as part of M20i blanket bog community variant in which this bog pool community occurs.	Included as part of M20i blanket bog community variant in which this bog pool community occurs.	-

*Only those communities that meet one of the categories are listed. Not applicable is used when vegetation communities/ habitats are listed under Annex 1, Scottish Biodiversity List or Ayrshire Local Biodiversity Action Plan priority habitats but they are not of suitable quality to be considered.

**Groundwater dependency as set out by the Scottish Environment Protection Agency. (2014); groundwater dependency scores are only available for a small number of NVC communities.

Annex 11A
NVC Community Descriptions

NVC Community Descriptions

The habitats and communities recorded in Monquhill are described below. They are listed in the order found within the *JNCC Handbook for Phase 1 habitat survey manual*[23], not in order of ecological importance. Quadrat data is presented in **Annex 11B** with target notes presented in **Annex 11C**. The NVC species list is presented in **Annex 11D** and NVC photographs are presented in **Annex 11E**. The NVC survey map, supplemented with Phase 1 habitat data where necessary, is presented in **Figure 11B.2a-11B.2d**. A summary of the vegetation communities are provided in **Section 3.2**.

Broadleaved woodland plantation (*Phase 1 habitat code: A1.1.2*)

Small stands (many of which are too small to map; and a small number of which have failed) of broadleaved woodland plantations occur within gaps in the coniferous woodland plantation in the east of Monquhill (TN 2, 3, 12, 13, **Annex 11C;** Photo 4, **Annex 11E**). These stands of young plantations, with tree height ranging from 4-12m high, support a range of species including locally dominant sycamore, locally abundant silver birch, locally frequent pedunculate oak and ash, locally occasional alder and locally rare rowan. The under flora of these plantations varies locally and includes marshy and provisional grassland and modified heath.

Coniferous woodland plantation (*Phase 1 habitat code: A1.2.2*)

Coniferous woodland plantation is the dominant habitat within the study area. The primary coniferous plantation is composed of densely planted young Sitka spruce trees approximately 10-15m high, occurring on former blanket bog, which is subject to extensive drainage (Photo 5, 6, **Annex 11E**). The limited vegetative growth beneath this woodland supports a ground layer which is dominated by bryophytes with frequent fungi. Bryophytes present include abundant *Pseudoscleropodium purum* and *Rhytidiadelphus loreus*. An area of mature Sitka spruce coniferous woodland plantation is present in the north east of the study area.

Scattered scrub (*Phase 1 habitat code: A2.2.2*)

Scattered scrub is widespread but local in the study area. Scattered willow occurs in disturbed open areas associated with forestry tracks, including an area adjacent to Monquhill Farmhouse.

Scattered broadleaved trees (*Phase 1 habitat code: A3.1*)

Scattered self-sown broadleaved trees, predominantly in the form of silver birch, occur rarely along open areas adjacent to the forestry tracks.

Scattered coniferous trees (*Phase 1 habitat code: A3.2*)

Scattered self-sown Sitka spruce is widespread in the study area, occurring throughout but most predominately in re-vegetating forestry tracks in the south east.

Recently felled woodland (*Phase 1 habitat code: A4*)

A large stand of recently felled coniferous woodland is present in the west of the study area.

Semi-improved acid grassland (*Phase 1 habitat code: B1.2*) NVC communities U2, U2a, U4, U4x, U5, U5a, U5b, U5c, U6

U2 semi-improved acid grassland (*Deschampsia flexuosa* grassland) which was not definable to sub-community level occurs as a minor to major community in mosaic with: U5 acid grassland; M23a and M23b rush-pasture; and M6d acid flush in two locations along forestry rides in the north east and the south.

U2a semi-improved acid grassland (*Deschampsia flexuosa* grassland, *Festuca ovina – Agrostis capillaris* sub-community) occurs in mosaic with: U5c acid grassland (Photo 7, **Annex 11E**); and M23 rush-pasture in the study area as a moderate sized mosaic on a steep hillside in the west; and a small narrow mosaic in the south. The semi-improved U2a acid grassland is dominated by wavy-hair grass, with abundant sheep's-fescue, common bent and the bryophytes *Hylocomium spledens* and *Polytrichum* sp., frequent sweet vernal grass, Yorkshire-fog, heath bedstraw, heath wood-rush and common sorrel, and a number of occasional species which include mat-grass, and the bryophytes *Rhytidiadelphus squarrosus*, *Pleurozium schreberi*, *Pseudoscleropodium purum* and *Sphagnum capillifolium*.

U4 semi-improved acid grassland (*Festuca ovina – Agrostis capillaris – Galium saxatile* grassland) is the dominant acid grassland in the north of the study area occurring as small to moderate sized stands and in mosaic with: M23 rush-pasture; M6 and M6b acid flush; provisional grassland; U6 acid grassland on embankments and sloping ground in the north of the study area.

U4x semi-improved acid grassland variant (*Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, species-poor variant) occurs within a mosaic with: U6 acid grassland; provisional grassland; and M6b acid flush in the south west of the study area. This species poor variant of U4 acid grassland is dominated by common bent, frequent sweet vernal-grass, tormentil and heath bedstraw.

U5 semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland) occurs as a moderate stand in the north east and in mosaic with: provisional grassland; U2 and U6 acid grassland; M23a and M23b rush-pasture; M25 mire; M6b and M6d acid flush; M15 wet heath; and M20 blanket bog throughout the study area on drier sloping ground and along sections of the forestry rides. The U5 grassland supports locally abundant wavy-haired grass, mat-grass, common sedge, velvet bent, *Rhytidiadelphus squarrosus* and locally frequent species include sweet vernal-grass, heath bedstraw and *Pleurozium schreberi*.

U5a semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, species-poor sub-community) occurs as a large stand on Strandlud Hill occupying, along with wet modified blanket bog, much of open non-coniferous woodland plantation space available here (Photo 8, **Annex 11E**). This species poor grassland is very tightly grazed and mossy supporting locally abundant wavy-haired grass, mat-grass, heath rush and the mosses *Hylocomium splendens, Polytrichum strictum*, *Pleurozium schreberi, Polytrichum commune,* locally frequent bilberry, heath bedstraw and *Sphagnum capillifolium*, locally occasional species include common cottongrass, tormentil, *Sphagnum fallax, Polytrichum juniperinum, Rhytidiadelphus squarrosus, and Rhytidiadelphus loreus,* with a small range of rarely occurring species.

U5b semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, *Agrostis canina – Polytrichum commune* sub-community) occurs as a small stand within a wider area of M25 mire on sloping ground in the north of the study area. This species poor sub-community is a grassy sub-community; dominated by mat-grass but also supports abundant velvet bent and wavy-haired grass, frequent *Rhytidiadelphus squarrosus* and creeping bent grass, and rarely occurring purple-moor grass, field wood-rush, heath rush, Yorkshire-fog, tormentil and heath bedstraw.

U5c semi-improved acid grassland (*Nardus stricta – Galium saxatile* grassland, *Carex panicea – Viola riviniana* sub-community) occurs in the west of the study area, on a steep west-facing hill, in an intricate mosaic with U2a acid grassland and M23a rush-pasture (Photo 7, **Annex 11E**). The U5c acid grassland is the most species rich grassland within the study area; and includes an element of basic flushing; with abundant Hylocomium splendens, mat-grass, sheep's-fescue, velvet bent, Yorkshire-fog, tufted-hair grass, wavy-haired grass, sweet-vernal grass and violet sp., locally abundant selfheal, common sedge, carnation sedge and *Sphagnum squarrosum*, frequent creeping bent, heath bedstraw, *Rhytidadelphus squarrosus, Pleurozium schreberi,* occasional species include bilberry, flea sedge, heath milkwort, common sorrel, and ribwort plantain, *Pseudoscleropodium purum*, and rare species include wild thyme.

U6 semi-improved acid grassland (*Juncus squarrosus – Festuca ovina* grassland) occurs as a small stand in the north east and in the mosaic with: provisional grassland; U4 and U5 acid grassland; M23a and M23b

rush-pasture; M25a mire; M6, M6b and M6d acid flush; M20 blanket bog; and scattered coniferous trees in the north and south. This grassland occurs predominantly as patchy vegetation on exposed, damaged peat and also in the east on shallow soil along forestry tracks that are becoming overgrown. This grassland supports a locally abundant cover of mosses and a range of graminoid species, many of which occur at low frequencies; it is dominated by heath rush, with abundant wavy-haired grass, mat-grass, *Polytrichum commune*, *Rhytidiadelphus squarrosus*, *Pleurozium schreberi,* locally abundant purple-moor grass, common sedge, bent grass, *Polytrichum strichum*, *Hylocomium spledens,* and frequent to occasional species include common cottongrass, hare's-tail cottongrass, bilberry, heath bedstraw, tormentil, *Polytrichum juniperinum* and Sitka spruce seedlings.

Semi-improved neutral grassland (*Phase 1 habitat code: B2.2*) - NVC communities MG9 and the non NVC community provisional grassland

MG9 semi-improved neutral grassland (*Holcus lanatus - Deschampsia cespitosa* grassland) occurs in a large flushed mosaic with: M23a and M23b rush-pasture; and M6d acid flush in the north, and as a flushed narrow linear mosaic (parallel to Carcow Burn) with M23b rush-pasture in the north east of the study area. This species-poor coarse sward is dominated by tufted hair-grass, with abundant sharp-flowered rush, Yorkshire-fog, velvet bent, *Hylocomium splendens* and occasional species include glaucous sedge, mat-grass, marsh thistle, common sorrel, heath bedstraw, *Rhytidiadelphus squarrosus, Pseudoscleropodium purum* and *Polytrichum commune*.

A species-poor semi-improved grassland in the study area which does not fit within the NVC classification system is best described as the provisional grassland (PG) *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* as described in the *Review of coverage of the National Vegetation Classification*[21] (Photo 9, **Annex 11E**). This grassland occurs as a small stand and as small to moderate mosaics with: U5 acid grassland; M23, M23a and M23b rush-pasture; M25 mire; and M15 wet heath in the north east of the study area. The PG is dominated by Yorkshire-fog, with abundant creeping bent and red fescue, locally abundant creeping soft-grass, frequent sharp-flowered rush, heath bedstraw, common sorrel, creeping buttercup and *Rhytidiadelphus squarrosus,* locally frequent wavy-haired grass and sweet vernal-grass and occasional marsh marigold, tormentil, common sedge and smooth-meadow grass.

