Ventient Energy

Beinn Ghlas Wind Farm

Habitat and Botanical Survey Report

2482508

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avian ecology

RSK biocensus
EXPERTS IN ECOLOGY

RSK GENERAL NOTES

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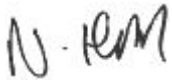
Signature	Howard Fearn [Digital]	Signature	
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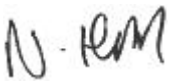
Signature	
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EXECUTIVE SUMMARY

1.1.1 RSK Biocensus were commissioned by Ventient Energy to undertake a Phase 1 habitat survey and detailed botanical survey within the Beinn Ghlas Wind Farm site and adjacent habitat management area, to the southwest of Taynuilt in Argyll and Bute, Scotland. The purpose of the survey was to provide a baseline for ongoing monitoring and management of habitats associated with the continued operation of the wind farm.

1.1.2 The surveys were led by Mark Wood from Avian Ecology Ltd, who is a competent botanist with considerable experience of undertaking upland Phase 1 Habitat and National Vegetation Classification surveys at across Scotland. They were undertaken between 12th and 14th October 2021, following industry-recognised best practice survey methods.

1.1.3 A variety of habitats characteristic of upland sites were recorded across both the wind farm site and adjacent habitat management area. The terrain comprised a complex of steep-sided hills and valleys with a few flatter patches of bogs or marshy grassland, with several scattered small lochs and lochans. The vegetation comprised mostly of a mosaic of wet heath and bogs, interspersed with areas of acid and marshy grassland. The very steep and rocky slopes supported a mosaic of dry heath and acid grassland. Several watercourses were present across the site, a few of which were flanked by small remnants of deciduous woodland and willow scrub.

1.1.4 The vegetation communities present were characteristic of dry and wet upland habitats, including some that are likely to comprise groundwater dependent terrestrial ecosystems. Varying levels of grazing pressure by sheep and deer was evident throughout, which in some localities was likely to be resulting in the degradation of the vegetation communities present.

1.1.5 Previous management within the site has focused on safeguarding breeding golden eagle. Opportunities for habitat enhancements through changes to ongoing management within the site are likely to exist and should be considered alongside the results of other proposed updated ecological baseline surveys, so that management proposals can seek to maximise the potential benefits for wider biodiversity.

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report has been prepared by Avian Ecology Ltd and RSK Biocensus in order to provide a baseline for ongoing monitoring and management of habitats in relation to the existing Beinn Ghlas Wind Farm and adjacent habitat management area.

1.1.2 Detailed methodologies and results of field surveys that were completed to establish baseline habitat conditions to inform the continuing monitoring of the site are presented.

1.1.3 It should be read with reference to the following Figures:

- **Figure 1** Site Layout.
- **Figures 2** and **3** Phase 1 Habitat Plan.
- **Figures 4** and **5** National Vegetation Classification Plan.

1.1.4 **Appendix A** provides the scientific names for the plant species referenced in this report.

1.2 Site Overview

1.2.1 The 'site', as shown by the red and blue line boundaries in Figure 1, encompasses the 'Beinn Ghlas Wind Farm Boundary' to the east, including the existing Beinn Ghlas Wind Farm, and the 'Habitat Management Area' to the west. The site lies approximately 4 km southwest of Taynuilt in Argyll and Bute, within an upland area of complex topography and habitats, largely comprising open bog, heathland and acid grassland habitats, fringed by commercial forestry to the south-east.

2.0 METHODOLOGY

2.1.1 Detailed methodologies of the field studies undertaken are presented below.

2.1 Field Surveys

2.1.1 The following field surveys have been completed:

- Phase 1 habitat survey.
- National Vegetation Classification (NVC) survey.

2.1.2 Survey methodologies and subsequent interpretation of results have made reference to the following key pieces of guidance:

- Argyll and Bute Biodiversity Partnership (2010) *The Argyll and Bute Local Biodiversity Action Plan 2010 - 2015*
- Averis et al. (2014). - *An Illustrated Guide to British Upland Vegetation.*
- Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey - a technique for environmental audit*.
- SNH (2017). *Commissioned Report 766 - Manual of terrestrial EUNIS habitats in Scotland.*
- Rodwell (2006). *National Vegetation Community Users' Handbook*.
- Rodwell ed. (1991). *British Plant Communities. Volume 1. Woodlands and Scrub*.
- Rodwell ed. (1992). *British Plant Communities. Volume 2. Mires and Heaths*.
- Rodwell ed. (1992). *British Plant Communities. Volume 3. Grasslands and montane communities*.
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- SNIFFER (2009). *WFD95: A Functional Wetland Typology for Scotland – Field Survey Manual.*
- Stace (2019). *Field flora of the British Isles*.
- Scottish Environment Protection Agency (2014). *Land Use Planning System Scottish Environment Protection Agency (SEPA) Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*.

Habitat Study Area

2.1.3 The study area within which baseline habitat and vegetation field surveys have been undertaken has comprised all terrestrial habitats within the site (both red line and blue line areas illustrated on **Figure 1**).

Phase 1 Habitat Survey

2.1.4 A Phase 1 habitat survey was undertaken on the 12th – 13th October 2021.

2.1.5 The survey was undertaken in accordance with the UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010[1]).

2.1.6 During the survey all habitats within the study area were mapped according to industry standards and described using a series of 'target notes' (TNs).

NVC Survey

2.1.7 An NVC survey was undertaken on 12th – 14th October 2021, following the guiding principles detailed within the 'National Vegetation Classification: User's Handbook' (Rodwell, 2006[2]).

2.1.8 The NVC survey comprised all noteworthy habitats within the study area. The survey concentrated on those areas where plant communities were deemed likely to form Annex 1 habitats and / or represent Groundwater Dependent Terrestrial Ecosystems.

2.1.9 During the survey, square quadrats of relevant size (as per best practice guidance) were distributed throughout homogenous stands identified, in order to provide a representative sample of the vegetation community present.

2.1.10 In each quadrat sample area, data was collected on the presence and abundance of vascular plant species using the Domin scale. These data were then analysed and classified to an NVC vegetation community, where possible, using the keys in Rodwell (various) British Plant Communities Volumes 1 to 5, aided by analysis using the Modular Analysis of Vegetation Information System (MAVIS) created by the UK Centre for Ecology and Hydrology.

Personnel

2.1.11 Surveys were conducted by M. Wood BSc from Avian Ecology Ltd; a competent botanist with considerable experience of undertaking upland Phase 1 Habitat and NVC surveys at comparable sites in Scotland.

2.1.12 The NVC analysis was checked by S. Turner BSc MSc from Avian Ecology Ltd; a competent botanist with experience of undertaking and analysing NVC surveys for similar upland sites across Scotland.

2.1.13 Technical and quality review was undertaken by N. Henson MEnvSci MCIEEM CEnv from RSK Biocensus; an associate director with over 16 years spent working in ecological consultancy.

[1] JNCC (2010) *Handbook for Phase 1 Habitat Survey - a technique for environmental audit.*
[2] Rodwell (2006). *National Vegetation Community Users' Handbook*.

3.0 RESULTS

3.1 Habitat Survey Results: Overview

3.1.1 This section presents the results of baseline field surveys, including an overview of habitat types present within the site and their distribution. It should be read with reference to **Figures 2** and **3**. Areas of habitat too small to accurately map are described as target notes.

3.1.2 Phase 1 habitat survey target notes are detailed in **Appendix B**, and NVC tables are presented in **Appendix C**, with photographs for target notes and NVC communities presented in **Appendix D**. **Appendix A** provides a full list of common and scientific names for the plant species.

3.1.3 Beinn Ghlas is an upland site rising to around 500m. The terrain is a complex of steep-sided hills and valleys with a few flatter patches of bogs or marshy grassland, with several scattered small lochs and lochans. The vegetation is mostly a mosaic of wet heath and bogs, interspersed with areas of acid and marshy grassland. The very steep and rocky slopes contain a mosaic of dry heath and acid grassland. There are several watercourses across the site a few of which are flanked by small remnants of deciduous woodland and willow scrub.

3.2 Habitat Survey Results: Phase 1 Habitats

3.2.1 Semi-natural broadleaf woodland (A1.1.1) was present in a few small remnant patches of deciduous woodland, generally only around 5m tall, found in a few of the steep gullies through which watercourses flow. Species were mostly limited to Rowan and Birch, with some Eared Willow.

3.2.2 Scrub (A2) was limited to some very small areas of Eared Willow found along watercourses.

3.2.3 Unimproved acid grassland (B1.1) was widespread but patchily distributed and mostly forming a mosaic with either dry and wet heath and mapped as a mosaic (D5 and D6). It occurred on shallow well drained soils or very shallow peat and was mostly found on steep slopes, the top of small hills and hillocks and along watercourse edges. Vegetation was dominated by a mix of grasses, in particular Sweet Vernal Grass, Sheep's Fescue, Common Bent, Mat Grass and Heath Rush. Herbs such as Tormentil and Heath Bedstraw were also present, along with a mix of hypnoid mosses.

3.2.4 Marshy grassland (B5) covered a few large patches across the site and several smaller swathes, in wet hollows and along watercourses. The vegetation was dominated by either Soft Rush or Sharp Flowered Rush, abundant mosses such as Flat-topped and Blunt-leaved Bog-mosses and Common Haircap, with some herbs such as Common Sorrel, Marsh Violet, Creeping Buttercup and occasionally Marsh Cinquefoil.

3.2.5 Dry dwarf shrub heath (D1) was restricted to steep and often rocky slopes where the peat is shallow and well drained. The habitat formed a mosaic with acid grassland. This habitat was dominated by dense stands of Common Heather with some Bell Heather,

Bilberry, Purple Moor-grass, abundant hypnoid mosses and herbs such as Tormentil, Marsh Bedstraw and Common Milkwort.

