

Appendix 12.2

Designated Sites, Ancient
Woodland and Habitats

Transport Scotland
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1. Introduction

- 1.1.1 This technical appendix presents desk study information and field survey data on the following specific areas of interest within the Study Area, which is described in Section 2:
- statutory and non-statutory designated sites;
 - areas of ancient woodland;
 - the classification, distribution, and composition of habitats;
 - the presence and distribution of non-designated important habitat, i.e. Habitats Directive Annex I habitats, Scottish Biodiversity List (SBL) priority habitats and potential Groundwater Dependent Terrestrial Ecosystems (GWDTE); and
 - protected vascular plants and bryophytes.
- 1.1.2 This information has been collated to inform the DMRB Stage 3 Assessment of the Proposed Dalraddy to Slochd Scheme.
- 1.1.3 Desk based information has been gathered from a variety of sources, such as information provided by consultees (e.g. Scottish Natural Heritage (SNH) and local biological records centres) and previous ecological studies undertaken to inform the Proposed Scheme's environmental assessment (e.g. the Preliminary Ecological Appraisal (PEA) undertaken by CH2M Hill in 2014 for the 'North Scheme – Dalraddy – Moy').
- 1.1.4 A number of field-based botanical and habitat surveys have also been undertaken to aid the Stage 3 Assessment, mainly centred on the National Vegetation Classification (NVC). The NVC scheme provides a standardised system for classifying and mapping semi-natural habitats in Great Britain. The aim of the NVC survey was to classify, map and describe the vegetation communities present within the relevant Study Area in order to identify those areas of greatest ecological interest/sensitivity: i.e. Annex I habitats, SBL priority habitats and potential GWDTE.
- 1.1.5 During the NVC surveys, areas mapped were also classified according to the Phase 1 habitat survey methodology¹. The 2014 CH2M Hill PEA included a Phase 1 habitat walkover survey of the Dalraddy to Slochd route. This generally included land 150m either side of the existing A9, although it was extended in places where considered appropriate. In 2016 further Phase 1 habitat surveys were carried out along the route to map additional areas around an extended Route Options Corridor (ROC) and ensure there were no gaps in original mapping coverage. Phase 1 mapping was extended during the current survey to match the extent of the larger NVC Study Area.
- 1.1.6 Detailed data has also been collected in areas of designated sites and ancient woodland, where these occur within the relevant Study Area, including extensive botanical species lists and qualitative information on impacts and pressures. This data was collected to aid in the determination of nature conservation value and importance of these specific areas.
- 1.1.7 Additional botanical data was collected on the locations of *Populus tremula* (aspen) within the Study Area, when this species was encountered. *P. tremula* is a Cairngorms National Park Authority (CNPA) priority species, and the CNPA promotes the conservation of this species. Stands of *P. tremula* can support several of the UK's rarest and most threatened lichens; these woodlands can also host rare species of moths,

flies, fungi and mosses. *P. tremula* woodland is a key habitat within the Cairngorms Local Biodiversity Action Plan (LBAP).

- 1.1.8 This document summarises the desk study information and details the results of the field surveys (together with an evaluation of those NVC communities recorded) carried out during April and May 2017.
- 1.1.9 This appendix then goes on to detail the methodology used for determining the nature conservation importance of the habitats present, the results of this evaluation process, and the resulting impact assessment on relevant habitat receptors.
- 1.1.10 Due to the number of types of survey reported in this Appendix and the different methods used for these surveys, the methods and results for each type are discussed in the same section. Therefore, the structure of this Appendix is different to the other Appendices.

2. The Study Area

- 2.1.1 The Dalraddy to Slochd Study Area extends from NH 852 088 by Dalraddy (south-west of Loch Alvie) northwards to NH 827 262, north-west of Slochd summit. The stretch is approximately 27km long.
- 2.1.2 The Study Area, within which NVC surveys were undertaken, was determined by buffering the maximum extent of the design footprint by 250m. The 250m buffer was applied to ensure surveys covered the necessary area to determine the presence of potential GWDTEs, in line with Scottish Environmental Protection Agency (SEPA) guidance on GWDTEⁱⁱ. The Phase 1 mapping and *Populus tremula* location surveys also extended out to this 250m buffer.
- 2.1.3 The designated site and ancient woodland surveys Study Area extended out to a 100m buffer from the maximum extent of the mainline design footprint; as in GIS shapefiles provided by AMJV.
- 2.1.4 Much of the built-up residential area of Aviemore was excluded from the respective Study Areas, as it consists primarily of buildings, non-semi-natural habitats and amenity grassland and gardens (see Figure 12.5).
- 2.1.5 Land to the south of the Allt an Fhearna watercourse on the northbound (NB) carriageway was not included within the Study Area as this area is covered by the A9 Kincaig to Dalraddy works. Furthermore, any works to occur at the Dalraddy end of this Study Area would not impact on any potential GWDTE to south of Allt an Fhearna, as the watercourse would act as a natural hydrological barrier.
- 2.1.6 The Dalraddy to Slochd Study Area contains a wide range of habitat types. The northerly sections mostly contain a range of upland mires, heaths, grasslands and woodlands/scrub. The central and southern sections of the Study Area also contain a mix of these upland habitats, however, there is a greater abundance of wetlands, improved and semi-improved grasslands, and a wider diversity of woodlands in these areas. Large stands of commercial coniferous plantation are a constant feature of the Study Area.
- 2.1.7 Much of the vegetation in the Study Area has been affected anthropogenically over time in a number of ways. In upland areas, these impacts have been mainly through moorland management techniques (such as muirburn, grazing and drainage) and commercial forestry. These management activities have clearly influenced the plant

communities here. In more lowland areas, livestock farming and associated agricultural practices are clear drivers and maintainers of many habitats and vegetation types present, and the species composition of much of the vegetation shows the influences of a history of intensive grazing, drainage, re-seeding and fertiliser application.

3. Designated Sites

3.1 Methodology

Desk Study

- 3.1.1 Information on designated sites has been collected from within the following search areas (the designated sites 'Study Area'):
- International sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Wetlands of International Importance (Ramsar site)) – 10km from the Proposed Scheme;
 - Other statutory designated sites (e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR)) – 2km; and
 - Non-statutory designated sites – 1km (e.g. Local Wildlife Sites, Sites of Importance for Nature Conservation (SINCs)).
- 3.1.2 The location of designated sites within the Study Area is presented on Figure 12.1a (2km Study Area) and Figure 12.1b (10km Study Area).
- 3.1.3 Information regarding the location of designated sites has been obtained from the following sources:
- Multi-Agency Geographic Information for the Countryside (MAGIC) websiteⁱⁱⁱ;
 - Scottish Natural Heritage 'SiteLink'^{iv};
 - Scottish Natural Heritage 'Interactive Map'^v;
 - Highland Biological Recording Group (HBRG); and
 - North East Scotland Biological Records Centre (NESBreC).
- 3.1.4 Information describing the qualifying features or reasons for site notification and primary interest features were downloaded from the Joint Nature Conservation Committee (JNCC) website^{vi}.

Field Survey

- 3.1.5 There are designated sites present within 100m of the route option (see Table 3.3 below; Figure 12.1a). Designated sites within the 100m Study Area were visited to collect additional data and descriptive information. This included making a target note (TN) of the main NVC community/sub-communities identified within a representative area of the designated site/habitat. For each TN a species list was compiled along with a measure of species abundance using the DAFOR scale for three levels of vegetation structure (where these existed); i.e. the canopy, understory and field layer. The species list was compiled by searching a 20m diameter plot around the TN location. Qualitative notes were also made on the habitats present and whether the area within the Study Area supports, is likely to support, or could support species or habitats for which the site has been designated (cf. Table 3.3 below).

3.2 Survey Constraints & Limitations

- 3.2.1 Designated site surveys were carried out by two surveyors from 15th-19th May and 23rd-25th May 2017 inclusive over 16 surveyor days, during suitable survey conditions. No weather constraints or limitations were experienced.
- 3.2.2 It was not considered appropriate to target note every single NVC community/sub-community within the identified polygons. Instead within each polygon the main habitat types or communities were sampled. On occasions, this meant more than one NVC community was recorded whilst surveying in the 20m diameter plot. For instance, a target note within broadleaved woodland may have noted the NVC types W11 and W17 together, where this occurred the species list compiled was for all NVC types within the TN plot.
- 3.2.3 Ecological surveys are limited by factors which affect the presence of plants such as the time of year and weather. The absence of evidence of a species should not be taken as conclusive proof that the species is not present in an area or that it will not be present in the future. The species lists generated cannot be considered to be totally complete. It is likely that with more time and longer searching additional species could be found, but these would probably be only in small quantity. The lists compiled give a good indication of the flora present and allow for meaningful comparison between locations.
- 3.2.4 The Proposed Scheme has undergone several (increasingly minor) design iterations alongside the development of the EclA since field surveys were undertaken. The latest design iterations resulted in an extension of the original Study Area for some features. Existing survey information has been extrapolated based on desk study information (e.g. contemporary aerial photography) to inform the valuation and assessment of impacts.
- 3.2.5 None of the above limitations are considered significant, and the data can be relied upon to form a robust assessment.

3.3 Results

Desk Study

- 3.3.1 There are 14 internationally designated sites with ecological qualifying features present within the 10km Study Area, comprising six SACs, seven SPAs, and one Ramsar site.
- 3.3.2 There are seven nationally designated sites with ecological qualifying features present within the 2km Study Area, comprising six SSSIs and one NNR.
- 3.3.3 There are no LNRs or non-statutory designated sites located within the Study Area.
- 3.3.4 Table 3.1 and Table 3.2 present information on international and national designated sites collected during the desk study review. The locations of designated sites within the Study Area are presented on Figure 12.1a&b.

Table 3.1: International Statutory Designated Site Information

Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Qualifying Features
River Spey: UK0019811	SAC	0m (i.e. partly within Proposed Scheme area)	Annex II species that are a primary reason for selection of this site: Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) Sea lamprey (<i>Petromyzon marinus</i>) Atlantic salmon (<i>Salmo salar</i>) Otter (<i>Lutra lutra</i>)
Slochd: UK0030347	SAC	0.081km to north	Annex I habitat that is a primary reason for selection of this site: European dry heath.
Kinveachy Forest: UK0012759	SAC	0.44km to west	Annex I habitat that is a primary reason for selection of this site: Caledonian forest. Annex I habitat present as a qualifying feature, but not a primary reason for selection of this site: Bog woodland.
Cairngorms: UK0016412	SAC	1km to east	Annex I habitats that are a primary reason for selection of this site: Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i> Northern Atlantic wet heaths with <i>Erica tetralix</i> European dry heaths Alpine and boreal heaths <i>Juniperus communis</i> formations on heaths or calcareous grasslands Siliceous alpine and boreal grasslands Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe) Blanket bogs Petrifying springs with tufa formation (<i>Cratoneurion</i>) Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i> . Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) Siliceous rocky slopes with chasmophytic vegetation Caledonian forest Bog woodland Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Qualifying Features
			<p>Natural dystrophic lakes and ponds, sub-Arctic <i>Salix</i> spp. scrub, semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>)</p> <p>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels</p> <p>Transition mires and quaking bog and calcareous rocky slopes with chasmophytic vegetation.</p> <p>Annex II species that is a primary reason for selection of this site: Green shield-moss (<i>Buxbaumia viridis</i>)</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection: Otter (<i>Lutra lutra</i>)</p>
Insh Marshes: UK0019812	SAC	2.51km to south-west	<p>Annex I habitats that are a primary reason for selection of this site: Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and / or of the <i>Isoeto-Nanojuncetea</i>.</p> <p>Transition mires and quaking bogs</p> <p>Annex I habitat present as a qualifying feature, but not a primary reason for selection of this site: Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)</p> <p>Annex II species that are a primary reason for selection of this site: Otter (<i>Lutra lutra</i>)</p>
Carn nan Tri-tighearnan: UK0019791	SAC	8.12km to north	<p>Annex I habitats that are a primary reason for selection of this site: Blanket bog</p>
Loch Vaa: UK9002751	SPA	0.045km to east	The SPA qualifying species are breeding Slavonian grebe (<i>Podiceps auritus</i>).
Kinveachy Forest: UK9002581	SPA	0.44km to west	SPA qualifying features are capercaillie (<i>Tetrao urogallus</i>) and breeding Scottish crossbill (<i>Loxia scotica</i>).
Cairngorms: UK9002241	SPA	1km to east	The SPA qualifying features are breeding capercaillie (<i>Tetrao urogallus</i>), dotterel (<i>Charadrius morinellus</i>), golden eagle (<i>Aquila chrysaetos</i>), merlin (<i>Falco columbarius</i>), osprey (<i>Pandion haliaetus</i>), peregrine (<i>Falco peregrinus</i>) and Scottish crossbill (<i>Loxia scotica</i>).
River Spey – Insh	SPA	2.51km to south-west	The SPA supports populations of European importance of osprey (<i>Pandion haliaetus</i>), spotted crane (<i>Porzana porzana</i>), and wood

Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Qualifying Features
Marshes: UK9002231			sandpiper (<i>Tringa glareola</i>) during the breeding season and hen harrier (<i>Circus cyaneus</i>) and whooper swan (<i>Cygnus cygnus</i>) over winter.
Abernethy Forest: UK9002561	SPA	3.83km to east	SPA qualifying features include breeding populations of capercaillie (<i>Tetrao urogallus</i>), osprey (<i>Pandion haliaetus</i>) and Scottish crossbill (<i>Loxia scotica</i>).
Cairngorms Massif: UK9020308	SPA	4.87km to east	The qualifying feature is breeding populations of golden eagle (<i>Aquila chrysaetos</i>).
Craigmore Woods: UK9001801	SPA	9.95km to east	SPA qualifying feature is breeding populations of capercaillie (<i>Tetrao urogallus</i>).
River Spey-Insh Marshes: UK13053	Ramsar site	2.52km to south-west	The site supports an assemblage of breeding bird's indicative of high wetland value and diversity including population levels of whooper swan of international importance (an average of 1.7% of GB population in winter).

Table 3.2: National Statutory Designated Site Information

Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Reasons of Site Notification
Alvie Site Code 53	SSSI Part of the Alvie SSSI overlaps River Spey SSSI & SAC	0m (i.e. partly within Proposed Scheme area)	Alvie SSSI is a large area of native woodland, open water and wetland habitats. This site is important for the variety of scarce invertebrate species that it supports, including but not limited to the endangered net-winged caddis fly, a snail-killing fly, the aspen hoverfly, and a true fly <i>Microprosopa pallidicauda</i> which in Scotland has only been found in Strathspey. Loch Alvie is also an important breeding area for goldeneye (<i>Bucephala clangula</i>).
Craigellachie Site Code 428	SSSI & NNR	0m (i.e. partly within Proposed Scheme area)	Craigellachie is a large birch (<i>Betula</i> spp.) wood located on the western edge of Aviemore. The site is notified for the upland birch woodland which is one of the largest in Strathspey, and for its invertebrate interest, specifically moths.
Kinveachy Forest Site Code 864	SSSI Parts of this SSSI are also designated as Kinveachy	0.44km to west	The pinewoods of Kinveachy Forest are one of the major remnants of Caledonian pine forest in Strathspey. Kinveachy Forest has dense stands of mature woodland separated by open



Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Reasons of Site Notification
	Forest SAC & SPA. Part of River Spey SAC passes through this SSSI		moorland with scattered trees. The woodland to the south of the River Dulnain is dominated by Scots pine (<i>Pinus sylvestris</i>), while on the north side there are also areas of broadleaved woodland dominated by birch (<i>Betula</i> spp.) and alder (<i>Alnus glutinosa</i>). Wetter ground has bog woodland with scattered, stunted Scots pine. Juniper (<i>Juniperus communis</i>) scrub is extensive in places. The extensive forests support a characteristic pinewood breeding bird assemblage which includes capercaillie (<i>Tetrao urogallus</i>), Scottish crossbill (<i>Loxia scotica</i>), and crested tit (<i>Lophophanes cristatus</i>).
Loch Vaa Site Code 1065	SSSI Also designated as Loch Vaa SPA	0.050km to east	Loch Vaa is a small, nutrient poor (oligotrophic) spring-fed loch in Strathspey. It is important as a breeding site for two nationally rare bird species, Slavonian grebe (<i>Podiceps auritus</i>) and goldeneye (<i>Bucephala clangula</i>). The loch is surrounded by birch woodland to the south and Scots pine (<i>Pinus sylvestris</i>) plantation to the north that is important breeding habitat for goldeneye. The marshy areas and the small ephemeral pools around the loch support a diverse assemblage of aquatic beetles including nationally scarce and notable species such as <i>Berosus luridus</i> , <i>Hydrochus brevis</i> , <i>Cyphon punctipennis</i> and <i>Agabus labiatus</i> .
North Rothiemurchus Pinewood Site Code 1241	SSSI Part of Cairngorms SAC & SPA. Part of SSSI overlaps with River Spey SAC	1km to east	The site contains Britain's second largest area of Caledonian forest including ancient and recently established woodland, juniper scrub, dry and wet heath, areas of bog woodland and clear water lochs. The site has also been notified for its breeding bird assemblage and specifically for its breeding populations of capercaillie (<i>Tetrao urogallus</i>), crested tit, Scottish crossbill (<i>Loxia scotica</i>) and osprey (<i>Pandion haliaetus</i>). The site is also designated for its assemblages of invertebrates, lichens, fungi, and vascular plants.
River Spey Site Code 1699	SSSI; Adjoins the River Spey – Insh Marshes SSSI and	0.17km to east	The River Spey has a variety of freshwater and riparian habitats including beds of shingle, gravel, sand and silt, islands, fringing woodlands and marshes. These habitats support important

Site Name	Designation	Distance and Orientation from Proposed Scheme	Summary of Reasons of Site Notification
	overlaps part of Alvie SSSI. Overlaps part of River Spey SAC		populations of Atlantic salmon (<i>Salmo salar</i>), sea lamprey (<i>Petromyzon marinus</i>), freshwater pearl mussel (<i>Margaritifera margaritifera</i>) and otter (<i>Lutra lutra</i>).

3.3.5 The NVC and habitats Study Area includes designated sites. Some of these sites have been designated for their habitats or have qualifying species or features that are intrinsically linked to certain habitats or plant species. The terrestrial designated sites which are within with the Study Area, and the relevant features in each designation, are detailed in Table 3.3 below. As a running water feature, no NVC of the River Spey SAC was undertaken. The location of the Study Area and the relevant designated sites can be seen within Figure 12.1a&b.

Table 3.3: Terrestrial Designated Sites within the Study Area

Designated Site	Qualifying Feature	Last Assessed Condition	Last Assessment Date
Alvie SSSI	Upland oak woodland.	Unfavourable No change	20/07/2005
	Invertebrate assemblage. Notable species associated with woodland and bog habitats, including: <ul style="list-style-type: none"> net-winged caddis fly <i>Hagenella clathrata</i>; uses edge of lowland raised bogs, quaking bogs and wet heaths. Associated with areas of well-developed tussocks and pools, mainly associated with <i>Molinia caerulea</i>. Larval food: <i>Betula</i> spp. the aspen hoverfly, <i>Hammerschmidtia ferruginea</i>; larvae associated with <i>Populus tremula</i> deadwood. 	Favourable Maintained	16/07/2013
Craigellachie SSSI & NNR	Upland birch woodland.	Favourable Maintained	23/07/2009
	Moth assemblage. Notable species associated with plants and habitats, including: <ul style="list-style-type: none"> Kentish glory <i>Endromis versicolora</i> – larval foodplant: <i>Betula</i> spp., sometimes <i>Alnus glutinosa</i>. Rannoch sprawler <i>Brachionycha</i> 	Favourable Maintained	13/08/2014

Designated Site	Qualifying Feature	Last Assessed Condition	Last Assessment Date
	<p>(<i>Asteroscopus</i>) <i>nubeculosa</i> - confined to areas of old natural <i>Betula</i> woodland. Larval foodplant: <i>Betula</i> spp.</p> <ul style="list-style-type: none"> • angle-striped sawfly <i>Enargia paleacea</i> – inhabits heaths and open woodland, larvae feed on <i>Betula</i> spp. • scarce prominent <i>Odontosia Carmelita</i> – inhabiting mature woodland, larvae feed on <i>Betula</i> spp. • great brocade <i>Eurois occulta</i> – feeds on sawfly (<i>Salix</i>) and <i>Betula</i> spp. Larval foodplant: <i>Myrica gale</i>. • cousin German <i>Protolampra sobrina</i> – found in <i>Betula</i> spp. woodland. Larval foodplant: feeding nocturnally on <i>Calluna vulgaris</i>, <i>Vaccinium myrtillus</i>, <i>Betula</i> spp. • netted mountain moth <i>Macaria carbonaria</i>, found on heath above the woodland. Larvae feeds on <i>Arctostaphylos uva-ursi</i>. 		
Loch Vaa SSSI	<p>Beetles – aquatic beetle assemblage. Including:</p> <ul style="list-style-type: none"> • water scavenger beetle <i>Berosus luridus</i>, marshy freshwater ponds, feed on algae or decaying matter. • gravel water beetle <i>Hydrochus brevis</i>, <i>Cyphon punctipennis</i> and <i>Agabus labiatus</i>; no terrestrial phases. 	Favourable Maintained	12/07/2010
	Breeding birds - Slavonian grebe (<i>Podiceps auritus</i>) and goldeneye (<i>Bucephala clangula</i>)	Unfavourable No change	30/06/2007
Loch Vaa SPA	Breeding Slavonian grebe (<i>Podiceps auritus</i>)	Unfavourable No change	30/06/2007
Slochd SAC	Dry heath	Unfavourable Recovering	08/12/2016

Field Survey

- 3.3.6 A total of 28 TNs were taken within the Alvie, Craigellachie, and Loch Vaa designated site areas to characterise the habitats present. Eight were taken within Alvie SSSI, two within Loch Vaa SSSI, and 18 within Craigellachie SSSI/NNR to reflect the relative areas of the respective sites and the variation in habitat types present. The location of these TNs and respective designated site areas are shown in Figure 12.2. No TNs were taken within Slochd SAC as this only became part of the habitats Study Area post-survey following Proposed Scheme design changes and the resultant expansion of the 250m Study Area buffer.
- 3.3.7 Given the nature of the Study Area and respective designated sites, the majority of TN locations were in woodland (i.e. 25 out of 28 TNs). However, some wetlands and grasslands were also sampled. The range of woodlands sampled at TN locations included the following NVC types; W2, W3, W4, W7, W9, W11, W17, W18 and W19 (full community names and descriptions given in Section 5 below).
- 3.3.8 The detailed raw data collected at each TN location is provided in Annex A. Species lists were compiled for the canopy, understorey and ground layer and species abundance estimated using the DAFOR scale. A total of 155 species of vascular plants and bryophytes were recorded at the 28 designated site TN locations.
- 3.3.9 At TN locations, the most frequent species in the canopy/understorey were *Betula pendula* (19 TNs), *B. pubescens* (14 TNs) and *Sorbus aucuparia* (11 TNs). The character and species-richness of the ground layer between plots varied widely depending on the respective NVC community (see Annex A). The overall character of the NVC communities recorded is discussed in detail in Section 5 below.
- 3.3.10 The total number of species recorded at a TN ranged from a low of 11 species at TN JA105 within W18 *Pinus sylvestris* plantation in Alvie SSSI, to a high of 35 species at TN JA153 within a W4/W11 *Betula* woodland mosaic, also within Alvie SSSI. The mean number of species per designated site TN was 23. The five most commonly recorded species were, in order; *Hylocomium splendens*, *Betula pendula*, *Anthoxanthum odoratum*, *Rhytidiadelphus triquetrus* and *Oxalis acetosella*. A number of ancient woodland indicator species were also recorded at these TNs (discussed in Section 4 below).
- 3.3.11 In addition to the species data collected, at each TN qualitative data was collected on whether the respective Study Area supports, or is likely to support, species or habitats for which the site has been designated (Table 3.3). This data and information is provided in Annex B.
- 3.3.12 With respect to the Alvie SSSI designation, there was no *Quercus* spp. woodland within the NVC Study Area. The woodland communities recorded were *Betula* spp. and *Alnus glutinosa* woods of the NVC types W2, W4, W7, W11 and W17; and blocks of W18 *Pinus sylvestris* plantation. Some suitable habitat exists for the invertebrate assemblage in terms of the presence of *Betula* and *A. glutinosa* woodland and the Allt na Fhearna watercourse, however there was no bog habitat within the Study Area. There is no suitable habitat for the net-winged caddis fly within the respective Study Area, although there is an abundant larval food source (i.e. *Betula* spp.). The larvae of the aspen hoverfly are associated with *Populus tremula* deadwood, only a small amount of *P. tremula* was recorded at one of the four Alvie SSSI TNs, none of which was deadwood.
- 3.3.13 Craigellachie SSSI/NNR is designated for upland *Betula* woodland. This remains extensive throughout the Study Area; as recorded in the TNs by the presence of *Betula*

dominated stands of NVC types W3, W4, W9, W11 and W17, and various associated sub-communities (see Annex A). It is also designated for its moth assemblage, with no less than seven species relying on this habitat and woodland. Most species are associated with mature *Betula* woodland or their larvae feed on *Betula*, and therefore there is abundant habitat and food sources within the Study Area for these particular species (see Annex B). The great brocade moth also feeds on *Salix* spp. and although not recorded at specific TN locations it is found within Craigellachie in low scattered abundances. The larvae of great brocade feed on *Myrica gale*, which is also scattered throughout the Study Area. The larvae of cousin German feeds on *Calluna vulgaris* and *Vaccinium myrtillus* as well as *Betula*, all these species are abundant in the Study Area. The larvae of the netted mountain moth feeds on *Arctostaphylos uva-ursi*, this was not recorded in the Study Area and is more likely to be present in areas of open heath above the woodland outwith the Study Area.

- 3.3.14 A small section of Loch Vaa SSSI (and SPA) is within the Study Area. Loch Vaa SSSI is designated for aquatic beetles (as well as Slavonian grebe, which is the qualifying feature of the SPA). A portion of the Study Area contains a freshwater pond and marginal swamp vegetation which has the potential to be used by these beetles. The main body of Loch Vaa, to which the ornithological qualifying features relate, is distant from the Study Area. In addition to the small area of standing water, the following NVC communities were recorded within the respective Study Area; S9 *Carex rostrata* marginal vegetation, W3 *Salix cinerea* woodland and W17 mixed woodland (see Annex A).
- 3.3.15 Part of Slochd SAC, which is designated for European dry heath, falls within the extended post-survey Study Area following design changes to the northern extent of the Proposed Scheme. No TNs were taken in this area. However, from the results of earlier surveys which fringed this area it is known that this area is characterised by *Calluna vulgaris* dominated dry heaths, and as such supports the qualifying feature for which it is designated.