Marsh/ marshy grassland (*Phase 1 habitat code: B5)* – NVC communities M23, M23a, M23b

M23 rush-pasture (*Juncus effusus/ acutiflorus – Galium palustre* rush-pasture) which could not be easily allocated to a sub-community is widespread in the study area occurring as small stands in a forestry ride in the north east and a steep hillside to the west and predominately in mosaic with a wide range of vegetation communities/ habitats which include: MG9 neutral grassland; provisional grassland; U4 acid grassland; M23b rush-pasture; M6, M6b and M6d acid flush; M15 wet heath; M20 modified blanket bog and E4 bare peat.

M23a rush-pasture (*Juncus effusus/ acutiflorus – Galium palustre* mire, *Juncus acutiflorus* sub-community) is widespread throughout the study area occurring as small to moderate stands in the north east, north west and east in association with moving water and forestry rides and widespread within mosaics with other vegetation communities which include: MG9 neutral grassland; provisional grassland; U2, U2a, U5, U5a and U6 acid grassland; M23 and M23b rush-pasture; M6, M6a, M6b and M6d acid flush; M15 wet heath; M20 modified blanket bog; and M25 and M25a mire. The M23a rush-pasture is dominated by graminoids supporting abundant sharp-flowered rush, creeping bent, mat-grass and wavy-haired grass, frequent Yorkshire-fog and creeping soft-grass and occasional purple moor-grass, sweet vernal-grass, soft-rush, compact rush and carnation sedge. The mire supports frequent bryophytes, including *Hylocomium splendens* and *Rhytidiadelphus squarrosus,* and frequent herbs include creeping buttercup, common sorrel, marsh thistle, marsh violet, heath bedstraw and cleavers.

M23b rush-pasture (*Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community) is widespread in the study area occurring as small to moderate stands in the north east associated with the movement of water and widespread in mosaics with a range of vegetation communities including: U2, U5 and U6 acid grassland; MG9 neutral grassland; provisional grassland; M25 mire; M23a rush-pasture; and M6, M6a, M6b and M6d acid flush (Photo 10, **Annex 11E**). The M23b rush-pasture is dominated by soft-rush, with abundant common sorrel, occasional Yorkshire-fog, creeping bent, tufted hair-

grass, *Rhytidiadelphus squarrosu*s, common bent, sharp-flowered rush and *Polytrichum commune*, whilst rare species include creeping buttercup, marsh willowherb and marsh bedstraw.

Mire (*Phase 1 habitat code: E)* – NVC communities M4x, M25, M25b

M4x mire (*Carex rostrata – Sphagnum recurvum* mire, variant) occurs in a small number of stands (too small to map) in forestry rides and at the edge of the coniferous woodland plantation in the north west and east of the study area where water has pooled and also within seepage flushes. The M4x mire within the study area does not fit within the NVC; these stands are so small they are heavily influenced by surrounding vegetation communities; the vegetation code M4x was selected due to the presence of bottle sedge over sphagnum in stands of seepage and pooled water. The M4x within the study area supports abundant *Sphagnum capillifolium, Polytrichum commune,* frequent bottle sedge, Yorkshire-fog, tufted-hair grass, purple-moor grass, creeping bent, soft-rush, tormentil, heath bedstraw, common sorrel, *Sphagnum palustre* and the bryophytes *Rhytidiadelphus squarrosus* and *Pleurozium shruberi.*

M25 mire (M*olinia caerulea – Potentilla erecta* mire) occurs locally as small to moderate stands in sloping ground in the east of the study area and within mosaics with a range vegetation communities including: U5 acid grassland; M23, M23a and M23b rush-pasture; provisional grassland; M6 acid flush; M15 wet heath; and M20 modified blanket bog along forestry rides and at the edge of the coniferous plantation. The species-poor M25 mire supports abundant purple moor-grass, *Hylocomium splendens*, tufted hair-grass, *Sphagnum capillifolium,* common cottongrass, occasional heath bedstraw, tormentil, *Pleurozium schreberi, Polytrichum stricta, Rhytidiadelphus squarrosus,* and rare bilberry and sheep sorrel.

Small stands of M25b mire (M*olinia caerulea – Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community), too small to map, occur upon a small number of hillocks to the north east of the study area within a wider area of mire. This M25b mire supports abundant purple moor-grass, abundant green-ribbed sedge, red fescue, creeping bent and Yorkshire-fog, with a range of plant species occurring occasionally including creeping bent, devil's-bit scabious, soft-rush, marsh thistle, tormentil and marsh ragwort.

Tall-herb and fern– non-ruderal (*Phase 1 habitat code: C3.2*) - NVC community U16

Small stands of U16 tall-herb (*Luzula sylvatica –Vaccinium myrtillus* tall-herb), too small to map, occur occasionally within the study area between forestry tracks and coniferous woodland plantation. The tall-herb community is dominated by wood-rush, with abundant tormentil, heath rush, heath bedstraw, wavy-hair grass and *Hylocomium splendens*.

Dry heath (*Phase 1 habitat code: D1.1*) – NVC community H12

H12 dry heath (*Calluna vulgaris – Vaccinium myrtillus* heath) occurs on shallow soil, some of which occurs on former hardstanding, as a small narrow stand in the north east adjacent to a forestry track and as a small intricate mosaic with M6d acid flush and a minor quantity of self-sown scattered coniferous trees (Photo 11, **Annex 11E**). The H12 dry heath is dominated by the dwarf shrub heather, with abundant amounts of the lichen *Cladonia uncialis,* and the moss *Racomitrium lanuginosum,* and occasional stag's-horn clubmoss, bilberry, cross-leaved heath, purple moor-grass, wavy hair-grass, lousewort, *Polytrichum strictum, Hylocomium splendens,* and *Pleurozium schreberi,* and rare Sitka spruce seedlings.

Wet dwarf shrub heath (*Phase 1 habitat code: D2*) – NVC community M15

The wet heath that occurs in the study area is best described as M15 wet heath (*Trichophorum cespitosum – Erica tetralix* wet heath). M15 wet heath occurs as small stands throughout the study area (often too small to map) occurring on the drier periphery of M20 modified blanket bog and upon shallow peat on the slopes of streams and forestry tracks and adjacent to drainage ditches and also occurring in mosaic with: provisional grassland; U5 acid grassland; M23 and M23a rush-pasture; M25 mire; M6 and M6d acid flush; and M20 modified blanket bog. The M15 wet heath within the study area supports locally dominant (to absent in other locations) purple-moor grass, locally abundant *Sphagnum quinquefarium, Sphagnum capillifolium, Sphagnum fallax* and *Polytrichum commune,* with locally frequent deergrass, common sedge, hare's-tail cottongrass, common cottongrass, wavy-haired grass, tufted-hair grass, mat-grass, common bent, heath rush, heather, bell heather, bilberry, tormentil, *Sphagnum fallax*, *Hylocomium splendens, Pleurozium schreberi* and *Rhytidiadelphus squarrosus* and locally rare Sitka spruce seedling, crowberry, *Rhytidiadelphus*

loreus and *Aulacomnium palustre*. In the north east of the study area, small stands of M15 wet heath occur in an intricate mosaic with dominant M20 modified blanket bog; the M15 wet heath vegetation composition nears that of M20 modified blanket bog with the frequent occurrence to local abundance of common cottongrass, however the common cottongrass does not dominate and the frequency of species including purple-moor grass, deergrass and *Sphagnum palustre* restricts this vegetation community being considered M20 modified blanket bog.

Wet modified blanket bog (*Phase 1 habitat code: E1.7*) - NVC community M19, M20i, M20ii, M20iii

One small stand of M19 wet modified blanket bog (*Calluna vulgaris – Eriophorum vaginatum* blanket mire) occurs on low lying ground in the east of the study area (Photo 12, 13, **Annex 11E**). The M19 wet modified blanket bog occurs on deep peat (>1m) supporting a variety of (heavily browsed) dwarf shrubs and frequent sphagnum. This wet modified blanket bog supports locally dominant hare's-tail cottongrass, abundant deergrass, wavy hair-grass and heather, locally abundant *Sphagnum fallax* and cranberry, frequent *Sphagnum capillifolium*, *Pleurozium schreberi*, *Polytrichum strictum*, *Sphagnum palustre*, and occasional cross-leaved heath, cowberry, Sitka spruce seedlings, purple moss-grass, common cottongrass, bog asphodel, *Hypnum cupressiforme* and *Rhytdiadelphus loreus*.

M20 dry modified blanket bog (*Eriophorum vaginatum* blanket mire*)* is an important community within the study area occupying the second largest extent of area, following coniferous woodland plantation (Photo 6, **Annex 11E**). The modified dry blanket bog occurs as large stands within the forestry rides and as a significant proportion of Strandlud Hill and also in mosaic with a large range of vegetation communities along the forestry rides. The vegetation assemblage of M20 dry modified blanket bog varies locally within the study: area due to a number of factors including drainage and (deer) grazing, giving rise to two distinct variants: M20i and M20ii (as presented in Tables B24-B25, **Annex 11B**) which do not fit readily within the NVC. Given the local and continuous variations within the vegetation assemblage of the M20 blanket bog, it was not feasible to map each alteration, rather all of this community was mapped as M20, and the variations are instead described.

M20i dry modified blanket bog (*Eriophorum vaginatum* blanket mire, variant*)* supports a greater diversity of plant species and a greater quantity of (browsed) dwarf shrubs and sphagnum than the other variants of the M20 occurring within the study area. The M20i dry modified blanket bog occurs primarily within the middle of the study area particularly within and adjacent Strandlud Hill. This M20 variant is dominated by common cottongrass, with abundant wavy-hair grass, purple-moor grass, bilberry, *Sphagnum capillifolium, Pleurozium schreberi* and *Hypnum jutlandicum,* locally frequent heather, crowberry, heath-rush*,* hare's tail cottongrass, deergrass, *Sphagnum palustre*, *Sphagnum fallax* and *Polytrichum commune*, occasional heath bedstraw, *Polytrichum* sp., and tormentil, and rare species include cross-laved heath and common sedge.

M20ii dry modified blanket bog (*Eriophorum vaginatum* blanket mire, variant*)* occurs, with frequency, along the forestry rides upon peat which ranges from 0.75-1m in depth. This dry M20ii variant supports a greatly varying assemblage dominated by mosses; with locally abundant *Polytrichum commune, Hylocomium splendens, Pleurozium schreberi, Sphagnum capillaris, Sphagnum fallax* and common cottongrass, locally frequent *Sphagnum capillaris,* and a range of locally occasional species, some of which include *Rhytidiadelphus squarrosus, Rhytidiadelphus loreus, Hypnum jutlandicum,* soft-rush, creeping-bent, bilberry and soft-rush.