3.2.6 Wet dwarf shrub heath (D2) was very extensive across the site and often formed a mosaic with acid grasslands and with adjacent blanket bog. The habitat occurred on shallow peat on more gradual slopes, hill tops and hillside that were noticeably wet and poorly drained. The vegetation was dominated by Deergrass, ericoids including Common Heather and Bell Heather. Purple Moor-grass, Bog-asphodel, Reindeer Lichen and Acute-leaved Bog-moss were often present. The grazing and hoof damage by deer and sheep was often apparent in this habitat.

3.2.7 Dry dwarf shrub/acid grassland mosaic (D5) was a mosaic habitat between the dry dwarf shrub heath and acid grassland habitats described above.

3.2.8 Wet dwarf shrub heath/acid grassland mosaic (D6) was a mosaic habitat between the above-mentioned wet dwarf shrub heath and acid grassland. This formed one of the most extensive habitats on the site.

3.2.9 Blanket bog (E1.6.1) was also a very widespread and extensive habitat across the site forming on deep peat on flat plateaus and valley bottoms or very gently sloping hillsides. The topography of the land and absence of drainage made for generally wet conditions with peat hags and bog pools common. The habitat was largely dominated by Deergrass and Hare's-tail Cottongrass with some areas having a greater abundance of Common Heather or Purple Moor-grass tussocks. Bog-mosses were often abundant, including Papillose Bog-moss and Feathery Bog-moss. Herbs such as Bog Asphodel and Round-leaved Sundew were present.

3.2.10 Acid flushes (E2.1) were found throughout the site but were very small in extent; they were generally located on sloping ground associated with wet heath and acid grassland habitats. They were dominated by a range of small sedges with other vegetation including rushes, Deergrass, Common Cottongrass, Mat Grass and Butterwort.

3.2.11 Basic flushes (E2.2) were limited to one location, on gently sloping stony ground beneath a spring. Sparse vegetation was dominated by Yellow Saxifrage.

3.2.12 Bryophyte dominated springs (E2.3) were restricted to a few small examples, within some areas of wet heath and acid grassland. These were found on sloping terrain with very shallow stony soil, with the vegetation dominated by Curled Hookmoss.

3.2.13 Dystrophic standing water (G1.4) was present in the form several peat-stained lochs and lochans across the site of varying size and depth. These are detailed in the target notes (**Appendix B**).

3.2.14 Dystrophic running water (G2.4) was present in the form of several peat-stained watercourses across the site, also detailed in **Appendix B**.

3.2.15 Agricultural buildings (J3.1) were limited to a wooden barn and pens for sheep in the north of the site.

3.2.16 No protected or non-native plant species listed on Schedule 8 and 9 of the Wildlife and Countryside 1981 (as amended), respectively, were recorded within the study area.

3.3 Habitat Survey Results: NVC Communities

Dry Heaths

H10 – Calluna vulgaris – Erica cinerea heath, typical sub-community

3.3.1 This community was found in scattered localities across the site, on steep, often rocky or scree slopes where there is very shallow, well drained peat. It mostly formed a mosaic with U4 acid grassland. Levels of grazing appeared to be more limited here than elsewhere, but still reasonably high.

3.3.2 This was a typical dry heath, dominated by dense stands of Common Heather with a lesser amount of Bell Heather and Bilberry. Hypnoid mosses were common, as were herbs such as Heath Bedstraw and Tormentil and ferns including Hard Fern and Broad Buckler Fern.

Wet Heaths

M15 - Trichophorum germanicum – Erica tetralix wet heath, no assigned sub-community.

3.3.3 This community was the most extensive on the site and found on a variety of gradients, wherever there was shallow, moist to wet peat. It forms a mosaic with the M17 blanket bog communities due to the complex topography of the site and also mosaics with a variety of acid grassland communities, including U4, U5 and U6. Grazing pressure appeared generally quite high from deer and sheep.

3.3.4 Vegetation was dominated by deergrass and ericoids including Cross-leaved Heath and Common Heather, while Purple Moor-grass, Bog Asphodel, Acute-leaved Bog-moss, Woolly Fringe Moss and Reindeer Lichen were constants but present in small amounts.

3.3.5 There were some similarities with the blanket bog community M17; however, the lack of Papillose Bog-moss and the very shallow peat soils indicated that it is in fact M15 heath. The mix of species noted above are all typical of M15, but do not indicate one clear community. As the community was extensive and forms a mosaic there is possibly more than one sub-community present; however, the lack of sedge species means M15a was unlikely. This, coupled with the presence of blanket bog, made it unlikely that this community is dependent to any extent on groundwater.

Blanket Bog

M17a - Trichophorum germanicum – Eriophorum vaginatum mire, Drosera rotundifolia – Sphagnum spp. sub-community.

3.3.6 This community was very widespread and extensive across most of the site being found on flat or very gently sloping terrain on deep peat, often forming a mosaic with M15 due to the complex topography. The conditions here were wet to very wet, with the drainage being poor and grazing levels apparently high.

3.3.7 The vegetation was a mix of Deergrass, Hare's-tail Cottongrass and Common Cottongrass, with ericoids mostly being Cross-leaved Heath with some Common

Heather. Herbs were represented by Bog Asphodel and Tormentil while mosses were mostly bog-mosses, including Acute-leaved Bog-moss, Soft Bog-moss, Papillose Bog-moss, Feathery Bog-moss and Compact Bog-moss. The range of bog-mosses and wet conditions indicated that this is the *Drosera rotundifolia – Sphagnum* spp. sub-community.

M19b Calluna vulgaris – Eriophorum vaginatum mire, Empetrum nigrum ssp nigrum subcommunity

3.3.8 This community was found mostly in the northwest of the site and forms of flat to gently sloping ground on deep peat that is fairly well drained. The vegetation was dominated by Hare's-tail Cottongrass tussocks and Common Heather with constant Bilberry, Cowberry and Crowberry, and mostly a hypnoid moss understory with occasional Acute-leaved Bog-moss. The dominant and constant species, along with the impoverished bog-moss flora and very limited Deergrass and Purple Moor-grass suggest the *Empetrum nigrum* sub-community.

M25a Molinia caerulea-Potentilla erecta mire, Erica tetralix sub-community

3.3.9 This community was mostly located in the southwest of the site, on deep peat on flat or very gently sloping terrain and is reasonably damp to wet. Grazing by sheep and deer appeared minimal. The vegetation was species-poor, largely being dominated by Purple Moor-grass tussocks with Common Heather and Cross-leaved Heath, with some mosses including Woolly Fringe-moss and Acute-leaved Bog-moss and occasional herbs such as Tormentil.

Upland Flushes

M6 Carex echinata – Sphagnum fallax /denticulatum mire: no sub-community assigned

3.3.10 This small sedge flush community, potentially highly dependent on groundwater, was found throughout the site but occupying very small areas. It was mostly found within M15, U4 and U5 communities on sloping ground where these were kept wet from spring water. The soil was very shallow and stony, with the vegetation dominated by small sedges such as Carnation Sedge, Glaucous Sedge, Common Yellow Sedge, Star Sedge and Flea Sedge. Other species present included Bulbous Rush, Sharp Flowered Rush, Common Cottongrass, Mat Grass and Deergrass with some Butterwort.

M11 Carex demissa-Saxifraga aizoides mire

3.3.11 This small flush community was found in one location only, on gently sloping ground and kept permanently wet due to a spring; as such, it is potentially highly dependent on groundwater. Soil was almost non-existent, with the substrate consisting mostly of exposed stones. The vegetation was sparse and mostly limited to Yellow Saxifrage, with sedges such as Common Yellow Sedge and Carnation Sedge, with some Bulbous Rush.

M37 – Palustriella commutata-Festuca rubra spring

3.3.12 There were a few examples of this small flush community scattered within some areas of M15 and U4 communities. The flush was found on sloping terrain with very shallow, often stony soil. The vegetation was dominated by Curly Hookmoss with lesser amounts of Red Fescue, Butterwort, occasional Acute-leaved Bog-moss and a variety of small sedges, mostly Carnation Sedge.

3.3.13 This is a likely highly groundwater dependent community with indicator species for base enrichment in a generally acidic area.

Marshy Grasslands

M23a Juncus effusus / acutiflorus - Galium palustre rush pasture, acutiflorus sub-community.

3.3.14 This community was found in a few scattered localities across the site but could be quite extensive in scale. It occurred in wet to very wet areas of poorly drained soils of varying depths, mostly along the banks of streams and in large flat hollows where water collects. The vegetation was dominated by Sharp-flowered Rush with an understory of mosses and herbs such as Common Haircap, Blunt-leaved Bog-moss and Flat-topped Bog-moss, Marsh Violet, Tormentil, Marsh Lousewort and grasses like Creeping Bent and Sheep's Fescue.

3.3.15 Sharp-flowered Rush was dominant throughout. Bog-mosses were abundant in some areas but absent in others. This suggests that where the bog mosses were abundant the community was closer to the flush community M6d *Carex echinata - Sphagnum fallax /denticulatum* mire, *Juncus acutiflorus* sub-community. Sharp-flowered Rush is a key species in both; however, the bog mosses are typical of M6d but not really a feature of M23a. Both communities are potentially highly groundwater dependent.

Swamps

S9 Carex rostrata swamp.

3.3.16 This swamp community was found in a very wet area in the south of the site, where it formed a mosaic with M23a. The vegetation was almost solely dominated by tall stands of Bottle Sedge, emerging from open water with a very slow lateral flow.

Acid Grasslands

U4 Festuca ovina-Agrostis capillaris-Galium saxatile grassland: no sub-community assigned

3.3.17 This community was widespread but patchily present across the site, almost exclusively forming a mosaic with either H10 or M15 communities. It was found mostly on sloping ground on shallow well drained soil where exposed to a medium to high level of grazing by sheep and deer, resulting in a generally short stature.

