Glen Fruin Blairnairn

Habitat Surveys to Inform Woodland Planting

Produced for RDS Forestry Ltd

By Applied Ecology Ltd

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1 Introduction

Background

1.1 In January 2022, Applied Ecology Ltd (AEL) was commissioned by RDS Forestry Ltd to carry out habitat surveys of land at Blairnairn in Glen Fruin, Argyll and Bute ("the Site"). A plan showing the location of the Site is provided in **Figure 1.1**.

1.2 The study was required in order to determine the likely habitat constraints associated with afforestation proposals ("the Development") within the Site boundary.

Purpose of this report

1.3 This report provides details relating to habitat surveys undertaken for the Site in July 2022. It includes a summary of the methodologies employed, a description of the Site's habitats, and a summary of the opportunities and constraints presented by these, in particular the potential presence of groundwater dependent terrestrial ecosystems (GWDTEs) as defined by SEPA[1], and other habitats of conservation importance.

Report qualification

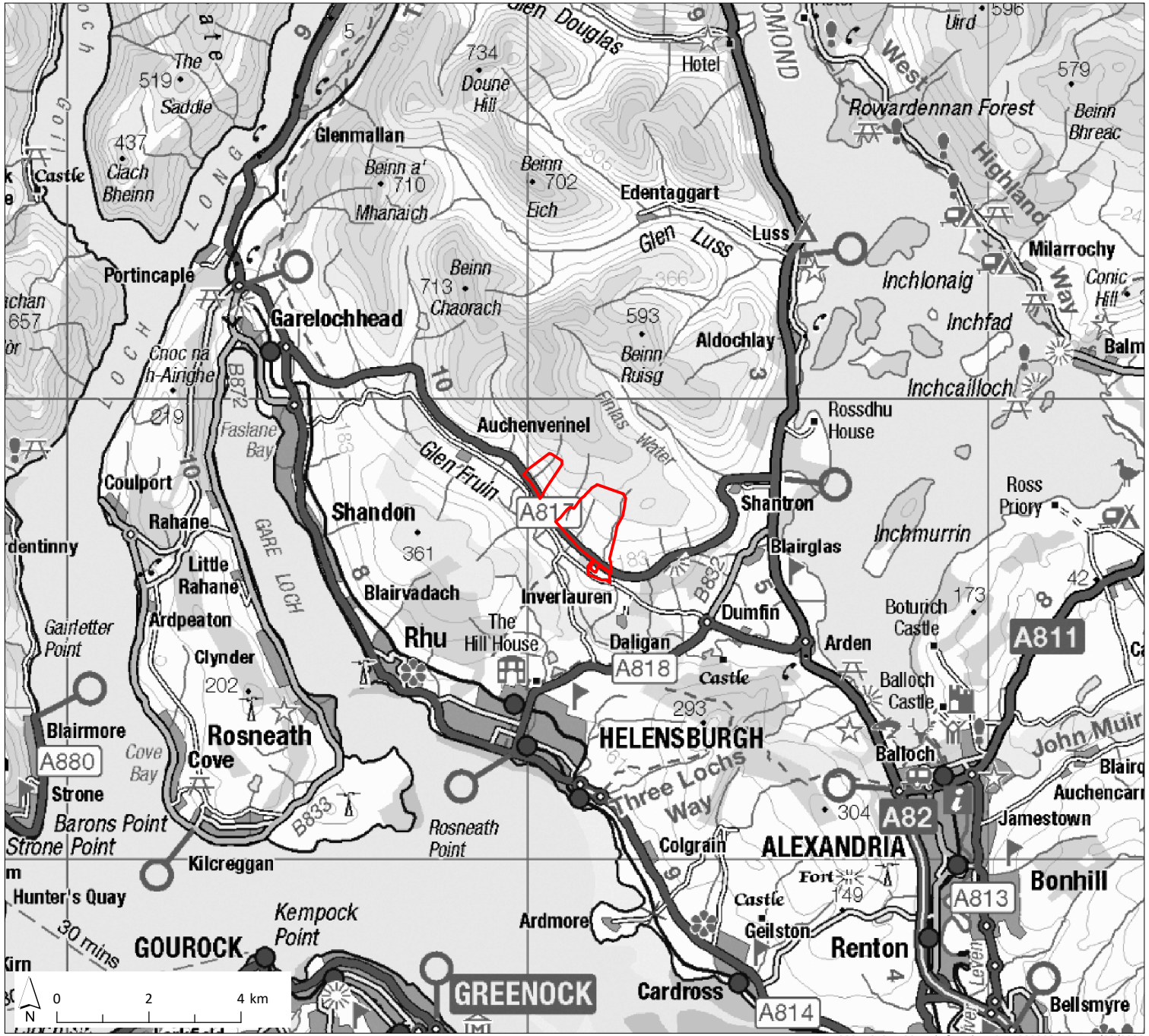
1.4 The surveys described here were undertaken in accordance with the best practice methodologies current at the time of commissioning. Site circumstances, scientific knowledge or methodological requirements can change during the course of a project, and these external factors may impact on the scope of subsequent work requirements.

1.5 All survey work and reporting was undertaken by experienced and qualified ecologists in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM) and BS 42020:2013 (Biodiversity).

1.6 All ecological surveys have an expected validity period, owing to the tendency of the natural environment to change over time. This validity period varies from feature to feature, and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the Site, this is highlighted in the appropriate section.

1.7 This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.

[1] **SEPA (2017)** *Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. 11 September 2017.



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Glen Fruin Blairnairn

Site Location

Site boundary

Figure 1.1

Map Scale @ A4: 1:125,000

Surveyed by: -	
Survey date: -	
Drawn by: RAH	
Checked by: KD	
Status: Final	

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2 Methodology

Scottish EUNIS

2.1 NatureScot has now adopted EUNIS, the European Nature Information System, as the standard habitat classification scheme for terrestrial habitat data and mapping in Scotland[2]. As a result, the old JNCC Phase 1 Habitat Survey (JNCC, 2010[3]) is being phased out, to be replaced by the new Scottish EUNIS system. The initial habitat survey of the Site was therefore undertaken between 05-07 and 14 July 2022 using Scottish EUNIS, during which all habitats present within the Site and a 100 m buffer of this were classified and mapped according to the standard EUNIS categories. Target notes were used to describe areas of both typical and unique botanical character. Habitat patches were mapped as polygon features, and if sufficient space on the map linear features (such as walls and fences) as lines where this provided added value. Point features were recorded where there were notable isolated trees or scrub. Plant species abundance was noted using the DAFOR[4] system, and the minimum mappable unit (MMU) was 10 x 10 m except where features marked on the base map allowed mapping to be more precise.

2.2 The habitat map was subsequently digitised using GIS.

2.3 The standard habitat survey approach was "extended" to include a search for evidence of or potential for the presence of protected species or species of nature conservation interest within and close to the Site. This was not a detailed survey for such species, but included noting the presence of habitats suitable to support specific protected species, and where seen, any evidence of presence such as droppings, mammal tracks and footprints, shelters (or nests/roosts), hair caught on fence-wire, foraging signs, and so on.

2.4 The survey was carried out in dry and bright conditions.

National Vegetation Classification

2.5 Following the classification of the Site's habitats using the Level 3 Scottish EUNIS categories, a National Vegetation Classification (NVC) survey was also undertaken on 07 and 14 July 2022 by experienced AEL botanists, for those habitats considered likely to be GWDTEs or habitats of conservation importance. The methodology adopted followed that outlined in Rodwell 2006[5], by which all habitats present within the Site were classified and mapped according to standard categories. NVC communities were allocated to stands based either

[2] **Strachan, I.M. (2017)** *Manual of terrestrial EUNIS habitats in Scotland*. Version 2. Scottish Natural Heritage Commissioned Report No. 766.