Bare peat (*Phase 1 habitat code: E4*)

Small to moderate stands of bare peat are widespread throughout the study area, occurring with a higher frequency in the south.

Acid flush (*Phase 1 habitat code: E2.1*) – NVC communities M6, M6a, M6b, M6d

M6 acid flush (*Carex echinata – Sphagnum recurvum/ auriculatum* mire) is widespread within the study area occurring as narrow linear stands within drainage ditches, including within the coniferous woodland plantation and in small to large mosaic with: U2, U4, U5 and U6 acid grassland; M23, M23a and M23b rush-pasture; M25 mire; M6b acid flush; M15x wet heath; and M20 blanket bog (Photo 14, **Annex 11E**). The M6 acid flush vegetation includes abundant *Sphagnum* sp., with locally abundant bottle sedge, and locally occasional devil's-bit scabious.

M6a acid flush (*Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex echinata* sub-community*)*, an acid flush supporting locally abundant star sedge, occurs locally as narrow linear stands; and as part of two small mosaics with M23b rush-pasture; as M6d acid flush.

M6b acid flush (*Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community) is the best fit for a widespread vegetation sub-community occurring upon the damaged, drained peat along the forestry rides. The M6b acid flush occurs in mosaic predominately with: M20 blanket bog; and to a lesser extent with U4, U5 and U6 acid grassland; M23, M23a and M23a rush-pasture; and M6 and M6d acid flush. The M20 blanket bog, along the forestry rides, grades in and out of the M6b sub-community, which is species-poor, supporting locally dominant - abundant common sedge, locally abundant hare's-tail cottongrass, and locally abundant – occasional common cottongrass, locally frequent *Sphagnum palustre*, *Sphagnum capillaris, Sphagnum fallax,* star sedge, sheep's-fescue, bent grass and *Polytrichum commune*, locally occasional soft-rush. In drier stands of M6b, sphagnum cover is much reduced or replaced by abundant *Hylocomium splendens* and *Pleurozium schreberi*, occasional *Pseudoscleropodium purum* and *Hypnum cupressiforme,* whilst other species in these drier stands include abundant common sedge, common mat-grass and occasional Sitka spruce seedling, soft-rush, tormentil and the lichen *Cladonia* sp.

M6d acid flush (*Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community) occurs in small stands throughout the study area, with the largest stand flushing into the Carcow Burn in the north east. The M6d acid flush occurring on sloping ground is dominated by sharp-flowered rush, with locally abundant bryophytes including *Sphagnum palustre, Sphagnum capillifolium*, *Polytrichum commune, Hylocomium splendens* and *Rhytidiadelphus squarrosus*, and grasses including creeping bent, creeping soft-grass, wavy-hair grass and tufted hair-grass, and occasional herbs which include common sorrel, heath bedstraw, marsh marigold and tormentil.

Standing water (*Phase 1 habitat code: G1*)

Three small stands of open water are present within the study area, one of these ponds is present upon Strandlud Hill in the middle, whilst the other two ponds occur in the east of the study area. One of the ponds present in the east is within what is believed to be an old borrow pit and is bordered by vegetation including bottle sedge and pondweed (see TN 6, **Figure 11B.2d**), and the third pond is present amongst M23a rush-pasture, M25 mire and M20 modified blanket bog communities (see TN 9, **Figure 11B.2d)**.

Dystrophic standing water (*Phase 1 habitat code: G1*) – NVC community M2

M2 bog pool (*Sphagnum cuspidatum* / *recurvum* bog pool) is the best fit for a small species poor bog pool present in the north of Strandlud Hill (see TN 19; **Figure 11B.2d**; Photo 15, **Annex 11E**) which is bordered by M20 wet modified blanket bog. The margin of the bog pool supports abundant hare's-tail cottongrass, wavy-hair grass and *Sphagnum sp*., and frequent common cottongrass, whilst growing in the dystrophic pool is *Sphagnum fallax*.

Annex 11B
NVC Quadrat Data

Table B1 U2a *Deschampsia flexuosa* grassland, *Festuca ovina – Agrostis capillaris* sub-community quadrat data

NVC code	U2a	U2a	U2a	U2a		
Quadrat number	42	43	44	45		
Grid reference	NS 57683 06527	NS 57688 06518	NS 57692 06510	NS 57693 06503		
Recorder	KL	KL	KL	KL		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN				Frequency	Range
Deschampsia flexuosa	9	7	7	5	IV	5-9
Hylocomium spledens	7	7	7	7	IV	7
Festuca ovina	6	7	5	4	IV	4-7
Agrostis capillaris	4	5	6	4	IV	4-6
***Polytrichum* sp.**	3	4	3	7	IV	3-7
Anthoxanthum odoratum	4	4	3	4	IV	3-4
Galium saxatile	4	3	3	3	IV	3-4
Luzula multiflora	3	4	4	3	IV	3-4
Holcus lanatus	3	4	4	2	IV	2-4
Rumex acetosa	3	3	3	3	IV	3
Rhytidiadelphus squarrosus	3	3	3	3	IV	3
Potentilla erecta	3	3	3	3	IV	3
Nardus stricta	3	3	3	3	IV	3
Pleurozium schreberi			3		I	3
Pseudoscleropodium purum	3				I	3
Sphagnum capilllifolium	3				I	3
Holcus mollis	1				I	1

Table B2 U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland quadrat data

NVC code	U4	U4	U4	U4	U4		
Quadrat number	50	56	58	59	60		
Grid reference	NS 59486 07205	NS 59230 07192	NS 59162 07162	NS 59151 07146	NS 59097 07149		
Recorder	DK	DK	DK	DK	DK		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN					Frequency	Range
Agrostis capillaris	8	9	5	8	9	V	5-9
Galium saxatile	5	6	5		5	IV	5-6
Nardus stricta	6	7	8	4		IV	4-8
Rhytidiadelphus squarrosus	5			10	5	III	5-10
Pleurozium schreberi	5	4		3		III	3-5
Juncus squarrosus	3		4	2		III	2-4
Deschampsia flexuosa			5	5		II	5
Polytrichum commune	4		5			II	4-5
Rumex acetosella				4	5	II	4-5
Molinia caerulea		4	3			II	3-4
Anthoxanthum odoratum				3	4	II	3-4
Potentilla erecta	2	3				II	2-3
Danthonia decumbens	2	1				II	1-2
Festuca ovina	5					I	5
Juncus acutiflorus	4					I	4
Cynosurus cristatus				4		I	4
Cirsium palustre				4		I	4
***Trifolium* sp.**				4		I	4
Plantago lanceolata				4		I	4

Ranunculs repens		3	I	3
Juncus conglomeratus	1		I	1

Table B3 U4x *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, species-poor variant quadrat data

NVC code	**U4x**			
Quadrat number		30		
Grid reference	NS 57759 05795			
Recorder	KL			
Date	14.09.2016			
Species	DOMIN		Frequency	Range
Agrostis capillaris		9	I	9
Rhytidadelphus squarrosus		4	I	4
Anthoxanthum odoratum		4	I	4
Potentilla erecta		3	I	3
Galium saxatile		3	I	3

Table B4 U5 *Nardus stricta – Galium saxatile* grassland quadrat data

NVC code	**U5**	**U5**	**U5**	**U5**	**U5**		
Quadrat number	5	6	7	8	29		
Grid reference	NS 58196 05947	NS 58210 05947	NS 58219 05935	NS 58224 05946	NS 58666 06000		
Recorder	KL	KL	KL	KL	KL		
Date	07.09.2016	07.09.2016	07.09.2016	07.09.2016	14.09.2016		
Species	DOMIN					Frequency	Range
Deschampsia flexuosa	7	8	6	7		IV	6-8
Nardus stricta	7	6	5	5		IV	5-7
Rhytidiadelphus squarrosus	7	5	3	6		IV	3-7
Carex nigra	3	5	6	7		IV	3-7
Agrostis canina	6	3	4	3		IV	3-6

NVC code	U5	U5	U5	U5	U5		
Galium saxatile		4	3	4	3	IV	3-4
Anthoxanthum odoratum		4	4	3	2	IV	2-4
Pleurozium schreberi		2	3	3	3	IV	2-3
Luzula multiflora		3	3	3		III	3
Pseudoscleropodium purum		2	1			II	1-2
Vaccinium myrtillus			2			I	2
Juncus effusus				2		I	2

Table B5 U5a *Nardus stricta – Galium saxatile* grassland, species-poor sub-community quadrat data

NVC code	U5a	U5a	U5a	U5a	U5a		
Quadrat number	66	67	68	71	72		
Grid reference	NS 58637 06857	NS 58651 06797	NS 58484 06962	NS 58458 07457	NS 58379 07339		
Recorder	DK	DK	DK	DK	DK		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN					Frequency	Range
Deschampsia flexuosa	7	6	5	5	5	V	5-7
Nardus stricta	4	7	3	7	7	V	3-7
Pleurozium schreberi	6	4	5		5	IV	4-6
Polytrichum commune	4			8	5	III	4-8
Juncus squarrosus	6		4	4		III	4-6
Sphagnum capillifolium	4	5			4	III	4-5
Galium saxatile	5	3	5	4		III	4-5
Luzula multiflora	1			1	1	III	1
Eriophorum angustifolium		4			3	II	3-4
Polytrichum juniperinum		3	4			II	3-4
Potentilla erecta				2	4	II	2-4

NVC code	U5a	U5a	U5a	U5a	U5a		
Sphagnum fallax				4	4	II	2-4
Festuca vivipara	4					I	4
Vaccinium myrtillus	4					I	4
Trichophorum cespitosum		4				I	4
Carex flacca		4				I	4
Sphagnum palustre		4				I	4
Anthoxanthum odoratum		3				I	3
Rhytidiadelphus squarrosus		2				I	2
Danthonia decumbens					2	I	2
Pedicularis palustris					2	I	2

Table B6 U5a *Nardus stricta – Galium saxatile* grassland, species-poor sub-community quadrat data