3.3.18 The vegetation was dominated by a mix of grasses, mostly Common Bent, Sweet Vernal-Grass and Sheep's Fescue with a variety of small herbs such as Heath Bedstraw, Yarrow, Tormentil and a variety of hypnoid mosses.

U5d Nardus stricta-Galium saxatile grassland, Calluna vulgaris-Danthonia decumbens sub-community

3.3.19 This community was widespread but patchily distributed across the site, mostly forming a mosaic with the adjacent M15 community. It was found on shallow soil on small hillocks, and steeper sloping ground that was fairly well drained and exposed to medium to high levels of grazing by sheep and deer.

3.3.20 The vegetation was mostly dominated by Mat Grass tussocks with other grasses such as Sheep's Fescue, sedges such as Carnation Sedge, some Heath Rush, and small amounts of Bilberry, Common Heather and mosses including Woolly Fringe-moss and Glittering Wood-moss.

U6a Juncus squarrosus-Festuca ovina grassland, Sphagnum sub-community

3.3.21 This community was found patchily across the site where it forms on areas of shallow, well drained peat, often forming a mosaic with adjacent M15 and M17 communities. It appeared exposed to a high level of grazing by sheep and deer.

3.3.22 The vegetation was dominated by Heath Rush, with frequent Mat Grass, Tormentil and Bilberry and abundant mosses, which included Common Haircap Moss, Big Shaggy-moss and Glittering Wood-moss. There were also scattered Acute-leaved Bog-moss and Flat-topped Bog-moss, which are indicative of the sub-community.

W1 Salix cinerea-Galium palustre woodland

3.3.23 There were a few small areas of Eared Willow scrub 2-3m tall along watercourses that loosely fit this community type.

W9 Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis woodland, no sub-community assigned.

3.3.24 This community was largely found in sheltered gullies in the north and south of the site, mostly with a mixed ground layer community of H10 heath and U4 grassland. The trees were mostly a mix of Rowan and Downy Birch, less than 10m tall and scattered with no closed canopy.

NVC Summary

3.3.25 Vegetation communities present within the study area and included in the NVC survey are summarised in **Table 1**, along with corresponding Habitats Directive (92/43/EEC) Annex 1 Habitat types, SBL priority habitat types, LBAP priority habitat types and potential Ground Water Dependant Terrestrial Ecosystems (GWDTE) status in

accordance with SEPA guidance (2014[3]) and SNH NVC / EUNIS / Annex 1 correspondence tables (2017[4]).

[3] SEPA (2014). *Land Use Planning System Scottish Environment Protection Agency (SEPA) Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*.

[4] SNH (2017). *Commissioned Report 766 - Manual of terrestrial EUNIS habitats in Scotland*.

Table 1 Summary of vegetation communities

Phase 1 habitat type	NVC community	Principal corresponding Habitats Directive Annex I type/s	Corresponding SBL Priority Habitat Type	Corresponding Argyll and Bute Local Biodiversity Action Plan Habitat Type[1]	Potential dependence of community / habitat on groundwater[2] 1=High, 2=moderate, 3=low
Dry dwarf shrub heath (D1) / Dry dwarf shrub/acid grassland mosaic (D5)	H10a *Calluna vulgaris – Erica cinerea* heath, typical sub-community	4030 European dry heaths	Upland Heathland	Upland Heathland	3
Acid flushes (E2.1)	M6 *Carex echinata – Sphagnum fallax /denticulatum* mire (suggested community)	-	Upland flushes, fens and swamps	Upland flushes, fens and swamps	1
B5 Marshy grassland (B5)	M6d *Carex echinata – Sphagnum fallax /denticulatum* mire, *Juncus acutiflorus* sub-community	-	Upland flushes, fens and swamps	Upland flushes, fens and swamps	1
Basic flushes (E2.2)	M11 *Carex demissa-Saxifraga aizoides* mire (suggested community)	H7230 Alkaline fens	Upland flushes, fens and swamps	Upland flushes, fens and swamps	1
Wet dwarf shrub heath (D2) Wet dwarf shrub heath/acid grassland mosaic (D6)	M15 *Trichophorum germanicum – Erica tetralix* wet heath	H4010 Northern Atlantic wet heaths with Erica tetralix	Upland Heathland	Upland Heathland	2
Blanket bog (E1.6.1)	M17a *Trichophorum germanicum – Eriophorum vaginatum* mire, *Drosera*	H7130 Active blanket bog	Blanket Bog	Blanket Bog	3

Phase 1 habitat type	NVC community	Principal corresponding Habitats Directive Annex I type/s	Corresponding SBL Priority Habitat Type	Corresponding Argyll and Bute Local Biodiversity Action Plan Habitat Type[1]	Potential dependence of community / habitat on groundwater[2] 1=High, 2=moderate, 3=low
	rotundifolia – Sphagnum spp sub-community				
Blanket bog (E1.6.1)	M19b *Calluna vulgaris – Eriophorum vaginatum* mire, *Empetrum nigrum ssp nigrum* sub-community	H7130 Active blanket bog	Blanket Bog	Blanket Bog	3
B5 Marshy grassland (B5)	M23a *Juncus effusus / acutiflorus - Galium palustre* rush pasture, *Juncus acutiflorus* sub-community	-	Upland flushes, fens and swamps	Upland flushes, fens and swamps	1
Blanket bog (E1.6.1)	M25a *Molinia caerulea-Potentilla erecta* mire, *Erica tetralix* sub-community	H7130 Blanket bog - as on deep peat	Blanket bog - as on deep peat	Blanket bog - as on deep peat	3 as on deep peat
Bryophyte dominated springs (E2.3)	M37 *Palustriella commutata-Festuca rubra* spring (suggested community)	H7220 Petrifying springs with tufa formation (*Cratoneurion*)	Upland flushes, fens and swamps	Upland flushes, fens and swamps	1
Unimproved acid grassland (B1.1) / Dry dwarf shrub/acid grassland mosaic (D5)	U4 – *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	-	-	-	3
Unimproved acid grassland (B1.1) / Dry dwarf shrub/acid grassland mosaic (D5)	U5d *Nardus stricta - Galium saxatile* grassland, *Calluna vulgaris - Danthonia decumbens* sub-community	-	*Nardus stricta-Galium saxatile* grassland	-	3

Phase 1 habitat type	NVC community	Principal corresponding Habitats Directive Annex I type/s	Corresponding SBL Priority Habitat Type	Corresponding Argyll and Bute Local Biodiversity Action Plan Habitat Type[1]	Potential dependence of community / habitat on groundwater[2] 1=High, 2=moderate, 3=low
Unimproved acid grassland (B1.1) / Dry dwarf shrub/acid grassland mosaic (D5)	U6a *Juncus squarrosus - Festuca ovina* grassland, *Sphagnum* sub-community	-	*Juncus squarrosus- Festuca ovina* grassland	-	2
Scrub (A2)	W1 *Salix cinerea-Galium palustre* woodland (suggested community)	-	Wet woodland	Wet woodland	2
Semi-natural broadleaf woodland (A1.1.1)	W9 *Fraxinus excelsior – Sorbus aucuparia – Mercurialis perennis* woodland (suggested community)	-	Upland mixed ashwoods	Upland mixed ashwoods	3

1 Argyll and Bute Local Biodiversity Partnership (2010) *The Argyll and Bute Local Biodiversity Action Plan 2010 – 2015*

2 As listed in Appendix 4 of SEPA (2014) LUPS Guidance Note 31. The categorisation of GWDTEs is preliminary and is based on vegetation communities present, and therefore confirmed GWDTE categorisation is based on subsequent formal hydrological assessment.

REFERENCES

Argyll and Bute Biodiversity Partnership (2010) *The Argyll and Bute Local Biodiversity Action Plan 2010 - 2015*