4. Ancient Woodland

4.1 Methodology

Desk Study

- 4.1.1 All areas of ancient woodland within 100m of the Proposed Scheme were identified; these are shown on Figure 12.2. This Study Area for ancient woodland was defined to include land in which direct effects (such as habitat loss) and indirect effects (such as degradation due to aerial pollutants) on ancient woodland are most likely to occur.
- 4.1.2 The definition of ancient woodland is 'land that is currently wooded and has been continually wooded, at least since 1750. It is not related to the age of the trees that are currently growing there; they don't have to be ancient or even elderly. It is the historical continuity of the woodland habitat that makes a woodland ancient.
- 4.1.3 Scottish Natural Heritage's (SNH) Ancient Woodland Inventory (AWI)^{vii} was reviewed to identify known areas of ancient woodland within the Study Area. This inventory holds information on the location and extent of ancient woodland within Scotland, and categorises each stand as follows:
- **Ancient Woodland (1a and 2a)** – Interpreted as semi-natural woodland from maps of 1750 (1a) or 1860 (2a) and continuously wooded to the present day. If planted with

non-native species during the 20th century they are referred to as Plantations on Ancient Woodland Sites (PAWS);

- **Long-established woodlands of plantation origin (LEPO) (1b and 2b)** – Interpreted as plantation from maps of 1750 (1b) or 1860 (2b) and continuously wooded since. Many of these sites have developed semi-natural characteristics, especially the oldest ones, which may be as rich as Ancient Woodland; and
- **Other woodlands on Roy maps (3)** – Shown as un-wooded on the 1st Edition of the Ordnance Survey maps (produced in circa 1850) maps but as woodland on the Roy maps (produced in circa 1750). Such sites have, at most, had only a short break in continuity of woodland cover and may still retain features of Ancient Woodland.

Field Survey

- 4.1.4 A number of areas classified as ancient woodland lie within 100m of the Proposed Scheme. However, the boundaries of these ancient woodland areas were often found during the survey to not follow existing woodland boundaries and many areas may not be considered ancient woodland for a number of reasons; e.g. having over time been converted to grassland.
- 4.1.5 The areas of ancient woodland identified within the 100m Study Area were visited to collect additional data and descriptive information. As for designated sites, this included making a TN of the main NVC community/sub-communities identified within the ancient woodland area with an associated species list compiled along with a measure of species abundance using DAFOR, for three levels of vegetation structure (where these existed); i.e. the canopy, understory and field layer.
- 4.1.6 Qualitative information was also collected on each ancient woodland polygon regarding the approximate maturity of the stand (young, semi-mature, mature, ancient), whether the woodland retains ancient woodland characteristics such as a well-developed ground-flora or ancient woodland indicator species, and any notes on disturbance/degradation – e.g. intensive grazing, nutrient enrichment from farming etc. Photographs were also taken for each TN.

4.2 Survey Constraints & Limitations

- 4.2.1 Ancient woodland surveys were carried out at the same time as the designated site surveys described above. These were undertaken by two surveyors from 15th-19th May and 23rd-25th May 2017 inclusive over 16 surveyor days, during suitable survey conditions. No weather constraints or limitations were experienced. Other limitations are the same as those described above for designated sites.
- 4.2.2 Two TN locations could not be directly accessed for H&S concerns and the presence of a deer fence: an area of recent clear fell plantation (and so of little botanical interest) and a small fenced-off lochan with marginal swamp vegetation.

4.3 Results

Desk Study

- 4.3.1 The ancient woodland sites within the 100m Study Area identified on the SNH AWI are presented in Table 4.1 and Figure 12.2. For each woodland block the table includes an identifier (ID Area) and location information (including co-ordinates of each ID areas centroid).

4.3.2 Within Table 4.1, ID Areas which are within the Proposed Scheme footprint are highlighted in light blue.

Table 4.1: Ancient Woodland Stands within 100m of the Proposed Scheme

ID Area	AW Category	X-Ref	Y-Ref	Location
1	3 Other	288455	823746	East and west of A9. Beneath Proposed Scheme mainline from Ch17600-Ch19200, Black Mount junction, A938 upgrades, and associated minor access roads; from Black Mount junction SB for a stretch of approximately 1.6km.
2	3 Other	289304	822984	East and west of A9. Beneath Proposed Scheme mainline for approximately 300m, north of the River Dulnain, by Carrbridge around Ch17000-Ch17300.
3	3 Other	288180	810203	East of A9 south of Aviemore. 100m from B9152 upgrades associated with Aviemore South Junction.
4	3 Other	290114	815455	East and west of A9 at Granish. Beneath Proposed Scheme mainline just north of Granish Junction for approximately 300m.
5	3 Other	289776	815125	West of A9 by Granish. Beneath Granish Junction and associated Tier 3 access roads.
6a	3 Other	289809	814733	East of A9 by Granish. Beneath Granish Junction, associated upgrades to the B9152 road, and Tier 3 access tracks and SuDS.
6b	3 Other	289919	814936	East of A9 by Granish. Minor section beneath Tier 3 access road.
6c	3 Other	290091	815059	East of A9 by Granish. Minor section beneath Tier 3 access road.
7a	2b Long-Established	291051	817695	East of A9 by Ch11900. Within 25m of nearest mainline embankment (but separated from this by A95 and Northern Mainline Railway).
7b	2b Long-Established	291069	818092	East of A9, by Loch Vaa. Within 60m of nearest Tier 3 access (but separated from this by A95 and Northern Mainline Railway).
8a	2a Ancient	284584	823975	West of A9, by Slochd. Outer margins of ancient woodland area beneath mainline embankments. Small section beneath Tier 3 access.
8b	2a Ancient	284608	824033	West of A9, by Slochd. Within 127m of mainline dualling route, and within 92m of associated embankments.
8c	2a Ancient	284247	824261	West of A9. Within 35m of Proposed Scheme junction upgrade by Slochd.
9	2a Ancient	287721	824185	East of A9, by existing A9 and A938 junction. Small section beneath embankment and SuDS area.
10a	2a Ancient	284201	824409	Northern end of Proposed Scheme, west of A9. Beneath junction upgrade by Slochd, Tier 3 access and SuDS.
10b	2a Ancient	284261	824512	West of A9. Within 62m of Proposed Scheme junction upgrade by Slochd.

ID Area	AW Category	X-Ref	Y-Ref	Location
11a	2a Ancient	289449	814490	East and west of A9. Beneath Proposed Scheme mainline for approximately 880m, south of the River Dulnain, by Carrbridge.
11b	2a Ancient	289781	815376	East and west of A9. Beneath Proposed Scheme mainline for approximately 1.1km, south of Crannaich. Also beneath Tier 3 access roads.
11c	2a Ancient	290165	816138	East and west of A9. Beneath Proposed Scheme mainline from around Avielochan south towards Granish. Small sections also beneath Tier 3 access roads.
11d	2a Ancient	290921	820175	West of A9 by Granish. Adjacent Tier 3 access associated with Granish Junction.
11e	2a Ancient	290031	822153	West of A9, west of Sluggangranish around Ch7800. Within 70m of mainline and within 35m of associated embankments.
12	2a Ancient	285483	809384	East and west of A9 at the Dalraddy end of the Proposed Scheme, by Allt an Fhearna watercourse. Beneath Proposed Scheme for approximately 375m.
13	2a Ancient	288675	810888	West of A9 at Craigellachie, north-east of Lynwilg. Beneath Proposed Scheme mainline and embankments for approximately 470m.
14	2a Ancient	287795	809990	East of A9 by Aviemore South Junction. Beneath Junction access roads and associated upgrades to B9152 road.
15	2a Ancient	287604	810190	East of A9 by Aviemore South Junction. Very small section beneath Junction embankments and linked Tier 3 access.
16	2a Ancient	286536	810046	East and west of A9 at Loch Alvie. Beneath Proposed Scheme for approximately 95m.
17	2a Ancient	286941	810120	East of A9, by Drium Mhor (south of Ch2000).
18	2a Ancient	287055	810132	East of A9, by Drium Mhor (south of Ch2100).
19	2a Ancient	286960	810246	East and west of A9, north-west of Druim Mhor, around Ch2000. Beneath Proposed Scheme for approximately 180m.
20	2a Ancient	290558	817126	West of A9 by Laggantygown. Beneath Proposed Scheme mainline for approximately 600m. Small section also beneath Tier 3 access road.
21	2a Ancient	290978	818619	West of A9. Partially beneath a Tier 3 access road, by Kinveachy Lodge around Ch12200-Ch12400.
22	2a Ancient	290987	819315	West of A9. Partially beneath a Tier 3 access road, north of Kinveachy.
23	1a Ancient	286682	809962	East of A9 at Loch Alvie. Within 60m of Proposed Scheme embankment and within 10m of LMA.
24	1a Ancient	290290	815423	East of A9 by Granish. Within 1m of A95 upgrade associated with Granish Junction.

ID Area	AW Category	X-Ref	Y-Ref	Location
25a	1a Ancient	287543	810439	West of A9, west of Lynwilg Farm Cottages. Beneath stretch of upgraded Tier 3 access roads for approximately 480m.
25b	1a Ancient	287134	810396	West of A9, north of Druim Mhor around Ch2250. Within 75m of a Tier 3 access road, and 110m of mainline embankment.
26	1a Ancient	287838	810442	West of A9 by Lynwilg Farm Cottages. Small section beneath Tier 3 access road associated with Aviemore South Junction.
27	1a Ancient	290857	817708	West of A9, north of Laggantygown, from Ch11300. Beneath Proposed Scheme mainline for approximately 195m.
28a	1a Ancient	289042	811513	West of A9 at Craigellachie, short section of approximately 22m beneath Proposed Scheme around Ch5950.
28b	1a Ancient	289003	812258	West of A9 at Craigellachie, within 17m of Tier 3 access and SuDS pond.
28c	1a Ancient	289004	812632	West of A9 at Craigellachie. Small edge sections beneath Proposed Scheme and Tier 3 access.
29	1a Ancient	290262	816288	East and west of A9, west of Avielochan. Beneath Proposed Scheme mainline for approximately 220m, from Ch9700-Ch9920.
30	1a Ancient	290528	821313	East and west of A9. Beneath Proposed Scheme mainline for approximately 1.1km, by Crannaich.
31	1a Ancient	289218	811964	East of A9, at caravan park in south of Aviemore. Small stretch beneath Proposed Scheme, also beneath section of Tier 3 access.
32	2a Ancient	287110	810399	West of A9, north of Druim Mhor around Ch2250. Within 75m of a Tier 3 access road.

Field Survey

- 4.3.3 A total of 153 TNs were taken within ancient woodland areas. Of these, 20 were also within designated sites as described above. These ancient woodland areas and associated TNs are spread throughout the length of Dalraddy to Slochd (see Figure 12.2).
- 4.3.4 As would be expected the majority of TN locations (126) were within woodlands of various types and ages; though many areas are now plantation woodland and have lost their semi-natural character. The range of woodlands sampled at ancient woodland TN locations included the following NVC types: W3, W4, W7, W9, W11, W17, W18, W19 and various associated sub-communities, and also non-NVC conifer plantation. Ninety-five of the woodland TNs were within category 1a and 2a ancient woodlands, three were within category 2b long-established woodlands of plantation origin and 28 were within category 3 other woodlands on Roy maps (as described above).
- 4.3.5 Furthermore, within these areas of ancient woodland there are open areas or clearings of other habitat types, or areas where the woodland has long since disappeared and the area converted to grassland. These treeless areas were sampled in 27 of the 153 TNs and included vegetation relating to the following NVC communities: U4, U20, H10, H12,

H9-H12 intermediate, W23, W25, M4, M6, M19, M28, MG6, MG10, S9, OV25 and OV28.

- 4.3.6 The detailed raw data collected at each TN location is provided in Annex A. Species lists were compiled for the canopy, understorey and ground layer and species abundance estimated using DAFOR. A total of 224 species were recorded at these 153 TN plots; 170 vascular plants, 49 bryophytes and 5 lichens. The character and species-richness of the vegetation between plots varied widely depending on the type of woodland, age of woodland, pressures, and respective NVC community (see Annex A).
- 4.3.7 Fourteen tree species were recorded within the canopy of ancient woodland TNs, in order of abundance these were (number of TNs in brackets): *Betula pendula* (77), *B. pubescens* (56), *Pinus sylvestris* (46), *Quercus petraea* (12), *Larix decidua* (8), *Alnus glutinosa* (5), *Populus tremula* (4), *Salix cinerea* (4), *Pseudotsuga menziesii* (3), *Sorbus aucuparia* (3), *Picea sitchensis* (2), *Prunus padus* (2), *Prunus avium* (1) and *Salix caprea* (1).
- 4.3.8 *Betula* spp. were also by far the most common understorey species below the canopy. 15 species were recorded in understorey vegetation and included (number of TNs in brackets); *Betula pendula* (31), *B. pubescens* (22), *Juniperus communis* (19), *Cytisus scoparius* (8), *Pinus sylvestris* (8), *Salix cinerea* (8), *Sorbus aucuparia* (7), *Myrica gale* (3), *Alnus glutinosa* (2), *Corylus avellana* (2), *Prunus padus* (2), *Acer pseudoplatanus* (1), *Populus tremula* suckers (1), *Rosa canina* (1) and *Salix caprea* (1).
- 4.3.9 A total of 216 species of vascular and lower plants were recorded in the ground layer, including seedlings of a number of the tree species listed above. Species per TN are provided in Annex A. The 15 most common vascular plants recorded were (number of TNs in brackets); *Anthoxanthum odoratum* (94), *Deschampsia flexuosa* (93), *Viola riviniana* (75), *Luzula pilosa* (72), *Calluna vulgaris* (68), *Holcus lanatus* (66), *Potentilla erecta* (65), *Oxalis acetosella* (64), *Galium saxatile* (62), *Vaccinium myrtillus* (59), *Agrostis capillaris* (58), *Anemone nemorosa* (58), *Pteridium aquilinum* (52), *Conopodium majus* (51) and *Veronica chamaedrys* (43).
- 4.3.10 The 10 most common lower plants recorded were *Hylocomium splendens* (122), *Rhytidiadelphus triquetrus* (109), *Pleurozium schreberi* (91), *Rhytidiadelphus squarrosus* (50), *Hypnum cupressiforme* (46), *Dicranum scoparium* (30), *Pseudoscleropodium purum* (23), *Polytrichastrum formosum* (21), *Polytrichum commune* (21) and *Thuidium tamariscinum* (16).
- 4.3.11 Where a species list was compiled¹, the total number of species recorded at a TN ranged from a low of seven species at TN JA155 within a block of mature *Pseudotsuga menziesii* plantation, to a high of 35 species at TNs JA101 and JA153 within *Betula* woodlands. Eight TNs contained over 30 species, the mean number of species per ancient woodland TN was 20.
- 4.3.12 There were no notable differences in the number of species recorded, or the number of ancient woodland indicator species present, between the different categories of ancient woodland. For instance, the mean number of species recorded within TNs at category 1a and 2a ancient woodlands, category 2b long-established woodlands of plantation origin and category 3 other woodlands on Roy maps were 21, 21 and 20 respectively.
- 4.3.13 Qualitative data was also collected at each TN on the age of canopy (if present), whether the woodlands retained any ancient woodland characteristics such as a well-developed field flora or the presence of recognised ancient woodland indicator species,

¹ Species lists were not made for an area of bare ground, inaccessible clear-fell, or the fenced off lochan/swamp.

and notes on any signs of disturbance or degradation such as intensive grazing, burning, nutrient enrichment etc (see Annex A).

- 4.3.14 The age of canopy is varied, with stands of young trees, semi-mature trees, mature trees and stands containing ancient trees all recorded. Much of the W18 recorded is of plantation origin, the plantation is also of various levels of maturity, some areas have been thinned and retain a distinctive ground storey, whereas others have been affected by canopy closure and shading.
- 4.3.15 Of the species recorded in ancient woodland TNs, 22 species are included in the vascular plant ancient woodland indicator list^{viii} with seven of these in Class 1 (i.e. found in Scotland mainly in woodland habitats) and 15 in Class 2 (i.e. at least as common in non-woodland habitats).
- 4.3.16 The Class 1 species recorded were (number of TNs); *Prunus padus* (2), *Corylus avellana* (2), *Circaea x intermedia* (3), *Goodyera repens* (2), *Gymnocarpium dryopteris* (2), *Luzula pilosa* (72) and *Mercurialis perennis* (2).
- 4.3.17 The Class 2 species recorded were (number of TNs); *Populus tremula* (4), *Quercus petraea* (12), *Anemone nemorosa* (58), *Brachypodium sylvaticum* (2), *Chrysosplenium oppositifolium* (4), *Conopodium majus* (51), *Fragaria vesca* (1), *Hypericum pulchrum* (15), *Luzula sylvatica* (3), *Melampyrum pratense* (9), *Oxalis acetosella* (64), *Primula vulgaris* (8), *Stellaria holostea* (10), *Trientalis europaea* (29) and *Valeriana officinalis* (10).
- 4.3.18 The number of ancient woodland indicator species in a plot ranged from zero to seven (at TN JA118 within an area of W11c). The number of Class 1 species were recorded in the following number of TNs; three species (one TN – W9 at JA142), two species (two TNs), one species (78 TNs) and zero species (72 TNs).
- 4.3.19 Levels of browsing and grazing are variable, some stands only lightly browsed by deer, while others are more intensively grazed by sheep, with a correspondingly short grazed sward evident.

5. Habitats and Vegetation

5.1 Methodology

Field Survey

National Vegetation Classification (NVC)

- 5.1.1 The Study Area vegetation was surveyed by a team of five suitably qualified and experienced botanical surveyors (Alison Averis, Brian Henry, Jason Mackay, Andrew Weston and Rafe Dewar) using the NVC scheme^{ix} and in accordance with NVC survey guidelines^x. The NVC scheme provides a standardised system for classifying and mapping semi-natural habitats and ensures that surveys are carried out to a consistent level of detail and accuracy.
- 5.1.2 Traditionally, the Study Area would be subject to a Phase 1 habitat survey, which would then identify specific areas to be subject to more detailed NVC surveys. Some areas were subject to Phase 1 surveys in the 2014 PEA, however, due to the extent of GWDTE potentially present within the Study Area, the entire Study Area required NVC survey.

- 5.1.3 Homogeneous stands and mosaics of vegetation were identified and mapped by eye and drawn as polygons on high resolution field maps; i.e. 1:5,000 @A3 using 10cm orthoimagery. These polygons were surveyed qualitatively to record dominant and constant species, sub-dominant species and other notable species present. The surveyors worked progressively across the Study Area to ensure that no areas were missed and that mapping was accurate. 10cm resolution aerial photography of the Study Area was used to aid accurate mapping of vegetation boundaries.
- 5.1.4 NVC communities were attributed to the mapped polygons using surveyor experience and matching field data against published floristic tables^x. Stands were classified to sub-community level where possible, although in some cases the vegetation was mapped to community level only because the vegetation was too species-poor or patches were too small to allow meaningful sub-community determination; or because some areas exhibited features or fine-scale patterns of two or more sub-communities.
- 5.1.5 Quadrat sampling was not used in this survey because experienced NVC surveyors do not need to record quadrats in order to reliably identify NVC communities and sub-communities^x. Notes were made about the structure and flora of larger areas of vegetation in many places (such as the abundance and frequency of species, and in some cases condition and evident anthropogenic impacts). It can be better to record several larger scale qualitative samples than one or two smaller quantitative samples; furthermore, qualitative information from several sample locations can be vital for understanding the dynamics and trends in local (Study Area) vegetation patterns^x.
- 5.1.6 Due to small scale vegetation and habitat variability, and numerous zones of habitat transition between similar NVC communities, many polygons represent complex mosaics of two or more NVC communities. Where polygons have been mapped as mosaics an approximate percentage cover of each NVC community within the polygon is given so that the dominant community and character of the vegetation could be ascertained.
- 5.1.7 Botanical nomenclature in this report follows that of Stace (2010) for vascular plants^{xi}, Atherton *et al.* (2010) for bryophytes^{xii} and Purvis *et al.* (1992) for lichens^{xiii}.

Phase 1 Habitat Survey

- 5.1.8 Polygons mapped during the NVC survey were also assigned a Phase 1 habitat classification to provide a general overview. The Phase 1 methodology^j is broader and more general in its classification than the NVC, and suggests carrying out mapping on a scale of 1:10,000. However, as 1:5,000 aerial maps were used in the NVC surveys, this level of detail of Phase 1 mapping was undertaken; this allows more accurate mapping of small areas and features such as verges along linear schemes such as this.

Aspen (Populus tremula)

- 5.1.9 During the course of undertaking NVC surveys, if *Populus tremula* were encountered their location was target noted, and if they were scattered throughout a woodland stand a note was made against the corresponding polygon. This allows a map of areas where *P. tremula* are present to be generated, along with specific locations of isolated trees or small groups of trees.

Protected Vascular Plants and Bryophytes

- 5.1.10 During the course of all habitat surveys a watching brief was maintained for any protected vascular plants and bryophytes, and their location target noted if found; however, dedicated species searches were not carried out.

5.2 Survey Constraints & Limitations

NVC

- 5.2.1 The NVC survey for Dalraddy to Slochd was carried out from 10th-14th April, 17th-19th April and 1st-5th May 2017 inclusive. Surveys were carried out over 47 surveyor days, approximately between the hours of 08:30-18:30. The weather conditions were amenable to survey: bright and sunny, sometimes with broken cloud and relatively light to moderate winds. All parts of the Study Area were accessible, except one small stand of woodland on the opposite bank of the River Spey south of Aviemore, which was surveyed using binoculars.
- 5.2.2 Surveys were conducted from mid-April to mid-May, which is relatively early in the flowering season for a northerly site such as Dalraddy to Slochd, and therefore not the optimal time for carrying out vegetation surveys. However, due to many of the easily recognisable types of habitat present (e.g. heaths, mires etc.), the presence of new young vegetation, early flowering species, buds, recognisable dead vegetation from the previous season, and vegetation that persists through the winter (e.g. trees, scrub, mosses), it was possible to classify the vegetation accurately. Therefore, the time of year was not seen as a significant constraint to the survey. However, it is noted that due to the timing of the survey it was not possible to compile full species-lists for many communities present, and that the lack of certain indicator species for particular NVC sub-communities meant that certain areas were classified to community level only.
- 5.2.3 The NVC system does not cover all possible semi-natural vegetation or habitat types that may be found. Since the NVC was adopted for use in Britain in the 1980s, further survey work and an increased knowledge of vegetation communities has led to additional communities being described that do not fall within the NVC system. Where such communities are found and recorded, they are given a non-NVC community code and are described. This also applies for common transitional communities between two recognised NVC types, e.g. see H9-H12 intermediate heath described in Section 5 below.
- 5.2.4 The results from the NVC survey, and the matches made in describing communities, represent a current community evaluation at the time of survey, as opposed to one seeking to describe what the community was before any human interference, or what it might become in the future. In light of this, a clear constraint of the vegetation survey and evaluation process as used in this and other surveys is that it offers a snapshot of the vegetation communities present and should not be interpreted as a static long-term reference.
- 5.2.5 Following Proposed Scheme design alignment amendments post-survey, a new 250m Study Area buffer from the Land Made Available (LMA) boundary identified a number of gaps in NVC survey coverage. These data gaps were generally on the outer edge of the already surveyed buffer (the new design marginally extending the width of the survey buffer in most cases), or around new or extended Tier 3 access roads. As a result, it was possible to extrapolate data and assign habitat categories and communities to many of these gaps by using surveyor knowledge of the Study Area with existing data, in combination with aerial imagery, to extend adjoining polygons where appropriate. A number of new polygons were also created during the aerial mapping exercise, these desk-mapped polygons are differentiated from areas mapped from field surveys in Figure 12.5. However, in some cases it was not possible to assign a habitat classification to a survey gap from the aerial imagery reliably; in these cases, the area has been left unclassified as a 'non-surveyed area'. These gaps do not pose a limitation to the habitat assessment, as these habitats will not be directly or indirectly effected due to the distance of these from the scheme. All areas within the footprint of the Proposed

Scheme were mapped during site surveys, and as such the use of desk-based mapping to extend the Study Area in certain areas is not considered a limitation to the assessment.

- 5.2.6 Ecological surveys are limited by factors which affect the presence of plants such as the time of year and weather. The ecological surveys undertaken to support this project have not therefore produced a complete list of plants and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the results of these surveys have been reviewed and are considered to be sufficient to undertake this assessment.

Phase 1

- 5.2.7 The Phase 1 surveys were carried out at the same time as the NVC surveys, therefore the same plant identification limitations exist with respect to the early timing of the survey, as described above, but are not considered to affect the validity of the survey results.
- 5.2.8 The Phase 1 methodology is broader and more general in its classification of habitats than the NVC. However, many polygons contain detailed NVC mosaic information on various different vegetation communities which can often be found juxtaposed in very small areas, or transitional to each other. These NVC community mosaics often contain numerous Phase 1 types, for instance blanket bog, wet heath, dry heath and flushes can commonly form intricate mosaics and patterning on a fine scale over short distances. It is not possible to convey this intricate level of detail within the Phase 1 methodology without the use of mosaics. As the Phase 1 mapping technique is used provide a broad overview of general habitat types within an area, and to avoid Phase 1 habitat mosaics, many mapped areas were assigned a Phase 1 habitat type based on the dominant vegetation type or the overall general character of the mapped area using surveyor experience, discretion and the local setting. Consequently, the Phase 1 mapping provides an overview, but often does not fully characterise the vegetation within a particular polygon. Therefore, it is recommended that the NVC data should always be referred to if certain areas require to be assessed in more detail.

Aspen Recording

- 5.2.9 *P. tremula* were recorded as they were encountered during surveys. Trees were not in leaf at the time of the survey and were identified using other methods such as identifying underlying leaf litter (which was still present and diagnostic) in combination with bark characteristics and tree morphology; *P. tremula* were still readily identifiable in this way.
- 5.2.10 *P. tremula* were mapped or target noted when encountered, often appearing as isolated scattered individuals, or sometimes small copses, within large near homogeneous stands of predominately birchwood. As a result, it cannot be assumed that all *P. tremula* within the Study Area have been located, as some individuals or small groups may not have been encountered during the course of the NVC surveys.

Protected Vascular Plants and Bryophytes

- 5.2.11 As noted above surveys were conducted from mid-April to mid-May, which is relatively early in the flowering season for a northerly site. Therefore, some protected plant species may not have been visible at the time of survey. Furthermore, as dedicated rare plant searches were not carried out, the absence of a species from the survey results or this report may not correlate to its absence from the Study Area.