NVC code	U5a	U5a	U5a		
Quadrat number	46	47	48		
Grid reference	NS 58294 06148	NS 58219 06115	NS 58232 06124		
Recorder	KL	KL	KL		
Date	16.09.2016	16.09.2016	16.09.2016		
Species	DOMIN			Frequency	Range
Hylocomium splendens	8	4	7	III	4-8
Polytrichum strictum	4	8	6	III	4-8
Deschampsia flexuosa	4	4	5	III	4-5
Nardus stricta	4	4	5	III	4-5
Vaccinum myrtillus	5	4	3	III	3-5
Pleurozium schreberi	4	4	4	III	4
Rhytidiadelphus squarrosus	3	3	3	III	3

NVC code	U5a	U5a	U5a		
Galium saxatile	3	3	3	III	3
Rhytidiadelphus loreus		2	3	II	2-3
Luzula multiflora	2	2	2	III	2
Eriophorum vaginatum		2	2	II	2
Carex nigra	4			I	4
Sphagnum capillifolium	4			I	4
Festuca ovina	3			I	3
Potentilla erecta		3		I	3
Anthoxanthum odoratum		3		I	3
Juncus squarrosus		2		I	2

Table B7 U5b *Nardus stricta – Galium saxatile* grassland, *Agrostis canina – Polytrichum commune* sub-community quadrat data

NVC code	U5b			
Quadrat number	75			
Grid reference				
Recorder	KL			
Date	26.10.2016			
Species	DOMIN	Frequency	Range	
Narsdus stricta	9	I		9
Agrostis canina	6	I		6
Deschampsia flexuosa	5	I		5
Rhytidiadelphus squarrosus	4	I		4
Holcus mollis	4	I		4
Polytrichum commune	4	I		4
Molinia caerulea	3	I		3
Potentilla erecta	3	I		3
Holcus lanatus	3	I		3
Galium saxatile	3	I		3

NVC code	U5b			
Pseudoscleropodium purum	3	I		3
Luzula campestris	3	I		3
Juncus squarrous	3	I		3
Pleurozium schreberi	3	I		3
Juncus effusus	2	I		2
Trifolum repens	1	I		1
Cirsium palustre	+	I	+	

Table B8 U5c *Nardus stricta – Galium saxatile* grassland, *Carex panicea – Viola riviniana* sub-community quadrat data

NVC code	U5c	U5c	U5c		
Quadrat number	39	40	41		
Grid reference	NS 57752 06604	NS 57735 06579	NS 57723 06562		
Recorder	KL	KL	KL		
Date	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN			Frequency	Range
Hylocomium splendens	7	7	7	III	7
Nardus stricta	7	7	4	III	4-7
Agrostis canina	7	4	7	III	4-7
Festuca ovina	7	6	4	III	4-7
Holcus lanatus	3	7	4	III	3-7
Deschampsia cespitosa	3	4	7	III	3-7
Deschampsia flexuosa	6	6	3	III	3-6
***Viola* sp.**	3	3	5	III	3-5
Anthoxanthum odoratum	4	3	5	III	3-5
Agrostis stolonifera	3	4	5	III	3-5
Galium saxatile	3	3	4	III	3-4
Rhytidadelphus squarrosus	3	4	3	III	3-4
Pleurozium schreberi	4	3	4	III	3-4

NVC code	U5c	U5c	U5c			
Pseudoscleropodium purum	3	3	3	III	3	
Rumex acetosa	3	3	3	III	3	
Vaccinum myrtillus	3	3	3	III	3	
Plantago lanceolata	3	3	1	III	1-3	
Carex nigra	6	5		II	5-6	
Carex panicea	6		4	II	4-6	
Lophocolea bidentata	4	4		II	4	
Sphagnum squarrosum	2	6		II	2-6	
Carex pulicaris	3	3		II	3	
Polygala serpyllifolia	3		3	II	3	
Juncus acutiflorus		7		I	7	
Prunella vulgaris		7		I	7	
Luzula multiflora	3			I		3
Narthecium ossifragum	3			I		3
Lathyrus pratensis		3		I	3	
Cirsium palustre	2			I	2	
Thymus polytrichus	2			I		2

Table B9 U6 *Juncus squarrosus – Festuca ovina* grassland quadrat data

NVC code	U6	U6	U6	U6		
Quadrat number	34	76	77	74		
Grid reference	NS 58262 05579	NS 59458 07105	NS 59471 07251	NS 59393 07228		
Recorder	KL	KL	KL	KL		
Date	14.09.2016	26.10.2016	26.10.2016	26.10.2016		
Species		DOMIN			Frequency	Range
Juncus squarrosus	8	7	6	5	IV	5-8
Deschampsia flexuosa	6	4	4	3	IV	3-6
Nardus stricta	4	5	3	3	IV	3-5

NVC code	U6	U6	U6	U6		
Hylocomium spledens	2	5	5	6	IV	2-6
Galium saxatile	3	3	3	3	IV	3
Polytrichum commune		8	6	4	III	4-8
Rhytidiadelphus squarrosus	5		3	3	III	3-5
Potentilla erecta	3	3	3		III	3
Pleurozium schreberi			5	3	II	3-5
Eriophorum angustifolium			3	3	II	3
Vaccinium myrtillus		2		2	II	2
Polytrichum strichum	5				I	5
Molinia caerulea			4		I	5
Carex nigra				4	I	4
Agrostis capillaris	4				I	4
Polytrichum juniperinum		3			I	3
Sphagnum fallax			3		I	3
Eriophorum vaginatum				3	I	3
Picea sitchensis **seedling**	3				I	3
Pseudoscleropodium purum	3				I	3
Thuidium tamariscinum	3				I	3
Sphagnum fallax	3				I	3
Sphagnum capillifolium		5			I	2
Anthoxanthum odoratum			2		I	2
Luzula multiflora				2	I	2
Festuca ovina	2				I	2
Rhytidiadelphus loreus	2				I	2
Salix **sp.**	1				I	1

Table B10 MG9 *Holcus lanatus - Deschampsia cespitosa* grassland variant quadrat data

NVC code	MG9
Quadrat number	79

NVC code	MG9			
Grid reference				
Recorder	KL			
Date	27.10.2016			
Species	DOMIN	Frequency	Range	
Deschampsia cespitosa	7	I		7
Hylocomium splendens	6	I		6
Agrostis canina	6	I		6
Juncus acutiflorus	5	I		5
Holcus lanatus	5	I		5
Carex flacca	4	I		4
Nardus stricta	3	I		3
Cirsium palustre	3	I		3
Rumex acetosa	3	I		3
Rhytidiadelphus squarrosus	3	I		3
Galium saxatile	3	I		3
Pseudoscleropodium purum	3	I		3
Polytrichum commune	3	I		3
Viola palustris	2	I		2
Potentilla erecta	2	I		2

Table B11 Provisional grassland *Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland quadrat data

NVC code	***Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland**	***Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland**	***Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland**	***Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland**		
Quadrat number	1	2	3	4		
Grid reference	NS 59443 07082	NS 59437 07078	NS 59429 07074	NS 59428 07074		
Recorder	KL	KL	KL	KL		
Date	06.09.2016	06.09.2016	06.09.2016	06.09.2016		
Species	DOMIN				Frequency	Range
Holcus lanatus	9	7	7	8	IV	7-9

NVC code	*Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	*Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	*Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland	*Festuca rubra - Holcus lanatus - Anthoxanthum odoratum* grassland		
Agrostis stolonifera	6	6	7	5	IV	5-7
Festuca rubra	4	4	5	5	IV	4-5
Rhytidiadelphus squarrosus	4	3	3	4	IV	3-4
Galium saxatile	4	3	3	3	IV	3-4
Juncus acutiflorus	4	3	3	3	IV	3-4
Rumex acetosa	3	3	3	3	IV	3
Ranunculus repens	2	2	2	3	IV	2-3
Holcus mollis		6	7	6	III	6-7
Deschampsia flexuosa		4		3	II	3-4
Anthoxanthum odoratum		4		3	II	3-4
Caltha palustris		3			I	3
Potentilla erecta				3	I	3
Carex nigra			2		I	2
Poa pratensis			2		I	2

Table B12 M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community quadrat data

NVC code	M23a	M23a	M23a	M23a		
Quadrat number	9	10	11	12		
Grid reference	NS 59325 07005	NS 59315 07004	NS 59316 07016	NS 59345 07021		
Recorder	KL	KL	KL	KL		
Date	08.09.2016	08.09.2016	08.09.2016	08.09.2016		
Species	DOMIN				Frequency	Range
Juncus acutiflorus	7	5	6	9	IV	5-9
Agrostis stolonifera	6	5	6	7	IV	5-7
Nardus stricta	6	6	6	6	IV	6

NVC code	M23a	M23a	M23a	M23a		
Deschampsia cespitosa	7	7	7	4	IV	4-7
Holcus lanatus	4	5	4	3	IV	3-5
Ranunculus repens	3	3	5	3	IV	3-5
Hylocomium splendens	5	3	3	3	IV	3-5
Holcus mollis	4	3	3	3	IV	3-4
Rhytidiadelphus squarrosus	3	3	3	4	IV	3-4
Rumex acetosa	3	3	3	3	IV	3
Cirsium palustre	3	3	3	3	IV	3
Dead litter	4	4	2	3	IV	2-4
Viola palustris	2	3	3	3	IV	2-3
Galium saxatile	3	2	3	3	IV	2-3
Potentilla erecta	3	3	3	1	IV	1-3
Molinia caerulea	6	4	4		III	4-6
Juncus effusus	3		3	4	III	3-4
Carex panicea	4	4	3		III	3-4
Anthoxanthum odoratum	3	3	4		III	3-4
Pseudoscleropodium purum	3	3		3	III	3
Epilobium palustre	1	3		3	III	1-3
Juncus conglomeratus	3		3		II	3
Poa pratensis		3		3	II	3
Lophocolea bidentata		2		3	II	2-3
Galium palustre			3	2	II	2-3
Galium aparine			2	3	II	2-3
Stellaria graminea			2	2	II	2
Plantago lancelota	3				I	3
Stellaria graminea				3	I	3
Cerastium fontanum	1				I	1

Table B13 M23a *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community quadrat data