Averis *et al*. (2014). - *An Illustrated Guide to British Upland Vegetation.*

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FIGURES

FIGURE 1: SITE LAYOUT

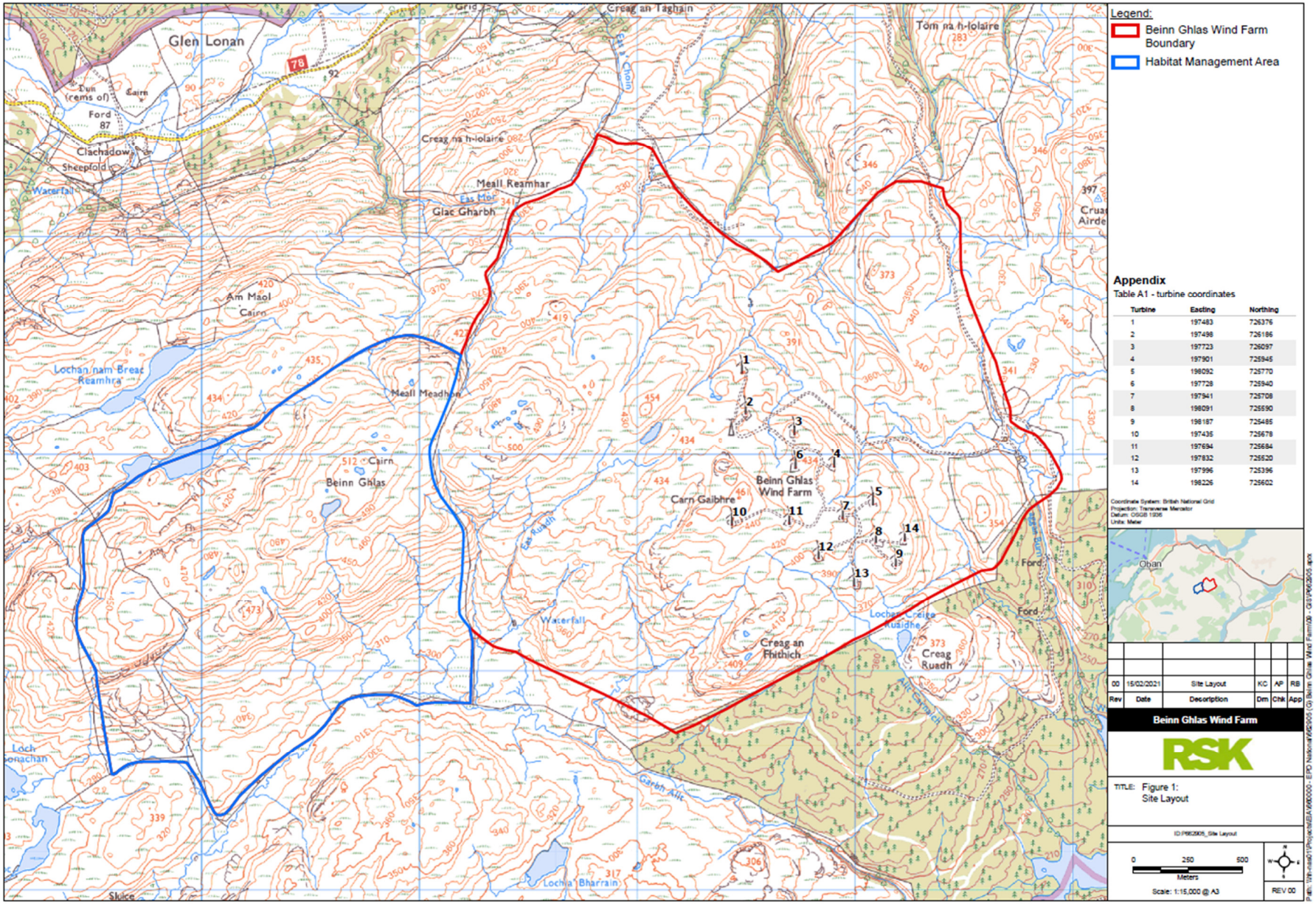


FIGURE 2: PHASE 1 HABITAT PLAN - WEST

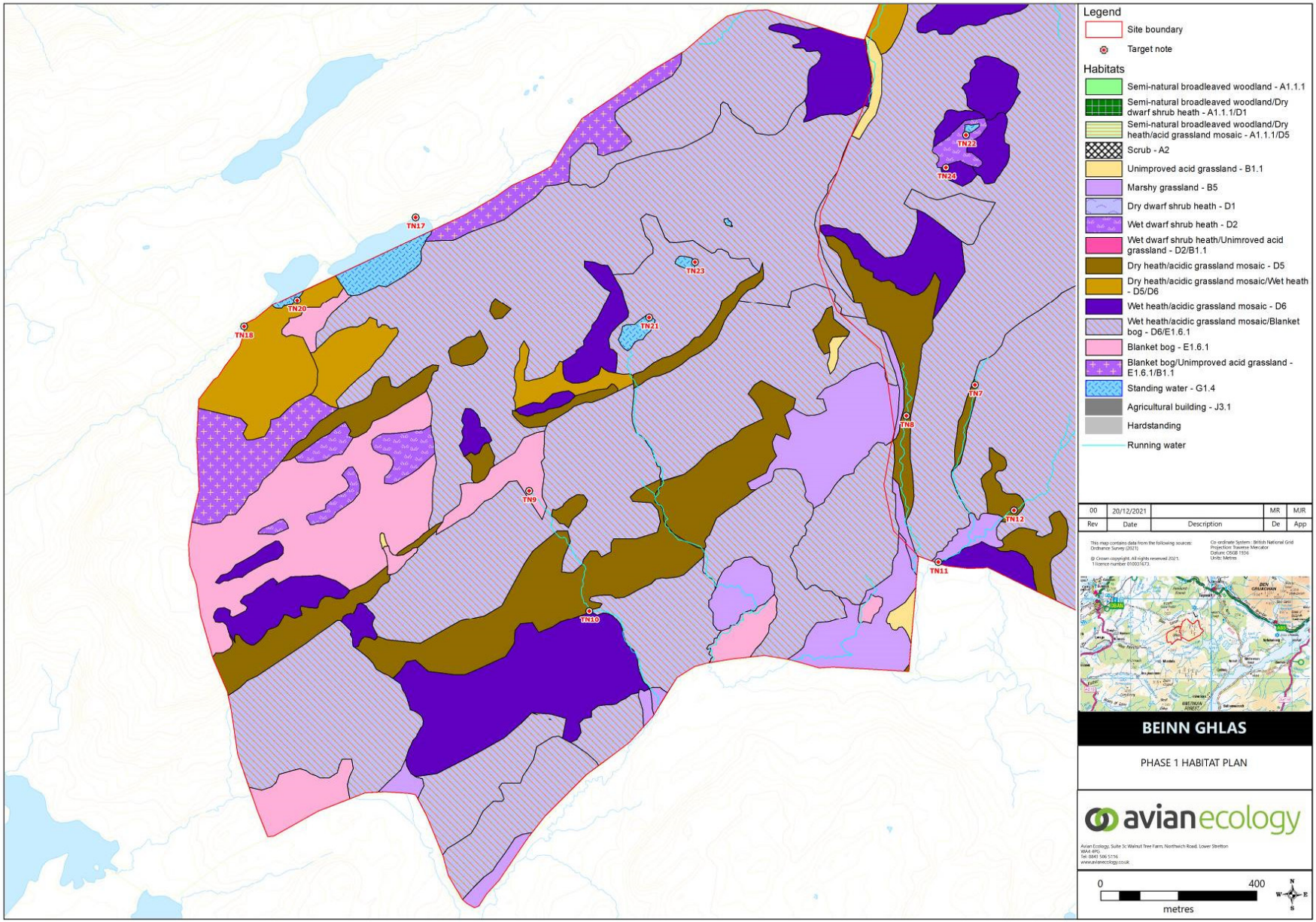


FIGURE 3: PHASE 1 HABITAT PLAN - EAST

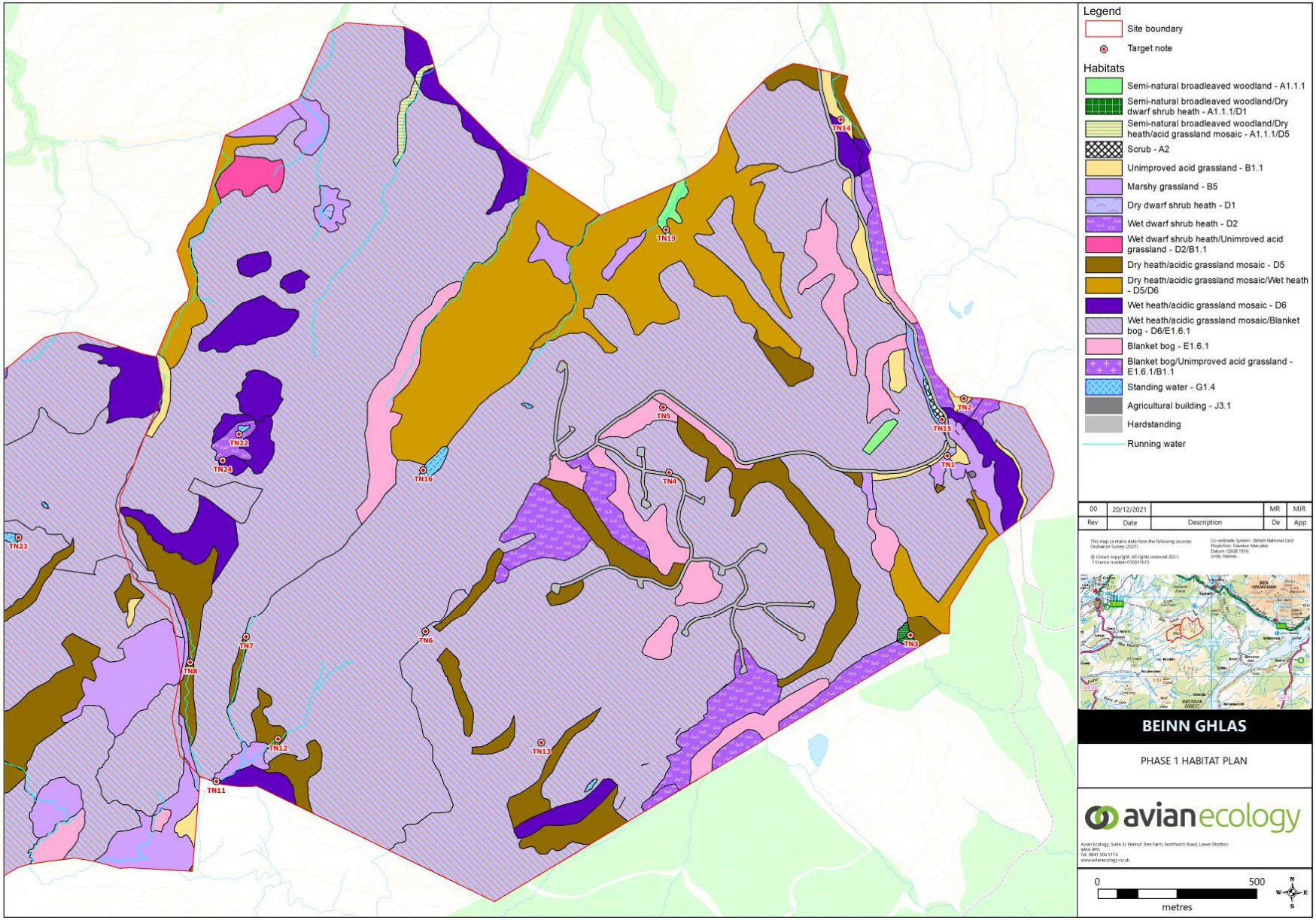


FIGURE 4: NVC SURVEY PLAN - WEST

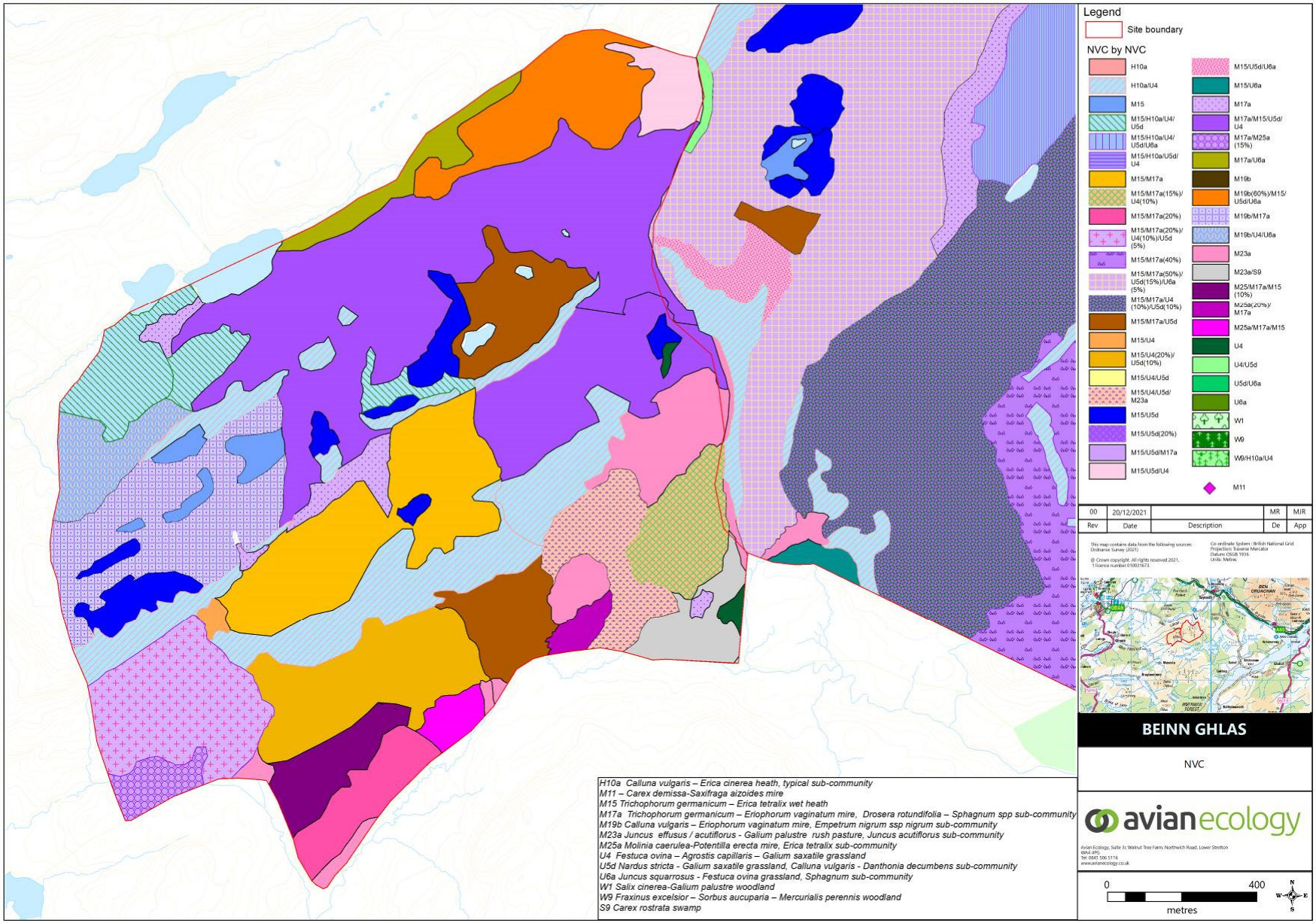
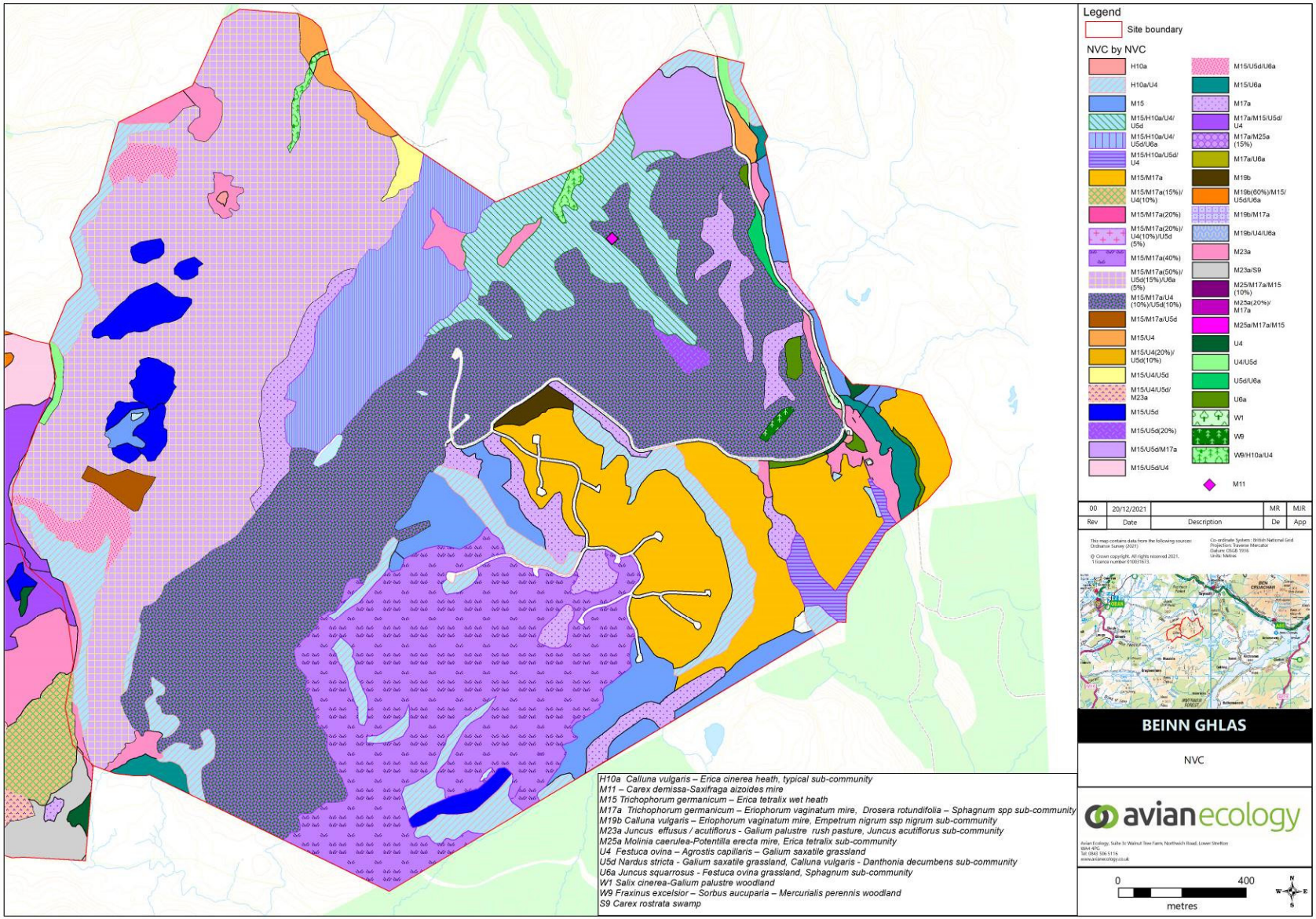


FIGURE 5: NVC SURVEY PLAN - EAST



APPENDIX A – SCIENTIFIC PLANT NAMES

Table A1 Common and scientific names of plant species recorded on site

Common Name	Scientific Name
Acute-leaved bog-moss	*Sphagnum capillifolium*
Alder	*Alnus glutinosa*
Alpine bearberry	*Arctostaphylos alpinus*
Aspen	*Populus tremula*
Autumn hawkbit	*Scorzoneroides autumnalis*
Beech fern	*Phegopteris connectilis*
Bell heather	*Erica cinerea*
Big shaggy-moss	*Rhytidiadelphus triquetrus*