5.3 NVC Results and Vegetation Descriptions

Summary of NVC Communities

- 5.3.1 The categories of vegetation within the Study Area include the following 66 NVC and intermediate NVC communities recorded during the survey:
- Woodland & scrub: W2, W3, W4, W6, W7, W9, W11, W17, W18, W19, W21, W22, W23, W24, W25;
 - Mires, flushes & springs: M2, M3, M4, M5, M6, M9, M10, M17, M19, M20, M23, M25, M27, M28, M32;
 - Wet heaths: M15, M16;
 - Dry heaths: H9, H10, H12, H9-H12 intermediate, H10-H12 intermediate, H12b-U6 intermediate, H16, H18, H21;
 - Calcifugous grasslands & fern vegetation: U1, U2, U4, U5, U6, U16, U19, U20;
 - Mesotrophic grasslands: MG1, MG5, MG6, MG7, MG9, MG10, MG13;
 - Calcicolous grasslands: CG10;
 - Swamps and tall-herb fens: S4, S7, S9, S10, S22, S28; and
 - Vegetation of open habitats: OV24, OV25, OV27.
- 5.3.2 A full list of the NVC codes and associated short description is provided in Annex C.
- 5.3.3 The following sections describe the flora, structure and habitats of these communities and any associated observed sub-communities, found within this Study Area. For each NVC community description, the first paragraph refers to the community in Britain or Scotland as a whole, before moving on to the other paragraphs which describe the vegetation as it was found to occur within this Study Area. The NVC communities within each broad habitat type (e.g. woodland) are described in order of community number within the Study Area.
- 5.3.4 The survey results are displayed in Figure 12.5. Occasional target notes were also made during surveys, mainly to pinpoint areas or species of special interest. These target notes are detailed within Annex D. Photographs of a number of the typical community and habitat types found within the Study Area are provided within Annex E.
- 5.3.5 For each community description, reference is also made to any association with Annex I habitats, SBL priority habitats and potential GWDTE status (as per SEPA guidance). These associations are Study Area specific; full details and discussion are provided in section 6 below.

Woodland & Scrub

- 5.3.6 Woodland is widespread and quite extensive throughout the Study Area, and a relatively diverse range of types are present in varying habitat patch sizes. Some woodland types are rare here, and some of the stands recorded are small and atypical for the assigned NVC communities or sub-communities, as further described below. A small number of woodland communities account for the majority of the woodland stands present.

W2 *Salix cinerea* – *Betula pubescens* – *Phragmites australis* woodland

Communities/sub-communities recorded: W2

GWDTE status – Moderate; Annex I – Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*; SBL – Wet woodland

- 5.3.7 W2 is a community of topogenous fen peats of floodplain mires, river valley mires and, more rarely, basin mires. It can develop as primary woodland through the direct invasion of fen, but other stands represent secondary succession of abandoned mowing-marsh^{xiv,xv}. *Salix cinerea* and *Betula pubescens* are the most frequent trees, but *Alnus glutinosa* may be locally abundant. Their relative abundance is determined by order of colonisation as much as by differing habitat requirements, so there is no specific sequence of succession of the preceding fen. The field layer is derived from the preceding fen communities, which are very variable, so there are few constant species. *Phragmites australis* is usually present, either as dense stands or scattered individuals. The floristic differences between the two sub-communities reflect variation in base-richness and calcium levels in the peat, which are largely dependent on the height and movement of groundwater^{xiv,xv}.
- 5.3.8 W2 is a scarce community within the Study Area, present as three small fragmented stands within larger areas of woodland. These stands can be found close to the River Spey, in its floodplain, or in transitional areas around Loch Alvie.
- 5.3.9 The stands have a canopy of mainly younger or coppiced *Alnus glutinosa*, with some *Salix cinerea* and *Betula pubescens*. The field layer is variable but *Phragmites australis* is constant and dominant in each. The stand by Loch Alvie, to its landward end, contains much Sphagna in the basal layer (*S. fallax*, *S. capillifolium*, *S. denticulatum* and *S. palustre*) along with other vascular associates in the field layer including *Myrica gale*, *Angelica sylvestris*, *Caltha palustris*, *Cirsium palustre*, *Cardamine flexuosa*, *Epilobium palustre*, *Equisetum palustre*, *Molinia caerulea*, *Juncus acutiflorus*, *Carex nigra* and *C. rostrata*. However, the woodland recedes towards Loch Alvie as the stand thins out as the water level deepens, with a transition to S4 *Phragmites australis* swamp evident.

W3 *Salix pentandra* – *Carex rostrata* woodland

Communities recorded: W3

GWDTE status – Moderate; SBL – Wet woodland.

- 5.3.10 This is a community of peat soils kept moist by moderately base-rich and calcareous groundwater in open water transitions, most common in northern Britain^{xiv,xv}. W3 is fairly constant in its composition and structure. The canopy is low, uneven-topped and dominated by *Salix* spp.; *Betula pubescens* can also be present. The field layer can vary widely. Many stands have several species co-dominating, but the overall assemblage of species is distinctive. Tall herbs and horsetails are the most prominent feature; shorter herbs often form a patchy lower layer. Large grasses, rushes and sedges may or may not be abundant, and bryophytes are abundant, sometimes forming a complete ground carpet^{xiv,xv}.
- 5.3.11 W3 is infrequently scattered throughout the Study Area as small stands within larger mosaics of woodland. The canopy consists predominately of *Salix cinerea* and *Betula* spp., with occasional *Alnus glutinosa* in some stands.
- 5.3.12 The field and basal layers are variable amongst the stands, but areas of W3 are generally separated out from other similar canopied woodlands by underlying swards

with abundant to frequent *Carex rostrata* or with abundant Sphagna (particularly *Sphagnum squarrosum*), sometimes both. The more species-poor swards can be heavily dominated by these species, for instance a stand of W3 by Loch Alvie is characterised by a thick carpet of *S. squarrosum* which is only interrupted with occasional shoots of vascular species.

- 5.3.13 Where the vegetation is a bit more species-rich a number of generally occasional associates were recorded in the swards, including: *Caltha palustris*, *Iris pseudacorus*, *Juncus effusus*, *Deschampsia cespitosa*, *Urtica dioica*, *Epilobium palustre*, *Rumex crispus*, *R. acetosa*, *Cardamine pratensis*, *Galium palustre*, *Valeriana officinalis*, *Ranunculus repens*, *Glyceria fluitans*, *Filipendula ulmaria*, *Crepis paludosa*, *Holcus lanatus*, *Lysimachia nummularia*, *Stachys palustris*, *Equisetum palustre* and *Viola palustris*.
- 5.3.14 As well as *Sphagnum squarrosum*, the basal layer in some stands also includes variable amounts of *Sphagnum fallax*, *Calliergonella cuspidata* and *Rhytidiadelphus squarrosus*.

W4 *Betula pubescens* – *Molinia caerulea* woodland

Communities/sub-communities recorded: W4, W4b, W4c

GWDTE status – High; SBL – Upland birchwoods (W4 at community level or W4b within larger stands of drier birchwood) or Wet woodland (W4c, some W4b dependant on local setting).

- 5.3.15 W4 is a community of moist, moderately acidic, though not necessarily highly oligotrophic, peaty soils. It is characteristic of thin or drying ombrogenous peats which are isolated from the influence of base-rich or eutrophic groundwaters, but is also found on peaty gleys flushed by rather base- and nutrient-poor water^{xiv,xv}. *Betula pubescens* is the most common woody species and is usually dominant. The great abundance of *Molinia caerulea* is the most distinctive feature of the field layer, and other species may be limited to areas between *Molinia* tussocks. A number of bryophytes can be found within W4; *Sphagnum* spp. are usually present^{xiv,xv}.
- 5.3.16 Within the Study Area W4 is quite common but generally occurs as smaller, scattered or fragmented stands, it rarely forms any large expanses of woodland. For the most part, it is found in mosaics with the more extensive and drier W11 and W17 *Betula* woodlands (described further below).
- 5.3.17 The W4 canopy within the Study Area is dominated by *Betula* spp., *Salix cinerea* is sometimes present in dense patches through the *Betula*. *Pinus sylvestris* and *Alnus glutinosa* are locally abundant associates in some stands, while *Juniperus communis* is occasionally found scattered in the understory.
- 5.3.18 Some stands of W4 were recorded to community level only due to the nature of small stands; usually drier and species-poor and dominated by a field layer of *Molinia* with few distinguishing sub-community species. Where the *Molinia* becomes less tussocky and thins out, there are other species such as *Agrostis capillaris*, *Anthoxanthum odoratum*, *Blechnum spicant* and *Galium saxatile*. The basal layer sometimes contains scattered patches of Sphagna but is characterised more by dense patches of pleurocarpous mosses, especially *Hylocomium splendens* and *Rhytidiadelphus* spp.
- 5.3.19 The majority of stands fall within the wetter sub-communities; **W4b *Juncus effusus* sub-community** and **W4c *Sphagnum* sub-community**. The canopy remains largely the same, with the floristic differences being observed in the field and basal layers.

- 5.3.20 In areas of W4b the vegetation is characterised more by mixtures of dominant to abundant *Juncus effusus* with species including *Deschampsia cespitosa*, *Holcus lanatus*, *Myrica gale*, *Carex nigra*, *Deschampsia flexuosa*, *Oxalis acetosella* and *Pteridium aquilinum*. These species tend to over-top a layer of mosses that most often contains *Polytrichum commune*, *Sphagnum fallax*, *S. palustre*, *S. capillifolium*, *Hylocomium splendens*, *Pleurozium schreberi*, *Rhytidiadelphus triquetrus*, *Pseudoscleropodium purum* and *Aulacomnium palustre*.
- 5.3.21 A number of stands of W4c are also present within the Study Area. The ground vegetation here preserves elements of the wet heath or mire from which the woodland has perhaps developed (e.g. in particular M19 *Calluna vulgaris* – *Eriophorum vaginatum* mire). The field layer in these stands contains mixtures of abundant to occasional *Molinia caerulea*, *Eriophorum vaginatum*, *E. angustifolium*, *Calluna vulgaris*, *Erica tetralix*, *Potentilla erecta* and *Vaccinium myrtillus*. Rarer is the presence of *Carex rostrata* and *C. nigra*, which can be very locally abundant. The basal layer is generally characterised by combinations of *Sphagnum fallax*, *S. palustre*, *S. capillifolium*, *S. papillosum*, *P. schreberi*, *H. splendens*, *Polytrichum commune*, *P. strictum*, *Hypnum jutlandicum*, *H. cupressiforme*, *R. triquetrus*, *Dicranum scoparium* and *Polytrichastrum formosum*.

W6 Alnus glutinosa – Urtica dioica woodland

Communities/sub-communities recorded: W6

GWDTE status – Moderate; SBL – Wet woodland

- 5.3.22 W6 is a poorly-defined community of eutrophic moist soils, especially where there has been substantial deposition of mineral matter, or on floodplain mires where enriched waters flood fen peat^{xiv,xv}. *Alnus glutinosa* is usually the most common tree, particularly on wetter soils, but is replaced by *Salix* spp. or *Betula pubescens* on some sites. Unlike the other *A. glutinosa* woodland types (W5 and W7) the field layer generally lacks the richer and tall swamp and fen species, and is instead replaced by a species-poor, albeit quite distinctive, field layer. The most typical species is *Urtica dioica*. The few other typical species are mainly characteristic of damp to moderately wet habitats^{xiv,xv}.
- 5.3.23 A single small stand of W6 was recorded in the very southern Study Area close to the Allt an Fheàrna burn. Located at the lower end of an improved field it appears the stand may be subjected to nutrient enrichment from the farmland which has led to the development of the W6 field layer.
- 5.3.24 The stand consists of a canopy of *Alnus glutinosa* and *Betula* spp. The field layer contains abundant *Urtica dioica* and *Galium aparine*, along with *Deschampsia cespitosa* and *Filipendula ulmaria*.

W7 Alnus glutinosa – Fraxinus excelsior – Lysimachia nemoreum woodland

Communities/sub-communities recorded: W7, W7a, W7b, W7c

GWDTE status – High; Annex I – Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*; SBL – Wet woodland

- 5.3.25 W7 is typical of moist to very wet mineral soils which are only moderately base-rich and not very eutrophic^{xiv,xv}. It is most extensive in the wetter parts of Britain, but usually occurs on soils where there is no great tendency for peat accumulation. *Alnus glutinosa* is usually the main tree species and is commonly accompanied by other species such as *Fraxinus excelsior*, *Betula* spp., *Salix* spp. and *Acer pseudoplatanus*. The field layer

can be very varied; the wetness and nutrient status of the soil determines what other species may occur, these being mainly grasses and herbaceous dicotyledons^{xiv,xv}. There are three sub-communities; differences between them are related to the extent of waterlogging, the nature of the water supply and its movement.

- 5.3.26 A number of relatively small stands of W7 occur scattered throughout the Study Area, most often around the fringes of watercourses or waterbodies, and sometimes distant from such features in wetter woodland hollows, forming a mosaic with drier woodland types.
- 5.3.27 A number of stands recorded are under a typical canopy of *Alnus glutinosa*, however in many other stands the canopy within the Study Area tends to be dominated by *Betula* spp. Within these canopies there is often also locally abundant to frequent *Salix cinerea*. Occasional canopy species include *Acer pseudoplatanus*.
- 5.3.28 A few stands are very wet/waterlogged whereas others are relatively dry, grazing intensity also ranges from intensively grazed stands to stands excluded from grazing, and as such the W7 field layer varies widely throughout the Study Area. In places, the vegetation was recorded to community level only, however, all three sub-communities were also recorded: **W7a *Urtica dioica* sub-community, W7b *Carex remota* – *Cirsium palustre* sub-community and W7c *Deschampsia cespitosa* sub-community**. Many stands are relatively species-poor and contain field layers corresponding to M23b rush-mire or MG9 grassland (see respective community descriptions below).
- 5.3.29 Species assemblages and species abundances within stands vary, W7c tends to be drier and grass dominated with abundant *Deschampsia cespitosa*, whereas W7a and W7b are wetter with more mixed vegetation.
- 5.3.30 Overall commonly recorded plants in areas of W7 included *Juncus effusus*, *J. acutiflorus*, *Deschampsia cespitosa*, *Urtica dioica*, *Cirsium palustre*, *Holcus lanatus*, *H. mollis*, *Agrostis* spp., *Anthoxanthum odoratum*, *Glyceria fluitans*, *Caltha palustris*, *Filipendula ulmaria*, *Rumex obtusifolius*, *R. acetosa*, *Oxalis acetosella*, *Chrysosplenium oppositifolium*, *Ranunculus repens*, *R. ficaria*, *R. flammula*, *Cardamine pratensis*, *Galium palustre*, *Viola palustris* and *Carex* spp. (sedges). Mosses were also abundant in some stands, in particular species such as *Calliergonella cuspidata*, *Bryum pseudotriquetrum* and *Rhytidiadelphus squarrosus*.
- 5.3.31 Each stand of W7 was assessed on a case by case basis to determine if it could be considered Annex I alluvial forest habitat. Many stands were not deemed to be of Annex I status due to their local setting; as discussed in Section 6.

W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland

Communities/sub-communities recorded: W9

- 5.3.32 W9 is a community of permanently moist calcareous soils in the sub-montane climate of north-west Britain. It is commonly found by streams and flush lines in the uplands, where the climate is cool, wet and windy^{xiv,xv}. In typical stands *Fraxinus excelsior* and *Corylus avellana* are the most abundant woody species, and *Betula pubescens* and *Sorbus aucuparia* may be co-dominant. The field layer is usually a complex mosaic, with no single species dominating, although *Mercurialis perennis* and *Hyacinthoides non-scripta* both tend to be frequent. Other features distinctive of W9 include an abundance of *Oxalis acetosella*, various fern species, and a well-developed bryophyte layer^{xiv,xv}.

- 5.3.33 W9 woodland is very rare within the Study Area, with only two small patches recorded. These areas do not contain the characteristic *Fraxinus excelsior* and *Corylus avellana* canopy but are patches of *Betula* woodland where the ground layer indicates some base-richness, in these areas evident by a sward of *Mercurialis perennis*.

W11 Quercus petraea – Betula pubescens – Oxalis acetosella woodland

Communities/sub-communities recorded: W11, W11b, W11c, W11d, W11Lsyl

SBL – Upland birchwoods (when dominated by birch) or Upland oakwood (where oak forms >30% of canopy cover)

- 5.3.34 W11 is a community of moist, free-draining base-poor brown earth soils in the cooler, wetter north-west of Britain. It is characteristic of substrates that are neither markedly calcareous nor strongly acidic. The character of the community is heavily influenced by grazing^{xiv,xv}. These woodlands have a canopy of *Betula* spp. and/or *Quercus* spp. and a field layer dominated mainly by grasses. The canopy composition reflects its affinities with the W17 *Quercus petraea – Betula pubescens – Dicranum majus* community described below, and from which it is distinguished mainly by the swards of grasses including *Agrostis* spp., *Holcus mollis* and *Anthoxanthum odoratum*, rather than one dominated by pleurocarpous mosses and sub-shrubs.
- 5.3.35 W11 is very common and widespread throughout the Study Area, as stands of natural woodland and also stands of planted origin, the latter being mainly in shelter-belts along the A9. Stand size varies greatly, from small pockets of woodland amongst other habitats, to large extensive stands that commonly form mosaics with similar woodlands, in particular W17 woodland (described below). In these areas there is typically some species overlap in the transitional zone, often seen through the grassy W11 flora becoming mossier with occasional sub-shrubs where tending toward W17.
- 5.3.36 Many stands of W11 were not recorded to sub-community level; these typically consist of a canopy of *Betula* spp. over a grazed and semi-improved grassy field layer similar to U4a or U4b grasslands (U4 community described further below). Many of the stands have evidently been subject to intensive grazing for many years and have a relatively open canopy with little to no regeneration, and a very short field layer sward. Stands such as these do not fit well into the W11 sub-communities.
- 5.3.37 However, in many other stands, sub-community determination was possible due to the presence of a few characteristic species. The **W11c *Anemone nemorosa* sub-community** and **W11d *Stellaria holostea – Hypericum pulchrum* sub-community** are widely scattered and commonplace throughout the Study Area; the **W11b *Blechnum spicant* sub-community** was recorded but is much less common than W11c and W11d.
- 5.3.38 Throughout W11 within the Study Area, the canopy of the vast majority of stands is dominated by young to mature/ancient *Betula* spp.; many stands are pure *Betula* with no other tree species. However, a few stands within the southern parts of the Study Area have a mature *Quercus petraea* canopy, and a few others contain a *Populus tremula* canopy; rarely there are mixed canopies containing *Betula*, *Quercus* and *P. tremula*.
- 5.3.39 The canopies of dominant *Betula* or *Quercus* that contain other species are most often accompanied by scattered individuals or small groups of *P. tremula*, *Sorbus aucuparia*, and *Salix caprea*; occasionally present in some patches are *Pinus sylvestris*, *Salix cinerea*, *Larix* sp., *Prunus avium*, *P. padus*, *Corylus avellana* and *Crataegus monogyna*. *Aesculus hippocastanum* is rarely present in stands near habitation. *Juniperus*

communis is locally frequent in the sub-layer of some W11 woods, *Cytisus scoparius* is occasional.

- 5.3.40 The W11 field layer throughout the Study Area is variable, but in general terms it is grassy and contains a few constant species. The most constantly abundant species recorded include *Agrostis* spp., *Anthoxanthum odoratum*, *Holcus lanatus* and *H. mollis*. Other grasses frequent in particular stands include *Festuca ovina* and *Deschampsia flexuosa*. Occasionally there can be some scattered *Deschampsia cespitosa* and *Dactylis glomerata*.
- 5.3.41 The herbs *Conopodium majus*, *Oxalis acetosella* and *Anemone nemorosa* are particularly abundant through these grasses in most of these stands. *Pteridium aquilinum* is also dominant to abundant in many stands.
- 5.3.42 Other field layer species recorded include sometimes abundant, but more often frequent to occasional, *Rubus fruticosus*, *Veronica chamaedrys*, *Luzula* spp., *Viola riviniana*, *Potentilla erecta*, *Stellaria holostea*, *Galium saxatile*, *Dryopteris* spp., *Urtica dioica*, *Blechnum spicant* and *Primula vulgaris*. Rarely there can be tufts of *Juncus effusus* in patches of damper soil. A larger number of other species can be found more rarely in specific stands (for instance see TN data in Annex A).
- 5.3.43 Stands of W11b tend to contain more *Blechnum spicant* and *Primula vulgaris* than the others, W11c is distinguished by the abundance of *Anemone nemorosa* and *Trientalis europaea*, while W11d has *Stellaria holostea* and *Veronica chamaedrys* and is often mossier with abundant *Rhytidiadelphus triquetrus*. One stand recorded as 'W11Lsyl' is characterised by a field layer dominated by *Luzula sylvatica*.
- 5.3.44 Mosses are usually present, although variable in their cover, being more abundant in areas where the grasses and forbs have been largely grazed out or the W11 is juxtaposed with W17. The most common moss species found in W11 in this survey are *Rhytidiadelphus squarrosus*, *R. triquetrus*, *Hylocomium splendens*, *Pseudoscleropodium purum*, *Kindbergia praelonga*, *Pleurozium schreberi* and *Thuidium tamariscinum*.

W17 *Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland

Communities/sub-communities recorded: W17, W17b, W17c, W17d

SBL - Upland birchwoods (when dominated by birch)

- 5.3.45 W17 woodland is a community of acid, often thin and fragmentary soils in the cool, wet north-west of Britain where there is a strong tendency for mor accumulation and where high rainfall leads to strong leaching^{xiv,xv}. Local differences in climate and topography have a strong influence on the vegetation and frequently interact with grazing to determine the distinctive floristics of the sub-communities^{xiv}. In this community *Quercus petraea* and/or *Betula pubescens* usually dominate, although *B. pubescens* is particularly frequent to the north-west where *Quercus* spp. are scarce. The field layer is usually characterised by ericoid shrubs, *Pteridium aquilinum* and grasses; bryophytes are also particularly abundant within this community^{xiv,xv}.
- 5.3.46 W17 is widespread throughout the Study Area, often as sole stands of the community, but also frequently in mosaics with W11 and as patches within larger W18 woodlands. Though sometimes recorded at the community level, the stands within the Study Area generally fall into two of the four recognised sub-communities: the two healthier versions, **W17b Typical sub-community** and **W17d *Rhytidiadelphus triquetrus* sub-community**. However, the grassier **W17c *Anthoxanthum odoratum* – *Agrostis capillaris* sub-community** was also recorded on a number of occasions.

- 5.3.47 The canopies of areas of W17 are almost all dominated by *Betula* spp. of various ages depending on the stand, and whether semi-natural or planted (rare stands have a canopy of dominant *Populus tremula*). Along with *Betula* there is sometimes occasional *P. tremula* and *Pinus sylvestris*, and more rarely *Salix caprea* and *Sorbus aucuparia*. In some stands the underscrub contains abundant to occasional *Juniperus communis*; rarely *Cytisus scoparius*.
- 5.3.48 In the Study Area, the field layer is characteristically shrubby in appearance, particularly in W17b. Variable levels of grazing are responsible for notable differences in the shrub layer, with stands ranging from shorter and sparser in areas of frequent grazing, to others excluded from grazing with a tall and sprawling shrub layer up to 3-5 decimetres (dm) tall. The most common sub-shrub species are variable amounts of *Calluna vulgaris*, *Vaccinium myrtillus* and *Vaccinium vitis-idaea*. *Erica cinerea* is present abundantly to frequently in some stands.
- 5.3.49 Stands of W17c lack the dominant sub-shrub element and instead are characterised more by sparse sub-shrubs with abundant *Deschampsia flexuosa*, *Anthoxanthum odoratum* and *Agrostis* spp.
- 5.3.50 Other vascular species commonly noted as scattered throughout many stands of W17 include *Blechnum spicant*, *Oxalis acetosella*, *Galium saxatile*, *Pteridium aquilinum*, *Festuca ovina*, *Holcus lanatus*, *Trientalis europaea*, *Luzula sylvatica*, *L. pilosa*, *Potentilla erecta*, *Galium saxatile*, *Anemone nemorosa* and *Viola riviniana*. A range of other species are more rarely present.
- 5.3.51 In all sub-communities, the basal layer usually contains extensive carpets of mosses that can effectively blanket the ground in places. Areas of W17d are distinguished from the other sub-communities by the great abundance, or even dominance, of the moss *Rhytidiadelphus triquetrus*.
- 5.3.52 The most abundant mosses recorded are *Rhytidiadelphus triquetrus*, *Pleurozium schreberi* and *Hylocomium splendens* but others such as *Dicranum majus*, *D. scoparium*, *R. loreus*, *R. squarrosus*, *Pseudoscleropodium purum*, *Thuidium tamariscinum*, *Polytrichastrum formosum*, *Hypnum* spp., *Mnium hornum* and *Plagiothecium undulatum* are common throughout and in some places can be locally prominent.

W18 Pinus sylvestris – Hylocomium splendens woodland

Communities/sub-communities recorded: W18, W18a, W18b, W18c, W18d

Annex I – Caledonian forest; SBL – Native pinewoods

- 5.3.53 W18 *Pinus sylvestris – Hylocomium splendens* woodland is a community of strongly leached, lime-free, podzolic soils in the east, central and western Highlands of Scotland. Variation in composition is generally related to the density and age of the pine canopy, but climate, soils and the incidence of browsing, grazing and burning are also important. *P. sylvestris* is always the most abundant tree, though *Betula* spp. may be common. There is a heathy field layer and bryophytes are abundant^{xiv,xv}.
- 5.3.54 W18 is the most extensive woodland type and one of the most extensive communities throughout the whole Study Area. It is present in large blocks all along Dalraddy to Slochd. However, the vast majority of W18 woodland is of planted origin, with many large even aged stands. A number of the maturing stands have been thinned out; this has allowed light penetration and the re-development of a ground flora which allows classification. In other areas of W18 the plantation is quite young and either has a

canopy that has not yet closed and shaded out the ground flora, or has been planted so densely and reached an age whereby no light reaches the ground; in these instances, there is rarely a ground flora, only scattered mosses and pine needle debris.