NVC code	M23a	M23a	M23a	M23a	M23a	
Quadrat number	49	51	55	69	73	
Grid reference	NS 59578 07218	NS 59472 07197	NS 59254 07164	NS 58494 07017	NS 58482 07213	
Recorder	DK	DK	DK	DK	DK	
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016	15.09.2016	
Species	DOMIN					Frequency
Juncus acutiflorus	9	9	8	9	8	V
Rumex acetosella	5	4	4	4	4	V
Galium saxatile	4	4	5	5	3	V
Rhytidiadelphus squarrosus	5	4	6		4	IV
Agrostis capillaris	3	4	4		4	IV
Holcus lanatus	2	4	2		1	IV
Polytrichum commune	3		6			II
Cirsium palustre		3			4	II
Agrostis canina				4	4	II
Ranunculus repens		2			6	II
Juncus conglomeratus	4					I
Viola palustris		4				I
Deschampsia cespitosa		4				I
Deschampsia flexuosa			3			I
Anthoxanthum odoratum			3			I
Nardus stricta			2			I
***Trifolium* sp.**		2				I
Luzula multiflora					1	I

Table B14 M23b *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community quadrat data

NVC code	M23b	M23b		
Quadrat number	18	61		
Grid reference	NS 58930 06522	NS 59487 07185		
Recorder	KL	DK		
Date	13.09.2016	15.09.2016		
Species	DOMIN		Frequency	Range
Juncus effusus	9	9	II	9
Rumex acetosa	3	7	II	3-7
Holcus lanatus	3	3	II	3
Agrostis stolonifera	6		I	6
Deschampsia cespitosa	4		I	4
Rhytidiadelphus squarrosus	4		I	4
Agrostis capillaris		4	I	4
Juncus acutiflorus		4	I	4
Polytrichum commune		4	I	4
Ranunclus repens	3		I	3
Equisetum palustre	3		I	3
Galium uliginosum	3		I	3
Stellaria graminea	3		I	3
Holcus mollis	3		I	3
Anthoxanthum odoratum	3		I	3
Lathyrus pratensis	2		I	2
Epilobium palustre	2		I	2

Table B15 M25 *Molinia caerulea – Potentilla erecta* mire quadrat data

NVC code	M25
Quadrat number	21
Grid reference	NS 58935 06488

NVC code	M25				
Recorder	KL				
Date	13.09.2016				
Species	DOMIN		Frequency	Range	
Molinia caerulea		7	I		7
Hylocomium splendens		7	I		7
Deschampsia cespitosa		6	I		6
Sphagnum capillifolium		4	I		4
Eriophorum vaginatum		4	I		4
Galium saxatile		3	I		3
Potentilla erecta		3	I		3
Pleurozium schreberi		3	I		3
Polytrichum stricta		3	I		3
Rhytidiadelphus squarrosus		3	I		3
Vaccinium myrtillus		2	I		2
Rumex acetosa		2	I		2
Carex sp.		2	I		2

Table B16 M25b *Molinia caerulea – Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community quadrat data

NVC code	M25b				
Quadrat number	17				
Grid reference	NS 59274 06925				
Recorder	KL				
Date	12.09.2016				
Species	DOMIN		Frequency	Range	
Molinia caerulea		8	I		8
Carex binervis		6	I		6
Festuca rubra		6	I		6
Agrostis stolonifera		5	I		5
Holcus lanatus		4	I		4
Ranunculus repens		3	I		3

NVC code	M25b			
Succisa pratensis	3	I		3
Juncus effusus	3	I		3
Cirsium palustre	3	I		3
Juncus articulatus	3	I		3
Potentilla erecta	3	I		3
Senecio aquaticus	3	I		3
Rumex acetosa	3	I		3
Hylocomium splendens	3	I		3
Pseudoscleropdoium purum	3	I		3
Galium palustre	2	I		2
Carex pulicaris	2	I		2
Epilobium palustre	2	I		2
Achillea ptarmica	1	I		1

Table B17 H12 *Calluna vulgaris – Vaccinium myrtillus* heath quadrat data

NVC code	H12	H12		
Quadrat number	24	25		
Grid reference	NS 59320 06936	NS 59325 06941		
Recorder	KL	KL		
Date	13.09.2016	13.09.2016		
Species	DOMIN		Frequency	Range
Calluna vulgaris	8	7	II	7-8
Cladonia uncialis	7	4	II	4-7
Racomitrium lanuginosum	4	7	II	4-7
Lycopodium clavatum	3	3	II	3
Vaccinum myrtillus	3	3	II	3
Polytrichum strictum	3	3	II	3
Molinia caerulea	3	2	II	2-3
Deschampsia flexuosa	3	2	II	2-3
Pedicularis sylvatica	3	2	II	2-3

NVC code	H12		H12			
Erica tetralix	2		2	II	2	
Picea sitchensis seedling	1	+		II	+ - 1	
Hylocomium splendens	4			I	4	
Pleurozium schreberi	3			I	3	
Nardus stricta	3			I	3	
Juncus squarrosus	2			I	2	
Sphagnum compactum	2			I	2	

Table B18 M15 *Trichophorum germanicum – Erica tetralix* wet heath, variant quadrat data

NVC code	M15			
Quadrat number	23			
Grid reference	N/A			
Recorder	KL			
Date	13.09.2016			
Species	DOMIN		Frequency	Range
Molinia caerulea		7	I	7
Sphagnum quinquefarium		6	I	6
Sphagnum capillifolium		5	I	5
Polytrichum commune		5	I	5
Trichophorum germanicum		4	I	4
Hylocomium splendens		4	I	4
Deschampsia cespitosa		4	I	4
Calluna vulgaris		3	I	3
Potentilla erecta		3	I	3
Erica cinerea		3	I	3
Vaccinum myrtillus		3	I	3
Nardus stricta		3	I	3
Pleurozium schreberi		3	I	3
Juncus squarossus		3	I	3

NVC code	M15			
Carex nigra		3	I	3
Eriophorum angustifloium		3	I	3
***Picea sitchensis* seedling**		2	I	2
Empetrum nigrum		2	I	2
Rhytidiadelphus loreus		2	I	2

Table B19 M15 *Trichophorum germanicum – Erica tetralix* wet heath, variant quadrat data

NVC code	M15	M15	M15	M15		
Quadrat number	52	53	54	57		
Grid reference	NS 59458 07212	NS 59447 07144	NS 59299 07173	NS 59195 07208		
Recorder	DK	DK	DK	DK		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN				Frequency	Range
Molinia caerulea	8	8	8	9	IV	8-9
Sphagnum capillifolium	5	4	6		III	4-6
Potentilla erecta	3	5	4	5	III	3-5
Polytrichum commune	3	4	3		III	3-4
Deschampsia flexuosa	2		4	4	III	2-4
Eriophorum vaginatum	4		4		II	4
Rhytidiadelphus squarrosus		3		5	II	3-5
Agrostis capillaris	4	2		1	II	2-4
Juncus squarrosus	1	4			II	1-4
Sphagnum fallax	5				I	5
Calluna vulgaris	4				I	4
Sphagnum palustre			4		I	4
Trichophorum cespitosum		4			I	4

NVC code	M15	M15	M15	M15		
Juncus acutiflorus		3			I	3
Aulacomnium palustre		2			I	2
***Polytrichum* sp.**		2			I	2
Vaccinium myrtillus		2			I	2
Carex echinata			2		I	2

Table B20 M15 *Trichophorum germanicum – Erica tetralix* wet heath, variant quadrat data

NVC code	M15	M15	M15		
Quadrat number	72	73	74		
Grid reference	NS 59458 07105	NS 59471 07251	NS 59393 07228		
Recorder	KL	KL	KL		
Date	26.10.2016	26.10.2016	26.10.2016		
Species	DOMIN			Frequency	Range
Sphagnum capillifolium	8	5	8	III	5-8
Molinia caerulea	7	7	5	III	5-7
Deschampsia flexuosa	6	5	5	III	5-6
Sphagnum palustre	4	4	7	III	4-7
Eriophorum vaginatum	5	4	6	III	4-6
Trichophorum germanicum	3	4	3	III	3-4
Galium saxatile	3	3	3	III	3
Polytrichum commune	3	3	3	III	3
Luzula multiflora	3	3	3	III	3
Vaccinium myrtillus	3	2		III	2-3
Potentilla erecta	3	3	1	III	1-3
Eriophorum angustifolium	5	3		II	3-5
Pleurozium schreberi	4	3		II	3-4

NVC code	M15	M15	M15		
Hylocomium splendens	4	3		II	3-4
Juncus squarrosus	3		3	II	3
Rhytidiadelphus squarrosus	3	3		II	3
Hypnum cupressiforme		3	3	II	3
Agrostis canina		4		I	4
Juncus acutiflorus		4		I	4
Anthoxanthum odoratum		4		I	4
Narthecium ossifragum			4	I	4
Carex nigra	3			I	3
Aulacomnium palustre		3		I	3
Nardus stricta			3	I	3
Plagiothecium undulatum			3	I	3
Picea sitchensis **seedling**	1			I	1

Table B21 M4x *Carex rostrata – Sphagnum recurvum* mire, variant quadrat data

NVC code	M4x			
Quadrat number	22			
Grid reference	NS 59195 06644			
Recorder	KL			
Date	13.09.2016			
Species	DOMIN	Frequency	Range	
Sphagnum capillifolium	6	I		6
Polytrichum commune	6	I		6
Carex rostrata	4	I		4
Holcus mollis	4	I		4
Sphagnum palustre	4	I		4
Galium saxatile	3	I		3

NVC code	M4x			
Deschampsia cespitosa	3	I		3
Agrostis stolonifera	3	I		3
Potentilla erecta	3	I		3
Rhytidiadelphus squarrosus	3	I		3
Molinia caerulea	3	I		3
Juncus effusus	3	I		3
Rumex acetosa	3	I		3
Pleurozium shruberi	2	I		2

Table B22 M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire quadrat data

NVC code	M19	M19	M19		
Quadrat number	31	32	33		
Grid reference	NS 57577 06251	NS 57574 06264	NS 57556 06297		
Recorder	KL	KL	KL		
Date	14.09.2016	14.09.2016	14.09.2016		
Species	DOMIN			Frequency	Range
Trichophorum germanicum	7	4	6	III	4-6
Deschampsia flexuosa	6	6	4	III	4-6
Calluna vulgaris	5	4	4	III	4-5
Sphagnum capillifolium	5	4	3	III	3-5
Pleurozium schreberi	5	4	3	III	3-5
Polytrichum strictum	3	3	4	III	3-4
Sphagnum palustre	3	4	3	III	3-4
Narthecium ossifragum	3	3	3	III	3
Ericia tetralix	3	3	3	III	3
Vaccinium vitis-idaea	3	3	1	III	1-3
Picea sitchensis	2	2	1	III	1-2