[3] **JNCC (2010)** *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*. JNCC, Peterborough.

[4] DAFOR: whereby species occurrence may be classified as being **d**ominant, **a**bundant, **f**requent, **o**ccasional or **r**are. Rare in the context of a DAFOR score should not be confused with species rarity in the more widely accepted meaning of general scarcity.

[5] **Rodwell, J.S. (2006)** *National Vegetation Classification: User's handbook*. JNCC, Peterborough.

on professional experience and judgement, or following consultation of the standard British Plant Communities texts (volumes 1[6] and 3[7]).

2.6 The survey was carried out in dry and bright conditions.

2.7 The NVC map was subsequently digitised using GIS.

Nomenclature

2.8 Higher plant vernacular and scientific names are given on the first usage of the species name, with the scientific name given in italics based on those given in Stace (2019)[8]. Moss nomenclature follows that given by Smith (2004)[9], and for liverworts that given by Paton (1999)[10], using only the scientific names as common names for mosses and liverworts are not yet well-established. Nomenclature for lichens follows that given by Smith *et al*. (2009)[11].

2.9 The exception to this nomenclature is the usage of the NVC, where the community names given by Rodwell based on Flora Europaea (Tutin *et al*., 1964)[12] have been adopted.

Potential limitations of the habitat surveys

2.10 Access permissions were provided for the whole Site, but cattle were roaming freely over the eastern section of the Site, which prevented close inspection of much of that ground. The far eastern strip of habitats was observed where necessary through binoculars, and land within the 100 m buffer was checked from the Site boundary, but this was in sufficient proximity that a habitat classification code could be allocated. Given the general overall character of the Site, and the fact that the purpose of the survey was not to provide a botanical audit, this did not represent a significant limitation to the conclusions of the investigation except with regard to the potential presence of very small-scale flush habitats, and the potential implications of this are discussed later in the report.

2.11 The survey was conducted within the core botanical flowering period, meaning that the vast majority of flowering species were conspicuous. There were therefore no seasonality limitations associated with the work.

2.12 It should however be recognised that the NVC is a classification scheme and not a survey technique *per se*. The allocation of predefined community types to stands of vegetation types can be subjective, as the enormous variation present in the UK vegetation cannot be reliably described by the limited number of samples used to derive the NVC system. Due to this variation, its value as a tool for establishing spatial habitat change over time is also

[6] **Rodwell, J.S. (ed.) (1991)** *British Plant Communities, Vol. 1: Woodland and Scrub*. Cambridge University Press, Cambridge.

[7] **Rodwell, J.S. (ed.) (1992)** *British Plant Communities, Vol. 3: Grasslands and montane communities*. Cambridge University Press, Cambridge.

[8] **Stace, C.A. (2019)** *New Flora of the British Isles*. 4th edition. C&M Floristics, UK.

[9] **Smith, A.J.E. (2004)** *The Moss Flora of Britain and Ireland.* 2nd edition. Cambridge University Press, Cambridge.

[10] **Paton, J.A. (1999)** *The Liverwort Flora of the British Isles*. Harley Books, Colchester.

[11] **Smith, C.W., Aptroot, A., Coppins, B.J., Fletcher, A., Gilbert, O.L., James, P.W. & Wolseley, P.A. (eds) (2009)** *The Lichens of Great Britain and Ireland. British Lichen Society*, London.

[12] **Tutin, T.G., Heywood, V.H., Burges, N.A., Valentine, D.H., Walters, S.M. & Webb, D.A. (1964)** *Volume 1. Lycopodiaceae to Platanaceae. Flora Europaea*. Cambridge University Press, Cambridge.

limited. However, it can be used as an indication of the type and extent of vegetation communities within a site, as a springboard for discussions regarding a site's relative conservation value, and for the identification of habitats of conservation interest where such schemes have been based on the NVC, for example GWDTEs.

3 Results

3.1 The Scottish EUNIS map for the Site and its 100 m buffer is shown in **Figure 3.1** and the associated NVC/GWDTE map in **Figure 3.2**. Habitats considered to overlap with Annex 1 types are summarised in **Figure 3.3**, and **Figure 3.4** shows the location of habitat patches which contained areas of NVC communities with notable conservation importance and which fell below the MMU adopted for the survey. A summary of the habitats recorded within just the Site is provided in **Table 3.1** below, and a selection of survey photographs can be found in **Figure 3.5**.

3.2 The Site comprised three main sections, two of which were north of the A817, and a smaller area to the south. The larger areas north of the road comprised a complex mosaic of upland pastures and bracken-dominated habitats, encircling narrow strips of native woodland along an unnamed burn above Blairnairn in the north, and the Chapel Burn in the south. Ground above Blairnairn that had historically planted with commercial conifers had been felled, and sheep and cattle grazing occurred throughout.

Table 3.1: Summary of habitat types recorded on the Site.

Habitat types	Area within Site (ha)	% of Site
D1.2: Blanket bog	3.42	1.7
E1.72/E3.52: Agrostis/Festuca/J. squarrosus grassland	15.67	7.6
E1.72/F3.15: Agrostis/Festuca grassland/gorse scrub	0.98	0.5
E1.72: Agrostis/Festuca grassland	14.49	7.0
E2.1: Abandoned pasture	14.64	7.1
E3.41/F3.15: Humid meadows/gorse scrub	6.92	3.4
E3.41/G1.9: Humid meadow with silver birch	0.42	0.2
E3.41: Humid meadows	28.92	13.6
E3.42: *Juncus acutiflorus* meadows	50.68	24.6
E3.51/E1.72: *Molinia/Festuca/Agrostis* meadows	10.11	4.9
E3.51/E3.52: *Molinia/J. squarrosus* meadow	5.09	2.5
E3.51: Purple moor-grass meadows	18.89	9.2
E5.1: Tall ruderal	0.22	0.1
E5.31: Bracken fields	18.77	9.1
F3.15: Gorse thickets	0.07	< 0.0
G1.2: Mixed riparian woodland	2.21	1.1
G1.A: Mixed broadleaved woodland	0.33	0.2
G5.8: Recently felled areas	11.64	5.7
H5.3: Bare ground	0.41	0.2
J4: Roads, paths and other hard standing	0.42	0.2
Total	**205.71**	**100.0**

Grasslands

3.3 The vast majority of the open hill comprised a complex mosaic of upland grassland types, which could not easily be subdivided clearly. The eastern part of the Site was characterised by wet grassland types, variously dominated by one or more of Yorkshire fog *Holcus lanatus*, soft rush *Juncus effusus*, sharp-flowered rush *Juncus acutiflorus* or purple moor-grass *Molinia caerulea*, but these frequently formed mosaics with drier upland grasslands types.

3.4 Generally speaking, those areas dominated by soft rush were classified as being **humid meadows**. In terms of the NVC, these were either areas of **M23b *Juncus effusus/acutiflorus* - *Galium palustre* rush-pasture, the *Juncus effusus* sub-community**, or **MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture, the typical sub-community**. With respect to the M23b habitats, these were usually tall swards overwhelmingly dominated by soft rush, sometimes to the exclusion of almost any other species. In the more diverse swards, herb species such as marsh bedstraw *Galium palustre*, marsh thistle *Cirsium palustre*, common sorrel *Rumex acetosa* and creeping buttercup *Ranunculus repens* were present, and there were occasional plants of tufted hair-grass *Deschampsia cespitosa*. Areas which were overwhelmingly composed solely of soft rush were simply categorised as "Je", as per the approach adopted by a number of botanical surveyors in Scotland[13].