- 5.3.55 Semi-natural or self-seeded areas of W18 are present within the Study Area, but these tend to be small and fragmented stands. A few of the more mature stands have been classed as potentially Annex I Caledonian Forest and SBL Native Pinewoods – see section 6 below. The younger stands tend to correlate to recent *P. sylvestris* invasion of dry heath areas.
- 5.3.56 Many stands of W18 were classified to community level only, owing to their planted nature, the absence of a ground flora, or the presence of a mosaic of sub-communities. However, many stands were classified to sub-community level, with the **W18b *Vaccinium myrtillus* – *Vaccinium vitis-idaea* sub-community** and the **W18c *Luzula pilosa* sub-community** being the most common types. There are also some smaller areas of the **W18a *Erica cinerea* – *Goodyera repens* sub-community** and **W18d *Sphagnum capillifolium/quinquefarium* – *Erica tetralix* sub-community** present.
- 5.3.57 The canopy is always dominated by *Pinus sylvestris* and this is commonly the sole tree species. Locally other species occur as scattered individuals or in small pockets; these are most often *Pinus contorta*, *Betula* spp., *Larix decidua* and *Salix* spp. Occasionally *Juniperus communis* appears in the understorey of older stands.
- 5.3.58 The W18b sub-community is the most common and widespread variant throughout the Study Area. These areas are characterised by a ground flora with abundant *Vaccinium myrtillus*, *V. vitis-idaea*, *Calluna vulgaris* and *Deschampsia flexuosa* over a dense moss carpet including *Hylocomium splendens*, *Rhytidiadelphus triquetrus*, *R. loreus*, *R. squarrosus*, *Pleurozium schreberi*, *Hypnum* spp., *Dicranum majus*, *D. scoparium* and *Pseudoscleropodium purum*. The liverwort *Lophocolea bidentata* is also frequent.
- 5.3.59 The other common variant present, the W18c sub-community, also contains many patches of the mosses as listed above, but the vascular flora is generally much grassier and lacks the dominant sub-shrub elements of the other sub-communities. Within areas of W18c the grassier field layer is characterised by dominant to abundant *Deschampsia flexuosa*, *Agrostis* spp., *Festuca ovina*, *Anthoxanthum odoratum* and *Holcus lanatus*; *Deschampsia cespitosa* is occasional. The grasses of W18c are frequently accompanied by *Galium saxatile*, *Oxalis acetosella*, *Luzula* spp., *Blechnum spicant* and *Pteridium aquilinum*.
- 5.3.60 W18d was recorded in a number of stands but is not extensive. This is a damper and more mire-like woodland and the field flora here typically contains a higher presence of common mire associates. As well as a scattering of many of the species already listed above, particularly *Calluna vulgaris*, these areas tend to be separated by the abundant to frequent presence of *Molinia caerulea*, *Eriophorum vaginatum*, *Erica tetralix*, *Juncus effusus*, *Polytrichum commune* and *Sphagna* (particularly *S. capillifolium*, *S. fallax*, *S. denticulatum* and *S. palustre*).
- 5.3.61 Rarely, a few patches of the W18a sub-community were noted, here the sub-shrub vegetation also contains frequent *Erica cinerea*. *Goodyera repens* was recorded in a small number of W18/W18a stands.



W19 Juniperus communis – Oxalis acetosella woodland

Communities/sub-communities recorded: W19, W19a, W19b

Annex I – *Juniperus communis* formations on heaths or calcareous grasslands

- 5.3.62 This is a community of medium to high altitudes, mostly within the cooler and relatively dry parts of northern Britain. It occurs on a wide variety of free-draining soils, and edaphic differences, together with grazing and browsing, have important influences on the floristics of the vegetation^{xiv,xv}. The main centre of distribution of W19 is in the east-central Highlands, particularly in the hill ranges running from the Cairngorms NW to Inverness. *Juniperus communis* is always the most abundant woody species in this community, although some stands can also have an open canopy of *Betula* spp.^{xiv,xv,xvi}. Stands of W19 can have less than 60% cover of *J. communis* and extensive stretches of a closed canopy are exceptional; the usual situation is of a varied, patchy cover with some more open areas. Within a stand of W19 the individual bushes can have very varied growth forms. The other major elements in W19 are ericoids, ferns, herbs, and bryophytes (which almost always make a prominent contribution to the vegetation^{xiv,xv}).
- 5.3.63 W19 is scattered throughout mainly the northern half of the Study Area where the landscape is more upland in character. It rarely forms large stands, the largest being on the upper slopes of the Slochd embankment to the east of the existing carriageway. Otherwise W19 generally forms small scattered stands throughout areas of dry heath and unimproved acid grasslands, and, particularly around the Kinveachy area (centred on NH 909 190), around the edges of and in clearings of acid woodlands.
- 5.3.64 Both the **W19a *Vaccinium vitis-idaea – Deschampsia flexuosa* sub-community** and **W19b *Viola riviniana – Anemone nemorosa* sub community** were recorded, with W19a being more common. Areas of W19a are stands with a heathy ground flora and those of W19b have a grassy and more herb-rich ground flora.
- 5.3.65 Within the Study Area the community is dominated by *Juniperus communis*. Stands around Slochd often contain patches of bare rock or scree, but otherwise the ground flora commonly contains *Festuca ovina*, *Agrostis capillaris*, *Deschampsia flexuosa*, *Anthoxanthum odoratum*, *Nardus stricta* and the mosses *Hylocomium splendens*, *Pleurozium schreberi*, *Hypnum jutlandicum*, *Rhytidiadelphus squarrosus* and *R. triquetrus*. In some areas *Vaccinium vitis-idaea*, *V. myrtillus* and *Calluna vulgaris* are also frequent (i.e. W19a).

W21 Crataegus monogyna – Hedera helix scrub

Communities/sub-communities recorded: W21

- 5.3.66 W21 *Crataegus monogyna – Hedera helix* scrub is the typical sub-climax woody community of circumneutral to base-rich soils throughout the British lowlands^{xiv}. Hedgerow stands are often of planted origin. It is a variable community which includes most of the seral thorn scrub and many hedges in the British Isles. The vegetation is always dominated by various mixtures of smaller trees and shrubs, undershrubs and woody climbers^{xiv}. The woody component of the vegetation can be quite varied, influenced by edaphic differences and availability of seed parents. However, *Crataegus monogyna* is the most common plant overall, and can be a sole dominant in some stands^{xiv}.
- 5.3.67 W21 is quite uncommon within the Study Area, only recorded as a few hedges near farms or habitation, or as isolated small stands by other taller woodlands. In all cases the vegetation is dominated by relatively short *Crataegus monogyna*.



W22 Prunus spinosa – Rubus fruticosus scrub

Communities/sub-communities recorded: W22

- 5.3.68 W22 is characteristic of mesotrophic soils of moderate base-status in the lowlands. It is mainly a sub-climax vegetation, often found around the fringes of woodland. In the community *Prunus spinosa* is generally the sole woody constant and almost always an overwhelming dominant in a species-poor canopy; other trees or shrubs are only occasional. *Rubus* spp. and *Rosa* spp. often grow sparsely through the bushes and the field layer is characteristically species-poor and often sparse but can contain a number of herbs, grasses, ferns and mosses^{xiv}.
- 5.3.69 Only two stands of W22 were recorded in the Study Area, one along a railway embankment which consisted of *Prunus spinosa* with *Rubus idaeus*, and the other a stand of *P. spinosa* near Aviemore in a mosaic with W11 and W21.

W23 Ulex europaeus – Rubus fruticosus scrub

Communities/sub-communities recorded: W23, W23a

- 5.3.70 The W23 community is generally dominated by *Ulex europaeus* (locally *Cytisus scoparius*) and has a usually sparse and species-poor ground flora, or in some places no ground flora at all. It is a community of acidic and free draining soils on gentle to steep, rocky slopes at low altitudes. The vegetation often develops after woodland clearance of, or on, abandoned pasture^{xiv,xvi}.
- 5.3.71 W23 was recorded frequently within the Study Area, mainly along roadsides or associated road or railway banks; sometimes also around the edges of woodlands. Stands were predominately small; however, some larger dense patches are to be found on A9 embankments south of Carrbridge.
- 5.3.72 In most cases, W23 in the Study Area is dominated by *Cytisus scoparius*; only occasionally is there some *Ulex europaeus*, and it rarely dominates. In these areas, where the bushes aren't so dense and allow the persistence of a ground flora, it is closely associated with typical U4 grassland species and is classed as the **W23a Anthoxanthum odoratum sub-community**.

W24 Rubus fruticosus – Holcus lanatus underscrub

Communities/sub-communities recorded: W24

- 5.3.73 W24 underscrub is a typical community of abandoned and neglected ground in the British lowlands, where it can be found on a wide variety of circumneutral and less oligotrophic soils^{xiv}. The community is typically dominated by mixtures of *Rubus* spp., rank grasses and tall dicotyledons. It is commonly found in close association with taller woody vegetation, in successions and zones around woodland and other scrub margins (although it generally lacks these woody species in the community itself)^{xiv}.
- 5.3.74 W24 is widely scattered as very small stands within the Study Area, generally found in neglected rank vegetation around farms, habitation or roadsides, on road/railway embankments, and sometimes around the edges of woodland.
- 5.3.75 In most cases the vegetation is dominated by *Rubus idaeus* rather than *R. fruticosus*, although in some cases there is a mix of the two. Through the straggling branches there are a mix of common taller grasses, such as *Holcus lanatus*.

W25 Pteridium aquilinum – Rubus fruticosus underscrub

Communities/sub-communities recorded: W25

- 5.3.76 W25 is vegetation dominated by mixtures of *Pteridium aquilinum* and *Rubus fruticosus* and is often found closely associated with taller woody vegetation, although trees are uncommon within the vegetation. *P. aquilinum* is generally the more abundant of the two constants, although in some stands *R. fruticosus* can be dominant and it can be more conspicuous in winter as *P. aquilinum* dies back. Associates tend to be of low cover and confined to the open patches between these main species^{xiv}.
- 5.3.77 One patch of W25 was recorded in the Study Area along a railway embankment, typically the stand was dominated by dense *P. aquilinum* with *R. fruticosus* and *R. idaeus* abundant through the fronds.

Mires, Flushes & Springs

- 5.3.78 Various mire types and associated flush and spring communities are present within the Study Area, most often occupying flatter, wetter and gently sloping peaty areas. Many areas of mire tend to be fragmented, but there are a few larger expanses of blanket bog habitat towards the north of the Study Area, particularly by Slochd Mòr and east and north-east of Carn Bad nan Luibhean (Figure 12.5). Mire communities are scarcer in the central and southern Study Area. These areas and the associated communities are described in further detail below.

M2 Sphagnum cuspidatum/fallax bog pool community

Communities/sub-communities recorded: M2

Annex I, SBL - Blanket bog²

- 5.3.79 This community is typically found in pools and lawns on the surface of very wet and base-poor peats on ombrogenous and topogenous mires in the less oceanic parts of Britain^{xvi,xvii,xviii}. M2 is typically dominated by soft wet carpets of *Sphagnum cuspidatum* or *S. fallax*, or both. This community has been reduced by widespread drainage and cutting of mires, so that often just small and modified fragments remain within predominantly agricultural landscapes. However, this community also readily colonises shallow flooded workings^{xvii,xviii}.
- 5.3.80 A number of small patches and pools of M2 were recorded within the Study Area, predominately as a small percentage component of larger areas of M17-M20 mires, and more rarely in M16 wet heath. These areas of M2 tend to be dominated by *Sphagnum fallax* and *S. cuspidatum*. Throughout the carpet of Sphagna there are often scattered shoots of *Eriophorum angustifolium*, *Carex nigra* and *C. rostrata*.

M3 Eriophorum angustifolium bog pool community

Communities recorded: M3

Annex I, SBL - Blanket bog²

- 5.3.81 The M3 *Eriophorum angustifolium* bog pool community is typically found as small stands on barer exposures of acid peat in depressions, erosion channels or shallow peat cuttings on a wide range of mire types^{xvii,xviii}. It can occur in permanently flooded pools

² When associated as a component part of larger M17-M20 mires.

and natural hollows on surfaces of more or less intact mires, and on dried-up hollows and among erosion features where the peat has been worn down in gullies or redistributed^{xvi,xvii,xviii}. The typical species, *Eriophorum angustifolium*, can occur as dense and often tall swards, but equally commonly it occurs as sparser shoots scattered over expanses of bare peat^{xvi}.

- 5.3.82 M3 is infrequently scattered throughout the areas of M17 and M19 mire within the Study Area as pools or carpets of *Eriophorum angustifolium*, it also occurs in areas of bare peat or M16 wet heath where the community is more a sward of *E. angustifolium* on exposed peat rather than a true pool community. In all cases *E. angustifolium* is the dominant species.

M4 Carex rostrata – Sphagnum fallax mire

Communities recorded: M4

Annex I – Transition mires and quaking bogs; SBL – Upland flushes, fens and swamps

- 5.3.83 The M4 community is characteristic of pools and seepage areas on peat soils of topogenous and soligenous mires where the waters are fairly acid and only slightly enriched. It can occur in bog pools on the surface of basin mires, but is more common in soligenous areas as in mire laggs and the wettest parts of water-tracks^{xvii,xviii}. This mire typically has a cover of sedges, including abundant to dominant *Carex rostrata*, over a carpet of semi-aquatic *Sphagnum* spp.
- 5.3.84 M4 is present as sparsely scattered stands throughout the Study Area, mostly as small stands marking the passage and localised ponding of surface water in depressions or basin mires, and rarely in old peat cuttings. The M4 community is readily recognised by the tall swards of *Carex rostrata* over lawns of *Sphagnum fallax*, *S. palustre* and *S. cuspidatum*, and it varies little from this dominance of defining species. In some areas, these are the only species present.
- 5.3.85 However, a few stands contain a number of more occasional associates along with the main species, these are most often scattered *Juncus effusus*, *Molinia caerulea*, *Carex nigra*, *Eriophorum angustifolium*, *E. vaginatum* and the moss *Polytrichum commune*.

M5 Carex rostrata – Sphagnum squarrosum mire

Communities recorded: M5

GWDTE status – High; Annex I – Transition mires and quaking bogs; SBL – Upland flushes, fens and swamps

- 5.3.86 M5 mire is typically found as floating rafts or on soft, spongy peats in topogenous mires and in soligenous areas with mildly acid, only moderately calcareous and more nutrient-poor waters. It is characteristically found in zonations and mosaics. The community has a widespread but fairly local distribution in northern and western parts of Britain^{xvii,xviii}.
- 5.3.87 M5 is characterised overall by the dominance of sedges with scattered poor-fen herbs over a patchy carpet of moderately base-tolerant *Sphagnum* spp. The commonest species throughout are *Carex rostrata* and *C. nigra*, with the former generally more extensive. The bryophyte carpet helps define M5 mire against closely related vegetation types; especially distinctive is the presence of *Sphagnum squarrosum* and *S. teres*^{xvii,xviii}.
- 5.3.88 M5 is rare within the Study Area and was only recorded once in an area of basin mire, and is part of larger mosaic area of mires and flush containing NVC types M6, M9, M16

and M19. In addition to the species listed above the area contained abundant *Potentilla palustris*.

M6 Carex echinata – Sphagnum fallax/denticulatum mire

Communities/sub-communities recorded: M6a, M6b, M6c, M6d

GWDTE status – High; SBL – Upland flushes, fens and swamps

- 5.3.89 This mire is the major soligenous community of peats and peaty gleys irrigated by base poor waters in the sub-montane zone of northern and western Britain. It typically occurs as small stands among other mire communities, grasslands and heaths, and is sometimes found with swamp and spring vegetation. It is commonly found in tracts of unenclosed upland pasture, particularly between 200m and 400m (although it may also be found much higher) and is ubiquitous in upland Britain^{xvii,xviii}. The M6 community has a distinct general character but includes a wide variation in species composition, expressed as four sub-communities (two of which are visually similar to the M23 community). It is essentially a poor-fen with small sedges or rushes dominating over a carpet of oligotrophic and base-intolerant Sphagna^{xvii,xviii}.
- 5.3.90 M6 is widespread throughout the whole Study Area in both upland and lowland settings. Present mostly as small flushes, runnels or soakways, and along and within occluding ditches and minor watercourses; however, it also occurs as a notable component of many areas of basin mire.
- 5.3.91 All four sub-communities occur within the Study Area, but the majority are of the mainly species-poor **M6c *Juncus effusus* sub-community**. M6c is scattered throughout the Study Area in wet depressions, usually in small, linear extents associated with surface waters on various steepness of slopes and on floodplains in association with other mire and swamp communities. In a few cases M6c is more extensive and appears within a basin mire setting without the characteristic flushing habit.
- 5.3.92 A tall sward of *Juncus effusus* over a species-poor lawn of *Sphagnum fallax*, *S. palustre* and *Polytrichum commune* indicates the M6c sub-community. In many stands its extent encompasses little more than these species already listed (particularly in basin mire areas). Other associates recorded that are more frequent to occasional and enrich the sward, and can be locally abundant, include; *Carex echinata*, *C. panicea*, *C. nigra*, *Eriophorum vaginatum*, *E. angustifolium*, *Erica tetralix*, *Molinia caerulea*, *Cirsium palustre*, *Rumex acetosa*, *Deschampsia cespitosa*, *Viola palustris* and the mosses *Sphagnum capillifolium*, *S. denticulatum*, *S. papillosum*, *Hylocomium splendens* and *Rhytidiadelphus squarrosus*.
- 5.3.93 A few stands of the **M6b *Carex nigra* – *Nardus stricta* sub community** were recorded, these areas are characterised more by a sward of abundant *Carex nigra* and are not dominated by *Juncus* spp. In addition to many of the species already listed above, many of these stands also included the appearance of *Nardus stricta* and *Juncus squarrosus*.
- 5.3.94 The **M6d *Juncus acutiflorus* sub-community** is much less common within the Study Area and was recorded only twice in very small stands; its species composition essentially mimics that of M6c above but with *J. acutiflorus* replacing *J. effusus* as the main rush species.
- 5.3.95 The **M6a *Carex echinata* sub-community** is infrequent within the Study Area and also was only recorded in two stands, this sub-community is characterised by smaller sedge species, particularly *Carex echinata*, *C. nigra* and *C. panicea*.

M9 Carex rostrata – Calliergon cuspidatum/giganteum mire

Communities/sub-communities recorded: M9, M9b

GWDTE status – High; Annex I – Transition mires and quaking bogs; SBL – Upland flushes, fens and swamps

- 5.3.96 This community is characteristic of soft, spongy peats kept permanently moist by at least moderately base-rich and calcareous waters. It is commonest in wetter parts of topogenous mires in hollows or old peat workings, but also around springs, laggs of raised mires and mowing marshes^{xvii,xviii}. The community is widespread but local.
- 5.3.97 M9 mire is generally characterised by a fairly rich assemblage of sedges and vascular plants over a carpet of bulky mosses and localised patches of *Sphagnum* spp. The commonest large sedge is *Carex rostrata*, which is often abundant and sometimes dominant; however, a number of other *Carex* spp. tend to be present and often frequent. Intermixed with these species, or fringing patches of them, are a variety of vascular associates. Bryophytes are almost always conspicuous, with *Calliergon cuspidatum* constant, and *Campylium stellatum*, *Scorpidium scorpioides* and *S. revolvens* distinctive species of this community^{xvii,xviii}.
- 5.3.98 M9 is rare within the Study Area and was recorded in four stands, within basin mire areas. Generally recorded to community level only, though one stand of the **M9b *Carex diandra* – *Calliergon giganteum* sub-community** was recorded.
- 5.3.99 These stands are dominated by *Carex rostrata* with the characteristic mosses *Calliergonella cuspidata*, *Campylium stellatum* and *Scorpidium revolvens*, but also include a number of associates in varying abundances which include *Carex paniculata*, *Caltha palustris*, *Potentilla palustris*, *Equisetum fluviatile*, *Montia fontana*, *Viola palustris*, *Filipendula ulmaria*, *Ajuga reptans*, *Hippuris vulgaris* and *Juncus effusus*.

M10 Carex dioica – Pinguicula vulgaris mire

Communities/sub-communities recorded: M10a

GWDTE status – High; Annex I – Alkaline fens; SBL – Upland flushes, fens and swamps

- 5.3.100 The M10 *Carex dioica* – *Pinguicula vulgaris* mire is a soligenous mire of mineral soils and shallow peats kept wet by base-rich, calcareous and oligotrophic waters^{xvii,xviii}. The community includes a range of distinctive calcicolous flush vegetation in which the bulk of the sward is composed of small sedges, dicotyledons and bryophytes. It is essentially a small sedge mire and is usually found as small stands. The community typically occurs in unenclosed uplands, and most of the stands are grazed and trampled by large herbivores^{xvii,xviii}. The community can occur wherever there is flushing with base-rich water, either below a springhead or where water emerges more diffusely from the ground, most stands being constantly irrigated^{xvi}.
- 5.3.101 Six polygons mapped in the Study Area include a proportion of M10 vegetation, specifically of the **M10a *Carex viridula* – *Juncus bulbosus/kochii* sub-community**. These are all located in the very north of the Study Area, and mainly on the steeper slopes to the east of the existing A9 around Slochd summit. The vegetation is found in small open and often rather stony flushes, often below a M32 springhead.
- 5.3.102 The vegetation is mostly made up of mixtures of *Carex panicea*, *C. viridula*, *C. dioica*, *Ranunculus flammula*, *Pinguicula vulgaris*, *Eriophorum angustifolium*, *Scorpidium*

scorpioides, *S. revolvens*, *Campylium stellatum*, *Hylocomium splendens*, *Bryum pseudotriquetrum* and *Aneura pinguis*.

- 5.3.103 These small soligenous mires are typically present as narrow flushes running through other habitats. This community is a GWDTE, due to its dependency on base-rich groundwater seepages (which are usually associated with a definite source point).

M17 Trichophorum germanicum – Eriophorum vaginatum blanket mire

Communities/sub-communities recorded: M17a, M17b

Annex I, SBL – Blanket bog

- 5.3.104 M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire is the characteristic blanket bog vegetation of the more oceanic parts of Britain. It is typically found on deposits that are maintained in a permanently waterlogged state by a high and generally stagnant water table^{xvii,xviii}. It usually occurs on peats greater than 2m in depth overlying flat or gently sloping ground^{xvii}. However, it can also occur extensively on shallower peat. The peats show varying degrees of humification but are typically highly acidic^{xvii}.
- 5.3.105 This community is dominated by mixtures of monocotyledons, ericoid sub-shrubs and *Sphagnum* spp. It can occur as extensive, relatively uniform tracts, or as hummock and hollow complexes, with this community giving way to bog pool vegetation in the hollows^{xvii,xviii}. Among the bulkier vascular species, the most common are *Trichophorum germanicum*, *Eriophorum vaginatum*, *E. angustifolium*, *Molinia caerulea*, *Calluna vulgaris* and *Erica tetralix*. *Sphagnum* spp. are an important component of the ground layer and can form extensive lawns. Burning, marginal peat-cutting and drainage have often resulted in surface drying of the peat and hence a modification of the vegetation^{xvii,xviii}.
- 5.3.106 M17 is relatively uncommon in the Study Area and is restricted to the northern section, mainly by Slochd Mòr and east and north-east of Carn Bad nan Luibhean, where it forms a substantial area of flat blanket bog. The **M17a *Drosera rotundifolia-Sphagnum* spp. sub-community** and the **M17b *Cladonia* sub-community** make up the vegetation.
- 5.3.107 The M17a sub-community is distinguished by frequent *Drosera rotundifolia* and extensive wet lawns of *Sphagnum* spp., particularly *S. papillosum* but also *S. capillifolium* and *S. palustre*, and occasionally *S. denticulatum* and *S. compactum*. The vascular vegetation cover is an assemblage of the shrubs, grasses and sedges already listed above and characteristic for the community as a whole. Additionally, the areas of M17a here often contain frequent *Myrica gale*. Where there are low hummocks, pleurocarpous mosses such as *Hylocomium splendens* and *Pleurozium schreberi* are prominent. Other moss species, including *Aulacomnium palustre* and *Polytrichum commune*, occur occasionally.
- 5.3.108 M17b is as common as M17a within the Study Area and the two sub-communities mosaic and transition between each other. M17b indicates a drier situation than that of M17a. Within M17b the characteristic M17 species remain, but *Sphagnum* cover and diversity is much reduced, with the main *Sphagnum* species in M17b being *Sphagnum capillifolium*. The reduced cover of *Sphagnum* is also accompanied by *Cladonia* spp. increasing in prominence over an often more exposed peat surface, particularly abundant is *Cladonia portentosa*.

M19 Calluna vulgaris – Eriophorum vaginatum blanket mire

Communities/sub-communities recorded: M19, M19a, M19b

Annex I, SBL – Blanket bog

- 5.3.109 This is the typical blanket bog vegetation of high-altitude ombrogenous peats in the wet and cold climate of the uplands of northern Britain. In particular, it occurs on high-level plateaux and broad watersheds, usually above 300m, and is confined to deeper peats on flat or gently-sloping ground^{xvii,xviii}. It is generally dominated by mixtures of *Eriophorum vaginatum* and ericoid sub-shrubs (especially *Calluna vulgaris*). *Sphagnum* spp. can be prominent over wetter ground but are not as luxuriant or rich as in M17 mire^{xvii,xviii}.
- 5.3.110 M19 has a sparse and patchy distribution of relatively small stands in the northern half of the Study Area, often in mosaics with M17 mire (described above). It is found in flat to gently sloping areas on upland plateaus and lower ground, it is also found in a few woodland openings (probably where a former larger expanse of mire in the wider area has been planted over). Two sub-communities were recorded, the **M19a *Erica tetralix* sub-community** and **M19b *Empetrum nigrum* sub-community**; differences between the sub-communities are often subtle in the field.
- 5.3.111 The areas of M19 within the Study Area are generally characterised by a clear co-dominance of *Eriophorum vaginatum* and *Calluna vulgaris*. Associated species vary greatly in their abundance, but most stands typically include some *Erica tetralix*, *Eriophorum angustifolium* and *Empetrum nigrum*. There can also be occasional *Vaccinium myrtillus*, *V. vitis-idaea*, *Deschampsia flexuosa*, *Trichophorum germanicum*, *Narthecium ossifragum*, *Myrica gale*, *Juncus squarrosus* and *Molinia caerulea*. Areas where the bog has been subject to some form of disturbance often have patches of *Juncus effusus* within the vegetation. The areas mapped as M19b contain higher abundances of *Empetrum nigrum* and less *Molinia caerulea*, *Trichophorum germanicum* and *Erica tetralix* than those mapped as M19a.
- 5.3.112 Mosses are also abundant and the most prominent species include *Hylocomium splendens*, *Pleurozium schreberi*, *Hypnum* spp., *Rhytidiadelphus loreus*, *Polytrichum commune* and *Aulacomnium palustre*. Patches of *Sphagna* are common, most tend to be of *Sphagnum capillifolium*, although *S. papillosum*, *S. palustre* and *S. fallax* are occasional. *Cladonia* spp. (lichens) also occur in drier patches of the basal layer.

M20 Eriophorum vaginatum blanket mire

Communities recorded: M20, M20b

Annex I, SBL – Blanket bog

- 5.3.113 M20 *Eriophorum vaginatum* blanket mire is a community characteristic of ombrogenous peats on bogs where certain treatments have greatly affected the vegetation; grazing and burning have been of greatest significance, but drainage has also played a part in the development of M20^{xvii,xviii}. It is commonest on blanket mires where these factors have contributed both to floristic impoverishment and to erosion of the peats. The peats are generally drier than in M17 and most M19 bogs, often showing surface oxidation^{xvii,xviii}.
- 5.3.114 M20 is uncommon within the Study Area, it is only found in a few stands to the north which tend to be very small and subsumed within larger blanket bog complexes; the

areas of M20 standing out as lacking the sub-shrub element more common to the M17/M19 mires and M15/M16 wet heaths recorded.