NVC code	M19	M19	M19			
Eriophorum vaginatum			6	7	II	6-7
Sphagnum fallax		5		5	II	5
Vaccinium oxycoccos		4	3		II	3-4
Vaccinium myrtillus		3	3		II	3
Hypnum cupressiforme		3			I	3
Molinia caerulea		3			I	3
Rhytdiadelphus loreus		3			I	3
Eriophorum angustifolium			3		I	3
Polytrichum commune			3		I	3
Dryopteris carthusiana				1	I	1

Table B23 M20i *Eriophorum vaginatum* blanket mire variant quadrat data

NVC code	M20i	M20i	M20i	M20i	M20i		
Quadrat number	60	61	62	63	71		
Grid reference	NS 59028 07238	NS 58965 07233	NS 58940 07152	NS 58879 07010	NS 58504 06928		
Recorder	DK	DK	DK	DK	DK		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN					Frequency	Range
Eriophorum vaginatum	8	8	8	8	7	V	7-8
Deschampsia flexuosa	4	4	4	5	5	V	4-5
Vaccinium myrtillus	5	5	5	4	4	V	4-5
Sphagnum capillifolium	5	6	7		7	IV	5-7
Pleurozium schreberi	4	4		6	7	IV	4-7
Molinia caerulea	5	4	4			III	4-5

NVC code	M20i	M20i	M20i	M20i	M20i		
Hypnum jutlandicum	4	4	4			III	4
Galium saxatile	3		3	4		III	3-4
Polytrichum sp.		3	4		4	III	3-4
Potentilla erecta		2		4	4	III	2-4
Juncus squarrosus				4	4	II	4
Sphagnum palustre	4		4			II	4
Polytrichum commune	4	3				II	3-4
Calluna vulgaris			5			I	5
Trichophorum germanicum			5			I	5
Sphagnum fallax		4				I	4
Empetrum nigrum			4			I	4
Eriophorum angustifolium				4		I	4
Aulacomnium palustre	4		4			II	4
Erica tetralix			3			I	3
Carex nigra				2		I	2
Anthoxanthum odoratum	2					I	2
Festuca vivipara					1	I	1
Luzula multiflora	1					I	1

Table B24 M20ii *Eriophorum vaginatum* blanket mire variant quadrat data

NVC code	M20ii	M20ii	M20ii	M20ii
Quadrat number	35	36	37	38

NVC code	M20ii	M20ii	M20ii	M20ii		
Grid reference	NS 58901 06744	NS 58832 06699	NS 58696 06581	NS 58695 06592		
Recorder	KL	KL	KL	KL		
Date	15.09.2016	15.09.2016	15.09.2016	15.09.2016		
Species	DOMIN				Frequency	Range
Polytrichum commune	6	5	7	4	IV	4-7
Carex nigra	4	3	5	3	IV	3-5
Deschampsia flexuosa	3	3	3	3	IV	3
Hylocomium splendens		5	4	8	III	4-8
Eriophorum vaginatum	4	4		7	III	4-7
Sphagnum capillaris	6		6	5	III	5-6
Pleurozium schreberi	4	7	3		III	3-7
Rhytidiadelphus squarrosus		3	3	3	III	3
Juncus effusus	1	1		3	III	1-3
Galium saxatile	3	3	+		III	+ - 3
Sphagnum fallax			5	5	II	5
Nardus stricta	3	3			II	3
Agrostis stolonifera	3	3			II	3
Rhytidiadelphus loreus	4				I	4
Hypnum jutlandicum	3				I	3
Vacinum myrtillus	3				I	3
Dicranum scoparium	3				I	3
Hypnum imponens			3		I	3
Calluna vulgaris				3	I	3
Trichophorum germanicum			2		I	2
Juncus squarrosus				1	I	1

Table B25 M15 *Trichophorum germanicum – Erica tetralix* wet heath/ M20*Eriophorum vaginatum* blanket mire ecotone quadrat data

NVC code	M15/M20	M15/M20	M15/M20		
Quadrat number	72	73	74		
Grid reference	NS 59458 07105	NS 59471 07251	NS 59393 07228		
Recorder	KL	KL	KL		
Date	26.10.2016	26.10.2016	26.10.2016		
Species	DOMIN			Frequency	Range
Sphagnum capillifolium	8	5	8	III	5-8
Molinia caerulea	7	7	5	III	5-7
Deschampsia flexuosa	6	5	5	III	5-6
Sphagnum palustre	4	4	7	III	4-7
Eriophorum vaginatum	5	4	6	III	4-6
Trichophorum germanicum	3	4	3	III	3-4
Galium saxatile	3	3	3	III	3
Polytrichum commune	3	3	3	III	3
Luzula multiflora	3	3	3	III	3
Vaccinium myrtillus	3	2		III	2-3
Potentilla erecta	3	3	1	III	1-3
Eriophorum angustifolium	5	3		II	3-5
Pleurozium schreberi	4	3		II	3-4
Hylocomium splendens	4	3		II	3-4
Juncus squarrosus	3		3	II	3
Rhytidiadelphus squarrosus	3	3		II	3
Hypnum cupressiforme		3	3	II	3
Agrostis canina		4		I	4

NVC code	M15/M20	M15/M20	M15/M20			
Juncus acutiflorus			4		I	4
Anthoxanthum odoratum			4		I	4
Narthecium ossifragum				4	I	4
Carex nigra		3			I	3
Aulacomnium palustre			3		I	3
Nardus stricta				3	I	3
Plagiothecium undulatum				3	I	3
Picea sitchensis seedling		1			I	1

Table B26 M6b *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Carex nigra-Nardus stricta* sub-community quadrat data

NVC code	M6b	M6b	M6b	M6b		
Quadrat number	26	27	28	29		
Grid reference	NS 57862 05461	NS 57863 05495	NS 57850 05497	NS 57816 05526		
Recorder	KL	KL	KL	KL		
Date	14.09.2016	14.09.2016	14.09.2016	14.09.2016		
Species	DOMIN				Frequency	Range
Carex nigra	5	5	5	7	IV	5-7
Deschampsia flexuosa	5	4	4	6	IV	4-6
Festuca ovina	5	4	4	6	IV	4-6
Hylocomium splendens	6	7	7	3	IV	3-7
Rhytidadelphus squarrosus	4	4	5	3	IV	3-5
Pleurozium schreberi	4	5	5	3	IV	3-5
Nardus stricta	4	4	3	4	IV	3-4
Pseudoscleropodium purum	3	3	3	3	IV	3
Bare peat	5	3	4	2	IV	2-5

NVC code	M6b	M6b	M6b	M6b		
***Picea sitchensis* seedling**	2	3	3	3	IV	2-3
Juncus effusus		3	2	3	III	2-3
Potentilla erecta		2	2	3	III	2-3
Hypnum cupressiforme	3			7	II	3-7
***Cladonia* sp.**		1		1	II	1
Dicranum scoparium				3	I	3
Vaccinum myrtillus	2				I	2
Festuca rubra	2				I	2

Table B27 M6d *Carex echinata – Sphagnum recurvum/ auriculatum* mire, *Juncus acutiflorus* sub-community quadrat data

NVC code	M6d	M6d	M6d	M6d		
Quadrat number	13	14	15	16		
Grid reference	NS 59353 07037	NS 59390 07060	NS 59404 07067	NS 59411 07073		
Recorder	KL	KL	KL	KL		
Date	08.09.2016	12.09.2016	12.09.2016	12.09.2016		
Species	DOMIN				Frequency	Range
Juncus acutiflorus	5	6	6	5	IV	5-6
Sphagnum palustre	6	5	5	4	IV	4-6
Agrostis stolonifera	6	3	5	6	IV	3-6
Hylocomium splendens	4	4	5	3	IV	3-5
Holcus mollis	3	4	3	3	IV	3-4
Rumex acetosa	3	3	3	3	IV	3
Galium saxatile	3	3	3	3	IV	3
Caltha palustris	3	2	3	3	IV	2-3
Polytrichum commune		4	4	5	III	4-5
Sphagnum	4	6	3		III	3-6

NVC code	M6d	M6d	M6d	M6d		
capillifolium						
Rhytidiadelphus squarrosus		3	4	5	III	3-5
Deschampsia flexuosa	4	2	4		III	2-4
Deschampsia cespitosa	4		2	3	III	2-4
Molinia caerulea	2	3		2	III	2-3
Epilobium palustre	2		3	2	III	2-3
Juncus effusus	3	3	3		III	3
Holcus lanatus	3			3	II	3
Potentilla erecta	3		3		II	3
Cirsium palustre	2				I	2

Annex 11C
NVC Target Notes

Table C1 NVC Target Notes

TN #	National grid reference	Date	Target notes
1	NS 58316 07404	27.10.2016	Small stand of M6a flush, with bottle sedge.
2	NS 59304 07010	06.09.2016	A small stand of broadleaved woodland plantation, with young sycamore trees (approximately 12 m high) spaced approximately 1-2 m apart, occurs on a slope to the east of a coniferous woodland plantation. The field and ground layer of this plantation support locally dominant Yorkshire-fog and tufted hair-grass, abundant common sorrel, occasional soft-rush and rare and marsh thistle.
3	NS 59246 06881	06.09.2016	Small stand of young broadleaved woodland plantation (of which sycamore trees are approximately 4-8 m high) at the edge of a coniferous woodland plantation.
4	NS 59044 06782	13.09.2016	Monquhill Farmhouse is present, with an associated stone wall. Scattered willow scrub occurs to the east of Monquhill Farmhouse, whilst scattered trees including birch and sycamore are present to the east and west of the house.
5	NS 58433 06813	27.10.2016	A system of drainage ditches present within M20 blanket bog, predominantly supporting M6 acid flush.
6	NS 58789 06694	15.09.2016	A small pond present in what appears to be an old borrow pit, bordered by vegetation which includes bottle sedge and pondweed sp. A M6 acid flush flushes into this pond.
7	NS 58723 06585	15.09.2016	U16 tall-herb community, approximately 4 x 4 m, dominated by wood-rush, with abundant tormentil, heath rush, heath bedstraw, wavy-hair grass and *Hylocomium splendens*. Small stands of U16 tall-herb community, similar to this stand, occur occasionally within the study area, at the edge of forestry tracks.
8	NS 58671 06597	15.09.2016	Drainage ditch present, typical of drainage ditch systems running throughout the coniferous woodland plantation.
9	NS 58927 06499	13.09.2016	A pond, present amongst M23a rush-pasture, M25 mire and M20 modified blanket bog communities.
10	NS 58918 06495	13.09.2016	A small stand of M6 acid flush, supporting occasional devil's-bit scabious. A very small stand of neutral flush (<5m in length and 1m in width) also occurs in this area supporting occasional grass-of-Parnassus.
11	NS 58720 06445	15.09.2016	M6 acid flush occurring within a drainage ditch.
12	NS 58908 06440	13.09.2016	A stand of young broadleaved woodland plantation, which supports frequent pedunculate oak and ash, many of which have failed.
13	NS 58808 06445	13.09.2016	A very small stand of broadleaved woodland plantation, supporting abundant silver birch, occasional alder, and rare rowan on a mire-grassland mosaic, occurring within a gap in the coniferous woodland plantation.
14	NS 58649 06456	15.09.2016	M6 acid flush occurs within a drainage ditch.
15	NS 58580 06460	15.09.2016	M6 acid flush (approximately 2-3 m wide) occurs within a drainage ditch.
16	NS 58900 06304	14.09.2016	A small stand of M6a acid flush, approximately 4 x 10 m wide, occurs along a forestry ride.
17	NS 58052 06375	14.09.2016	Disturbed area of U5 acid grassland, with exposed bare peat.