3.5 The MG10a category was used where the soft rush was reduced to distinct tufts within a shorter grassland sward dominated by Yorkshire fog and crested dog's-tail *Cynosurus cristatus*. These areas had clearly been grazed, and herb species were limited to creeping buttercup and meadow buttercup *Ranunculus acris*, white clover *Trifolium repens*, common sorrel *Rumex acetosa* and curled dock *R. crispus*.

3.6 The other humid meadow type was that which was dominated by tufted hair-grass, referenceable to **MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland, the *Poa trivialis* sub-community** in the NVC. In these area, the tufted hair-grass was conspicuously dominant, or co-dominant with Yorkshire fog, with frequent soft rush, occasional common bent *Agrostis capillaris* and red fescue Festuca rubra, and frequent creeping buttercup. Occasional other forbs occurred, such as common sorrel and ribwort plantain *Plantago lanceolata*, but these were generally relatively species-poor.

3.7 The rush pastures dominated by sharp-flowered rush were generally allocated to the **M23a *Juncus effusus/acutiflorus* - *Galium palustre* rush-pasture, the *Juncus acutiflorus* sub-community.** This included areas which were overwhelmingly composed solely of sharp-flowered rush, which some users of the NVC in Scotland simply call "Ja". Generally however, the M23a swards were considerably more species-rich than the M23b areas, supporting a wide range of herb species such as marsh thistle, marsh bedstraw, creeping buttercup, common sorrel, greater bird's-foot trefoil *Lotus pedunculatus*, tufted forget-me-not *Myosotis laxa*, and, interestingly, frequent whorled caraway *Trocdaris verticillata*. *Dactylorhiza* orchids were also found in these areas. Flush communities also frequently occurred within these M23a areas (see below).

[13] [13] **Averis, B. and Averis, A (2000)** *Plant Communities Found in Surveys by Ben and Alison Averis But Not Described in the UK National Vegetation Classification*. Unpublished paper available online.

3.8 **Purple moor-grass meadows** occurred throughout the Site, scattered amongst the bracken habitats in the east, and in larger patches in the west. Purple moor-grass tended to be the dominant species in these areas, and in isolation these were relatively species-poor communities, classifiable as **M25a *Molinia caerulea – Potentilla erecta* mire, the *Erica tetralix* sub-community** in the NVC. Where the M25a formed a mosaic with other communities, the accompanying species were dependent on the other habitats within the mosaic.

3.9 The drier grassland types within the Site tended to occur above the 200 m contour. Most frequently, these were ***Agrostis/Festuca* grasslands** classifiable as **U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland** in the NVC. In these areas, a number of other grass species accompanied the common bent and sheep's fescue *Festuca ovina*, including sweet vernal grass *Anthoxanthum odoratum* and wavy hair-grass *Deschampsia flexuosa*. The diversity of herb species was dependent on the soil depths but tended to include abundant heath bedstraw *Galium saxatile* and tormentil, as well as common milkwort *Polygala vulgaris*, eyebrights *Euphrasia* agg., heath woodrush *Luzula multiflora* and scattered bracken *Pteridium aquilinum*.

3.10 However, these U4 grasslands frequently formed an intricate mosaic with areas dominated by heath rush *Juncus squarrosus*, referenceable to **U6 *Juncus squarrosus – Festuca ovina* grassland** in the NVC. In these areas, wavy hair-grass was also often abundant, as well as sheep's fescue and heath bedstraw. Tormentil was constant throughout, and heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus* were occasional.

3.11 A small area of **perennial calcareous grassland** was recorded outwith the western part of the Site but within the 100 m survey buffer (and therefore shown in **Figure 3.4** but not summarised in **Table 3.1**). This was a short turf area dominated by sheep's fescue and common bent with abundant common thyme *Thymus drucei*. Mat grass *Nardus stricta*, sweet vernal-grass, white clover *Trifolium repens*, field woodrush *Luzula campestris*, fairy flax *Linum catharticum* and carnation sedge *Carex panicea* were also found here, and rarely lady's-mantle *Alchemilla glabra*. It is described here because this community would be referenceable to **CG10a *Festuca ovina – Agrostis capillaris – Thymus praecox* grassland, the *Trifolium repens – Luzula campestris* sub-community**, and it is possible that very small extents of this habitat could have been present elsewhere within the Site but not within ground that was directly walked.

3.12 The final type of grassland within the mosaic was that dominated by Yorkshire fog, either in isolation, or co-dominant with sweet vernal-grass, fescue species and/or common bent. These areas were classified as being **abandoned pasture** in Scottish EUNIS, although they are not well-described in the NVC, as noted by other practitioners in Scotland[14]. These were either mapped as "*Holcus lanatus* grassland" ("Hlan"), or as "*Holcus – Festuca – Anthoxanthum grassland"*, rather than forcing the habitat into a defined NVC type.

3.13 Much of the western part of the Site, and patches of the eastern section were conspicuously dominated by bracken, although it was considered possible that earlier in the year vernal species would be identifiable in these areas before becoming out-shaded by

[14] **Averis, B. and Averis, A (2000)** *Plant Communities Found in Surveys by Ben and Alison Averis But Not Described in the UK National Vegetation Classification*. Unpublished paper available online.

the bracken canopy. They were classified in EUNIS as being bracken fields, and were referenceable to **U20 *Pteridium aquilinum – Galium saxatile* community** in the NVC.

3.14 Around the hard standing at the entrance to the eastern part of the Site there was a **tall ruderal** community dominated by common nettle *Urtica dioica* and Yorkshire fog, with hogweed *Heracleum sphondylium* and creeping thistle *Cirsium arvense*. This small habitat patch was referenceable to **OV24a *Urtica dioica – Galium aparine* community** in the NVC, the typical sub-community.

Peatlands and flushes

3.15 Peatland habitats occurred throughout the Site, to a greater or lesser extent. However, there were a few areas in the eastern section of the Site where more extensive peat deposits had formed, and where consequently **blanket bog** habitat was recorded. These were all located above the 200 m contour, in pockets of ground with lower gradients. More extensive areas of peatland habitat occurred outwith the Site boundary.

3.16 The blanket bogs recorded within the Site were on relatively shallow peat, and as the vegetation was dominated by hare's-tail cottongrass *Eriophorum vaginatum*, these were classified as being examples of the **M20 *Eriophorum vegetation* blanket and raised mire** NVC community. A number of grass species also occurred, such as purple moor-grass, wavy hair-grass and sweet vernal-grass, and heather and deergrass also occurred occasionally between the cottongrass tussocks. Tormentil, heath bedstraw, bog asphodel and bilberry were all locally frequent, and there were occasional patches of *Sphagnum palustre* and *S. capillifolium*, although in some locations *Polytrichum commune* was the most abundant bryophyte. These areas are highlighted in **Figure 3.3**.

3.17 A number of areas within the Site, often below the 200 m contour and within both sharp-flowered rush and acid grassland habitats, contained very small-scale basic flush habitats which were generally referenceable to **M10a *Carex dioica – Pinguicula vulgaris* mire**. These were often less than 0.5 m wide and generally occurred over a stony substrate. Various sedge species were noted here, including star sedge, common sedge *C. nigra* and carnation sedge *C. panicea*. Purple moor-grass was occasional, but common butterwort *Pinguicula vulgaris* was conspicuous, along with bog asphodel, tormentil, devil's-bit scabious *Succisa pratensis*, and a range of brown mosses and *Sphagnum* species. These habitats fell below the MMU for the survey, but were target noted wherever they were encountered. As shown in **Figure 3.4**, these areas were more often found in the west of the Site.