- 5.3.115 In all stands the vegetation is dominated by tussocky *Eriophorum vaginatum*. Throughout the tussocks there is sometimes sparse *Eriophorum angustifolium*, *Vaccinium myrtillus*, *Potentilla erecta*, *Molinia caerulea*, *Deschampsia flexuosa* and *Agrostis* sp. Patchy *Juncus effusus* appears where there has been some disturbance. Mostly recorded to community level only, although one stand was recorded as the **M20b *Calluna vulgaris* – *Cladonia* sub-community** and also contained some *Erica tetralix*, *Nardus stricta* and *Juncus squarrosus*.
- 5.3.116 Mosses also vary in abundance depending on tussock density and vigour of *Eriophorum vaginatum*; some tussocks are carpeted in *Hylocomium splendens*, *Hypnum jutlandicum*, *Rhytidiadelphus loreus* and *Pleurozium schreberi*. Between the tussocks where the ground is sometimes wetter there is often *Polytrichum commune*, *Aulacomnium palustre*, *Dicranum scoparium*, *Sphagnum fallax*, *S. palustre* and *S. capillifolium*.

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

Communities/sub-communities recorded: M23a, M23b

GWDTE status – High; SBL – Upland flushes, fens and swamps (M23a only)

- 5.3.117 This rush-pasture is a community of gently-sloping ground in and around the margins of soligenous flushes, as a zone around topogenous mires and wet heaths, and in poorly drained, comparatively unimproved or reverted pasture. It can be found on a variety of moderately acid to neutral soils that are kept moist to wet for most of the year^{xvii,xviii}. As a result, this community can be, at least partially, potentially dependent on groundwater; however, it is also commonly associated with surface water flows and surface water collection. This vegetation is characterised by the abundance of either *Juncus effusus* or *J. acutiflorus* (sometimes both), with a ground layer of mesophytic herbs common in moist or permanently wet grasslands; associates are quite diverse. Acidophilous Sphagna and the moss *Polytrichum commune* are rare in the M23 community^{xvi}.
- 5.3.118 M23 is not extensive within the Study Area but is widely scattered in small stands. It is most often found around the edges of ponds or lochs, or in wet hollows, poorly drained pasture or by the edge of mires. Only two small areas of the **M23a *Juncus acutiflorus* sub-community** was recorded, all other examples of the community being of the more species-poor **M23b *Juncus effusus* sub-community**.
- 5.3.119 M23b within the Study Area consists of a tall, tussocky rush sward dominated by *J. effusus* with a low diversity of herbaceous associates; wetness also varies from damp ground to waterlogged stands with shallow standing water.
- 5.3.120 The field layer beneath the rush sward is highly variable between and within stands and is often strongly influenced by the water level. Many stands are almost wholly dominated by *J. effusus*, but where the field layer beneath the rushes is better developed there is a variable assemblage of species with the most common recorded including *Cirsium palustre*, *Cardamine pratensis*, *Rumex acetosa*, *R. obtusifolius*, *Ranunculus repens*, *Viola palustris*, *Galium palustre*, *Agrostis* spp., *Holcus lanatus* and *Deschampsia cespitosa*. Wefts of mosses are also common between these species and patchily carpeting the ground, with the main species including *Calliergonella cuspidata*, *Brachythecium* spp., *Kindbergia praelonga* and *Rhytidiadelphus squarrosus*. These species are widely frequent to occasional but are abundant locally. Among these

associated species the grasses are most abundant in relatively dry, marginal areas of the habitat, while more mixed forb-rich assemblages are common in the wetter areas.

- 5.3.121 M23a was recorded only twice, in addition to the above species *Caltha palustris* and *Angelica sylvestris* were present in this sub-community and *Juncus acutiflorus* was the dominant rush. The stand on the edge of Aviemore was also scattered with young *Alnus glutinosa* and *Salix cinerea* 1-2.5m tall.

M25 Molinia caerulea – Potentilla erecta mire

Communities/sub-communities recorded: M25, M25a, M25b

GWDTE status – Moderate; Annex I, SBL – Blanket bog (M25a)

- 5.3.122 M25 mire is a community of moist, but usually well aerated, acid to neutral peats and peaty soils^{xvii}. It generally occurs over gently-sloping ground, marking out seepage zones and flushed margins of topogenous mires, but also extends onto the fringes of ombrogenous mires^{xvi,xvii,xviii}. *Molinia caerulea* is the most abundant species found in this community. The associated flora is usually species-poor and consists largely of *Juncus* spp. and a few dicotyledons. Occasionally sub-shrubs can be quite common, particularly *Calluna vulgaris* and *Erica tetralix*. Treatments such as burning, grazing and drainage are likely to be largely responsible for the development of this community over ground that would naturally host some other kind of mire or wet heath vegetation^{xvii,xviii}.
- 5.3.123 M25 does not form extensive stands within the Study Area but is patchily present as small marginal areas and in mosaics with blanket bog and heath. M25 is always dominated by *Molinia caerulea*, the sub-communities are defined according to the *M. caerulea* associates. Within the Study Area the community predominately takes the form of the **M25a *Erica tetralix* sub-community** (indicated by the presence of a range of mire associates); however, three areas of the grassier **M25b *Anthoxanthum odoratum* sub-community** were also recorded.
- 5.3.124 Within M25a in the Study Area, *M. caerulea* is typically dominant because of the density of its tall tussocks and leaf litter. The common associates which are frequent to occasional include *Erica tetralix*, *Eriophorum angustifolium*, *E. vaginatum*, *Vaccinium myrtillus*, *Calluna vulgaris*, *Narthecium ossifragum*, *Potentilla erecta*, *Succisa pratensis* and *Viola palustris*. *Myrica gale* is locally abundant and co-dominant in some areas. Many *Molinia* tussocks also contain *Hylocomium splendens*, *Pleurozium schreberi*, *Hypnum jutlandicum* and *Rhytidiadelphus* spp. Sphagna are present in some areas around the wet bases of tussocks: predominately *Sphagnum fallax* and *S. palustre*, but also occasionally *S. capillifolium* and *S. papillosum*. *Aulacomnium palustre* and *Polytrichum commune* can also be found here.
- 5.3.125 Grasses are also often sparsely present within the patches of M25a, but their abundance increases in M25b where *M. caerulea* is typically accompanied by *Nardus stricta*, *Agrostis* spp. and occasional *Deschampsia cespitosa* with patches of pleurocarpous mosses.

M27 Filipendula ulmaria – Angelica sylvestris mire

Communities/sub-communities recorded: M27a

GWDTE status – Moderate; SBL – Upland flushes, fens and swamps

- 5.3.126 This community is typically found where moist, reasonably rich, circumneutral soils occur in situations protected from grazing. It can be found in both topogenous and

soligenous mires and is especially typical of silted margins of slow-moving streams and soakways, the edges of flushes and damp hollows, and also of artificial habitats such as along dykes and roadside ditches and around ponds^{xvii,xviii}. The community cannot tolerate any other than very light or sporadic grazing and so stands often only persist outside enclosures, and around un-reclaimed mires and flushes^{xvii,xviii}. *Filipendula ulmaria* forms the overwhelming dominant and the only constant. Bryophytes are few in number and of low cover^{xvii,xviii}.

- 5.3.127 Just a single small stand of M27 mire was recorded within the Study Area, of the **M27a *Valeriana officinalis* - *Rumex acetosa* sub-community**. In this stand *Filipendula ulmaria* is accompanied by *Valeriana officinalis*, *Deschampsia cespitosa*, *Juncus effusus* and *Ajuga reptans*.

M28 Iris pseudacorus – Filipendula ulmaria mire

Communities/sub-communities recorded: M28a

GWDTE status – Moderate; SBL – Lowland fens

- 5.3.128 The M28 community is confined to moist, more nutrient-rich soils mostly along the oceanic seaboard of Britain. In its typical form this is a species-rich community with abundant *Iris pseudacorus* and a number of other tall herbs which can become frequent in the sward. Rushes and grasses are frequently important; however, bryophytes are few^{xvii,xviii}.
- 5.3.129 Three small areas of vegetation were recorded where the best-fit NVC community was M28, owing to the dominance of *Iris pseudacorus* present. These stands tend to be associated with small ponds or wet hollows, two were found around Meikle Kinveachy east of the A95 and north of Loch Vaa, the other stand is around a pond to the east of the B9152 opposite Granish, north of Aviemore. All were classified as the **M28a *Juncus* spp. sub-community**.
- 5.3.130 These areas are dominated by *Iris pseudacorus*, with some stands also containing variable amounts of *Caltha palustris*, *Juncus effusus*, *Cardamine flexuosa*, *Galium aparine*, *Glyceria fluitans*, *Heracleum sphondylium*, *Ranunculus repens*, *Urtica dioica*, *Rumex acetosa*, *Carex rostrata*, *Senecio jacobaea*, *Epilobium montanum*, *Ajuga reptans* and *Mentha aquatica*.

M32 Philonotis fontana – Saxifraga stellaris spring

Communities/sub-communities recorded: M32b

GWDTE status – High; SBL – Upland flushes, fens and swamps

- 5.3.131 M32 is a community of springs and rills at moderate to high altitudes, mainly from 450m to over 1000m, where there is irrigation with circumneutral and oligotrophic waters. This is one of the most common and widespread types of spring vegetation in the uplands of north-west Britain and is dependent on sustained and vigorous irrigation by groundwater^{xvii,xviii}. The community is common through the Scottish Highlands. These bryophyte-dominated springs, flushes and rills are striking in appearance; *Philonotis fontana* is usually dominant and visually obvious by its bright green colour.
- 5.3.132 A number of M32 springs were recorded within the Study Area, all of the **M32b *Montia fontana* – *Chrysosplenium oppositifolium* sub-community**. These are all located in the very northern Study Area to the east of the existing A9 on the steeper slopes south

and west of Carn nam Bain-tighearna, by Slochd. These springs were recorded as point features via target notes, see Figure 12.5 and Annex D, photographs in Annex E.

- 5.3.133 These springs are small features, typically only a couple of square metres in size, but easily picked out from the dark vegetation by bright green-yellow mounds and rills of mosses, dominated by *Philonotis fontana*, with abundant *Montia fontana* and often *Dichodontium palustre*.
- 5.3.134 This community is a GWDTE, due to its dependency on groundwater upwellings.

Wet Heaths

M15 Trichophorum germanicum – Erica tetralix wet heath

Communities/sub-communities recorded: M15, M15a, M15b, M15c

GWDTE status – Moderate; Annex I – Northern Atlantic wet heath; SBL – Upland heathland

- 5.3.135 This wet heath community is characteristic of moist and generally acid and oligotrophic peats and peaty mineral soils in the wetter western and northern parts of Britain. It is also associated with thinner or better drained areas of ombrogenous peat^{xvii,xviii}. It is a vegetation type with few constant species and wide variation in its flora and dominant species. *Calluna vulgaris*, *Molinia caerulea*, *Trichophorum germanicum* and *Erica tetralix* are usually all of high frequency, and it is mixtures of these species that give the vegetation its general character. However, sometimes one or two of them may be missing and their relative proportions can be very varied; M15 is a variable community which can change markedly over short distances^{xvii,xviii}. Grazing and burning have important effects on the floristics and structure of this community, and draining and peat-cutting have extended its coverage to formerly deeper and wetter peats in which blanket mire communities (i.e. M17-M19) were probably initially present^{xvii,xviii}.
- 5.3.136 M15 wet heath is scarce within the Study Area, it is only found in the northern sections as small stands within larger areas of blanket bog or mosaic habitats, or linked to these. Three of the four sub-communities were recorded, most stands were of the **M15b Typical sub-community**, however there were a few areas of the more flushed **M15a Carex panicea sub-community** and one area of the **M15c Cladonia spp. sub-community**.
- 5.3.137 M15b here consists mainly of a sward with variable amounts of a few of the main characteristic species, most often abundant are *Calluna vulgaris*, *Erica tetralix* and *Eriophorum angustifolium*. Other species more frequent to occasional include *Molinia caerulea*, *Trichophorum germanicum*, *Empetrum nigrum*, *Vaccinium vitis-idaea*, *Carex binervis*, *Potentilla erecta*, *Juncus squarrosus*, *Narthecium ossifragum*, *Nardus stricta*, *Deschampsia flexuosa*, *Myrica gale*, *Juncus effusus*, *Blechnum spicant* and *Polygala serpyllifolia*. Rarely there are sparse tussocks of *Eriophorum vaginatum*. Mosses are also abundant and *Sphagnum capillifolium* is common, other frequent mosses in the basal layer include *Sphagnum palustre*, *S. compactum*, *Plagiothecium undulatum*, *Aulacomnium palustre*, *Hypnum jutlandicum*, *Pleurozium schreberi*, *Hylocomium splendens*, *Rhytidiadelphus squarrosus* and *Polytrichum commune*.
- 5.3.138 M15a is more of a flushed wet heath on sloping ground and contains many of the species already listed. However, in these stands the shrubby component is a bit sparser due to the increased wetness, with *Calluna vulgaris* only occasional here. Instead there is much more *Eriophorum angustifolium* and sedges such as *Carex panicea*, *C. echinata*, *C. viridula*, and *C. nigra* and the moss *Sphagnum denticulatum*.

- 5.3.139 A single area of M15c was recorded, this is at the drier end of M15 and is often of a more open sward, it also contains species such as *Erica cinerea* and *Cladonia* spp. (lichens), *Sphagna* are only occasional in this sub-community.

M16 Erica tetralix – Sphagnum compactum wet heath

Communities/sub-communities recorded: M16, M16d

GWDTE status – High; Annex I – Northern Atlantic wet heath or blanket bog; SBL – Upland heathland or blanket bog

- 5.3.140 This wet heath community is found on acid and oligotrophic mineral soils or shallow peats that are moist and at least seasonally waterlogged. M16 typically occurs on sloping ground, although it can cover almost level ground too. In Scotland, it extends onto thin ombrogenous peats at higher altitudes. Grazing and burning are important in maintaining the vegetation^{xvii,xviii}. This community is characteristically dominated by mixtures of *Erica tetralix*, *Calluna vulgaris*, *Trichophorum germanicum* and *Molinia caerulea*, but their proportions are very variable, being influenced by differences in the water regime and trophic state of the soils, and also by grazing and burning.
- 5.3.141 A number of patches of M16 were recorded in the northern third of the Study Area, but it is not extensive nor does it form particularly large stands. Much M16 was recorded in mosaics with blanket bog or adjacent to it, the M16 having likely been derived from the degradation of the better-quality mire. Therefore, the M16 in many areas is not typical for the community and is on deeper flatter peat with a drying surface, however the species assemblage reflects M16. Stands are of the **M16d *Juncus squarrosus* - *Dicranum scoparium* sub-community**, which is the most common form in Scotland.
- 5.3.142 Even within M16d the composition varies greatly from stand to stand in the Study Area. Some areas are characterised by a tall rank growth of *Calluna vulgaris* on flat deeper peat with other species in the sward being only occasional to rare, typically some sparse scattered shoots of *Erica tetralix*, *Eriophorum angustifolium*, *Trichophorum germanicum*, *Molinia caerulea* and *Juncus squarrosus*, and very rarely a tussock of *Eriophorum vaginatum*. Other stands remain dominated by *Calluna* but also contain abundant *Erica tetralix*, again with a sparse scattering of the species listed above.
- 5.3.143 Beneath the dense *Calluna* there are often patches of bare peat, bryophytes are often patchy but, in some stands, can form relatively continuous carpets. The most common recorded species were *Dicranum scoparium*, *Hypnum jutlandicum*, *Hylocomium splendens*, *Pleurozium schreberi*, *Polytrichum commune* and *Aulacomnium palustre*. *Sphagna* are rarer but where present *Sphagnum capillifolium* is the most commonly encountered. Some stands were notably more lichen-rich with abundant *Cladonia portentosa* and *C. uncialis*.

Dry Heaths

- 5.3.144 Dry heath is common within the Study Area, particularly in the very northern sections of the Study Area where there are large expansive tracts of relatively homogeneous dry heath, albeit quite often in various stages of recovery after muirburning and with subtle differences in community types because of this.
- 5.3.145 The largest expanses are on the steeper slopes to the east of the existing A9 on higher, steeper and drier slopes with thinner soils around Slochd and the slopes of Carn nam Bain-tighearna, and to the west of the A9 in this same region, by Tòrr Mòr. There are some substantial areas of dry heath in the southern Study Areas as well, most notably

southwest of Ballinluig to the north of the A9 by Loch Alvie. Elsewhere, dry heath is commonly scattered throughout the whole Study Area in stands of various sizes.

- 5.3.146 The dry heath present commonly forms mosaics and transitions with various mire and grassland communities. The dry heath across the majority of the Study Area is overwhelmingly dominated by *Calluna vulgaris*. Six recognised dry heath NVC communities, and three intermediate communities, have been identified within the Dalraddy to Slochd Study Area, as described below.

H9 Calluna vulgaris – Deschampsia flexuosa heath

Communities/sub-communities recorded: H9, H9a, H9d

Annex I – European dry heaths: SBL – Upland heathland

- 5.3.147 This heath is a characteristic sub-shrub vegetation of acid and impoverished soils at low to moderate altitudes. It is normally found on very base-poor soils, highly oligotrophic and at least moderately free-draining, often excessively so, which have been derived from a wide variety of parent materials^{xvii,xviii}. The cool and wet climate has some influence on the floristics of this community, but much of its character derives from a combination of frequent burning and grazing. *Calluna vulgaris* is typically the most abundant plant in this community. No other sub-shrubs are consistently frequent throughout, although some can be quite common and locally abundant. The only other vascular constant is *Deschampsia flexuosa*, although even in open *Calluna* it often occurs only as sparse tufts, and under dense canopies it can almost disappear. Other herbs are also few and are of low cover. Bryophytes and lichens are rarely abundant and associated species diversity is low^{xvii,xviii}.
- 5.3.148 Areas of heath classed as H9 are frequently scattered throughout the Study Area, and can form some large stands, such as by Ballinluig. H9 has been used in the Study Area to identify areas where the heath is notably species-poor and overwhelmingly dominated by *Calluna* with, at best, a few infrequently scattered associates and an absence of the sub-shrubs characteristic of other dry heaths in the area (i.e. those of H10, H12 and H16).
- 5.3.149 H9 was often recorded at community level only, but some areas were classified as the **H9a *Hypnum cupressiforme* sub-community** or the **H9d *Galium saxatile* sub-community**. H9a where the *Calluna* is accompanied by little more than carpets of *Hypnum jutlandicum*, and H9d where there are a few scattered herbs underneath the *Calluna*.
- 5.3.150 The sparse associates recorded through the *Calluna* within areas of H9 included *Deschampsia flexuosa*, *Festuca ovina*, *Juncus squarrosus*, *Galium saxatile*, *Potentilla erecta* and rarely *Pteridium aquilinum*. Mosses are abundant, with the most common species recorded being *Hylocomium splendens*, *Dicranum scoparium*, *Pleurozium schreberi* and *Rhytidiadelphus loreus*; *Cladonia* spp. (lichens) are also occasional.

H10 Calluna vulgaris – Erica cinerea heath

Communities/sub-communities recorded: H10, H10a, H10b, H10c, H10d

Annex I – European dry heaths: SBL – Upland heathland

- 5.3.151 H10 *Calluna vulgaris – Erica cinerea* heath is a dry heath community that occurs widely throughout the more oceanic (western) parts of Scotland and around the east-central part of the Highlands. It is characteristic of acid to circumneutral and generally free-

draining soils and is typically dominated by *Calluna vulgaris*. *Erica cinerea* is another constant but is generally subordinate to *C. vulgaris*. H10 is commonly found in zonation and mosaics with grasslands, other heath types and mire communities^{xvii,xviii}.

- 5.3.152 H10 is relatively sparse and fragmented within the Study Area, rarely forming larger homogeneous stands. It is found mainly in the northern Study Area, usually in mosaics with other dry heaths and calcifugous grasslands. In some locations, it is a secondary heath, for example having colonised embankments created during the construction of the existing A9.
- 5.3.153 All four sub-communities were recorded within the Study Area, the most common is the **H10a Typical sub-community**, however the **H10c *Festuca ovina* – *Anthoxanthum odoratum* sub-community** is just as frequent. Six patches of the **H10d *Thymus polytrichus* – *Carex pulicaris* sub-community** were recorded and two small stands of the **H10b *Racomitrium lanuginosum* sub-community** were also mapped.
- 5.3.154 In areas of H10a *Calluna vulgaris* is the canopy dominant, but with *Erica cinerea* also abundant and sometimes almost co-dominant in places. These two species characterise the community and its canopy throughout the Study Area. More occasional within H10a here are *Deschampsia flexuosa*, *Anthoxanthum odoratum*, *Nardus stricta*, *Vaccinium myrtillus*, *V. vitis-idaea*, *Carex binervis*, *Potentilla erecta* and *Galium saxatile*. The ground layer consists of abundant pleurocarpous mosses and *Cladonia* spp. (lichens). Occasionally there are some small scattered bushes of *Juniperus communis*.
- 5.3.155 H10c is a grassier (and often grazed) version of this heath and along with the defining species contains more frequent *D. flexuosa*, *A. odoratum*, *Agrostis capillaris*, *Festuca ovina* and *N. stricta* in the sward.
- 5.3.156 The few patches of H10d recorded characterise areas where the H10 heath is noticeably more species-rich. Along with *Calluna* and *E. cinerea* the species recorded in these stands included *Thymus polytrichus*, *Anthoxanthum odoratum*, *Festuca ovina*, *Agrostis capillaris*, *Luzula multiflora*, *Pilosella officinarum*, *Carex caryophyllea*, *Succisa pratensis*, *Conopodium majus*, *Anemone nemorosa*, *Campanula rotundifolia*, *Lotus corniculatus*, *Plantago lanceolata*, *Viola riviniana*, *Galium verum*, *Hypericum pulchrum*, *Pyrola media*, *Potentilla erecta*, *Lathyrus linifolius*, *Rhytidadelphus squarrosus*, *R. triquetrus* and *Hylocomium splendens*.
- 5.3.157 Two small patches of H10b were also recorded. These were on thin soils over rocky ground, and the open sward of *Calluna vulgaris* and *Erica cinerea* was dotted with *Trichophorum germanicum*, *Polygala serpyllifolia* and *Campanula rotundifolia* growing through a silvery carpet of *Racomitrium lanuginosum*.

H12 Calluna vulgaris – *Vaccinium myrtillus* heath

Communities/sub-communities recorded: H12, H12a, H12b, H12c

Annex I – European dry heaths: SBL – Upland heathland

- 5.3.158 H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath is a common sub-shrub community of acidic to circumneutral, free-draining mineral soils throughout the cold and wet sub-montane zone, generally between 200m and 600m. H12 is generally dominated by *Calluna vulgaris* although the cover of this species can be open and degenerate. *Vaccinium myrtillus* is constant, though it is usually subordinate to *C. vulgaris*. The ground layer is generally characterised by bulky mosses^{xvii,xviii}. H12 heaths are rather uniform and they cover extensive areas throughout large parts of Scotland.

- 5.3.159 H12 vegetation is the most common and widespread dry heath community within the Study Area. It forms large homogeneous and continuous stands in the northern part of the Study Area, as well as forming many smaller stands and mosaics throughout the whole Dalraddy to Slochd reach. Within the Study Area the H12 vegetation consists of dense canopies of *Calluna* with shoots of *Vaccinium myrtillus* and *V. vitis-idaea* where the former is not overly dominant. Herbs are usually inconspicuous below the canopy, and there is usually a dense carpet of pleurocarpous mosses including *Hylocomium splendens*, *Hypnum jutlandicum*, *Pleurozium schreberi*, *Pseudoscleropodium purum*, *Plagiothecium undulatum*, *Rhytidiadelphus triquetrus* and *R. loreus*. In places there are also *Cladonia* spp. (lichens).
- 5.3.160 The height, density and vigour of the *Calluna*, and the abundance of associated sub-shrubs, throughout the Study Area varies between and within stands, mainly as a result of rotational muirburn, but also in some cases grazing.
- 5.3.161 All three sub-communities were recorded within the Study Area. Most stands are of the **H12a *Calluna vulgaris* sub-community** and **H12b *Vaccinium vitis-idaea* – *Cladonia portentosa* sub-community**; more rarely there are some areas of the **H12c *Galium saxatile* – *Festuca ovina* sub-community**.
- 5.3.162 The vegetation of a considerable proportion of H12a consists of little more than *Calluna vulgaris* over a lawn of pleurocarpous mosses with a few sprigs of *Vaccinium myrtillus* and/or *V. vitis-idaea* interleaved through the canopy (both can be locally absent). In some cases, *V. myrtillus* thickens up and is more noticeable in the sward, often depending on the time since burning and grazing intensity. Other typical associates in lower but very variable abundances in H12a within the Study Area include *Erica cinerea*, *Arctostaphylos uva-ursi*, *Empetrum nigrum*, *Deschampsia flexuosa*, *Festuca ovina*, *Agrostis capillaris*, *Nardus stricta*, *Juncus squarrosus*, *Potentilla erecta*, *Galium saxatile*, *Polygala serpyllifolia*, *Pteridium aquilinum*, *Viola riviniana*, *Blechnum spicant*, *Luzula multiflora*, *L. pilosa*, *Juniperus communis*, *Carex binervis* and *Lycopodium clavatum*.
- 5.3.163 Stands of H12b are a very common feature of the dry heath within the Study Area. These areas contain many of the species listed above but are distinguished by a noticeable abundance of *Vaccinium vitis-idaea*, which defines this sub-community and in places is co-dominant with *Calluna*.
- 5.3.164 Areas of H12c tend to have a shorter, grazed and more open sward of *Calluna* with an increased abundance of the graminoids listed above. In this sub-community, the cover of *Calluna* is reduced so that elements of U4 and U5 calcifugous grasslands have become established in the intervening spaces.

H9 – H12 Intermediate heath

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.165 There is a widespread and common type of heathland in Scotland that is often termed H9-H12 intermediate heath as it does not fit readily within conventional NVC community codes or habitat descriptions. The H9-H12 intermediate classification arises from the similarity of the vegetation to both H9 *Calluna vulgaris* – *Deschampsia flexuosa* heath and H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath but the vegetation does not allow the true classification of either. The canopy resembles that of H9 in being dominated by *Calluna vulgaris* with no (or very rare) accompanying dwarf shrub species, but the moss carpets are of the H12 type which is more developed and more floristically diverse than in H9.

- 5.3.166 Patches of H9-H12 are scattered throughout the Study Area, generally as smaller stands within a larger mosaic of dry heaths, but also sometimes as isolated patches of vegetation. The vascular cover is dominated by *Calluna vulgaris* with rare shoots of *Vaccinium myrtillus*, *V. vitis-idaea* or some creeping *Arctostaphylos uva-ursi*. A number of other species were recorded as scattered in this type of heath and include *Deschampsia flexuosa*, *Anthoxanthum odoratum*, *Juncus squarrosus*, *Nardus stricta*, *Potentilla erecta* and *Galium saxatile*.
- 5.3.167 The basal layer consists of carpets of bulky mosses, typically abundant are *Hylocomium splendens*, *Hypnum jutlandicum*, *Pleurozium schreberi*, *Rhytidiadelphus triquetrus* and *R. loreus*, and sometimes *Cladonia* lichens.