Bilberry	*Vaccininum myrtillus*
Birch	*Betula* spp.
Blunt-leaved bogmoss	*Sphagnum palustre*
Bog asphodel	*Narthecium ossifragum*
Bog bean	*Menyanthes trifoliata*
Bog myrtle	*Myrica gale*
Bog pondweed	*Potamogeton polygonifolius*
Bog-mosses	*Sphagnum* spp.
Bottle sedge	*Carex Rostrata*
Bottle sedge	*Carex rostrata*
Broad buckler fern	*Dryopteris dilitata*
Bulbous rush	*Juncus bulbosus*
Butterwort	*Pinguicula vulgaris*
Carnation sedge	*Carex panicea*
Common bent	*Agrostis capillaris*
Common cottongrass	*Eriophorum angustifolium*
Common eyebright	*Euphrasia nemerosa*
Common haircap moss	*Polytrichum commune*
Common heather	*Calluna vulgaris*
Common milkwort	*Polygala vulgaris*
Common mouse-ear	*Cerastium fontanum*
Common sedge	*Carex nigra*
Common sorrel	*Rumex acetosa*
Common woodrush	*Luzula multiflora*
Common yellow-sedge	*Carex demissa*
Compact bog-moss	*Sphagnum compactum*
Cowberry	*Vaccininum vitis-idaea*