Woodlands and scrub

3.18 Approximately 4 ha of the Site was recorded as being under woodland at the time of the survey. The majority of this was the **mixed riparian woodland** that ran up the Chapel Burn and the unnamed burn above Blairnairn. These areas were dominated by a mix of silver birch *Betula pendula* and occasional downy birch *B. pendula*, goat willow *Salix caprea*, hazel *Corylus avellana* and rowan *Sorbus aucuparia*. The cleuchs in which the burns flowed were generally steep-sided, with abundant ferns (e.g. hard fern *Blechnum spicant* and male fern *Dryopteris felix-mas*), foxglove *Digitalis purpurea* and the moss *Polytrichum formosum*.

There were occasional grassy glades or ledges, with sweet vernal-grass *Anthoxanthum odoratum*, wavy hair-grass and Yorkshire fog, as well as scattered soft rush, creeping buttercup and beaked hawk's-beard *Crepis vesicaria*.

3.19 Along the margins of the A817, there were broad-leaved species of tree, including sycamore *Acer pseudoplatanus*, as well as willows *Salix* sp. which may have been self-seeded. This narrow strip was classified as being **mixed broad-leaved woodland**, although in reality it was little more than a line of trees and scrub.

3.20 Through the centre of the western part of the Site, coniferous plantation either side of the burn had been **recently felled**, as well as a small coupe in the far south of the Site. Foxglove and soft rush dominant amongst the remnant stumps and brash, with occasional bracken, bramble *Rubus fruticosus* agg., star sedge *Carex echinata*, toad rush *Juncus bufonius*, purple moor-grass, tormentil and heath bedstraw. Small watercourses ran through the area, with some stagnant pools of water supporting duckweed *Lemna minor* and broad-leaved pondweed *Potamogeton natans*.

3.21 Parts of the eastern section of the Site, notably those below the 200 m contour, supported small patches of **gorse thicket**, often in a mosaic with one or more of the grassland types describe above. Here, gorse *Ulex europeaus* formed a canopy over the pasture, and was the only shrub species present.

3.22 The small part of the Site situated south of the A817 also supported areas of **broad-leaved plantation woodland** and a **conifer plantation**. The former of these contained young trees of oak, birch, rowan and willow, planted along a watercourse. The upper section of this plantation also had dense stands of bracken.

Other habitats

3.23 Just under 0.5 % of the Site comprised either **bare ground**, or **roads, tracks and other areas of hard standing**.

Non-native plant species

3.24 No stands of notable invasive non-native species (INNS) such as Japanese knotweed *Reynoutria japonica* or giant hogweed *Heracleum mantegazzianum* were seen during the survey.

Faunal signs and potential

3.25 No dedicated faunal surveys were undertaken as part of this survey, but a range of signs of or potential for protected species were noted.

3.26 Both of the burns within the parts of the Site north of the A817 had suitability for **otter** foraging, and possibly also as commuting features if animals were transiting between watersheds. No optimal habitat for **water vole** was noted, as the majority of the watercourses were either too deep and fast-flowing for this species, or were stony and shallow, and did not offer good opportunities for bankside burrow creation.

3.27 The majority of trees within the Site were small and did not offer optimal roosting features for **bats**. However, it was considered likely that bats would be foraging over much of the Site given the likelihood that it supported good habitats for prey invertebrates.

3.28 There was no suitability for **red squirrel** within the wooded areas north of the A817, and also no ground with suitability for **badger** sett creation. Habitats suitable for **reptiles** were widespread across the Site, including for shelter, hunting, basking and hibernation. A common lizard was seen during the habitat surveys. There was however no suitable breeding ponds for specially protected **amphibians** such as great crested newt, neither on the Site nor within relevant buffers of it.

3.29 Dedicated **bird** surveys have been commissioned for the Site and are reported elsewhere.

Glen Fruin Blairnairn

Scottish EUNIS Habitat Map

Site boundary

Habitat types:

- D1.2: Blanket bog
- E1.2: Perennial calcareous grassland
- E1.72/E3.52: Agrostis/Festuca/J. squarrosus grassland
- E1.72/F3.15: Agro/Fest grassland/gorse scrub
- E1.72: Agrostis/Festuca grassland
- E2.1: Abandoned pasture
- E3.41/F3.15: Humid meadows/gorse scrub
- E3.41/G1.9: Humid meadow with silver birch
- E3.41: Humid meadows
- E3.42: Juncus acutiflorus meadows
- E3.51/E1.72: Molinia/Festuca/Agrostis meadows
- E3.51/E3.52: Molinia/J. squarrosus meadow
- E3.51: Purple moor-grass meadows
- E5.1: Tall ruderal
- E5.31: Bracken fields
- F3.15: Gorse thickets
- F4.1: Wet heath
- G1.2: Mixed riparian woodland
- G1.A: Mixed broadleaved woodland
- G1.C: Broadleaved plantation woodland
- G3.F: Conifer plantation
- G5.8: Recently felled areas
- H5.3: Bare ground
- J4: Roads, paths and other hard standing
- Target note

Figure 3.1

Map Scale @ A3: 1:12,500

Surveyed by: DS and RAH	
Survey date: July 2022	
Drawn by: RAH	
Checked by: DS	
Status: Final	

Applied Ecology Ltd

0 125 250 metres

Glen Fruin Blairnairn

GWDTEs and NVC Types

Site boundary

GWDTEs:

- Highly GWDTE
- Partially highly GWDTE
- Moderately GWDTE
- Partially moderately GWDTE

Figure 3.2

Map Scale @ A3: 1:12,500

Surveyed by: DS and RAH	
Survey date: July 2022	
Drawn by: RAH	
Checked by: DS	
Status: Final	

Applied Ecology Ltd

0 125 250 metres

Glen Fruin Blairnairn

Annex 1 Habitat Types

Site boundary

Annex 1 habitat types:

Overlaps with Annex 1

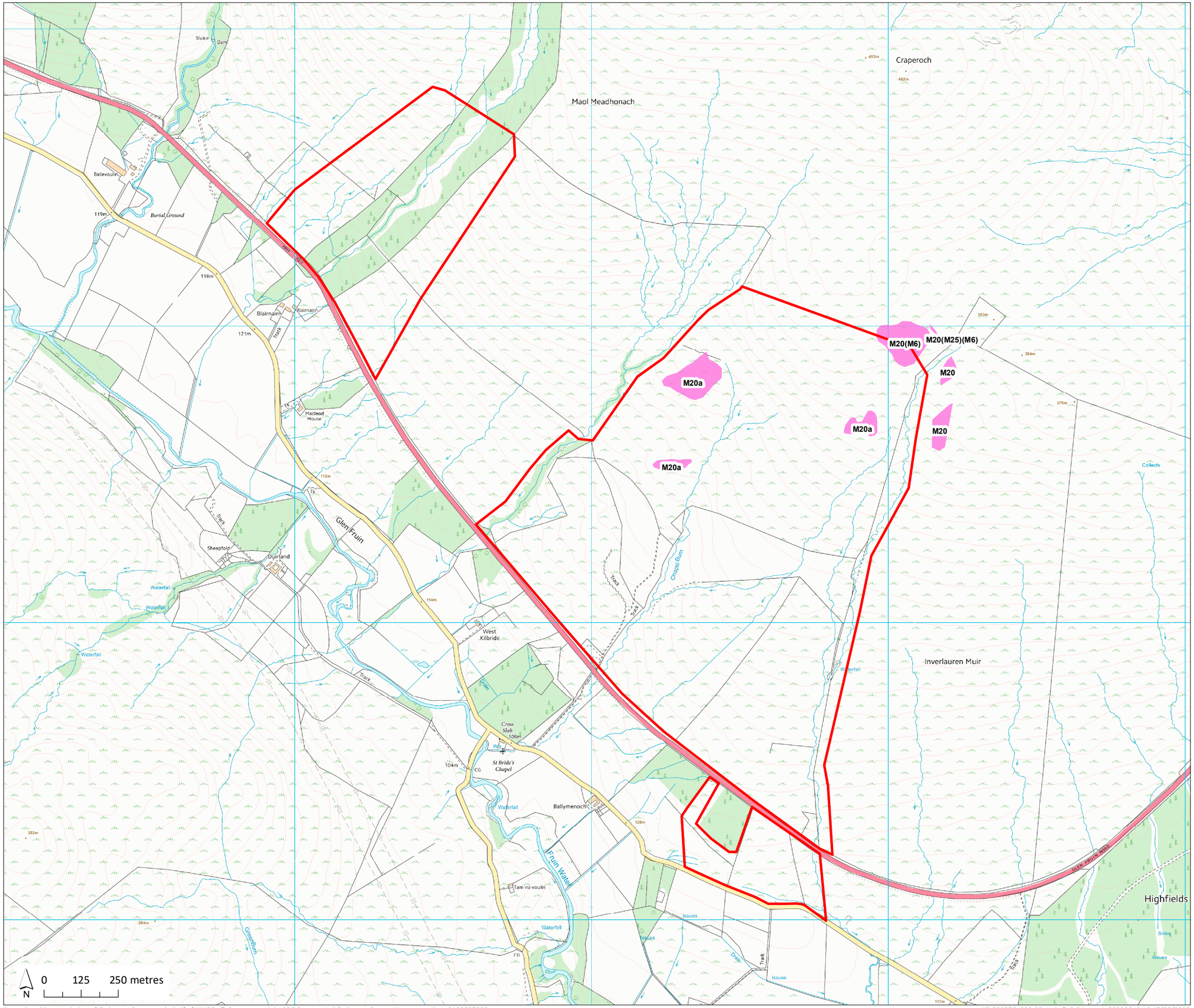

Figure 3.3

Map Scale @ A3: 1:12,500

Surveyed by: DS and RAH	
Survey date: July 2022	
Drawn by: RAH	
Checked by: DS	
Status: Final	

Glen Fruin Blairnairn

Notable Habitats Below MMU

Site boundary

General areas of high conservation interest:

Small-scale M10a flushes present

CG10a present

Figure 3.4

Map Scale @ A3: 1:12,500

Surveyed by: DS and RAH	
Survey date: July 2022	
Drawn by: RAH	
Checked by: DS	
Status: Final	

Applied Ecology Ltd

Figure 3.5: Selection of habitat survey photographs.

(a) Recently felled woodland in east of Site.

(b) Cleuch woodland in west of Site, dominated by silver birch and goat willow.

(c) Whorled caraway.

(d) M10a habitat with butterworts.

(e) Flush with cottongrass.

(f) Bracken habitats in east of Site.

(g) Golden-ringed dragonfly in west of Site.

(h) Mosaic of MG10 and gorse scrub in west of Site.

(i) Cleuch woodland in east of Site.

(j) Pasture dominated by *Holcus lanatus* in the south of the Site.

(k) Broad-leaved planted trees in the south of the Site.

4 Discussion and Recommendations

Habitat evaluation

Holcus lanatus grassland (Hlan) and *Holcus-Festuca-Anthoxanthum* grasslands

4.1 The grassland areas dominated by Yorkshire fog were relatively species-poor at the time of their recording, and being common and widespread would not be considered habitats of particular nature conservation interest. They are not GWDTEs and therefore do not represent a constraint to woodland planting.

MG9 and MG10

4.2 MG9 and MG10 are common and widespread habitat types. They are both typical of pastures with impeded drainage as well as abandoned agricultural land, damp verges, ditches and around pools and fens. Despite their commonplace nature and low conservation importance, SEPA considers both of these vegetation communities to be moderately groundwater dependent. However, at this Site, these were habitats with low species diversity, and of sufficiently low botanical interest so as not necessarily presenting a constraint to planting[15]. However, the impeded drainage in these areas which has resulted in the formation of this plant community may need to be taken into consideration when selecting tree species, or when planning ground preparation for planting.

M23, and areas exclusively comprising *Juncus effusus* (*Je*) and *Juncus acutiflorus* (*Ja*)

4.3 The majority of the stands of M23 recorded at the Site were of the species-poor M23b sub-community or were classified as “Je” due to their dominance by soft rush. This is a commonplace habitat type, particularly in agricultural settings, tending to occur over moist, moderately acid to neutral peaty and mineral soils in the cool and wet west of the UK. It is particularly common in ill-drained, unimproved or reverted pastures. The areas where soft rush occurred almost exclusively could be considered to be related to these M23b swards, but were frequently exceptionally species-poor. Areas dominated by sharp-flowered rush tended to be more species-rich than the M23b swards, and notably supported whorled caraway which is a species with a fairly localised distribution in the western parts of the UK. M23a is found in similar situations to the M23b sub-community, but is generally considered to be of greater nature conservation value.

4.4 SEPA considers all forms of M23 to be highly groundwater dependent, but it can be a community that is as often surface water fed as it is groundwater fed. It is also often a species-poor community, as was the case with the M23b swards recorded at Glen Fruin Blairnairn; however the M23a swards were of greater interest. To that end, the M23b, *Je* and *Ja* areas, with low species diversity, would generally not necessarily presenting a

[15] https://www.ruralpayments.org/media/resources/GWDTE-guidance.pdf Accessed April 2022.

constraint to planting[16], but as described above, the impeded drainage in these areas which has resulted in the formation of this plant community may need to be taken into consideration when selecting tree species, or when planning ground preparation for planting. Areas of M23a and should be considered more likely to be GWDTEs, and therefore be excluded from the planting areas wherever practicable. It is acknowledged that this will be less feasible where M23a occurs in a complex mosaic with M23b.

M20

4.5 All of the blanket bog areas within the Site were considered to be a form of M20, either in isolation or as a mosaic with one or more additional NVC type. These areas were on peat of varying depths, but were characterised by abundant hare's-tail cottongrass and occasional heather. The domination of the hare's-tail cotton-grass will likely have come about as a result of a history of either draining or burning of originally more floristically diverse blanket bog types, but these areas have high potential ecological importance for their role as functioning peatlands. M20 is not considered to be a GWDTE but it is an NVC type that overlaps with blanket bog habitats listed in Annex 1 of the EU Habitats Directive, and being a habitat of deeper peat should be excluded from the planting proposals. The nature conservation value of these areas could be significantly improved by the exclusion of sheep grazing.

M25

4.6 M25 is a common habitat type in western parts of the UK, on gently sloping ground. It is often found in seepage zones and flushed areas, which is why it is considered to be moderately groundwater dependent. In some locations, the purple moor-grass can become overwhelmingly dominant, forming a tussocky sward that is difficult to traverse, and in these circumstances it is likely that the habitat has been derived from the burning, grazing and/or drainage of deeper blanket peats. At the Site, these habitats were generally species-poor and not considered to be of high conservation importance, and would not present a constraint to woodland planting. However, some areas of M25 were found to include very small areas of M10 flush (see above), and these areas should therefore either be excluded from the proposals, or detailed micrositing be used to avoid tree planting in the flush locations of greater botanical interest, ensuring also an unplanted buffer of at least 5 m.