H10 – H12 Intermediate heath

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.168 Another relatively common type of intermediate heathland found in Scotland, especially at low to moderate altitude and in the south and west of the country, is often termed H10-H12 intermediate heath. The H10-H12 intermediate heath has a canopy of *Calluna vulgaris*, *Vaccinium myrtillus* and *Erica cinerea*, interleaved with *Deschampsia flexuosa*, *Carex binervis*, *Potentilla erecta* and *Galium saxatile*, and with an under-layer of large pleurocarpous mosses including *Pleurozium schreberi*, *Hylocomium splendens*, *Hypnum jutlandicum* and *Rhytidiadelphus loreus*. A single stand of this intermediate heath was recorded in the very northern Study Area.

H12b – U6 Intermediate heath

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.169 H12b - U6 is vegetation intermediate between *Calluna-Vaccinium* heath and *Juncus squarrosus* grassland. The short, dense sward is made up of equal amounts of *Calluna vulgaris* and *Juncus squarrosus*, sprigged with *Vaccinium myrtillus* and *V. vitis-idaea* and with a little *Potentilla erecta*, *Galium saxatile* and *Carex binervis*. It has the typical bryophyte assemblage of acid heaths and grasslands, including *Pleurozium schreberi*, *Rhytidiadelphus loreus*, *Hypnum jutlandicum* and *Hylocomium splendens*. This sort of vegetation is widespread though rarely extensive throughout the British uplands from Wales northwards, generally where there has been a history of heavy grazing.
- 5.3.170 A single stand of this intermediate vegetation was recorded to the west of the A9 around 1km north of the River Dulnain crossing near Carrbridge.

H16 Calluna vulgaris – Arctostaphylos uva-ursi heath

Communities/sub-communities recorded: H16, H16b

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.171 H16 *Calluna vulgaris – Arctostaphylos uva-ursi* heath is a typical sub-shrub community of circumneutral to base-poor soils at moderate altitudes, and is generally found between 240m and 600m altitude in the cold continental climate of the east-central Highlands, with especially good representation around Speyside^{xvii,xviii}. H16 is characterised by the relative abundance of *A. uva-ursi* alongside typical heath vegetation including *C. vulgaris*, and in lower abundances *Erica cinerea*. It is an important part of grouse moors in the east-central Highlands; in this area the vegetation type is most commonly a secondary heath developing after burning^{xvi,xviii}.

- 5.3.172 H16 is restricted to the very northern sections of the Study Area around Slochd, but here it is quite extensive and forms large swathes of the dry heath present, particularly to the east of the A9 and in areas that have been burned in recent times. It is common in mosaics with H12 *Calluna* - *Vaccinium* heath, where the relative abundances of *Arctostaphylos uva-ursi* and *Vaccinium* spp. respectively determine the community classification.
- 5.3.173 The H16 heaths here have the characteristic mix of *Calluna* with extensive low, creeping mats of co-abundant *A. uva-ursi*, these species and their abundance characterise and define the community. Most stands were assigned to the **H16b *Vaccinium myrtillus* – *Vaccinium vitis-idaea* sub-community**, owing to the presence of these *Vaccinium* spp. and very similar mix of sub-shrubs between H16b, H12a and H12b, and the frequent mosaics and transitional zones between these particular assemblages.
- 5.3.174 Dotted through the *Calluna* and *A. uva-ursi* there is often variable, but always lesser, amounts of *Erica cinerea*, *Vaccinium vitis-idaea*, *V. myrtillus*, *Empetrum nigrum*, *Carex binervis*, *Nardus stricta*, *Festuca ovina*, *Juncus squarrosus* and *Deschampsia flexuosa*. These vascular species are underlain by thin carpets of mosses which typically are most often made up of *Hylocomium splendens*, *Pleurozium schreberi*, *Dicranum scoparium*, *Rhytidiadelphus* spp. and *Hypnum jutlandicum*. The lichen *Cladonia portentosa* is common here too.
- 5.3.175 The H16 within the Study Area is evidently transitory, occupying a middle to late stage in the succession from muirburn to restoration of the surrounding H12 canopy. *Arctostaphylos uva-ursi* is evidently able to take advantage of the temporarily open conditions and form its distinctive extensive mats.

H18 Vaccinium myrtillus – Deschampsia flexuosa heath

Communities/sub-communities recorded: H18a, H18b, H18c

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.176 H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* heath is typical of moist but free draining acid to neutral mineral soils, humic rankers and dry peats over steeper slopes at moderate to high altitudes^{xvi,xvii}. H18 includes moss-rich and grassy sub-shrub vegetation in which *V. myrtillus* is the most frequent and generally the most abundant ericoid^{xvii,xviii}. H18 can be a near-natural heath as in the montane zone, or one that is clearly anthropogenic as seen at lower altitudes where it is evidently a derivative of H12 *Calluna vulgaris* – *Vaccinium myrtillus* heaths that have been burned and then grazed too hard to allow *Calluna* to re-establish^{xvi,xvii}.
- 5.3.177 H18 is infrequent within the Study Area and is found as small patches within larger areas of *Calluna* dominated heaths. All three sub-communities were recorded, most were of the **H18a *Hylocomium splendens* – *Rhytidiadelphus loreus* sub-community**, however single small stands of the **H18b *Alchemilla alpina* – *Carex pilulifera* sub-community** and **H18c *Racomitrium lanuginosum* – *Cladonia* spp. sub-community** were also recorded.
- 5.3.178 H18a is identified by a mossy sward in which the shoots of *Vaccinium myrtillus* are the vascular dominant. Along with *V. myrtillus*, there is also frequent to occasional *Vaccinium vitis-idaea* and *Deschampsia flexuosa*; there is little to no *Calluna vulgaris*. The bryophytes are typically pleurocarpous with a dense carpet of predominately *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Hypnum jutlandicum* and *Pleurozium schreberi*.

- 5.3.179 The patches of H18b and H18c are grassier versions and contain more *Anthoxanthum odoratum*, *Festuca ovina*, *Agrostis capillaris* and *Nardus stricta*.

H21 - Calluna vulgaris – Vaccinium myrtillus – Sphagnum capillifolium heath

Communities/sub-communities recorded: H21a

Annex I – European dry heaths; SBL – Upland heathland

- 5.3.180 The H21 community generally has a mixed canopy of sub-shrubs, usually 30-50cm high, with a damp layer of luxuriant bryophytes. *Calluna vulgaris* is usually the dominant ericoid, although *Vaccinium myrtillus* can also be common. Bryophytes form an extensive and lush carpet; particularly distinctive is the high frequency and local abundance of *Sphagnum capillifolium*^{xvii,xviii}. This heath is highly characteristic of fragmentary humic soils in situations with a cool but equable climate and a consistently shady and humid atmosphere. It is widespread at low to moderate altitudes in upland Britain. It is found mainly on steep, shady slopes of north-west to easterly aspect, often with rock outcrops^{xvii,xviii}.
- 5.3.181 Just five patches of H21, specifically the **H21a *Calluna vulgaris – Pteridium aquilinum* sub-community**, were recorded in the northern section of the Study Area. The community was picked out by a layer of red-green *Sphagnum capillifolium* beneath a canopy of *Calluna* interleaved with *Vaccinium* spp.

Calcifugous Grasslands & Fern Dominated Vegetation

U1 Festuca ovina – Agrostis capillaris – Rumex acetosella grassland

Communities/sub-communities recorded: U1

- 5.3.182 U1 is characteristic of thin, base-poor, oligotrophic and summer-parched soils. It is generally a lowland community but can extend as scattered patches into the uplands. It tends to have an open sward of small tussocky grasses among which there can be an abundance of dicotyledons. The sward usually contains *Agrostis capillaris*, *Aira praecox* and *Festuca ovina* with frequent to occasional *Rumex acetosella*. Grazing and disturbance are typically important contributory factors in maintaining the open structure of the vegetation^{xix,xx}.
- 5.3.183 A few small patches of U1 are present in the southern Study Area, to the south of the A9; the largest patch being in the area around Druim Mhor. The stands are typically small on sloping, thin dry soils with patches of bare soil and have been disturbed from sheep trampling and grazing, and in some cases from rabbit activity and burrowing. These patches of U1 contain the characteristic community species as listed above, in particular there is a noticeable abundance of *Rumex acetosella*. Also present in the main area of U1 was *Aphanes australis*.

U2 Deschampsia flexuosa grassland

Communities/sub-communities recorded: U2, U2a

- 5.3.184 This grassland is characteristic of base poor soils that are free draining but not parched and are sometimes quite moist. It occurs through the upland fringes and in moderately oceanic parts of the lowlands. The community is often seen in close association with some heaths and mires and can grade into them. *Deschampsia flexuosa* grassland comprises swards in which often tussocky *D. flexuosa* is the obvious dominant with a number of sparse associates^{xix}. Many stands of U2 grassland have evidently been

derived from some sort of disturbance in previous heath, mire or woodland, and the community often appears to be transitional post-disturbance vegetation^{xvi}.

- 5.3.185 U2 is quite rare within the Study Area, present as a few patches in heathland or in former felled plantation. Stands were mostly mapped as U2 only, however some were recorded as the grassier of the two sub-communities, the **U2a *Festuca ovina* – *Agrostis capillaris* sub-community**.
- 5.3.186 The areas of U2a are typically dominated by *Deschampsia flexuosa*, and the occasional associates within the Study Area include *Agrostis capillaris*, *Nardus stricta* and *Galium saxatile*. Underneath the grasses bryophytes are present in patches, in particular the common pleurocarpous mosses of calcifuge grasslands.

U4 Festuca ovina – Agrostis capillaris – Galium saxatile grassland

Communities/sub-communities recorded: U4, U4a, U4b, U4d, U4e

- 5.3.187 The U4 *Festuca ovina* - *Agrostis capillaris* - *Galium saxatile* grassland is a form of predominately upland grassland of well-drained, acidic and base-poor mineral soils throughout the wet and cool regions of north-west Britain where it dominates extensive areas of pastureland^{xix,xx}. Throughout this geographic range the community can often be found forming a distinctive component of larger mosaics of grasslands, heaths, and mires.
- 5.3.188 U4 grassland is generally identified by the presence of an often close-cropped, grass-rich sward dominated by various combinations of *A. capillaris*, *F. ovina* and *Anthoxanthum odoratum*, with *G. saxatile* and *Potentilla erecta* consistent associates. A well-developed moss layer is also characteristic, but in the U4b sub-community described below it may be limited by the dense, relatively productive sward of grasses.
- 5.3.189 U4 is the most widespread and extensive grassland community along the length of the Study Area. It covers both extensive areas that are sometimes partially improved and used for grazing, and smaller discrete patches of unimproved grassland in mosaics with mire, heath and other grassland communities. U4 also forms the majority of the immediate road verge along the existing carriageways within the Study Area, where often the first metre or two are mown annually.
- 5.3.190 Four sub-communities were recorded within the Study Area. The **U4a Typical sub-community** and **U4b *Holcus lanatus* – *Trifolium repens* sub-community** are both very widespread and common within the Study Area and form a major percentage of the pastoral grassland present; many stands of both are intensively grazed year-round by sheep. The **U4d *Luzula multiflora* – *Rhytidiadelphus loreus* sub-community** is quite common as small patches through a range of mosaic habitats, it does not form large stands and most appears ungrazed, or only lightly browsed. The least common variant recorded in the Study Area is the **U4e *Vaccinium myrtillus* – *Deschampsia flexuosa* sub-community**, which tends to be found as small patches in higher altitude and heathy areas.
- 5.3.191 Overall, the stands of U4 within the Study Area tend to have variable amounts of the grasses *A. capillaris*, *F. ovina*, *H. lanatus* and *A. odoratum*, and the mosses *Rhytidiadelphus squarrosus*, *Hylocomium splendens* and *Pleurozium schreberi*. Typical quantities of these species and associate species differ between the respective sub-communities. A number of U4 grasslands also contain scattered trees of various species, particularly *Betula* spp. and *Pinus sylvestris*.

- 5.3.192 U4a is common throughout the Study Area, particularly where there is little/no evidence of any improvement or enrichment (cf. U4b). Along with the above community grasses, the sward in some stands is often thick with mosses. Associates commonly present through the areas of U4a, of which abundances can vary locally, include *Galium saxatile*, *Potentilla erecta*, *Deschampsia flexuosa*, *D. cespitosa*, *Nardus stricta*, *Festuca rubra*, *Carex pilulifera*, *Juncus effusus*, *J. squarrosus*, *Anemone nemorosa*, *Conopodium majus*, *Campanula rotundifolia*, *Viola riviniana*, *Rumex acetosa*, *Plantago lanceolata*, *Luzula* spp., *Blechnum spicant*, *Cirsium* spp., *Veronica chamaedrys* and *V. officinalis*.
- 5.3.193 U4b is also very common within the Study Area, particularly in more lowland settings and around towns and farms where there has been some enrichment or management. Swards of U4b tend to have a lush cover of broader leaved grasses, an increase in the number of herbs associated with improvement, and a decrease in the abundance and diversity of mosses. U4b is also the most common form of grassland along the verges of the existing road network. *Holcus lanatus* and *Trifolium repens* are abundant characteristic associates, growing with *Festuca ovina*, *A. capillaris* and *A. odoratum*. This semi-improved U4b grassland also sees the appearance of species such as *Poa annua*, *Cynosurus cristatus*, *Lolium perenne*, *Dactylis glomerata*, *Festuca rubra*, *Achillea millefolium*, *Plantago lanceolata*, *Prunella vulgaris*, *Cerastium fontanum*, *Luzula campestris*, *Rumex acetosa*, *Senecio jacobaea*, *Bellis perennis*, *Veronica serpyllifolia*, *V. chamaedrys*, *Ranunculus repens* and occasional patches of *Cirsium arvense*, *Urtica dioica* and *Rumex obtusifolius* where there is localised enrichment of the soil from livestock. Valuable as pasture, this sub-community is managed by relatively continuous grazing, although other treatments such as ploughing and fertiliser/manure application may have been applied in the past to bring it into its semi-improved condition.
- 5.3.194 A number of smaller stands of U4d are present within the Study Area, these areas are separated here from the other U4 variants by the abundance of *Deschampsia cespitosa* over dense wefts of *Thuidium tamariscinum*, *Hylocomium splendens* and *Pleurozium schreberi*. The areas of U4d at a distance are superficially quite similar to stands of MG9 *Holcus lanatus* – *Deschampsia cespitosa* neutral grassland (described below) owing to the abundance of *D. cespitosa*. However, the areas of U4d contain a more acidophilous flora on thinner soils, with more *Agrostis* spp. than *H. lanatus* and the presence of dense carpets of calcifuge mosses instead of forbs. *Calluna vulgaris* was also occasionally present.
- 5.3.195 A few stands of U4e were also recorded, these are stands of U4 that contain a heathy element and can be quite mossy, and as well as the characteristic community species as described above, these areas tend to contain more *Nardus stricta*, *Deschampsia flexuosa* and some *Calluna vulgaris* with rare scattered sprigs of *Vaccinium* spp. Occasionally there are small *Juniperus communis* bushes.

U5 *Nardus stricta* – *Galium saxatile* grassland

Communities/sub-communities recorded: U5, U5a, U5b, U5d

- 5.3.196 U5 grassland tends to be found on damp mineral soils which have peaty upper horizons. U5 typically occupies slopes where the depth and wetness of the soil are intermediate between those of the drier podsols under U4 grasslands and wet shallow peats found under U6 grassland. The underlying rock can be anything from acid to basic, but the soils are generally acidic^{xvi,xix}. U5 is common on the higher hill slopes of the cool, wet north and west of Britain^{xix,xx}. It is also commonly found on well-drained but moist alluvial soil along the margins of streams^{xvi}.
- 5.3.197 The sward of the U5 community is dominated by *Nardus stricta* in association with the same main community species as listed above for U4, albeit at a lower cover. The

prominence of *N. stricta* defines U5 and the associated flora defines the sub-communities.

- 5.3.198 U5 is generally confined to the very northern sections of the Study Area where it can be picked out as substantial light/whiteish coloured patches of grassland amongst expanses of brown/purple *Calluna*-dominated heaths. Three U5 sub-communities were recorded within the Study Area. The **U5a Species-poor sub-community** and the **U5b *Agrostis canina* – *Polytrichum commune* sub-community** are common, and the **U5d *Calluna vulgaris* – *Danthonia decumbens* sub-community** is occasional.
- 5.3.199 U5a lacks any of the species distinctive to the other sub-communities; U5a is readily identified on this basis alone. The sward is dominated largely by *Nardus stricta*, with *Agrostis capillaris*, *Festuca ovina* and *Anthoxanthum odoratum* sometimes locally frequent. Other associates are more occasional in the sward, but can be locally frequent, the most common of these include *Juncus squarrosus*, *J. effusus*, *Galium saxatile*, *Viola riviniana* and *Potentilla erecta*. Mosses such as *Hypnum jutlandicum*, *Hylocomium splendens*, *Rhytidiadelphus squarrosus*, *R. loreus* and *Pleurozium schreberi* are common throughout all the sub-communities.
- 5.3.200 Areas of U5b have a high cover of *Polytrichum commune* within the sward; *Juncus squarrosus* is also more frequent.
- 5.3.201 U5d is a heathier *Nardus* sward distinguished by having a scattering of *Calluna vulgaris*, *Empetrum nigrum*, *Vaccinium vitis-idaea*, *V. myrtillus* and rarely *Eriophorum angustifolium* and *Erica tetralix*. Also, rarely, there are some scattered bushes of *Juniperus communis*, especially around the Slochd area.
- 5.3.202 U5 is a low productivity vegetation type; this, combined with the dominance of the unpalatable *Nardus stricta*, means that grazing of the community is limited.

U6 Juncus squarrosus – *Festuca ovina* grassland

Communities/sub-communities recorded: U6, U6d

GWDTE Status – Moderate

- 5.3.203 U6 *Juncus squarrosus* - *Festuca ovina* grassland is characteristic of moist peats and peaty mineral soils, almost always base-poor and infertile, over gentle slopes and plateaux at higher altitudes (400m to 800m) in the cool and wet north and west of Britain^{xix,xx}. U6 is often a secondary vegetation type, strongly encouraged by particular kinds of grazing and burning treatments in damper upland pastures and on the drying fringes of blanket mires. The spread of *Juncus squarrosus* in upland pastures tends to be encouraged where uncontrolled heavy and selective grazing has been applied over rather ill-drained ground^{xix,xx}.
- 5.3.204 U6 is rare within the Study Area, only found in four small stands in the very northern section, around areas of mire and heath. As would be expected *Juncus squarrosus* is the dominant species in each stand, however the vegetation is mainly of the **U6d *Agrostis capillaris* – *Luzula multiflora* sub-community**. This is the most grass-rich form of U6. It is essentially quite similar to the U4a *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland Typical sub-community as described above, but with abundant *J. squarrosus* in the sward.

U16 Luzula sylvatica – Vaccinium myrtillus tall-herb community

Communities/sub-communities recorded: U16, U16c

GWDTE Status – High

- 5.3.205 U16 is a widespread but local community, generally confined to inaccessible slopes and ledges in the colder and wet uplands of north-west Britain, where there has been some protection from grazing and burning, but no succession to scrub or woodland. It occurs on a variety of rocky habitats and more isolated slopes over base-poor humic soils. This community is dominated by *Luzula sylvatica*, often overwhelmingly so, commonly with a few sparse associates. *Vaccinium myrtillus* is the one associate that occurs with consistent frequency; it can form vigorous bushes or an irregular second tier to the vegetation, or it can be co-dominant^{xix,xx}.
- 5.3.206 U16 was recorded in five polygons mapped during the surveys, mostly the **U16c Species-poor sub-community**. This classification was used to describe areas where the vegetation was made up of little else but *Luzula sylvatica*, despite the specific local setting, i.e. stands in the Study Area were not inaccessible slope or ledge communities but rather dense areas of *L. sylvatica* in heath, forest rides or on railway embankments.

U19 Oreopteris limbosperma – Blechnum spicant community

Communities recorded: U19

- 5.3.207 This community is found on moist, base-poor peaty soils on steep, sheltered banks at low to moderate altitudes throughout the wetter western and northern uplands of Britain; although it can be present as high as 800m in the Scottish Highlands^{xix,xx}. Typical situations for this community are on banks above gullies and streams which are cutting back into hills, and just below the brows of valley sides. U19 comprises often dense stands of *Oreopteris limbosperma*, together with a variety of herbaceous sub-shrub associates and a patchy cover of bryophytes. *Blechnum spicant* is the other constant fern of the community, generally not as abundant as *O. limbosperma* but it can be locally prominent^{xix,xx}.
- 5.3.208 Just two very small patches of U19 were recorded in the northern Study Area. These areas contained a mixture of co-abundant *Oreopteris limbosperma* and *Blechnum spicant*, with some *Calluna vulgaris* and *Luzula sylvatica* also present in the sward.

U20 Pteridium aquilinum – Galium saxatile community

Communities/sub-communities recorded: U20, U20a, U20b, U20c

- 5.3.209 The U20 *Pteridium aquilinum – Galium saxatile* community occurs on well-aerated and often moist soils that are base-poor to circumneutral^{xix,xx}. *Pteridium aquilinum* is the sole dominant and is overwhelmingly abundant in some stands. This is a community of mostly low ecological value.
- 5.3.210 U20 occurs as frequent scattered stands throughout the Study Area, usually in mosaics with other grasslands or as patches of varying sizes through areas of dry heath. It is also common around the edges, and in clearings, of *Betula* woodlands. It rarely forms large expansive stands in the Study Area. All three sub-communities were recorded, and all are equally common and widely distributed. *Pteridium aquilinum* dominates within each sub-community.

- 5.3.211 In the grassier **U20a *Anthoxanthum odoratum* sub-community**, *P. aquilinum* is accompanied by a grassland species assemblage reflecting close affinities to the U4 grassland described above. Species recorded common to this sub-community include *Anthoxanthum odoratum*, *Agrostis capillaris*, *Deschampsia flexuosa*, *Holcus lanatus*, *Festuca ovina*, *Anemone nemorosa*, *Oxalis acetosella*, *Galium saxatile*, *Rumex acetosa*, *Campanula rotundifolia*, *Conopodium majus*, *Potentilla erecta*, *Viola riviniana* and *Trientalis europaea*. The mosses listed in the paragraph below for U20b are also frequent to occasional.
- 5.3.212 Stands of the **U20b *Vaccinium myrtillus* – *Dicranum scoparium* sub-community** contain some of the species listed above at lower abundances, but overall have a heathier species association. Here, *P. aquilinum* is joined by frequent *V. myrtillus* and sometimes occasional *Erica tetralix*, *E. cinerea* and *Calluna vulgaris*. There is also generally a higher cover of mosses, including: *Rhytidiadelphus squarrosus*, *R. triquetrus*, *Pleurozium schreberi*, *Dicranum scoparium*, *Hylocomium splendens*, *Hypnum jutlandicum* and *Pseudoscleropodium purum*.
- 5.3.213 In the stands of the **U20c Species-poor sub-community**, *P. aquilinum* is the overwhelming dominant with plants below the *P. aquilinum* canopy shaded out or covered by frond litter. Only occasional associates from U20a and U20b are found within the areas of U20c.

Mesotrophic Grasslands

MG1 Arrhenatherum elatius grassland

Communities/sub-communities recorded: MG1, MG1a, MG1b

- 5.3.214 MG1 is essentially ungrazed grassland in which coarse-leaved tussock grasses are dominant in the sward. It is found on circumneutral and free draining soils throughout the British lowlands. Key to its development is the irregularity or absence of grazing or mowing^{xix}.
- 5.3.215 MG1 is quite frequently scattered throughout the Study Area, in usually small stands. It occurs as strips or patches around semi-improved or improved field margins, along road sides, road/rail embankments, track verges (particularly those that have been neglected and unmown) and in neglected grassland around urban areas. MG1 was often mapped at the community level, but some stands were assigned a sub-community; with the **MG1a *Festuca rubra* sub-community** and the **MG1b *Urtica dioica* sub-community** both recorded.
- 5.3.216 The MG1 vegetation within the Study Area generally lacks abundant *Arrhenatherum elatius*, although this species is frequent. More commonly the vegetation is a co-abundant mix of *Dactylis glomerata* and *Holcus lanatus*. With these species, the frequent to occasional associates recorded include *Agrostis capillaris*, *Festuca rubra*, *Heracleum sphondylium*, *Chamerion angustifolium*, *Deschampsia cespitosa*, *Urtica dioica*, *Rumex obtusifolius*, *Rubus idaeus*, *Achillea millefolium*, *Centaurea nigra*, *Luzula* sp., *Cirsium arvense*, *Plantago lanceolata*, *Trifolium repens*, *Anthriscus sylvestris* and sometimes young *Cytisus scoparius*.

MG5 Cynosurus cristatus – Centaurea nigra grassland

Communities/sub-communities recorded: MG5

- 5.3.217 MG5 is dicotyledon-rich grassland of variable appearance; it may have a tight, low-growing sward or comprise a quite lush growth up to 60cm tall according to grazing

intensity. It is the typical grassland of grazed hay-meadows on circumneutral brown soils of loamy to clayey texture throughout the lowlands of Britain^{xix,xx}.

- 5.3.218 MG5 is rare within the Study Area, recorded in five mosaic areas, with the stands not typical for the community setting as described in Rodwell *et al.*^{xix}. Instead, MG5 recorded within the Study Area is secondary grassland vegetation present on rail embankments and a road verge, but which has floristic affinities to the MG5 species assemblage and was the best-fit NVC community. MG5 here may have been established from a meadow-type of seed mixture sown when the areas were landscaped, as in these situations it looks unlikely to be a remnant of original vegetation.
- 5.3.219 The swards present were of *Holcus lanatus*, *Dactylis glomerata*, *Anthoxanthum odoratum*, *Festuca rubra* and *Cynosurus cristatus* growing with *Centaurea nigra*, *Achillea millefolium*, *Ranunculus acris*, *Plantago lanceolata* and *Potentilla erecta*. As these parts of the Study Area were surveyed early in the season, there are likely to be more species that weren't in evidence at the time of survey.

MG6 Lolium perenne – Cynosurus cristatus grassland

Communities/sub-communities recorded: MG6, MG6a, MG6b

- 5.3.220 MG6 is the major permanent pasture type on moist but freely draining circumneutral brown soils in lowland Britain and is often found in enclosed farmland. It has usually been subjected to some form of agricultural improvement such as fertiliser application and drainage, and many stands have been derived from historical ploughing and re-seeding^{xix}.
- 5.3.221 MG6 is largely restricted in the Study Area to a few areas of enclosed improved fields; mainly in the very southern Study Area around Ballinluig, Druim Mhor and Lynwilg, north of Aviemore by Slugganranish, and either side of the A95 around Lochside and Alvie Lochan Farm. The vegetation was mostly recorded to community level only, though fields of two sub-communities were recorded, the **M6a Typical sub-community** and the **MG6b Anthoxanthum odoratum sub-community**.
- 5.3.222 These fields of MG6 are managed for agriculture, being used for hay/silage or intensive livestock grazing, and likely improved with periodic fertiliser applications. The vegetation is dominated by a sward of *Lolium perenne* with typically abundant *Trifolium repens*. More occasional to locally frequent between stands are *Cynosurus cristatus*, *Holcus lanatus*, *Phleum pratense*, *Anthoxanthum odoratum*, *Festuca rubra*, *Poa annua*, *Agrostis* spp., *Dactylis glomerata*, *Ranunculus* spp., *Plantago lanceolata*, *Cirsium arvense*, *Cerastium fontanum*, *Taraxacum officinale* and *Bellis perennis*. Mosses are sparse within these areas of MG6.