Common Name	Scientific Name
Cow-horn bog-moss	*Sphagnum denticulatum*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Creeping soft-grass	*Holcus mollis*
Creeping willow	*Salix repens*
Creeping willow	*Salix repens*
Crested dog's-tail	*Cynosurus cristatus*
Cross-leaved heath	*Erica tetralix*
Crowberry	*Empetrum nigrum*
Cup lichens	*Cladonia* spp.
Curled hookmoss	*Palustriella commutata*
Deergrass	*Trichophorum germanicum*
Devil's-bit scabious	*Succisa pratensis*
Downy birch	*Betula pubescens*
Dwarf birch	*Betula nana*
Eared willow	*Salix aurita*
Eyebright	*Euphrasia* sp.
Fairy flax	*Linum catharticum*
Feathery bog-moss	*Sphagnum cuspidatum*
Flat-topped bog-moss	*Sphagnum fallax*
Flea sedge	*Carex pulicaris*
Fountain apple-moss	*Philonotis fontana*
Glaucous sedge	*Carex flacca*
Glittering wood-moss	*Hylocomium splendens*
Great wood-rush	*Luzula sylvatica*
Great sundew	*Drosera anglica*
Green-ribbed sedge	*Carex binervis*
Hard fern	*Blechnum spicant*
Hare's-tail cottongrass	*Eriophorum vaginatum*
Heath bedstraw	*Galium saxatile*
Heath dog-violet	*Viola canina*
Heath milkwort	*Polygala serpyllifolia*
Heath plait-moss	*Hypnum jutlandicum*
Heath rush	*Juncus squarrosus*
Heath-grass	*Danthonia decumbens*
Horsetails	*Equisetum* spp.
Lesser spearwort	*Ranunculus flammula*
Little shaggy-moss	*Rhytidiadelphus loreus*
Lodgepole pine	*Pinus contorta*
Marsh bedstraw	*Galium palustre*

Common Name	Scientific Name
Marsh cinquefoil	*Comarum palustre*
Marsh horsetail	*Equisetum palustre*
Marsh lousewort	*Pedicularis palustris*
Marsh saxifrage	*Saxifraga hirculus*
Marsh violet	*Viola palustre*
Marsh willowherb	*Epilobium palustre*
Mat grass	*Nardus stricta*
Meadow buttercup	*Ranunculus acris*
Meadowsweet	*Filipendula ulmaria*
Milkwort	*Polygala* sp.
Papillose bog-moss	*Sphagnum papillosum*
Purple moor-grass	*Molinia caerulea*
Purple spoonwort	*Pleurozia purpurea*
Red fescue	*Festuca rubra*
Red-stemmed feathermoss	*Pleurozium schreberi*
Reindeer lichen	*Cladonia portentosa*
Ribwort plantain	*Plantago lanceolata*
Round-leaved sundew	*Drosera rotundifolia*
Rowan	*Sorbus aucuparia*
Self-heal	*Prunella vulgaris*
Sharp-flowered rush	*Juncus acutiflorus*
Sheep's fescue	*Festuca ovina*
Sheep's sorrel	*Rumex acetosella*
Sitka spruce	*Picea sitchensis*
Slender pondweed	*Potamogeton filiformis*
Soft bog-moss	*Sphagnum tenellum*
Soft rush	*Juncus effusus*
Springy turf-moss	*Rhytidiadelphus squarrosus*
Star sedge	*Carex echinata*
Sundews	*Drosera* spp.
Sweet vernal-grass	*Anthoxanthem odoratum*
Thorn lichen	*Cladonia uncialis*
Tormentil	*Potentilla erecta*
Tufted hair-grass	*Deschampsia cespitosa*
Viviparous sheep's fescue	*Festuca vivipara*
Wavy hairgrass	*Avenella flexuosa*
Whitebeam	*Sorbus aria*
Wild thyme	*Thymus polytrichus*
Woolly fringe moss	*Racomitrium lanuginosum*
Yarrow	*Achillea millefolium*

Common Name	Scientific Name
Yellow saxifrage	*Saxifraga aizoides*
Yorkshire fog	*Holcus lanatus*

APPENDIX B – PHASE 1 HABITAT SURVEY TARGET NOTES

Target Notes presented in **Table A2** should be read with reference to **Figures 2** and **3** and photographs presented in **Appendix D**.

Table A2 Phase 1 Habitat Survey Target Notes.

Target Note	Grid reference	Description	Photographs (see Appendix D)
TN1	NM98674 26043	Burn; 0.7m wide and 0.2m deep, peat-stained water flowing quickly over a bed of small boulders and pebbles, banks of sharp-flowered rush dominated marshy grassland.	1
TN2	NM98734 26220	Old quarry, now with a mix of acid and marshy grassland and with some 5-7m tall crags.	2
TN3	NM98531 25483	Burn; 1.5m wide and 0.25m deep, of peat-stained water flowing rapidly over a bed of boulders, pebbles and bedrock with banks of acid grassland and dry/wet heath. Also, some remnant deciduous trees growing from crags here above the burn, mostly rowan and birch.	3
TN4	NM97798 26032	Recently made monument within the windfarm.	4
TN5	NM97789 26238	Small common cottongrass choked bog pool, approximately 3x4 m. Also small crag with colony of beech fern on it.	5,6
TN6	NM97009 25567	Burn; 1m wide and 0.25m deep of peat-stained water flowing rapidly over a bed of pebbles and small boulders with banks of wet heath.	7
TN7	NM96445 25577	Burn; 1m wide and 0.25m deep of peat-stained water flowing rapidly over a bed of pebbles and small boulders with banks of wet heath and acid grassland.	8
TN8	NM96266 25506	Burn; 1m wide and 0.20m deep of peat-stained water flowing rapidly over a bed of pebbles, small boulders and bedrock with banks of dry heath and acid grassland. Also, in a large, deep, dramatic ravine with very steep slopes, crags clad in dry heath with a small amount of remnant woodland composed of birch and rowan trees with broad buckler fern, hard fern and great wood-rush.	9
TN9	NM95293 25361	Small area of recovering peat hags within bog.	10
TN10	NM95432 25047	Burn; 1m wide and 0.25m deep of peat-stained water flowing quickly over a bed of pebbles, boulders and bedrock with banks of wet heath and acid grassland.	11

Target Note	Grid reference	Description	Photographs (see Appendix D)
TN11	NM96330 25129	Burn; 1m wide and 0.3m deep of peat-stained water flowing quickly over a bed of pebbles, boulders and bedrock with banks of sharp-flowered rush marshy grassland.	12
TN12	NM96530 25252	Large deep gully with large waterfall.	13
TN13	NM97356 25202	Burn; 0.5m wide and 0.2m deep of peat-stained water flowing quickly over a bed of pebbles small boulders with banks of acid and marshy grassland.	14
TN14	NM98390 27116	Steep v-shaped valley with acid grassland, scree slopes, dry heath and some remnant rowan and birch woodland. Burn; 1.5m wide and 0.4m deep of peat-stained water flowing rapidly over a bed of boulders and bedrock with banks of acid and marshy grassland.	15
TN15	NM98662 26157	Burn; 0.5m wide and 0.2m deep of peat-stained water flowing quickly over a bed of pebbles small boulders with banks of acid and marshy grassland.	16
TN16	NM97026 26076	Large lochan, at least 100m x 30 in size, depth unknown, bog pondweed and bog bean present on loch surface, little invertebrate life visible, heavily peat stained.	17
TN17	NM95036 26075	Large loch, roughly 200x 300m in size, depth unknown, little emergent vegetation or invertebrate life visible, heavily peat stained.	18
TN18	NM94584 25816	Burn; 1m wide and 0.2m deep of peat-stained water flowing quickly over a bed of pebbles, small boulders and bedrock with banks of acid grassland and dry heath.	19
TN19	NM97825 26797	Small gullies with remnant patches of birch and rowan woodland.	20
TN20	NM94723 25877	Large loch, roughly 150x 150m in size, depth unknown, little emergent vegetation or invertebrate life visible, heavily peat stained.	21
TN21	NM95621 25789	Large lochan, at least 100m x 30 in size, depth unknown, no emergent plants or invertebrate life visible, heavily peat stained.	22
TN22	NM96453 26217	Small lochan, 50x 30m in size, perhaps 1m deep, mostly emergent common cottongrass.	23
TN23	NM95745 25926	Small lochan, 20x20m in size, 0.5m deep, edges of feathery bog-moss and common cottongrass.	24
TN24	NM96398 26137	Complex of small, shallow bog pools, full of mixed bog-mosses and common cottongrass.	25

APPENDIX C – NVC SURVEY RESULTS

Tables A3 to **A12** below outline DOMIN scales and scores for the NVC survey results.