M10

4.7 The small extents of M10 flush found within some areas of M25 and U4 grasslands would be considered to have high nature conservation value, as well as being highly groundwater dependent. This community occurs where there is base-rich flushing of groundwaters, and can be host to a number of rare species. These make a significant contribution to the overall species diversity of upland habitats and these flushes should be excluded from the planting proposals, as well as an exclusion buffer of at least 5 m.

4.8 The stands of M10 recorded at the Site were very small, often only half a metre wide, and due to their scattered nature it was considered likely that additional areas of this habitat

[16] https://www.ruralpayments.org/media/resources/GWDTE-guidance.pdf Accessed April 2022.

type would not have been target noted during the survey. Their small-scale and sporadic distribution means that their identification on the ground would require either careful micrositing during planting preparation, or a fine-scale and detailed mapping exercise prior to commencement.

CG10a

4.9 In a similar vein to the areas of M10 recorded within the Site, it was possible that some very small areas of CG10a could also have been present in areas which were not directly walked. CG10 is a particularly species-rich grassland type, and like M10 is influenced by irrigation by base-rich waters. It is therefore considered to be highly groundwater dependent. Its species-richness means that it can contribute greatly to the diversity of the overall habitat mosaic, generally being surrounded by species-poor habitat types. These areas and at least a 5 m buffer should not be planted if at all practicable, however this would need to be achieved either via careful micrositing during planting preparation, or through a fine-scale and detailed mapping exercise.

U2

4.10 The U2 NVC category was used at this Site to describe grassland swards where wavy hair-grass was conspicuously dominant. However, it rarely formed cohesive patches in isolation, occurring instead as a mosaic with either U4 or U6, or both (see below). Like M25 (see earlier), U2 is a tussocky grassland type, which in isolation is generally not considered to have any notable nature conservation importance. It also is not considered to be a GWDTE, and therefore its presence at the Site does not represent a constraint to woodland planting.

U4

4.11 U4 is a commonplace upland NVC type, tending to occur on better drained, grazed slopes. In comparison to the wet, rush-dominated meadows within the Site, this is not a habitat considered to be a GWDTE, and the vast majority of these areas would not present a constraint to woodland planting. However, as with the M25 habitats described above, some areas of U4 were found to include very small areas of M10 flush, and these should therefore either be excluded from the proposals, or detailed micrositing be used to avoid tree planting in these areas of greater interest, ensuring an unplanted buffer of at least 5 m around the flushes. The area of CG10 noted within the survey buffer (see earlier) occurred within a larger patch of U4.

U6

4.12 U6 rarely occurred on the Site in isolation, and instead it was recorded as a mosaic with both U2 and U4 grasslands. It comprised a heathy, tussocky sward, and is a community that is typical of damp, peaty soils in the north and west of the UK. It tends to be a species-poor habitat with relatively low nature conservation interest, but it is considered by SEPA to be moderately groundwater dependent. Due to its relatively low species diversity at this Site, it would generally not necessarily presenting a constraint to planting[17], but as described above, the impeded drainage in these areas which has resulted in the formation

[17] https://www.ruralpayments.org/media/resources/GWDTE-guidance.pdf Accessed April 2022.

of this plant community may need to be taken into consideration when selecting tree species, or when planning ground preparation for planting.

U20

4.13 Bracken habitats are ubiquitous across Scotland, and due to its relatively low species-diversity, and also the difficulties often associated with controlling spread of the species, U20 is not usually considered to be a habitat of conservation value. It is not however completely without ecological importance, but in the context of the Development does not represent an impediment to woodland planting.

W7

4.14 It is assumed that the W7 woodlands along the Site's watercourses will be unaffected by the planting proposals. These are commonplace woodland types in Scotland, but they are considered to be GWDTEs.

W23

4.15 Gorse scrub is not normally considered to be a habitat of particular nature conservation importance, nor is it a GWDTE. It is commonplace and widespread, although it does provide some diversity, particularly for birds, within the wider ecological mosaic of the upland/lowland fringe. In this context it does not present any constraints to woodland planting.

Other habitats

4.16 None of the other recorded habitats would present an impediment to planting, namely:

- broad-leaved and coniferous plantations;
- bare ground;
- tall ruderal;
- roads, paths and other hard standing.

Other considerations

Otter

Relevant legislation

4.17 The otter is a European Protected Species (EPS), protected by the Conservation (Natural Habitats, etc.) Regulations 1994, as translated into domestic legislation post-Brexit and via the Wildlife and Countryside Act 1981 (as amended). This legislation collectively makes it an offence to capture, harass, injure or kill an otter; obstruct access to, damage or destroy a breeding site or resting place of an otter; disturb an otter in such a way as is likely to affect their distribution or abundance, disturb otter in such a way as is likely to impair their ability to survive or breed, or disturb an otter while it is occupying a structure or place which it uses for shelter or protection. Each of these actions is considered to be an offence whether the action is deliberate or reckless, except in the case of damaging or destroying a breeding

site or resting place, which is a strict liability offence i.e., there is no defence for destroying a breeding site or resting place.

4.18 A licence is required for all developments that will affect otter. Disturbance is defined by NatureScot as any new effect occurring within a minimum of 30 m of an otter shelter. This distance is likely to increase for activities with a higher potential for disturbance, such as blasting or track-laying, or in remote locations or where the shelter in question is regarded as being high-status. If breeding is suspected, NatureScot may request a non-intervention zone of 100-200 m, or that work be suspended pending further investigation[18]. Otters are inquisitive animals and are known to habituate to a range of disturbances. They are, however, often particularly intolerant of dogs.

Recommendations relating to otter

4.19 It is highly unlikely that otter would represent a constraint to the woodland planting proposals. However, if there was an otter shelter within a licensable distance of proposed works, the possibility of causing disturbance should be taken into consideration. If this may be the case, it is recommended that a formal otter survey is undertaken of the watercourses within the Site, and a 200 m buffer of this, as per current guidance from NatureScot. In addition to this, the following best practice recommendations are made:

- machinery left on-site overnight must be carefully checked each morning for the potential presence of resting up otters;
- in the unlikely event of any Site activity being carried out during the hours of darkness, machinery and floodlights will be directed away from watercourses, ensuring wherever possible an unlit corridor of 10 m;
- the use of heavy machinery should be limited to avoid the period two hours before and after dawn and dusk during the months of March to October inclusive, and one hour before and after dawn/dusk during the months of November to February inclusive. This is because these are the times of day when otter will be most active on the nearby watercourses.

Reptiles

Relevant legislation

4.20 All native reptiles in Scotland are protected under the Wildlife and Countryside Act (1981, as amended) and the Nature Conservation (Scotland) Act (2004) against intentional or reckless killing, injury and sale (or advertising for sale). In 2011, both of these Acts were amended by the Wildlife and Natural Environment (Scotland) Act ("WANE Act"). Section 18(2)(a) and (b) of the WANE Act insert a licensable purpose into section 16 of the Wildlife and Countryside Act. NatureScot can therefore issue licences to permit disturbance to reptiles for over-riding reasons of social, economic and environmental reasons provided there is no satisfactory alternative. Of the six reptile species native to the UK, adder, common lizard and slow worm are found in Scotland, and grass snake is thought to be increasing its range northwards.

[18] https://www.nature.scot/doc/standing-advice-planning-consultations-otters accessed July 2022.