MG7 Lolium perenne leys and related grasslands

Communities/sub-communities recorded: MG7

- 5.3.223 MG7 *Lolium perenne* leys and related grasslands are species-poor, grass dominated swards characterised by the constant abundance of *L. perenne* and other specifically selected grasses. This community is a distinctive one of intensive grassland treatment, including the frequent addition of fertilisers^{xix,xx}. Grasslands of this type are often specifically sown as high productivity swards for intensive agricultural use, such as for hay or silage.
- 5.3.224 In the Study Area, two fields of more recently re-sown species-poor *Lolium perenne* pasture were recorded as MG7.

MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland

Communities/sub-communities recorded: MG9, MG9a

GWDTE Status – Moderate

- 5.3.225 MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland is characteristic of permanently moist, gleyed and periodically inundated circumneutral soils across large areas of the British lowlands. It can exist on level to moderately sloping ground in areas of pasture or meadow, but can also be found along woodland rides and fen/wetland margins. MG9 typically contains a coarse and tussocky sward dominated by *D. cespitosa*^{xix,xx}.
- 5.3.226 MG9 is scattered throughout the study, usually as small patches, or in mosaics with a number of other grassland or rush mire communities. In all cases these areas are obvious from the dominance of tussocky *D. cespitosa*; a few stands were mapped as the **MG9a *Poa trivialis* sub-community**.
- 5.3.227 Associate species fill the gaps throughout the tussocks, with *Holcus lanatus* frequent and sometimes locally abundant. Other species more occasional in the sward include *Juncus effusus*, *Poa trivialis*, *Agrostis* spp., *Dactylis glomerata*, *Rumex acetosa*, *R. obtusifolius*, *Cirsium palustre* and *Ranunculus repens*.

MG10 *Holcus lanatus* – *Juncus effusus* rush-pasture

Communities/sub-communities recorded: MG10, MG10a

GWDTE Status – Moderate

- 5.3.228 MG10 is a form of rush-pasture characteristic of areas with strongly impeded drainage over a wide range of usually acid to neutral mineral soils on level to gently sloping ground^{xix,xx}. This community requires consistently high soil moisture^{xix}. It occurs across most of the British lowlands, with the typical sub-community being particularly prominent towards the north and west. Although found on various soil types including brown earth and calcareous earth throughout its range, this habitat can also have close associations with various types of mire vegetation and can form significant parts of rush-dominated mire mosaics in areas of suitably moist soils.
- 5.3.229 MG10 is characterised by an assemblage in which tussocks of *Juncus effusus* are abundant in species-poor swards of the grasses *Holcus lanatus*, *Agrostis stolonifera*, *Poa trivialis* and forbs including *Ranunculus acris*, *R. repens*, *Rumex acetosa*, *Cardamine pratensis* and *Trifolium repens*. Mosses such as *Brachythecium rutabulum*, *Calliergonella cuspidata*, *Kindbergia praelonga* and *Rhytidiadelphus squarrosus* often form diffuse wefts over the damp soil and among the larger plants^{xix,xx}.
- 5.3.230 MG10 forms widespread small stands within the Study Area, mostly within wetter hollows, flow lines and poorly drained parts of agricultural fields where *Juncus effusus* has taken over (e.g. within U4 and MG6). It is also often present in mosaics with other wet grasslands (MG9) and *Juncus* spp. mires (M6 and M23).
- 5.3.231 The vegetation within the Study Area is referable to the **MG10a Typical sub-community**. This reflects both the species-poor nature of the vegetation as well as absence of the species characteristic of the other sub-communities (i.e. no *Juncus inflexus* or *Iris pseudacorus*). The vegetation is typically dominated by dense tussocks of *J. effusus*, with frequent to occasional *H. lanatus*, tussocks of *Deschampsia cespitosa*

and *Cirsium palustre* and the typical species as already listed above for the community as a whole. The sward throughout the Study Area is generally species-poor.

MG13 *Agrostis stolonifera* – *Alopecurus geniculatus* grassland

Communities recorded: MG13

- 5.3.232 MG13 is widely distributed in the lowlands, typically on silty circumneutral soils kept moist and sometimes waterlogged by periodic inundation with freshwater. It often occurs as fragmentary stands along sluggish watercourses and around pools in lowland pastures^{xix,xx}. The sward tends to be dominated by mixtures of *Agrostis stolonifera* and *Alopecurus geniculatus* with a variety of occasional associates that may be abundant in particular stands^{xix,xx}.
- 5.3.233 One very small stand of MG13 was recorded in a wet and flushed area; it was species-poor and poached and trampled by cattle. This area had a sward of *Agrostis stolonifera* with smaller amounts of *Ranunculus repens*, *Juncus effusus*, *Anthoxanthum odoratum* and *Holcus lanatus*.

Calcareous Grasslands

CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus polytrichus* grassland

Communities/sub-communities recorded: CG10a

GWDTE Status – High; Annex I – Species-rich *Nardus* grassland, on siliceous substrates in mountain areas; SBL – Upland calcareous grassland

- 5.3.234 CG10 is a sub-montane community of base-rich and often moist brown earths which have developed over a wide variety of calcareous bedrocks and coarse-textured superficial deposits. The soils have a moderately calcareous superficial pH of 5-7. The community can be found up to 750m in altitude, and is generally restricted to areas of cool, moist and cloudy climatic conditions in the uplands. The grassland is typically a plagioclimax vegetation maintained by grazing (usually sheep)^{xix,xx}. CG10 generally occurs as swards close-cropped by grazing and dominated by *Agrostis capillaris* and *Festuca ovina*. Other grasses tend to be more specific to particular sub-communities. Of the dicotyledons the commonest species is *Thymus polytrichus*, which tends to be abundant^{xix,xx}.
- 5.3.235 Just three stands of CG10 were recorded within the Study Area, all referable to the **CG10a *Trifolium repens* – *Luzula campestris* sub-community**. One stand is semi-natural and part of a mosaic with species-rich H10d *Calluna* – *Erica* heath, whereas the other two are secondary and associated with strips of road verge, where there have been some salting influences.
- 5.3.236 CG10a shares a species assemblage quite similar to that of U4 grassland described above, with a sward of abundant *Agrostis capillaris*, *Festuca ovina* and *Anthoxanthum odoratum*, the separation between the communities depending largely on the relative abundances of *Thymus polytrichus* (more common in CG10) and *Galium saxatile* (more common in U4).
- 5.3.237 The areas of CG10 contain a number of species as listed for U4, but are more species-rich, in addition to the above the following were recorded in these areas: *Luzula multiflora*, *Nardus stricta*, *Pilosella officinarum*, *Carex caryophyllaea*, *Succisa pratensis*, *Conopodium majus*, *Campanula rotundifolia*, *Lotus corniculatus*, *Achillea millefolium*, *Viola riviniana*, *Galium verum*, *Hypericum pulchrum*, *Potentilla erecta*, *Lathyrus linifolius*,

Plantago lanceolata and *P. maritima* (from road salt influence). The mosses *Rhytidiadelphus squarrosus*, *R. triquetrus*, *Hylocomium splendens* are also common.

Swamps and Tall-Herb Fens

S4 Phragmites australis swamp and reed-beds

Communities/sub-communities recorded: S4

SBL – Reedbeds

- 5.3.238 S4 is found in a wide range of permanently wet or periodically waterlogged habitats of differing trophic states and with a variety of substrates. Stands are common in open water transitions around lakes and ponds, in floodplain mires and in estuaries, along dykes, canals and slow-flowing lowland rivers, in small pools, peat cuttings and on salt marshes. The community is usually very species-poor with the vegetation overwhelmingly dominated by *Phragmites australis*, no other species attains even occasional frequency throughout^{xxi}.
- 5.3.239 S4 was recorded from only one area within the Study Area, in the very western corner of Loch Alvie where there is a pure stand of *Phragmites australis* in transition to open water.

S7 Carex acutiformis swamp

Communities recorded: S7

SBL – Lowland fens

- 5.3.240 S7 swamp is most often found on moderately eutrophic, circumneutral substrates on the margins of slow-moving or standing lowland waters in open-water transitions, in wet hollows in floodplain meadows, in ditches and alongside sluggish watercourses. The vegetation is always dominated by *Carex acutiformis* forming an open or closed canopy of foliage about 1m tall. No other species are constant but there are usually some scattered tall fen herbs; other swamp species can be locally prominent^{xxi}.
- 5.3.241 Just a single small stand of S7 swamp was recorded within the Study Area, found in a wet hollow within a semi-improved field adjacent to the A95 by Kinveachy. The stand was dominated by *Carex acutiformis* and there were patches of bare mud, there was also sparse and occasional *Caltha palustris* and *Carex rostrata*.

S9 Carex rostrata swamp

Communities/sub-communities recorded: S9, S9a, S9b

SBL – Upland flushes, fens and swamps or Lowland fens (depending on local setting)

- 5.3.242 S9 swamp is generally a community of the north and west of Britain. The vegetation is typically a swamp of shallow to moderately deep, mesotrophic to oligotrophic standing waters with organic substrates. It also occurs more fragmentarily in peat cuttings^{xxi}. The S9 community is readily recognised by the tall, dense growth of *Carex rostrata* rooted in shallow water. Separation from other communities in which *C. rostrata* is present is based on its almost exclusive dominance in this community and the low cover and diversity of associates.

- 5.3.243 S9 is the most common and widespread swamp vegetation throughout the Study Area in suitable locations, from small stands in and around wet hollows and pools to larger stands in wet marshes, terrestrialsising shallow lochans, and marginal to large waterbodies. Both sub-communities, the **S9a *Carex rostrata* sub-community** and **S9b *Menyanthes trifoliata* – *Equisetum fluviatile* sub-community** occur here, however S9a is by far the most common variant.
- 5.3.244 The dominance of *Carex rostrata* and absence or very low cover and number of associates makes the S9a sub-community easy to identify. S9a within the Study Area is typically species-poor, with some stands consisting solely of *C. rostrata* in shallow water.
- 5.3.245 Where associates occur in S9a and S9b, they tend to be sparse and of low cover. Other species recorded in some areas of S9 included occasional *Juncus effusus*, *Caltha palustris*, *Equisetum fluviatile*, *Potamogeton polygonifolius*, *Viola palustris*, *Glyceria fluitans* and *Menyanthes trifoliata*.

S10 Equisetum fluviatile swamp

Communities/sub-communities recorded: S10a

SBL – Lowland fens

- 5.3.246 S10 occurs in similar situations to S9 above, being found in shallow to moderately deep, eutrophic to oligotrophic, standing waters in both lowland and upland lakes and pools. This community is comprised of open or closed vegetation up to around 50cm high in which *Equisetum fluviatile* is the most abundant species. No other species is frequent throughout, although in each sub-community some of the associates may be locally abundant^{xxi}.
- 5.3.247 Only a single stand of S10 was recorded within the Study Area, this was within part of a mosaic with S9a swamp (described above). The stand was of the **S10a *Equisetum fluviatile* sub-community** and consisted of a sward of little else other than *E. fluviatile*.

S22 Glyceria fluitans water-margin vegetation

Communities/sub-communities recorded: S22a

SBL – Lowland fens

- 5.3.248 The S22 community is characteristic of shallow, standing or sluggish, mesotrophic waters and fine mineral substrates, and is commonly found around ponds and wet depressions in fens and pastures and on the margins of small dykes and streams. This community is characterised by a dominant low mat or floating carpet of *Glyceria fluitans*. No other species reaches even occasional frequency throughout, but the most usual associates are plants of shallow water margins^{xxi}.
- 5.3.249 Two small stands of the **S22a *Glyceria fluitans* sub-community** were recorded, both associated with shallow ponds where a mat of *G. fluitans* formed the sole dominant species.

S28 Phalaris arundinacea tall-herb fen

Communities/sub-communities recorded: S28, S28a, S28c

SBL – Upland flushes, fens and swamps or Lowland fens (depending on local setting)

- 5.3.250 S28 comprises vegetation in which *Phalaris arundinacea* is dominant, forming an often-dense canopy, usually 1-1.5m tall. The vegetation is almost always species-poor and no associates tend to be frequent throughout^{xxi}. The community is typical of the margins of fluctuating, circumneutral and mesotrophic to eutrophic waters, both standing and running^{xxi}. Although it can be found on organic soils, it is more characteristic of mineral substrates, from fine clays to coarse gravels. It is common in open-water transitions around ponds and lakes of all sizes and also occurs around reservoirs and in some floodplain and basin mires^{xxi}.
- 5.3.251 Three very small patches of S28 were recorded in the Study Area, including the **S22a *Phalaris arundinacea* sub-community** and the **S28c *Elymus repens* – *Holcus lanatus* sub-community**. In all cases the community is easily recognisable from the almost pure dominance of *Phalaris arundinacea*, the area of S28c also contained some *H. lanatus*.

Vegetation of Open Habitats

OV24 Urtica dioica – Galium aparine community

Communities/sub-communities recorded: OV24, OV24a, OV24b

- 5.3.252 OV24 is a tall-herb weed community that occurs widely throughout lowland Britain; under suitable conditions it is also found in the upland fringes. It typically occurs on disturbed, nutrient-rich soils and is frequently found around dumps of rich soil, dung or farm waste, in neglected gardens and around abandoned buildings, on waste land, and on disturbed verges and tracks^{xxii}.
- 5.3.253 Within the Study Area there are some small infrequent areas of OV24, usually found on disturbed or nutrient-enriched lowland and sometimes grazed ground, or in neglected areas around habitation. Both the **OV24a Typical sub-community** and the **OV24b *Arrhenatherum elatius* – *Rubus fruticosus* agg. sub-community** were recorded. The vegetation is dominated by the characteristic species, *Urtica dioica* and *Galium aparine* with frequent *Cirsium arvense*; the single stand of OV24b also contained *Rubus idaeus*.

OV25 Urtica dioica – Cirsium arvense community

Communities/sub-communities recorded: OV25

- 5.3.254 OV25 is a tall-herb weed community. It is found throughout lowland Britain, on disturbed, nutrient-rich soils, usually where there are patches of bare or lightly covered ground in which *Cirsium* spp. can establish themselves. It is typically found in poorly managed meadows, on abandoned arable land or waste land, on disturbed verges and tracks, and in cleared woodland or young plantations^{xxii}.
- 5.3.255 OV25 was mainly recorded in a number of small stands on disturbed ground around Aviemore, and rarely as patches of vegetation within intensively grazed grassland that shows signs of localised ground enrichment. The OV25 vegetation within the Study Area typically has dominant *Urtica dioica* and *Cirsium arvense* with *Rumex obtusifolius* a frequent associate.

OV27 *Chamerion angustifolium* community

Communities/sub-communities recorded: OV27, OV27b

- 5.3.256 OV27 *Chamerion angustifolium* tall-herb vegetation is a community that occurs on damp, fertile, disturbed soils in woodlands, on heaths and along road verges and railway embankments^{xxii}. It is also common in regenerating conifer plantation clear-fell areas. The OV27 community is marked by the dominant tall growth of *C. angustifolium*.
- 5.3.257 A number of stands of OV27 are present within the Study Area, they tend to be quite fragmentary, and the majority are to be found along the verges of the existing A9 or on railway embankments. The community was generally recorded to community level only, however one area was assigned to the **OV27b *Urtica dioica* - *Cirsium arvense* sub-community**.
- 5.3.258 These stands are easily distinguished by a tall thick growth of *Chamerion angustifolium* which suppresses other plant growth. The sparse associates recorded throughout these areas of OV27 included *Holcus lanatus*, *Arrhenatherum elatius*, *Dactylis glomerata*, *Deschampsia cespitosa*, *Rubus idaeus*, *Urtica dioica* and *Cirsium arvense*.

Non-NVC Communities & Categories

- 5.3.259 A number of non-NVC vegetation types or features were mapped during the survey. These were classified as follows. Codes used in the results Figures are given in parentheses:
- conifer plantation (CP);
 - forestry plantation clear-fell (CF);
 - broadleaved plantation (BP);
 - mixed plantation (MP);
 - bare or exposed peat (Pt);
 - recent muirburn (MB);
 - *Juncus effusus* acid grassland community (Je);
 - non-NVC neutral sedge mire (Mx);
 - non-NVC stands of ferns, predominately *Dryopteris* spp. (Fn);
 - *Holcus lanatus* dominant neutral grassland (Hl);
 - *Poa annua* dominant grassland (Pa);
 - *Lonicera periclymenum* scrub (Lp);
 - *Symphoricarpos rivularis* scrub (Sr);
 - *Racomitrium lanuginosum* carpets (RI);
 - planted shrubbery in built-up areas (SH);
 - private gardens/lawns/amenity grassland (PG);
 - bare ground, soil, rock, shingle, hardstandings (BG);
 - arable/crops (AR);
 - quarry (QY);
 - refuse tip (R);

- standing water (SW); and
- buildings (BD).

- 5.3.260 Areas of *Pinus sylvestris* plantation were classified as W18 woodland as described above. The other coniferous plantation (CP) areas were unremarkable in terms of their flora and species composition, with many having no ground flora except for some scattered mosses due to the canopy and shading effects. Areas of CP were mainly *Larix decidua*, however there are also plantations of *Picea sitchensis*, *Pseudotsuga menziesii* and *Pinus contorta*.
- 5.3.261 Areas of *Betula* spp. broadleaved plantation, common in shelter belts along the A9, were each assigned to a respective NVC woodland community as appropriate dependant on field flora; i.e. usually W4, W11 or W17 woodland. Thus, only a few areas were recorded as 'BP', these were usually small and included some stands of *Fagus sylvatica* or *Tilia x europaea*. One area of mixed plantation (MP) was recorded and included *Tilia* sp., *Acer pseudoplatanus* and *Picea sitchensis*.
- 5.3.262 There are a few areas of recent clear-fell (CF) within the Study Area, both coniferous (as part of forestry operations) and broadleaved (felling occurring during the survey of trees directly adjacent the railway on its embankments).
- 5.3.263 The Je, Mx and Hl species assemblages are described further below. All other bulleted vegetation or feature types listed above are not extensive and are either lacking vegetation, non-natural, or floristically poor and of negligible botanical or conservation importance. These are therefore not discussed further within this report.

Je – Juncus effusus acid grassland community

- 5.3.264 The Je acid grassland community is present within the Study Area as vegetation in which very dominant and tall tussocks of *J. effusus* grow abundantly among shorter 'acid grassland' swards including frequent to occasional *Agrostis capillaris*, *Holcus lanatus*, *Rumex acetosa*, *Potentilla erecta*, *Galium saxatile*, *Hylocomium splendens*, *Pleurozium schreberi* and *Rhytidiadelphus squarrosus*. This vegetation does not fit into any NVC community as it lacks the wetland element of M6 and M23 *Juncus* spp. mires and has a more acidophilous flora than MG10 *Juncus effusus* rush-pasture. It is therefore classed separately.
- 5.3.265 This vegetation is of limited botanical interest, but in light of the SEPA classification of potential GWDTEsⁱⁱ the non-NVC type Je should also qualify for potential GWDTE status. The classification of moderate sensitivity is in line with other similar rushy grassland communities (e.g. MG10).

Mx – Neutral sedge mire

- 5.3.266 Mx is neutral sedge mire lacking the acidophilous species of M6 and the basiphilous species of M10. It could be described as floristically very similar to M23 mire but with smaller *Carex* spp. (sedges) replacing *Juncus* spp. (rushes) as the main vascular feature. It varies from species-poor swards of sedges such as *Carex nigra*, *C. echinata*, *C. flacca* and *C. panicea* to richer swards with diverse assemblages of herbs and bryophytes. *Carex rostrata* is no more than sparse; if it were dominant the vegetation could be assigned to M5 mire.
- 5.3.267 Two stands of Mx were recorded within the Study Area, both around Aviemore, with one to the north of the town intensively grazed by horses. These areas contained a sward of rather sparse and grazed *Carex* spp., in particular *C. nigra*, with some graminoids;

scattered stems of *Juncus acutiflorus* were only occasional to rare. These species overtopped dense wefts of more neutral mosses common to the M23 community.

- 5.3.268 In light of the SEPA classification of potential GWDTEs, Mx is also considered to qualify for potential GWDTE status. The classification of high sensitivity is in line with its close similarity and landscape settings to M23 mire.

HI – *Holcus lanatus* dominant neutral grassland

- 5.3.269 A number of areas of 'HI', *Holcus lanatus* neutral grassland, were recorded in the Study Area, in particular around Aviemore. This classification has been used to describe areas of vegetation that are near pure swards of *H. lanatus* that do not fit well within the closest similar type of vegetation, i.e. the U4b *Holcus lanatus* – *Trifolium repens* sub-community of U4. Areas of HI are more neutral, and lack any of the more calcifuge associates that can be found in U4b, in particular species such as *Potentilla erecta* and *Galium saxatile*; HI also lacks the characteristic bryophytes of a U4 grassland.

5.4 Phase 1 Results

- 5.4.1 For each of the above-described vegetation and habitats types found in this survey, Table 5.1 shows the equivalent habitats according to the Phase 1 habitat classification¹ for this Study Area, taking into account the species compositions, habitat quality, impacts, local setting, surrounding habitats and the character of transitional areas.
- 5.4.2 For instance, typical blanket bog communities such as M17 - M20 have generally been classed as blanket bog, whereas M25 has been classed as wet modified bog due to the species-poor nature of the vegetation and impacts from forestry, drainage and grazing.
- 5.4.3 Furthermore, many NVC communities can fall within different Phase 1 types; for example, within the Study Area stands of woodland such as W11, W17, W18 can often be either semi-natural or plantation, these therefore have been assigned the different respective Phase 1 codes. In some cases, these NVC codes can include 'mixed woodland' in Phase 1 terms depending on the respective percentages of broadleaved or coniferous trees. In a further example, communities such as M4/M5/M6/M9 can be considered either flushes or types of fen, e.g. basin mire, depending on the local setting.
- 5.4.4 The Phase 1 results are shown on Figure 12.3 and have been interpreted from field surveys, mapping data, and the NVC polygon data broadly using Table 5.1. Polygons where there are mosaic NVC communities have generally been assigned a single Phase 1 classification based on the dominant NVC type (despite many polygons containing multiple Phase 1 types, often in low percentages). Therefore, Figure 12.3 is a broad overview, and the NVC data should be consulted for further detail in a specific area.

Table 5.1: Phase 1 habitat type equivalents of NVC communities and other habitats recorded

Phase 1 Equivalents	NVC & Other Habitats/Features Recorded
A1.1.1 Woodland: broadleaved, semi-natural	W2, W3, W4, W6, W7, W9, W11, W17
A1.1.2 Woodland: broadleaved, plantation	W11, W17, BP
A1.2.1 Woodland: coniferous, semi-natural	W18
A1.2.2 Woodland: coniferous, plantation	W18, CP
A1.3.1 Woodland: mixed, semi-natural	W4, W7, W11, W17, W18
A1.3.2 Woodland: mixed, plantation	W11, W17, W18

Phase 1 Equivalents	NVC & Other Habitats/Features Recorded
A2.1/A2.2 Scrub: dense-continuous/scattered	W19, W21, W22, W23, W24, Sr, Lp
A4.1/A4.2 Recently-felled woodland: broadleaved/coniferous	CF
B1.1/B1.2 Acid grassland: unimproved/semi-improved	U1, U2, U4, U5, U6, Je
B2.1/B2.2 Neutral grassland: unimproved/semi-improved	MG1, MG5, MG9, MG10, MG13, HI, Pa
B3.1 Calcareous grassland: unimproved	CG10
B4 Improved grassland	MG6, MG7
B5 Marsh/marshy grassland	M23, M25b, M27, MG10, Je, Mx
B6 Poor semi-improved grassland	MG6, U4b
C1.1/C1.2 Bracken: continuous/scattered	U20, W25
C3.1 Other tall herb & fern: tall-ruderal	OV24, OV25, OV27
C3.2 Other tall herb & fern: non-ruderal	U16, U19, Fn
D1.1 Dry dwarf shrub heath - acid	H9, H10, H12, H16, H18, H21, H9-H12, H10-H12, H12b-U6, MB, RI
D1.2 Dry dwarf shrub heath - basic	H10d
D2 Wet dwarf shrub heath	M15, M16
D5 Dry heath/acid grassland mosaic	Mosaics of B1 and D1.1 communities
D6 Wet heath/acid grassland mosaic	Mosaics of B1 and D2 communities
E1.6.1 Bog: blanket	M2, M3, M17, M19, M20
E1.7 Bog: wet modified	M25a
E1.8 Bog: dry modified	M16
E2.1 Flush/spring: acid/neutral	M4, M6
E2.2 Flush/spring: basic	M10
E2.2 Flush/spring: bryophyte dominated	M32
E3.2 Fen: basin mire	M4, M5, M6, M9
E4 Bare peat	Pt
F1 Swamp	S4, S7, S9, S28, M28
F2.1 Marginal/inundation - marginal	S9, S10
G1 Open water – standing water	SW
I1.1.1 Natural inland cliff – acid neutral	BG
I2.1 Quarry	QY
I2.4 Refuse-tip	R
J1.1 Arable	AR
J1.2 Amenity grassland	PG
J1.4 Introduced shrub	SH
J3.6 Buildings	BD
J4 Bare ground	BG, DG

5.5 Aspen Results

- 5.5.1 *Populus tremula* was recorded at various locations throughout the Study Area. Trees were most often infrequent scattered individuals or small groups, of varying age, within larger woodland stands. *P. tremula* were most often found within W11 and W17 *Betula* woodlands, in the few stands of *Quercus* W11 woodland, and rarely within W18 *Pinus sylvestris* woodland.
- 5.5.2 Most individual, or small patches, of *P. tremula* have been recorded as TNs so their precise location is mapped. In a few instances *P. tremula* was much more abundant in a stand, being scattered throughout, co-abundant with another species, or rarely as a pure stand of this species (sometimes planted). The locations of *P. tremula* recorded during this survey are shown on Figure 12.7, mapped as either a stand containing *P. tremula* or as a specific TN location.
- 5.5.3 As can be seen in Figure 12.7, *P. tremula* was not recorded (or is very scarce) in the northern part of the Study Area, first appearing with any regularity around Carrbridge. It is much more abundant to frequent in the central Study Area in patches of woodland along the B9153 south of Ellan Wood, around Kinveachy, the cemetery by Loch Vaa, and the mature *Quercus* woodlands at Granish, north of Aviemore. South of Aviemore there are also a number of woodland areas that also contain scattered *P. tremula*, including a sizeable pure stand north of the A9 by Lynwilg Farm.
- 5.5.4 Details of the specific *P. tremula* TNs are provided in Annex F.