TN #	National grid reference	Date	Target notes
18	NS 58470 06219	15.09.2016	A small stand of M6a acid flush, approximately 10 m², with abundant bottle sedge.
19	NS 58292 06207	15.09.2016	A species-poor M2 bog pool present, bordered by modified blanket bog, the margin of which supports abundant hare's-tail cottongrass, wavy-hair grass and *Sphagnum* sp., and frequent common cottongrass, whilst growing in the pool is *Sphagnum fallax*.
20	NS 58667 05970	14.09.2016	A track (composed of stone and sand) which has largely become re-vegetated with U5 and U6 grassland and scattered young conifer trees.
21	NS 57852 06049	14.09.2016	Localised stands of M6 acid flush.
22	NS 57792 05924	14.09.2016	A linear stand of M6 acid flush, approximately 3 m wide.
23	NS 58082 05754	15.09.2016	Shallow bare degraded peat.

Annex 11D
NVC Species List

Table D1 Species list of plants recorded during the NVC survey

Broad plant group	Vernacular name	Scientific name
Trees and shrubs	Sycamore	*Acer pseudoplatanus*
	Alder	*Alnus glutinosa*
	Ash	*Fraxinus excelsior*
	Bell heather	*Erica cinerea*
	Bilberry	*Vaccinium myrtillus*
	Birch sp.	*Betula* sp.
	Cowberry	*Vaccinium vitis-idaea*
	Cranberry	*Vaccinium oxycoccos*
	Cross-leaved heath	*Erica tetralix*
	Crowberry	*Empetrum nigrum*
	Heather	*Calluna vulgaris*
	Pedunculate oak	*Quercus robur*
	Rowan	*Sorbus aucuparia*
	Silver birch	*Betula pendula*
	Sitka spruce	*Picea sitchensis*
	Sitka spruce seedling	*Picea sitchensis* seedling
	Willow sp.	*Salix* sp.
Herbs	Yarrow	*Achillea millefolium*
	Sneezewort	*Achillea ptarmica*
	Bog pimpernel	*Anagallis tenella*
	Marsh-marigold	*Caltha palustris*

Broad plant group	Vernacular name	Scientific name
	Bittercress sp.	*Cardamine* sp.
	Common mouse-ear	*Cerastium fontanum*
	Marsh thistle	*Cirsium palustre*
	Marsh willowherb	*Epilobium palustre*
	Cleavers	*Galium aparine*
	Marsh bedstraw	*Galium palustre*
	Heath bedstraw	*Galium saxatile*
	Fen bedstraw	*Galium uliginosum*
	Cat's-ear	*Hypochaeris radicata*
	Meadow vetchling	*Lathyrus pratensis*
	Fairy flax	*Linum catharticum*
	Bog asphodel	*Narthecium ossifragum*
	Grass-of-Parnassus	*Parnassia palustris*
	Marsh lousewort	*Pedicularis palustris*
	Lousewort	*Pedicularis sylvatica*
	Ribwort plantain	*Plantago lancelota*
	Heath milkwort	*Polygala serpyllifolia*
	Pondweed sp.	*Potamogeton* sp.
	Tormentil	*Potentilla erecta*
	Selfheal	*Prunella vulgaris*
	Meadow buttercup	*Ranunculus acris*
	Lesser spearwort	*Ranunculus flammula*
	Creeping buttercup	*Ranunculus repens*
	Common sorrel	*Rumex acetosa*
	Sheep's sorrel	*Rumex acetosella*

Broad plant group	Vernacular name	Scientific name
	Marsh ragwort	*Senecio aquaticus*
	Lesser stitchwort	*Stellaria graminea*
	Devil's-bit scabious	*Succisa pratensis*
	Wild thyme	*Thymus polytrichus*
	Clover sp.	*Trifolium* sp.
	White clover	*Trifolum repens*
	Marsh voilet	*Viola palustris*
	Voilet sp.	*Viola* sp.
Graminoids	Velvet bent	*Agrostis canina*
	Common bent	*Agrostis capillaris*
	Creeping bent	*Agrostis stolonifera*
	Sweet vernal-grass	*Anthoxanthum odoratum*
	Green-ribbed sedge	*Carex binervis*
	Star sedge	*Carex echinata*
	Glaucous sedge	*Carex flacca*
	Common sedge	*Carex nigra*
	Carnation sedge	*Carex panicea*
	Flea sedge	*Carex pulicaris*
	Bottle sedge	*Carex rostrata*
	Sedge sp.	*Carex* sp.
	Crested dog's-tail	*Cynosurus cristatus*
	Heath-grass	*Danthonia decumbens*
	Tufted hair-grass	*Deschampsia cespitosa*
	Wavy-hair grass	*Deschampsia flexuosa*
	Common cottongrass	*Eriophorum angustifolium*

Broad plant group	Vernacular name	Scientific name
	Hare's-tail cottongrass	*Eriophorum vaginatum*
	Sheep's-fescue	*Festuca ovina*
	Red fescue	*Festuca rubra*
	Viviparous sheep's-fescue	*Festuca vivipara*
	Yorkshire-fog	*Holcus lanatus*
	Creeping soft-grass	*Holcus mollis*
	Sharp-flowered rush	*Juncus acutiflorus*
	Jointed rush	*Juncus articulatus*
	Compact rush	*Juncus conglomeratus*
	Soft-rush	*Juncus effusus*
	Heath rush	*Juncus squarossus*
	Field wood-rush	*Luzula campestris*
	Heath wood-rush	*Luzula multiflora*
	Purple moor-grass	*Molinia caerulea*
	Mat-grass	*Nardus stricta*
	Smooth meadow-grass	*Poa pratensis*
	Deergrass	*Trichophorum germanicum*
Ferns	Narrow Buckler-fern	*Dryopteris carthusiana*
Clubmoss	Stag's-horn clubmoss	*Lycopodium clavatum*
Liverworts		*Lophocolea bidentata*
		Scapania undulata
Mosses		*Aulacomnium palustre*
		Calliergonella cuspidata
		Dicranum scoparium
		Hylocomium splendens

Broad plant group	Vernacular name	Scientific name
		Hypnum cupressiforme
		Hypnum imponens
		Hypnum jutlandicum
		Philonotis caespitosa
		Philonotis fontana
		Plagiothecium undulatum
		Pleurozium schreberi
		Polytrichastrum alpinum
		Polytrichum commune
		Polytrichum juniperinum
		Polytrichum sp.
		Polytrichum strichum
		Polytrichum stricta
		Pseudoscleropodium purum
		Racomitrium lanuginosum
		Rhytdiadelphus loreus
		Rhytidadelphus sp.
		Rhytidadelphus squarrosus
		Thuidium tamariscinum
Sphagnum		*Sphagnum capillaris*
		Sphagnum capillifolium
		Sphagnum compactum
		Sphagnum fallax
		Sphagnum fallax
		Sphagnum palustre

Broad plant group	Vernacular name	Scientific name
		Sphagnum quinquefarium
		Sphagnum sp.
		Sphagnum squarrosum
Lichens		*Cladonia* sp.
		Cladonia uncialis

Annex 11E
NVC Photographs

Table E1 NVC Survey Photographs

Photograph #	Description	Photograph
1	View within the north east of the study area, illustrating the different vegetation communities and habitats present within close proximity.	
2	A forestry ride in the east of the study area illustrating small stands of young broadleaved plantations (middle ground of the photograph) and provisional grassland and mire (foreground of the photograph).	
3	Monquhill Farmhouse (middle ground of the photo) as viewed from a westerly aspect.	

Photograph #	Description	Photograph
4	Monquhill Farmhouse (middle ground of the photo) as viewed from an easterly aspect.	
5	A young broadleaved woodland plantation present in the north east of the study area.	
6	Coniferous woodland plantation (middle ground of the photo) and M20 modified blanket bog (foreground of the photo) in the middle of the study area.	

Photograph #	Description	Photograph
7	A mosaic of U5c and U2a acid grassland occurring with M23a rush-pasture on a steep slope in the west of the study area.	
8	U5a acid grassland present on Strandlud Hill in the middle of the site.	
9	Provisional grassland, a species-poor semi improved grassland which does not fit within the NVC classification system, occurring as a small stand in the north east of the study area.	

Photograph #	Description	Photograph
10	M23b rush-pasture (foreground of the photo) present in the north east of the study area.	
11	A small stand of H12 dry heath (foreground of the photo) present in the north east of the study area.	
12	M19 wet modified blanket bog, with frequent (deer browsed) heather visible, in the west of the study area.	

Photograph #	Description	Photograph
13	The fruit of the trailing dwarf shrub cranberry, visible in M19 wet modified blanket bog in the west of the study area.	
14	A localised area of M6 acid flush (too small to map) amongst M23 rush-pasture in the north east of the study area.	
15	The M2 blanket bog community borders a dystrophic pond in the north of Strandlud Hill, within an area of M20 modified blanket bog in the middle of the study area.	