Recommendations relating to reptiles

4.21 Common lizard was seen on the Site, but it is likely that reptiles here will be present at such a low density that survey would be impractical and uninformative. The nature of the ground preparation works required for forestry, and the subsequent planting, are such that it is also likely that any reptiles potentially present would be capable of moving away from machinery, especially if works are carried out during the warmer months. During the hibernation period (nominally October-March), if any disturbance of rock piles or drystane dykes is required, then this should occur by hand and in the presence of a Suitably Qualified Ecologist (SQE). If hibernating reptiles are disturbed, all work should stop, and the SQE will provide advice as necessary.

Nesting birds

Relevant legislation

4.22 All wild birds in the UK, their nests and their eggs are protected by the Wildlife and Countryside Act 1981, (as amended), strengthened in Scotland by the Nature Conservation (Scotland) Act (2004). Under this legislation it is an offence, with certain exceptions, to:

- intentionally or recklessly kill, injure or take any wild bird;
- intentionally or recklessly take, damage or destroy the nest of any wild birds while it is in use or being built;
- intentionally or recklessly take or destroy the egg of any wild bird.

4.23 A number of bird species have been highlighted as priorities for bird conservation in the UK (Stanbury *et al*., 2021[19]), and allocated Red or Amber status. All other species not of conservation concern are considered to be Green-listed. Certain bird species also have additional protection under the terms of the EC Birds Directive, and may be local priorities for conservation action via the Scottish Biodiversity List (SBL) or Local Biodiversity Action Plans (LBAPs).

Recommendations relating to nesting birds

4.24 Full recommendations relating to nesting birds will be provided in the ornithological reporting. However, it is recommended here that ground preparation works and planting should be timed so as to avoid the nesting bird season[20]. If works cannot be scheduled so as to avoid the nesting bird season, checks will need to be made by a suitably qualified ecologist (SQE) in advance of the works, to ensure that no breeding birds are present. If nesting is noted or suspected, works will need to cease until it has been ascertained that all fledglings have hatched and have left the nest. The time required for this varies between bird species.

[19] **Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021)**. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

[20] The breeding bird season is usually considered to be mid-March through to the end of August, although some species can start to nest earlier than this, and some later. In all cases timings are dependent on the prevailing weather conditions each spring.

5 Conclusions

5.1 An extended habitat survey was undertaken for land at Glen Fruin Blairnairn, near Helensburgh in Argyll and Bute, to inform woodland planting proposals for the Site. A range of upland pasture and peatland habitats was identified, in the main forming an intricate mosaic of different vegetation types which could not easily be mapped in isolation.

5.2 Although the vast majority of the Site would be considered to be groundwater dependent in some circumstances, much of this was relatable to species-poor M23b, M25 and U6 communities. Other areas of low conservation interest were also noted, such as recently felled woodland and stands of bracken. Some habitats of conservation importance did occur, but a number of these were very small-scale. Guidance has therefore been given with regards to the main habitat types which should be avoided during planting, including areas of deeper peat, marshy grasslands supporting whorled caraway, and areas flushed by basic groundwaters.

5.3 The Site was considered to have potential for a number of protected species, either within the Site itself or within licensable distances, including otter, reptiles and nesting birds, and depending on the planting proposals further survey may be necessary. Measures have also been described which should be implemented to avoid contravention of the legislation which currently protects nesting birds.

5.4 These survey data and conclusions will remain valid for a period of approximately 12-18 months from the date of the survey reported here, after which time a review of their validity would be necessary. Updates after this time would likely be dependent on whether or not there have been any significant changes in how the Site has been managed since the date of the survey reported here.

Appendix A
List of Abbreviations Used in this Report

Abbreviation	Full terminology
AEL	Applied Ecology Limited
CIEEM	Chartered Institute of Ecology and Environmental Management
DAFOR	Dominant, Abundant, Frequent, Occasional, Rare
EUNIS	European Nature Information System
GIS	Geographical Information System
GWDTE	Groundwater Dependent Terrestrial Ecosystem
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
MMU	Minimal Mappable Unit
NVC	National Vegetation Classification
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency

Appendix B
Habitat Survey Target Notes

Target note	Description
1	Recently felled area either side of burn. Foxglove and soft rush dominant amongst the stumps and brash, with occasional bracken, bramble, star sedge, toad rush, purple moor-grass, tormentil and heath bedstraw. Small watercourses ran through the area, with some stagnant pools of water supporting duckweed and broad-leaved pondweed.
2	Riparian woodland dominated by silver birch, goat willow, hazel and rowan. Steep rocky sides to the burn, with abundant ferns, foxglove and the moss Polytrichum formosum. Grassy areas characteristically had sweet vernal-grass, wavy hair-grass and Yorkshire fog, with scattered soft rush, creeping buttercup and beaked hawk's-beard.
3	Pasture dominated by Yorkshire fog and sweet vernal-grass, with abundant soft rush (locally dominant in some places). Other herbs present included foxglove, marsh thistle, creeping buttercup and meadow buttercup, tormentil, whorled caraway and occasional sharp-flowered rush and greater bird's-foot trefoil. Tufted hair-grass was rare.
4	Small flush with lesser spearwort and a number of small sedges including common sedge, carnation sedge and star sedge, and a selection of brown mosses. Whorled caraway also occurred here, along with bog asphodel, blunt-flowered rush, common cottongrass, marsh thistle, marsh willowherb and devil's-bit scabious. There were scattered *Dactylorhiza* species of orchid – probably common spotted but plants not well-developed. Sweet vernal-grass, sharp-flowered rush and Yorkshire fog were occasional. *Sphagnum palustre* was conspicuous.
5	A type of wet heath community dominated by purple moor-grass and deergrass, although heather was very sparse. Frequently occurring species included tormentil and *Dactylorhiza* species, along with sharp-flowered rush, heath woodrush, sweet vernal-grass, star sedge and whorled caraway, with bog asphodel and cross-leaved heath only occasional. There were also occasional flushes through this area that were similar to TN4.
6	Small area of M10a flush within pasture dominated by purple moor-grass. With common butterwort, bog asphodel, round-leaved sundew, deergrass, tormentil, star sedge, flea sedge, whorled caraway and marsh thistle. Various *Sphagnum* species also present.
7	Small area of mire with common cottongrass, with abundant star sedge, carnation sedge, purple moor-grass, tormentil, devil's-bit scabious and whorled caraway.
8	Small area of M10a flush within acid grassland mosaic.
9	Mosaic of *Molinia*-dominated grassland with that composed of sweet vernal-grass, Yorkshire fog and red and sheep's fescue, forming a complex mosaic with bracken-dominated habitats. The acid grassland areas tended to have heath bedstraw, tormentil, common milkwort and cross-leaved heath, and there were also very small flushes with round-leaved sundew and abundant *Sphagnum* mosses. Carnation sedge and bog asphodel also formed conspicuous patches within the mosaic.
10	CG10a grassland dominated by sweet vernal-grass and heath bedstraw, with abundant purple moor-grass, tormentil, common thyme, white clover, creeping buttercup, field woodrush, field pansy and ribwort plantain, and more occasional Yorkshire fog, tufted hair-grass, bracken, fairy flax and carnation sedge. Crested dog's-tail and lady's-mantle were both rare.
11	M23 community dominated by a mix of both sharp-flowered and soft rush, with abundant sweet vernal-grass and frequent Yorkshire fog, purple moor-grass and *Sphagnum fallax*. Bog asphodel, marsh bedstraw, tormentil and marsh violet were all occasional. Lies outwith 100 m buffer.
12	Small area of M10a flush.
13	Mosaic of U4a and U6, dominated by sweet vernal-grass, sheep's fescue and wavy hair-grass, with frequent heath rush. Heath bedstraw was the dominant herb species, and tormentil was abundant. Less frequently occurring species included heath woodrush and common sedge, and the mosses *Rhytidiadelphus squarrosus* and *Pseudoscleropodium purum* were frequent.
14	Area of U6 habitat with abundant heath rush and wavy hair-grass. Velvet bent was frequent, along with sweet vernal-grass and tormentil. Heath woodrush was occasional, and heather was present, although rare. Characteristic of this area, but TN lies outwith 100 m buffer.
15	Area of low stature bracken, where spikes of marsh thistle extended above the bracken canopy, along with pignut, meadow buttercup, tormentil, heath bedstraw, ribwort plantain and occasional dense patches of soft rush. Frequently occurring grass species included Yorkshire fog, crested dog's-tail, purple moor-grass and mat grass.
16	Mosaic of pasture types where Yorkshire fog was dominant, with abundant sweet vernal-grass and frequent purple moor-grass and sharp-flowered rush. Whorled caraway occurred here, with other herb such as creeping buttercup, tormentil, ribwort plantain and marsh thistle. There were occasional flushes with star