Table A3 : Dominance (DOMIN) scale

Code	Approximate percentage cover in quadrat
10	>90 %
9	75 – 90 %
8	51 – 75 %
7	34 – 50 %
6	26 – 33 %
5	11 – 25 %
4	5 – 10 %
3	<5 %, many individuals
2	<5 %, a few individuals
1	<5 %, one or two individuals

Table A4 NVC Results Tables - H10a Calluna vulgaris – Erica cinerea heath, typical sub-community

Phase 1 habitat type	Dry dwarf shrub heath (D1) Dry dwarf shrub/acid grassland mosaic (D5)					
NVC Community	H10a *Calluna vulgaris – Erica cinerea* heath, typical sub-community					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM98244 25407	NM95770 25329	NM95127 25327	NM 98028 27037	NM 95172 25732	-
Peat Depth (cm)	10	10	10	10	10	-
Veg height (cm)	20	35	20	30	35	-
Species	**Cover**					**Constancy**
Calluna vulgaris	6	7	6	7	8	**5**
Erica cinerea	6	5	5	5	-	**4**
Pleurozium schreberi	5	7	3	4	3	**5**
Thymus vulgaris	3	-	-	-	-	**1**
Galium saxatile	3	3	-	-	4	**3**
Potentilla erecta	3	4	1	4	3	**5**
Veronica officianalis	3	-	-	3	-	**2**
Dryopteris dilitata	1	-	-	-	2	**2**
Rhytidiadelphus triquetrus	4	5	4	3	5	**5**
Hylocomium splendens	4	5	5	3	3	**5**

Phase 1 habitat type	Dry dwarf shrub heath (D1) Dry dwarf shrub/acid grassland mosaic (D5)					
NVC Community	**H10a *Calluna vulgaris – Erica cinerea* heath, typical sub-community**					
Festuca ovina	4	3	3	3	3	**5**
Polygala vulgaris	3	2	-	3	-	**3**
Blechnum spicant	-	3	-	-	3	**2**
Molinia caerulea	-	3	-	-	-	**1**
Racomitrium lanuginosum	-	-	5	3	-	**2**
Cladonia portentosa	-	-	3	3	-	**2**
Vaccininum myrtillus	-		-	3	3	**2**
Polytrichum commune	-	-		-	5	**1**
Agrostis capillaris	-	-		-	3	**1**
Sphagnum capillifolium	-	-		-	4	**1**
Juncus squarrosus	-	-	1	3	3	**3**
Hypnum jutlandicum	-	-	-	3	-	**1**

Table A5 NVC Results Tables - M15 Trichophorum germanicum – Erica tetralix wet heath

Phase 1 habitat type	Wet dwarf shrub heath (D2) Wet dwarf shrub heath/acid grassland mosaic (D6)					
NVC Community	**M15 *Trichophorum germanicum – Erica tetralix* wet heath**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM98925 25948	NM98408 25503	NM94910 24781	NM 95496 25652	NM 95642 25890	-
Peat Depth (cm)	15	10	15	20	15	-
Veg height (cm)	25	15	20	25	20	-
Species	**Cover**					**Constancy**
Trichophorum germanicum	6	6	7	5	8	**5**
Calluna vulgaris	6	4	3	3	4	**5**
Molinia caerulea	3	3	4	6	3	**5**
Narthecium ossifragum	4	5	4	5	3	**5**
Cladonia portentosa	3	3	3	3	4	**5**
Sphagnum capillifolium	4	3	4	3	4	**5**
Erica tetralix	4	4	3	3	3	**5**
Hypnum jutlandicum	4	3	3	-	-	**3**
Potentilla erecta	3	4	4	3	4	**5**
Racomitrium lanuginosum	5	5	3	5	3	**5**
Juncus squarrosus	4	3	3	-	4	**4**

Phase 1 habitat type	Wet dwarf shrub heath (D2) Wet dwarf shrub heath/acid grassland mosaic (D6)					
NVC Community	**M15 *Trichophorum germanicum – Erica tetralix* wet heath**					
Hylocomium splendens	3	-	3	-	-	**2**
Empetrum nigrum	3	-	-	-	-	**1**
Bare peat	-	4	-	-	5	**2**
Pleurozia purpurea	-	4	-	-	-	**1**
Eriophorum angustifolium	-	3	3	3	3	**4**
Vaccininum myrtillus	-	-	4	-	-	**1**
Nardus stricta	-	-	4	-	4	**2**
Pedicularis vulgaris	-	-	-	-	2	**1**
Carex flacca	-	-	-	-	3	**1**

Table A6 NVC Results Tables - M17a Trichophorum germanicum – Eriophorum vaginatum mire, Drosera rotundifolia – Sphagnum spp sub-community

Phase 1 habitat type	Blanket bog (E1.6.1)					
NVC Community	**M17a *Trichophorum germanicum – Eriophorum vaginatum* mire, *Drosera rotundifolia – Sphagnum spp* sub-community**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM98117 25267	NM97820 25753	NM95140 24622	NM96163 25005	NM 96904 26257	-
Peat Depth (cm)	100+	100+	100+	100+	100+	-
Veg height (cm)	25	25	25	25	30	-
Species	**Cover**					**Constancy**
Eriophorum vaginatum	4	5	4	6	5	**5**
Eriophorum angustifolium	4	3	4	3	3	**5**
Trichophorum germanicum	4	5	5	4	5	**5**
Molinia caerulea	3	3	5	3	3	**5**
Narthecium ossifragum	5	3	5	3	4	**5**
Calluna vulgaris	4	4	4	3	3	**5**
Erica tetralix	4	4	4	3	4	**5**
Sphagnum compactum	5	5	5	-	4	**4**
Sphagnum tenellum	5	-	3	-	-	**2**
Sphagnum cuspidatum	3	4	-	-	4	**3**
Sphagnum capillifolium	4	4	4	5	4	**5**
Sphagnum papillosum	4	5	4	5	6	**5**
Racomitrium lanuginosum	4	-	-	-	-	**1**

Phase 1 habitat type	Blanket bog (E1.6.1)					
NVC Community	**M17a *Trichophorum germanicum – Eriophorum vaginatum* mire, *Drosera rotundifolia – Sphagnum spp* sub-community**					
Nardus stricta	4	-	-	-	-	**1**
Vaccininum myrtillus	-	-	-	3	-	**1**
Potentilla erecta	-	-	-	3	4	**2**
Carex flacca	-	-	-	2	-	**1**

Table A7 NVC Results Tables - M19b Calluna vulgaris – Eriophorum vaginatum mire, Empetrum nigrum ssp nigrum sub-community

Phase 1 habitat type	Blanket bog (E1.6.1)					
NVC Community	**M19b *Calluna vulgaris – Eriophorum vaginatum* mire, *Empetrum nigrum ssp nigrum* sub-community**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM97687 26198	NM85044 25351	NM94783 25579	NM 95999 26322	NM 95743 26267	-
Peat Depth (cm)	100+	100+	100+	100+	100+	-
Veg height (cm)	30	30	35	40	35	-
Species	**Cover**					**Constancy**
Eriophorum vaginatum	5	5	6	6	6	**5**
Eriophorum angustifolium	3	3	3	3	3	**5**
Calluna vulgaris	6	7	6	5	5	**5**
Empetrum nigrum	4	4	4	6	5	**5**
Vaccininum myrtillus	3	3	3	3	4	**5**
Sphagnum capillifolium	4	4	4	-	-	**3**
Ptilium crista-castrensis	4	-	-	-	-	**1**
Sphagnum fallax	5	-	-	-	-	**1**
Sphagnum papillosum	4	-	-	-	-	**1**
Narthecium ossifragum	3	-	-	3	3	**3**
Pleurozium schreberi	4	3	4	4	4	**5**
Hylocomium splendens	4	5	5	5	4	**5**
Rhytidiadelphus triquetrus	3	3	5	4	5	**5**
Polytrichum commune	3	3	3	3	3	**5**
Potentilla erecta	-	3	-	3	3	**3**
Cladonia portentosa	-	3	-	3	-	**2**
Vaccininum vitis-idaea	-	3	3	3	4	**4**
Racomitrium lanuginosum	-	-	4	-	3	**2**

Phase 1 habitat type	Blanket bog (E1.6.1)					
NVC Community	**M19b *Calluna vulgaris – Eriophorum vaginatum* mire, *Empetrum nigrum ssp nigrum* sub-community**					
Molinia caerulea	-	-	-	-	3	**1**
Trichophorum germanicum	-	-	-	-	4	**1**

Table A8 NVC Results Tables - M23a Juncus effusus / acutiflorus - Galium palustre rush pasture, Juncus acutiflorus sub-community

Phase 1 habitat type	Marshy grassland (B5)					
NVC Community	**M23a *Juncus effusus / acutiflorus - Galium palustre* rush pasture, *Juncus acutiflorus* sub-community**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM98426 25938	NM98727 26061	NM96162 25411	NM 97476 26727	NM 96779 27158	-
Peat Depth (cm)	80	30	100+	70	50	-
Veg height (cm)	60	60	70	60	70	-
Species	**Cover**					**Constancy**
Juncus acutiflorus	6	7	8	7	7	**5**
Viola palustris	3	2	3	3	3	**5**
Sphagnum palustre	6	-	-	6	3	**3**
Potentilla erecta	4	3	3	5	4	**5**
Rhytidiadelphus squarrosus	4	4	4	-	-	**3**
Eriophorum angustifolium	3	3	-	3	3	**4**
Sphagnum fallax	5	-	-	7	8	**3**
Galium palustris	4	3	-	4	4	**4**
Carex echinata	3	-	-	-	-	**1**
Festuca ovina	4	4	3	-	-	**3**
Pedicularis palustris	3	-	-	3	4	**3**
Polytrichum commune	3	-	-	4	4	**3**
Hylocomium splendens	5	5	-	-	-	**2**
Carex panicea	3	3	-	-	-	**2**
Scorzoneroides autumnalis	2	-	-	-	-	**1**
Holcus lanatus	3	4	4	3	3	**5**
Ranunculus repens	-	3	4	-	-	**2**
Trifolium repens	-	3	3	-	-	**2**

Phase 1 habitat type	Marshy grassland (B5)					
NVC Community	M23a *Juncus effusus / acutiflorus - Galium palustre* rush pasture, *Juncus acutiflorus* sub-community					
Rumex acetosa	-	3	4	3	-	**3**
Agrostis stolonifera	-	3	4	3	4	**4**
Pleurozium schreberi	-	5	-	-	-	**1**
Cerastium fontanum	-	2	-	-	-	**1**
Plantago lanceolata	-	3	-	-	-	**1**
Achillea ptarmica	-	-	-	-	3	**1**

Table A9 NVC Results Tables - M25a Molinia caerulea-Potentilla erecta mire, Erica tetralix sub-community