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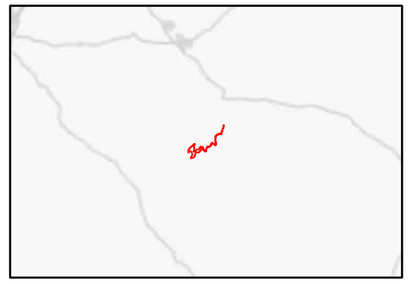
607000

606000

N

Key

- Site boundary
- Study area
- Proposed turbine location
- Access tracks
- Cranepad hardstanding
- Substation
- Temporary construction compound
- Watercourse crossing



Inset Map - Scale: 1:750,000

0 100 200 300 400 500 600 m

Scale at A3: 1:10,000

Client

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Appendix 11B National Vegetation Classification Survey Report

Figure 11B.1
Monquhill site overview

September 2020

wood.

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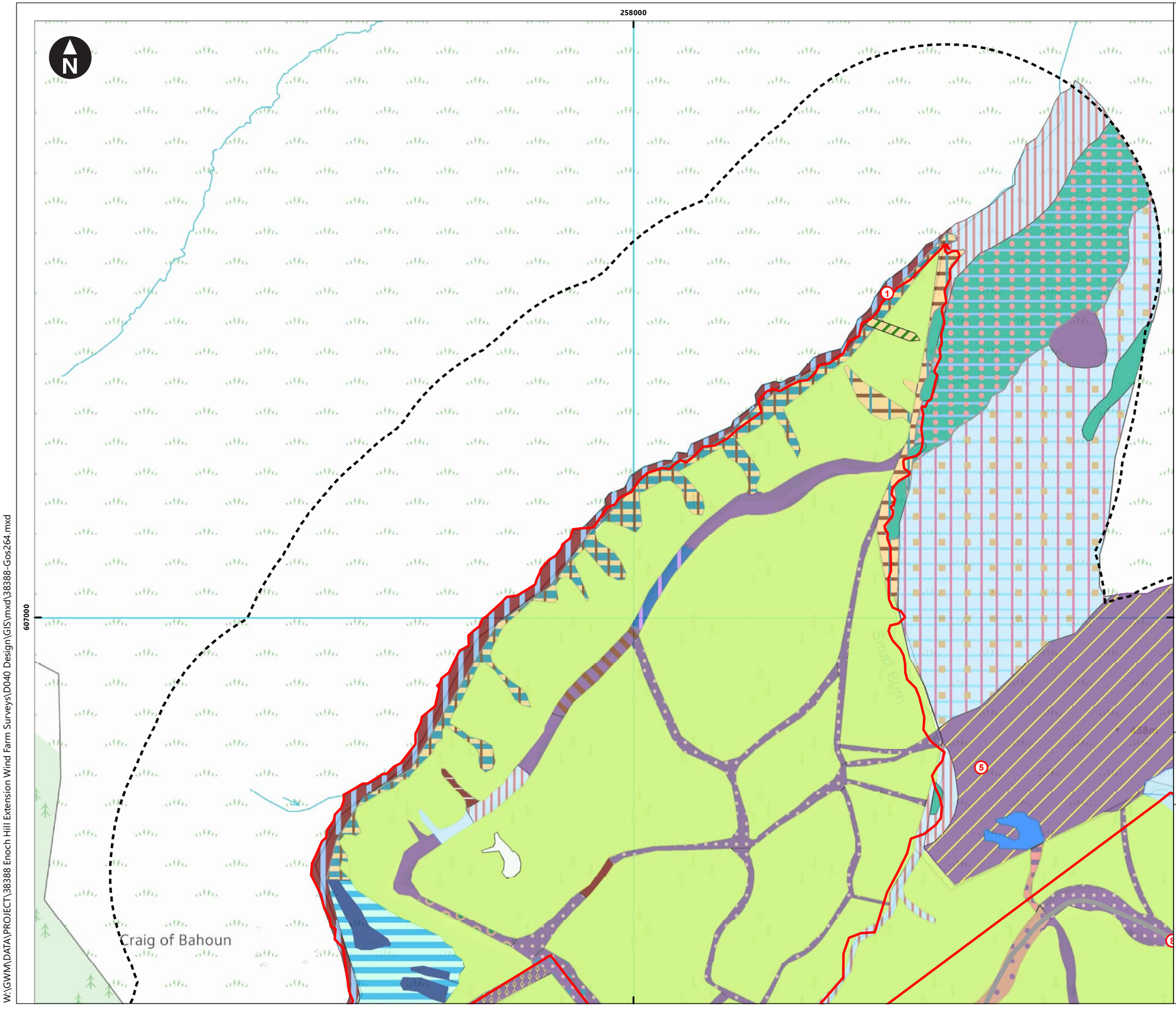

Key

- Site boundary
- Study area
- Proposed turbine location
- Access tracks
- Cranepad hardstanding
- Substation
- Temporary construction compound
- Watercourse crossing
- Target notes

Phase 1 Habitat

- Broad-leaved plantation woodland
- Coniferous plantation woodland
- Recently felled coniferous woodland
- Hardstanding / built environment

0 50 100 150 200 250 m

Scale at A3: 1:4,500

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Figure 11B.1a
National Vegetation Classification map

September 2020

wood.

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259000

607000

422m

429m

Carcow Burn

Sheepfold

Monquhill

Blood Moss

Quarry (dis)

1

2

3

4

5

6

7

8

N

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Key

- Site boundary
- Study area
- Proposed turbine location
- Access tracks
- Cranepad hardstanding
- Substation
- Temporary construction compound
- Watercourse crossing
- Target notes

Phase 1 Habitat

- Broad-leaved plantation woodland
- Coniferous plantation woodland
- Recently felled coniferous woodland
- Hardstanding / built environment

0 50 100 150 200 250 m

Scale at A3: 1:4,500

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Figure 11B.1b
National Vegetation Classification map

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wood.

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258000

606000

Craig of Bahoun

Ford

Bitch Burn

Strandlud Hill

Carcow

505m

498m

425m

Water of Deugh

Key

- Site boundary
- Study area
- Proposed turbine location
- Access tracks
- Cranepad hardstanding
- Substation
- Temporary construction compound
- Watercourse crossing
- Target notes

Phase 1 Habitat

- Broad-leaved plantation woodland
- Coniferous plantation woodland
- Recently felled coniferous woodland
- Hardstanding / built environment

0 50 100 150 200 250 m

Scale at A3: 1:4,500

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Appendix 11A Desk Study Report

Figure 11B.1c
National Vegetation Classification map

September 2020

wood.

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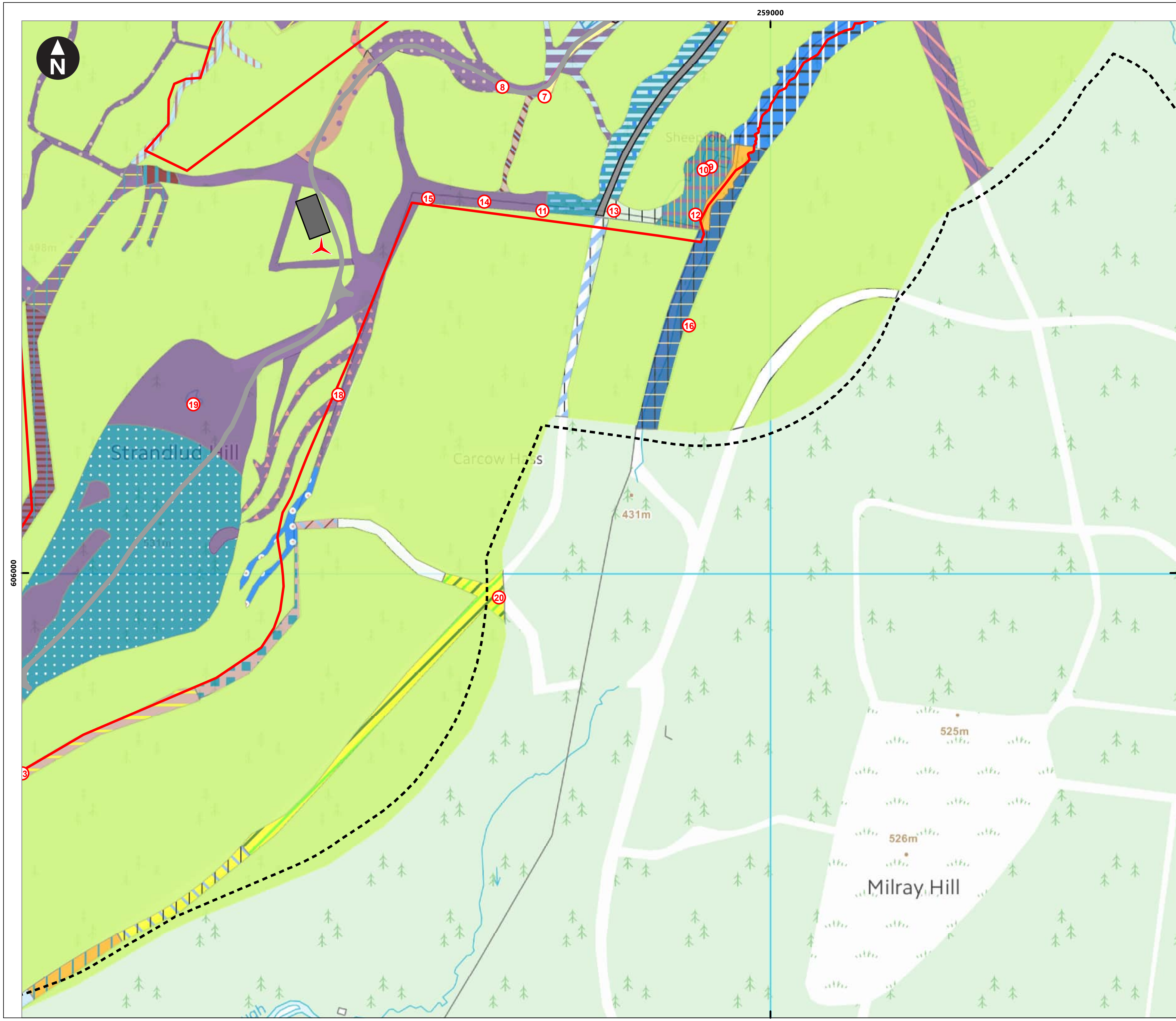

Key

- Site boundary
- Study area
- Proposed turbine location
- Access tracks
- Cranepad hardstanding
- Substation
- Temporary construction compound
- Watercourse crossing
- Target notes

Phase 1 Habitat

- Broad-leaved plantation woodland
- Coniferous plantation woodland
- Recently felled coniferous woodland
- Hardstanding / built environment

0 50 100 150 200 250 m

Scale at A3: 1:4,500

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Figure 11B.1d
National Vegetation Classification map

September 2020

wood.

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