Target note	Description
	sedge, few-flowered sedge and carnation sedge, species of *Dactylorhiza* orchid and abundant *Sphagnum* mosses. Occasional dense patches of bracken did occur here, and any of the main species listed above could be locally dominant.
17	Flush habitat with carnation sedge, star sedge, toad rush, lesser spearwort, common cottongrass, frequent *Sphagnum* mosses and round-leaved sundew.
18	M23a dominated by sharp-flowered rush and frequent soft rush. Other abundant species included Yorkshire fog and creeping buttercup. Marsh thistle was frequent, and whorled caraway and marsh bedstraw were occasional. Greater bird's-foot trefoil and tufted forget-me-not were rare.
19	Small flush area with broad-leaved cottongrass, lesser spearwort, carnation sedge, sharp-flowered rush and whorled caraway.
20	Narrow ditch running along the contour, dominated by sharp-flowered rush, but with abundant broad-leaved pondweed, lesser spearwort and Yorkshire fog. More occasional species included star sedge and carnation sedge, whorled caraway, common sorrel, tormentil and ribwort plantain. A golden-ringed dragonfly was seen here, and a common lizard was also noted close by.
21	Purple moor-grass dominated habitat with frequent heath rush. A number of other graminoids were frequent, including deergrass and wavy hair-grass. Bilberry was abundant, and heather was only occasional. Frequently occurring species included tormentil, *Sphagnum capillifolium*, *Pleurozium schreberi*, *Plagiothecium undulatum*, *Hypnum jutlandicum* and *Rhytidiadelphus loreus*.
22	Mosaic of M25a and U6 where purple moor-grass was abundant, and heath rush at least frequent, and often locally abundant. Other abundant species included heath bedstraw, bilberry and *Polytrichum commune*, whilst tormentil, sweet vernal-grass *Rhytidiadelphus squarrosus* and *Pleurozium schreberi* were all frequent. There was occasional hare's-tail cottongrass in the sward, as well as heath woodrush and wavy hair-grass.
23	Area of peat around 50 cm deep where purple moor-grass and hare's-tail cottongrass were co-dominant. Heathy appearance, but wet underfoot. Wavy hair-grass, hummocks of *Polytrichum commune* and heath bedstraw were all abundant but there were frequent *Sphagnum* species including *S. capillifolium* and *S. fallax*. Cross-leaved heath was occasional.
24	Area of relatively deep peat where *Sphagnum* mosses were more abundant. Despite this, purple moor-grass was the dominant species, with hare's-tail cottongrass and tormentil occurring throughout. Cranberry also seen here.
25	Edge of M23b habitat dominated by soft rush but with *Polytrichum commune* and marsh bedstraw, and some cover of *Sphagnum* mosses.
26	Heathy version of M20 bog, where hare's-tail cottongrass and heather were accompanied by cranberry, tormentil, bilberry and cross-leaved heath. Heath rush, wavy hair-grass and heath woodrush also occurred, along with occasional *Sphagnum* mosses and *Pleurozium schreberi*.
27	Area of tussocky wavy hair-grass grassland, with bilberry and *Polytrichum commune,* but frequent purple moor-grass and sweet vernal-grass. Also occasional hummocks of *Sphagnum*, and *Sphagnum*-filled ditches. Heather was occasional to frequent, along with deergrass, heath bedstraw and hare's-tail cottongrass.
28	Meadow of sharp-flowered rush and marsh thistle, with white clover, crested dog's-tail, meadow buttercup, Yorkshire fog, tormentil and sheep's fescue. Occasional tufted hair-grass and purple moor-grass, and a number of sedges seen, including carnation sedge and few-flowered sedge.
29	M20 bog on relatively shallow peat, dominated by hare's-tail cottongrass, although purple moor-grass, wavy hair-grass and sweet vernal-grass were also present. Tormentil, heath bedstraw and bilberry were all frequent, and there were occasional patches of *Sphagnum palustre*, although *Polytrichum commune* was the most abundant bryophyte. Heath rush, heath woodrush and Yorkshire fog were occasional.
30	Pockets of deep peat with abundant *Sphagnum* species under a sharp-flowered rush canopy. Purple moor-grass and Yorkshire fog also present.
31	Small area of M20 bog dominated by hare's-tail cottongrass. There was however some heather, bog asphodel, bilberry and deergrass amongst the cottongrass, and occasional purple moor-grass, wavy hair-grass and deergrass.
32	Sharp-flowered rush pasture, with occasional patches of tufted hair-grass. Marsh thistle was constant.
33	Area observed at a distance due to the presence of cattle. Dominated by a mix of Yorkshire fog and both sharp-flowered and soft rush.
34	Sharp-flowered rush pasture where tufted hair-grass and Yorkshire fog were locally abundant, as well as some patches of fairly abundant purple moor-grass and soft rush.

Target note	Description
35	Area of M23a with relatively species rich flora that had partially been fragmented by previous felling activities and access routes. Sharp-flowered rush and Yorkshire fog dominant, alongside marsh thistle, whorled carraway, greater bird's foot trefoil, tormentil and marsh bedstraw.
36	Soft rush pasture forming M23b with grasses including Yorkshire fog and tufted hair-grass. Marsh thistle, whorled carraway and marsh bedstraw all were frequent.
37	Strip of grassland between previous blocks of plantation. Dominant grasses included Yorkshire fog, red fescue and common bent. Frequent common sorrel, common hogweed and common spotted orchid. Locally abundant sharp-flowered rush.
38	Previously felled coniferous woodland that had now started to form successional humid meadow/Yorkshire fog dominant grassland.
39	Sloped field that was not recently grazed with overwhelmingly dominant Yorkshire fog alongside soft rush, with frequent common sorrel and occasional marsh thistle.
40	Sharp flowered-rush/soft dominant rush pasture along small watercourse. More species rich here with marsh cinquefoil, marsh bedstraw, marsh thistle and tormentil.
41	Young plantation broad-leaved woodland that had been planted along watercourse. Young trees comprising oak, birch, rowan and willow. Upper section of plantation had dense bracken.
42	Wet ground on sloped field that had been grazed and poached by cattle. Appeared to be potentially on deep peat, and was a mosaic of wet heath/bog with sections of M23a and M23b. Grazed areas had a carpet of dominant heather, blaeberry, tormentil, *Sphagnum* mosses and wavy hair-grass. There was also frequent common spotted orchid in places, and locally abundant cross-leaved heath and bog asphodel.

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