Phase 1 habitat type	Blanket bog (E1.6.1)					
NVC Community	M25a *Molinia caerulea-Potentilla erecta* mire, *Erica tetralix* sub-community					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM95045 24560	NM 94702 24627	NM 95065 24493	NM 95417 24683	NM 95821 24975	-
Peat Depth (cm)	100+	100+	100+	100+	100+	-
Veg height (cm)	40	50	50	50	50	-
Species	**Cover**					**Constancy**
Molinia caerulea	9	9	10	10	9	**5**
Potentilla erecta	4	3	3	3	3	**5**
Sphagnum capillifolium	4	3	-	-	3	**3**
Cladonia portentosa	3	-	-	-	3	**2**
Narthecium ossifragum	4	4	-	-	3	**3**
Erica tetralix	3	3	3	-	3	**4**
Trichophorum germanicum	3	-	-	-	-	**1**
Calluna vulgaris	2	5	-	-	-	**2**
Vaccininum myrtillus	2	-	-	-	-	**1**
Racomitrium lanuginosum	4	-	-	-	3	**2**
Hylocomium splendens	-	-	4	3	4	**3**
Pleurozium schreberi	-	-	4	5	3	**3**
Hypnum jutlandicum	-	-	-	-	3	**1**

Table A10 NVC Results Tables - U4 Festuca ovina – Agrostis capillaris – Galium saxatile grassland

Phase 1 habitat type	Unimproved acid grassland (B1.1) Dry dwarf shrub/acid grassland mosaic (D5)					
NVC Community	**U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM98317 25503	NM95963 25432	NM95730 25307	NM96244 25004	NM 97180 27237	-
Peat Depth (cm)	10	15	15	20	10	-
Veg height (cm)	5	15	5	5	10	-
Species	**Cover**					**Constancy**
Agrostis capillaris	5	5	5	5	5	**5**
Galium saxatile	6	6	5	5	4	**5**
Luzula multiflora	3	3	3	3	3	**5**
Viola canina	3	3	2	3	-	**4**
Pleurozium schreberi	4	3	3	3	5	**5**
Rhytidiadelphus squarrosus	5	3	4	4	5	**5**
Hylocomium splendens	4	5	5	5	5	**5**
Potentilla erecta	4	4	3	3	3	**5**
Festuca ovina	4	4	3	3	3	**5**
Anthoxanthem odoratum	4	4	4	4	3	**5**
Danthonia decumbens	3	2	-	-	-	**2**
Nardus stricta	4	-	-	-	-	**1**
Carex demissa	4	4	3	-	3	**4**
Carex panicea	3	2	2	-	-	**3**
Cerastium fontanum	2	-	-	2	-	**2**
Eriophorum angustifolium	3	-	-	-	-	**1**
Calluna vulgaris	-	3	-	-	4	**2**
Plantago lanceolata	-	-	3	-	3	**2**
Achillea millefolium	-	-	3	3	-	**2**
Festuca vivipara	-	-	3	-	-	**1**
Veronica officianalis	-	-	3	-	-	**1**
Trifolium repens	-	-	3	-	-	**1**
Ranunculus repens	-	-	-	4	-	**1**
Rumex acetosa	-	-	-	4	-	**1**
Bellis perennis	-	-	-	-	3	**1**
Thymus vulgaris	-	-	-	-	3	**1**

Table A11 NVC Results Tables - U5d Nardus stricta - Galium saxatile grassland, Calluna vulgaris - Danthonia decumbens sub-community

Phase 1 habitat type	Unimproved acid grassland (B1.1) Dry dwarf shrub/acid grassland mosaic (D5)					
NVC Community	U5d *Nardus stricta - Galium saxatile* grassland, *Calluna vulgaris - Danthonia decumbens* sub-community					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM96985 25575	NM 96548 26234	NM95521 25306	NM 96166 26407	NM 98315 27059	-
Peat Depth (cm)	10	10	15	15	20	-
Veg height (cm)	20	20	20	25	25	-
Species	**Cover**					**Constancy**
Nardus stricta	6	7	8	8	7	**5**
Carex demissa	5	4	3	-	-	**4**
Carex panicea	4	3	3	-	-	**3**
Potentilla erecta	4	3	4	4	4	**5**
Erica cinerea	4	3	3	-	5	**4**
Racomitrium lanuginosum	4	3	-	-	3	**3**
Hylocomium splendens	5	5	3	4	4	**5**
Pleurozium schreberi	5	4	3	4	4	**5**
Calluna vulgaris	3	3	-	3	3	**4**
Polygala vulgaris	3	3	-	3	3	**4**
Danthonia decumbens	3	3	-	-	3	**3**
Agrostis capillaris	3	3	3	4	4	**5**
Galium saxatile	3	3	3	3	3	**5**
Trichophorum germanicum	3	3	3	3	4	**5**
Pedicularis vulgaris	-	3	-	-	2	**2**
Polytrichum commune	-	4	-	3	-	**2**
Vaccininum myrtillus	-	4	3	4	3	**4**
Festuca ovina	-	3	3	3	4	**4**
Hypnum jutlandicum	-	4	-	3	3	**3**
Rhytidiadelphus squarrosus	-	3	4	4	3	**4**
Juncus squarrosus	-	-	4	-	3	**2**
Festuca vivipara	-	-	3	-	3	**2**

Table A12 NVC Results Tables - U6a Juncus squarrosus - Festuca ovina grassland, Sphagnum sub-community

Phase 1 habitat type	Unimproved acid grassland (B1.1) Dry dwarf shrub/acid grassland mosaic (D5)					
NVC Community	**U6a *Juncus squarrosus - Festuca ovina* grassland, *Sphagnum* sub-community**					
Quadrat	Q1	Q2	Q3	Q4	Q5	-
OS Grid Coordinates	NM96427 25694	NM 98878 26010	NM 98902 25901	NM 98714 26035	NM 98480 25991	-
Peat Depth (cm)	25	30	20	20	20	-
Veg height (cm)	25	25	30	25	30	-
Species	**Cover**					**Constancy**
Juncus squarrosus	6	6	6	7	6	**5**
Sphagnum capillifolium	4	3	-	3	-	**3**
Sphagnum fallax	3	3	-	-	-	**2**
Polytrichum commune	4	7	7	7	7	**5**
Rhytidiadelphus triquetrus	5	5	4	5	6	**5**
Pleurozium schreberi	4	4	5	4	4	**5**
Hylocomium splendens	5	5	4	4	4	**5**
Vaccininum myrtillus	3	3	-	3	3	**4**
Nardus stricta	4	5	4	5	5	**5**
Eriophorum angustifolium	3	3	3	-	-	**3**
Vaccininum vitis-idaea	3	3	-	-	-	**2**
Potentilla erecta	4	4	4	3	3	**5**
Galium saxatile	3	3	3	3	3	**5**
Festuca ovina	-	3	3	3	-	**3**
Holcus lanatus	-	-	3	3	-	**2**
Molinia caerulea	-	-	3	-	3	**2**

APPENDIX D – PHOTOGRAPHS

Phase 1 Target Notes	
	**Photo 1** **TN1**
	**Photo 2** **TN2**

	**Photo 3** **TN3**
	**Photo 4** **TN4**

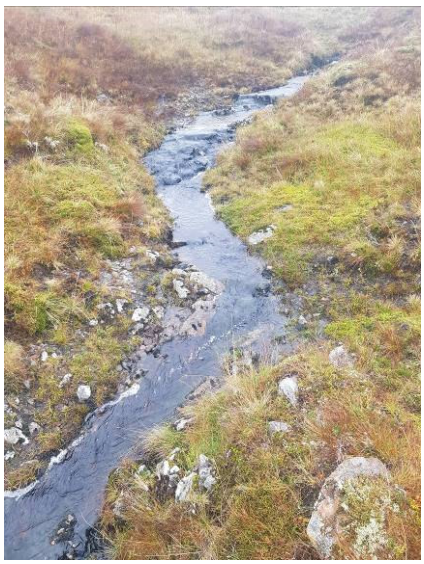
	**Photo 5** **TN5**
	**Photo 6** **TN5**
	**Photo 7** **TN6**

	**Photo 8** **TN7**
	**Photo 9** **TN8**

	**Photo 10** **TN9**
	**Photo 11** **TN10**

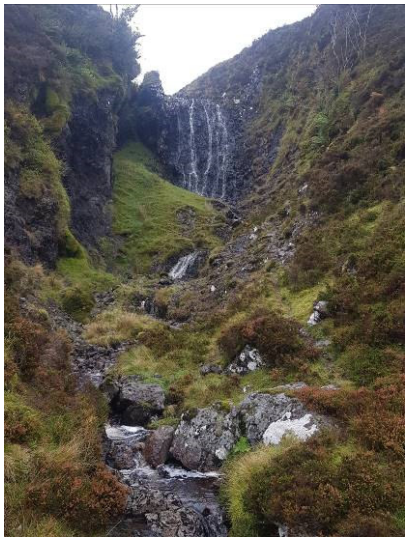
	**Photo 12** **TN11**
	**Photo 13** **TN12**
	**Photo 14** **TN13**

	**Photo 15** **TN14**
	**Photo 16** **TN15**

	**Photo 17** **TN16**
	**Photo 18** **TN17**
	**Photo 19** **TN18**

	**Photo 20** **TN19**
	**Photo 21** **TN20**
	**Photo 22** **TN21**

	**Photo 23** **TN22**
	**Photo 24** **TN23**
	**Photo 25** **TN24**

NVC Communities	
	**Photo 26** H10a (right side on steep slope)
	**Photo 27** M6

	**Photo 28** M11
	**Photo 29** **M15** (foreground)
	**Photo 30** M17a

	**Photo 31** M15 / M17a mosaic
	**Photo 32** M19b
	**Photo 33** M23a

	**Photo 34** M23a / M6d
	**Photo 35** M25a

	**Photo 36** M37
	**Photo 37** U4

	**Photo 38** U5a
	**Photo 39** U6a
	**Photo 40** W1