5.6 Protected Vascular Plants and Bryophytes

- 5.6.1 *Pyrola media* was recorded in a couple of localities from the Study Area, see Annex D and Figure 12.5. This species is classified as vulnerable (VU) in the Vascular Plant Red Data List for Great Britain^{xxiii}.
- 5.6.2 No other rare species were recorded during the course of surveys; however, this does not preclude their presence from the Study Area. A number of other species that may be considered uncommon were recorded, i.e. *Persicaria vivipara*, *Goodyera repens* and *Pyrola minor* (Annex D; Figure 12.5). These are all species of Least Concern (LC)^{xxiii}.
- 5.6.3 A pond within the Study Area is known to be one of just 20 Scottish localities (and the only one in this part of the country) where *Rorippa islandica* has previously been recorded. This location was searched twice during the survey period but no plants were recorded; however, as a late-flowering annual it might not yet have been in evidence early in the year, or it may not appear every year.

6. Evaluation of Nature Conservation Importance and Other Sensitivities

6.1 Overview

- 6.1.1 NVC communities can be compared with a number of habitat classifications in order to inform the assessment of sensitivity and conservation interest. The following sections compare the survey results and the NVC communities identified against three classifications:
- SEPA guidance on GWDTE;

- Habitats Directive (92/43/EEC) Annex I habitats; and
- Scottish Biodiversity List (SBL) priority habitats.

6.1.2 A summary table of all NVC communities recorded and any respective sensitivity is then given.

6.2 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

6.2.1 SEPA has classified a number of NVC communities as potentially dependent on groundwaterⁱⁱ. Wetlands or habitats containing these particular NVC communities are to be considered GWDTE unless further information can be provided to demonstrate this is not the case. Many of the NVC communities on the list are very common habitat types across Scotland, and some are otherwise of low ecological value. Furthermore, some of the NVC communities may be considered GWDTE only in certain hydrogeological settings.

6.2.2 Designation as a GWDTE does not therefore infer an intrinsic biodiversity value, and GWDTE status has not been used as criteria to determine conservation importance. There is however a statutory requirement to consider GWDTEs and the data gathered during the NVC surveys has been used to inform this assessment (see Environmental Statement (ES) Chapter 10 Geology, Soils and Groundwater).

6.2.3 Using SEPA's guidance, Table 6.1 shows which communities recorded within the Study Area may, depending on hydrogeological setting, be considered GWDTE. Those communities that may have limited (moderate) dependency on groundwater in certain settings are marked in yellow, and NVC communities recorded that are likely to be considered high or sensitive GWDTE in certain hydrogeological settings are highlighted in red.

Table 6.1: Study Area potential GWDTE communities

NVC Code	NVC Community Name
W4	<i>Betula pubescens</i> – <i>Molinia caerulea</i> woodland
W7	<i>Alnus glutinosa</i> – <i>Fraxinus excelsior</i> – <i>Lysimachia nemoreum</i> woodland
M5	<i>Carex rostrata</i> – <i>Sphagnum squarrosum</i> mire
M6	<i>Carex echinata</i> – <i>Sphagnum fallax/denticulatum</i> mire
M9	<i>Carex rostrata</i> – <i>Calliergon cuspidatum/giganteum</i> mire
M10	<i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire
M16	<i>Erica tetralix</i> – <i>Sphagnum compactum</i> wet heath
M23	<i>Juncus effusus/acutiflorus</i> – <i>Galium palustre</i> rush pasture
M32	<i>Philonotis fontana</i> – <i>Saxifraga stellaris</i> spring
U16	<i>Luzula sylvatica</i> – <i>Vaccinium myrtillus</i> tall-herb community
CG10	<i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus polytrichus</i> grassland
Mx ³	<i>Carex</i> spp. neutral mire
W2	<i>Salix cinerea</i> – <i>Betula pubescens</i> – <i>Phragmites australis</i> woodland
W3	<i>Salix pentandra</i> – <i>Carex rostrata</i> woodland

³ In light of the SEPA classification on potential GWDTEs the non NVC type 'Mx' should also qualify for potential GWDTE status. The classification of high sensitivity is keeping in line with the species description in Section 5 above, which shows its similarity to M23 rush-pasture.

NVC Code	NVC Community Name
W6	<i>Alnus glutinosa</i> – <i>Urtica dioica</i> woodland
M15	<i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath
M25	<i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire
M27	<i>Filipendula ulmaria</i> – <i>Angelica sylvestris</i> mire
M28	<i>Iris pseudacorus</i> – <i>Filipendula ulmaria</i> mire
U6	<i>Juncus squarrosus</i> – <i>Festuca ovina</i> grassland
MG9	<i>Holcus lanatus</i> – <i>Deschampsia cespitosa</i> grassland
MG10	<i>Holcus lanatus</i> – <i>Juncus effusus</i> rush pasture
S7	<i>Carex acutiformis</i> swamp
Je ⁴	<i>Juncus effusus</i> acid grassland

6.2.4 The location and extent of all identified potential GWDTE are provided on Figure 12.6.

6.2.5 Within Figure 12.6 the potential GWDTE sensitivity of each polygon containing a potential GWDTE is classified on a four-tier approach as follows:

- highly – dominant’ where potential high GWDTE(s) dominate the polygon;
- ‘highly – sub-dominant’ where potential high GWDTE(s) make up a sub-dominant percentage cover of the polygon;
- ‘moderately – dominant’ where potential moderate GWDTE(s) dominate the polygon and no potential high GWDTEs are present; and
- ‘moderately – sub-dominant’ where potential moderate GWDTE(s) make up a sub-dominant percentage cover of the polygon and no potential high GWDTEs are present.

6.2.6 Where a potential high GWDTE exists in a polygon it outranks any potential moderate GWDTE communities within that same polygon.

6.2.7 GWDTE sensitivity has been assigned solely on the SEPA listingsⁱⁱ. However, depending on a number of factors such as geology, superficial geology, presence of peat and topography, many of the potential GWDTE communities recorded may in fact be only partially groundwater fed or not dependent on groundwater. Determining the actual groundwater dependency of particular areas or habitat will require further assessment (see ES Chapter 10 Geology, Soils and Groundwater).

6.3 Annex I Habitats

Overview

6.3.1 A number of NVC communities can also correlate to various Annex I habitat types. However, the fact that an NVC community can be attributed to an Annex I type does not necessarily mean all instances of that NVC community constitute Annex I habitat. Its Annex I status can depend on various factors such as quality, extent, species assemblages, geographical setting, substrates etc.

⁴ In light of the SEPA classification on potential GWDTEs the non NVC type ‘Je’ should also qualify for potential GWDTE status. The classification of moderate sensitivity is keeping in line with other similar *Juncus* spp. dominated grassland communities (e.g. MG10).

6.3.2 Using Joint Nature Conservation Committee (JNCC) Annex I habitat listings and descriptions⁵, which have then been compared with survey results and field observations, the following NVC communities within the Study Area which constitute Annex I habitat are shown in Table 6.2.

Table 6.2: Study Area Annex I habitats

NVC Community	Community Name	Annex I Code	Annex I Title
W2	<i>Salix cinerea</i> – <i>Betula pubescens</i> – <i>Phragmites australis</i> woodland	91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>
W7	<i>Alnus glutinosa</i> – <i>Fraxinus excelsior</i> – <i>Lysimachia nemoreum</i> woodland	91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>
W18	<i>Pinus sylvestris</i> – <i>Hylocomium splendens</i> woodland	91C0	Caledonian forest
W19	<i>Juniperus communis</i> – <i>Oxalis acetosella</i> woodland	5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands
M2	<i>Sphagnum cuspidatum</i> / <i>fallax</i> bog pool community	7130	Blanket bogs
M3	<i>Eriophorum angustifolium</i> bog pool community	7130	Blanket bogs
M4	<i>Carex rostrata</i> - <i>Sphagnum fallax</i> mire	7140	Transition mires and quaking bogs
M5	<i>Carex rostrata</i> – <i>Sphagnum squarrosum</i> mire	7140	Transition mires and quaking bogs
M9	<i>Carex rostrata</i> – <i>Calliergon cuspidatum/giganteum</i> mire	7140	Transition mires and quaking bogs
M10	<i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	7230	Alkaline fens
M15	<i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath	4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>
M16	<i>Erica tetralix</i> – <i>Sphagnum compactum</i> wet heath	4010, or 7130	Northern Atlantic wet heaths with <i>Erica tetralix</i> , or blanket bog (where peat depth is greater than 0.5m)
M17	<i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire	7130	Blanket bogs
M19	<i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire	7130	Blanket bogs
M20	<i>Eriophorum vaginatum</i> blanket mire	7130	Blanket bogs
M25	<i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire	7130	Blanket bogs (where peat is greater than 0.5m deep – M25a only)
H9	<i>Calluna vulgaris</i> – <i>Deschampsia flexuosa</i> heath	4030	European dry heaths

⁵ <http://jncc.defra.gov.uk/page-1523>

NVC Community	Community Name	Annex I Code	Annex I Title
H10	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	4030	European dry heaths
H9-H12	H9 to H12 Intermediate heath	4030	European dry heaths
H10-H12	H10 to H12 Intermediate heath	4030	European dry heaths
H12	<i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> heath	4030	European dry heaths
H12b-U6	H12b to U6 Intermediate heath	4030	European dry heaths
H16	<i>Calluna vulgaris</i> – <i>Arctostaphylos uva-ursi</i> heath	4030	European dry heaths
H18	<i>Vaccinium myrtillus</i> – <i>Deschampsia flexuosa</i> heath	4030	European dry heaths
H21	<i>Calluna vulgaris</i> – <i>Vaccinium myrtillus</i> – <i>Sphagnum capillifolium</i> heath	4030	European dry heaths
CG10	<i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus polytrichus</i> grassland	6230	Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas

6.3.3 The locations of these Annex I habitat types are also shown within Figure 12.5, in which all polygons containing an Annex I habitat type are shaded, irrespective of the percentage cover of Annex I habitat within that polygon. Each polygon is shaded according to the dominant Annex I type within the polygon; however, many polygons contain multiple Annex I habitat types, so the communities listed should be cross-referenced to Table 6.2.

6.3.4 Further details on the inclusion or omission of certain NVC communities/sub-communities and/or Annex I types are also provided below.

91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

6.3.5 This Annex I type comprises woods dominated by *Alnus glutinosa* and *Salix* spp. on floodplains in a range of situations from islands in river channels to low-lying wetlands alongside the channels. The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation. Many such woods are dynamic, being part of a successional series of habitats. Their structure and function are best maintained within a larger unit that includes the open communities, mainly fen and swamp, of earlier successional stages. On the drier margins of these areas other tree species such as *Fraxinus excelsior* and *Ulmus* spp., may become abundant. In other situations, the *Alnus glutinosa* woods occur as a stable component within transitions to surrounding dry-ground forest.

6.3.6 The ground flora is correspondingly varied. Some stands are dominated by tall herbs, reeds and sedges, with species such as *Urtica dioica*, *Phragmites australis*, *Carex paniculata* and *Filipendula ulmaria*. Other stands have lower-growing communities with *Ranunculus repens*, *Galium palustre*, *Chrysosplenium oppositifolium* and *Caltha palustris*.

6.3.7 In the UK this Annex I habitat falls mainly within the W2a, W5, W6 and W7 NVC types. Riparian trees are excluded from the Annex I type except where these form part of a wider network of alluvial woodland and wetland communities.

- 6.3.8 These communities are scarce within the Study Area, with some stands of W2, W6 and W7 recorded; although they are all relatively small and often isolated and fragmented. Each polygon in which these communities have been recorded has been assessed on a case-by-case basis, to ascertain if it may be classified as this Annex I type, based on community size, location, flora etc. Thin strips of riparian trees or stands (possibly of planted origin) away from floodplains or the appropriate setting for this Annex I type have been excluded.
- 6.3.9 As a result of this process no stands of W6 woodland were considered to fit this Annex I type. The stands of W2 on the fringes of Loch Alvie and a number of stands of W7 abutting the River Spey were considered to belong to this Annex I habitat type; many other stands of W7 were not found in the correct landscape setting. None of the areas contained *Fraxinus excelsior* and instead were comprised of mixtures of *Alnus glutinosa*, *Betula* spp. and *Salix* spp. Figure 12.5 shows the polygons that have been attributed to the Annex I type 91E0.

91C0 Caledonian forest

- 6.3.10 Caledonian forest comprises relict indigenous pine forests of *Pinus sylvestris*, and associated *Betula* spp. and *Juniperus communis* woodlands of northern character. The majority of this habitat corresponds to NVC type W18 *Pinus sylvestris* – *Hylocomium splendens* woodland.
- 6.3.11 W18 woodland is extensive within the Study Area, but the vast majority is of planted origin. Thinning of the canopy over time in some areas has allowed the development of a ground flora in many stands, but because of their planted origin none of the plantation W18 within the Study Area has been deemed a candidate area for Annex I 91C0 Caledonian forest status.
- 6.3.12 However, there are a number of relatively small and fragmented stands of more mature W18 woodland that appears semi-natural, and in some cases, contain old specimen trees. The field flora in these areas also tends to be well-developed. These areas are relatively scarce within the Study Area and, irrespective of size, these semi-natural-appearing stands, not obviously planted, and with mature *Pinus sylvestris*, have been classed as potentially Annex I Caledonian forest (see Figure 12.5).
- 6.3.13 Within the Study Area there are also a few areas of young self-seeding *P. sylvestris* which are encroaching into areas of dry heath. Despite these young trees being semi-natural and self-seeded they are not considered Caledonian forest due to their age and not being a relic of an older Caledonian pinewood.

91D0 Bog woodland

- 6.3.14 Under certain combinations of physical circumstances, scattered trees can occur across the surface of a bog in a relatively stable ecological relationship as open woodland, without the loss of bog species. This true bog woodland is much rarer than the progressive invasion of bogs by trees through natural colonisation or afforestation following changes in the drainage pattern which leads eventually to the loss of the bog vegetation.
- 6.3.15 Secondary *Betula* woodland on degraded bogs, and woodland encroachment resulting from falling water tables, are excluded from the Annex I definition. A few NVC types (e.g. W3, W4c and W18) could fall within this Annex I type, but none of these communities within the Study Area were considered to be Annex I Bog woodland. Within the Study Area, trees found within mire habitats were due to *Betula* and scrub invasion of drying mire surfaces.

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

- 6.3.16 This Annex I habitat consists of a range of woodland types dominated by mixtures of *Quercus* spp. and *Betula* spp. It is characteristic of base-poor soils in areas of at least moderately high rainfall in northern and western parts of the UK. The habitat corresponds particularly to NVC types W10e, W11, W16b and W17.
- 6.3.17 Extensive areas of W11 and W17 are present within the Study Area, but they are not deemed to be of Annex I status because they are for the most part birchwoods with little or no oak; many of these stands are also of planted origin, and some have been intensively grazed for a long period of time and lack the required flora.
- 6.3.18 The rare stands of oak woodland present lack any characteristics, such as a rich bryophyte assemblage, which would refer to them as 'old sessile oak woods'.

5130 *Juniperus communis* formations on heaths or calcareous grasslands

- 6.3.19 In Scotland *Juniperus communis* is found on a wide range of acidic substrates supporting acidophilous plant communities. In many places these are thinly scattered bushes of *J. communis* among heathland or grassland, but where the *J. communis* has evidently been established for longer it thickens up to form patches of NVC type W19 *Juniperus communis* – *Oxalis acetosella* woodland. All records of W19 within the Study Area have been assigned to this Annex I type. Such vegetation is typically dominated by *J. communis*.

7130 Blanket bog

- 6.3.20 Annex I type 7130 Blanket bog correlates directly with a number of NVC communities within the Study Area such as the M17, M19 and M20 mires. However, 7130 Blanket bog can also include bog pool communities (M1-M3) where these occur within the wider blanket mire macrotope. As such M2 and M3 within the Study Area are also assigned to the blanket bog Annex I type, as they are typically associated with areas of M17, M19 and M20 mire.
- 6.3.21 M25a *Molinia caerulea* – *Potentilla erecta*, *Erica tetralix* sub-community mire can also fall within the 7130 Blanket bog category where the peat depth present is greater than 0.5m. In the absence of detailed peat depth data for areas of M25a mire, these have also been classified as potential Annex I Blanket bog where the habitat patch resembles mire or is in a mosaic with other mire communities.
- 6.3.22 M15⁶ and M16 wet heaths can also fall within the 7130 Blanket bog Annex I type where the peat depth underlying these communities is greater than 0.5m. M15 and M16 also fall under the 4010 Northern Atlantic wet heaths with *Erica tetralix* Annex I type, so these NVC communities do not need blanket bog status to be recognised as of Annex I conservation interest. As a result, the few patches of M15 within the Study Area have been classified as 4010 wet heath only, as these stands appear to be on shallow peats.
- 6.3.23 However, areas of M16 have been categorised as both (i.e. '4010_7130') as the stands within the Study Area are variable, some appearing as true wet heath, but more often present as stands of degraded bog with a drying surface and a species-poor M16d type vegetation on peat over 0.5m in depth.

⁶ Excluding M15a *Carex panicea* sub-community, due to its flushed nature over generally shallower substrates.

7140 Transition mires and quaking bogs

- 6.3.24 All examples of M4 *Carex rostrata* – *Sphagnum fallax* mire, M5 *Carex rostrata* – *Sphagnum squarrosum* mire and M9 *Carex rostrata* – *Calliargon cuspidatum/giganteum* mire within the Study Area were assigned to the Annex I type Transition mires and quaking bogs. The term ‘transition mire’ relates to vegetation that in floristic composition and general ecological characteristics is intermediate between acid bog and alkaline fen.

7230 Alkaline fens

- 6.3.25 Alkaline fens consist of a complex assemblage of vegetation types characteristic of sites where there is tufa and/or peat formation with a high water table and a calcareous base-rich water supply. The core vegetation is short sedge mire. All examples of M10a mire in the Study Area fall within this Annex I habitat type.

4010 Northern Atlantic wet heaths with *Erica tetralix*

- 6.3.26 All examples of M15 wet heath in the Study Area have been included within the 4010 Northern Atlantic wet heaths category. However, as per above, areas of M16 have been categorised as both wet heath and blanket bog.

4030 European dry heaths

- 6.3.27 European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf shrubs dominate the vegetation. The most common dwarf shrub is *Calluna vulgaris*.
- 6.3.28 The dry heath communities recorded within the Study Area – H9, H10, H12, H9-H12, H10-H12, H12b-U6, H16, H18 and H21 – all fall within this Annex I type. These NVC types can also be included within the Annex I type H4060 Alpine and Boreal heaths, but only where they are at higher altitudes and include arctic-alpine floristic elements. These communities within the Study Area are lower altitudinal examples lacking alpine indicator species and so they all fall under the 4030 European dry heaths Annex I type.
- 6.3.29 The most common forms of dry heath in the Study Area, as noted in the community descriptions above, are relatively species-poor stands of *Calluna* dominated heath.

6230 Species-rich *Nardus* grassland, on siliceous substrates in mountain areas

- 6.3.30 Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (and submountain areas in continental Europe) tend to develop where there is flushing through base-rich strata on siliceous bedrock. These may include moderately base-rich metamorphic and igneous rocks. Species-rich *Nardus* grasslands on limestone are excluded from the definition of this Annex I habitat because limestone lacks silica.
- 6.3.31 Two main types of grassland belonging within the species-rich *Nardus* grassland Annex I habitat occur in the UK: CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus polytrichus* grassland and CG11 *Festuca ovina* – *Agrostis capillaris* – *Alchemilla alpina* grassland.
- 6.3.32 CG10 is rare within the Study Area, with only three small stands mapped. One stand is semi-natural and part of a mosaic with species-rich H10d *Calluna* – *Erica* heath, and therefore this stand has been assigned to this Annex I type. The other two patches of this grassland appear secondary and are associated with strips of road verge, where there have been some road salting influences, and as such these two patches have not been considered Annex I habitat.

6.4 Scottish Biodiversity List Priority Habitats

- 6.4.1 The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The SBL was published in 2005 to satisfy the requirement under Section 2(4) of The Nature Conservation (Scotland) Act 2004.
- 6.4.2 The SBL identifies habitats which are the highest priority for biodiversity conservation in Scotland: these are termed 'priority habitats'. Some of these priority habitats are broad and include several NVC types.
- 6.4.3 The relevant SBL priority habitat types (full descriptions of which can be found on the Biodiversity Scotland website⁷), and associated NVC types recorded within the Study Area are as follows:
- wet woodland: W2, W3, W4b⁸, W4c, W6 and W7;
 - upland birchwoods: W4, W4b (when part of a larger dry birch woodland), W11 and W17;
 - upland oakwoods: W11 and W17 (where oak forms >30% of canopy cover);
 - native pinewoods: W18 (excluding plantation);
 - blanket bog: M17, M19, M20, M2 and M3 (M2/M3 where associated with M17-M20), and M16/M25a where peat depth is greater than 0.5m;
 - upland heathland: H9, H10, H12, H9-H12, H10-H12, H12b-U6, H16, H18, H21, M15 and M16⁹;
 - upland calcareous grassland: CG10;
 - upland flushes, fens and swamps: M4, M5, M6, M9, M10, M23a, M27, M32, S9⁸ and S28⁸;
 - lowland fens: M28, S7, S9⁸, S10, S22 and S28⁸; and
 - reedbeds: S4.
- 6.4.4 These SBL priority habitats correspond with UK Biodiversity Action Plan (BAP) Priority Habitats¹⁰.
- 6.4.5 This information is also summarised in Table 6.4 below. The locations of these SBL priority habitats are also shown within Figure 12.7, in which all polygons containing a SBL priority habitat type are shaded, irrespective of the percentage cover of SBL priority habitat within that polygon. Each polygon is shaded according to the dominant SBL priority habitat type within the polygon; however, many polygons contain multiple SBL priority habitat types, so the communities listed should be cross-referenced to Table 6.4.

6.5 Nature Conservation Evaluation

Methodology

- 6.5.1 The general approach to defining the importance of ecological features follows that of CIEEM (2016)^{xxiv}. The approach is also in line with advice given in DMRB Interim Advice Note 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment'^{xxv}.

⁷ <http://www.biodiversityscotland.gov.uk/advice-and-resources/habitat-definitions/priority/>

⁸ Dependant on local setting.

⁹ Where peat depths are less than 0.5m deep.

¹⁰ <http://jncc.defra.gov.uk/page-5718>

6.5.2 Ecosystems, habitats and species within the Ecological Zone of Influence (EZoI)¹¹ are assigned levels of importance for nature conservation based on the criteria set out in Table 6.3.

6.5.3 The rarity, ability to resist or recover from environmental change, and uniqueness of an ecological feature, function/role within an ecosystem, and level of legal protection or designation afforded to a given ecological feature are all factors taken into account in determining its importance.

Table 6.3: Importance Criteria

Importance	Criteria
International	<p>Ecosystems and Habitats Ecosystems or habitats essential for the maintenance of:</p> <ul style="list-style-type: none"> internationally designated areas or undesignated areas that meet the criteria for designation; and/or viable populations of species of international conservation concern. <p>Species Species whose presence contributes to:</p> <ul style="list-style-type: none"> the maintenance of qualifying habitats, communities and assemblages that occur within internationally designated sites or within undesignated areas that meet the criteria for such designation.
National	<p>Ecosystems and Habitats Ecosystems or habitats essential for the maintenance of:</p> <ul style="list-style-type: none"> qualifying communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; and/or viable populations of species of national conservation concern. <p>Species Species whose presence contributes to:</p> <ul style="list-style-type: none"> the maintenance of qualifying habitats, communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; or the maintenance and restoration of biodiversity and ecosystems at a national level, as defined in the Scottish Biodiversity Strategy (SBS)^{xxvi}.
Regional	<p>Ecosystems and Habitats Ecosystems or habitats essential for the maintenance of:</p> <ul style="list-style-type: none"> communities and assemblages that occur within regionally important sites or localities listed as being of conservation importance in the Highland BAP or CNAP (including Local Nature Reserves (LNR)) or within undesignated areas that meet the criteria for such designation; and/or viable populations of species of regional conservation concern. <p>Species Species whose presence contributes to:</p> <ul style="list-style-type: none"> the maintenance and restoration of biodiversity and ecosystems at a regional level, as defined in the Highland BAP or CNAP.

¹¹ EZoI is an area defined by the assessment in which there may be ecological features subject to impacts and subsequent effects as a result of the Proposed Scheme.

Importance	Criteria
Authority Area	<p>Ecosystems and Habitats Ecosystems or habitats essential for the maintenance of:</p> <ul style="list-style-type: none"> populations of species of conservation concern within the authority area. <p>Species Species whose presence contributes to:</p> <ul style="list-style-type: none"> the maintenance and restoration of biodiversity and ecosystems within a relevant area such as such as Aviemore in the CNAP.
Local	<p>Ecosystems and Habitats Ecosystems or habitats essential for the maintenance of:</p> <ul style="list-style-type: none"> populations of species of conservation concern within the local area (for example a Local Nature Reserve). <p>Species Species whose presence contributes to:</p> <ul style="list-style-type: none"> the maintenance and restoration of biodiversity and ecosystems at a local level.
Less than Local	<p>Ecosystems and Habitats</p> <ul style="list-style-type: none"> Ecosystems or habitats that do not meet the above criteria, i.e., supporting at least populations of species of conservation concern within the local area <p>Species</p> <ul style="list-style-type: none"> Features that are considered to be absent or do not meet any of the above criteria.

Evaluation

- 6.5.4 An evaluation of the nature conservation importance of the habitats recorded within the respective Study Area is provided below, in accordance with the guidance described above and using the levels of importance as described in Table 6.3. Where appropriate, the NVC communities and associated sub-communities have been grouped according to the sensitivity/habitat classification being described.
- 6.5.5 The approach used here aims to identify important areas of habitat in the Study Area rather than assigning a habitat type a blanket nature conservation importance based solely on its designation (e.g. Annex I, SBL, etc.). Consequently, the Study Area has been split into multiple areas of habitat, depending on various respective designations, sensitivity, quality, size etc. Each of these habitat areas have been assigned a level of nature conservation importance. Assigning importance to an area of habitat followed a tiered approach, as described below.
- 6.5.6 **Step 1:** Sections of the Study Area within designated sites have been assigned nature conservation importance equivalent to that designation, i.e. areas within Alvie SSSI and Craigellachie SSSI & NNR are all considered to be of National importance, whereas Loch Vaa SSSI is also covered by Loch Vaa SPA and is therefore of International value. Slochd SAC is also of International value.
- 6.5.7 **Step 2:** Each area of ancient woodland within the 100m ancient woodland Study Area has been assessed individually to determine its respective nature conservation importance (includes many NVC woodland types recorded during the survey). Data collected during field surveys in each of these ancient woodland areas included qualitative notes and detailed data recording at target note plots (see Section 4 above, Figure 12.2 and Annex A). These data were used to assign an appropriate level of

importance; including data on NVC types, species presence/composition, species abundances, numbers of ancient woodland indicator species, age of trees, semi-natural versus plantation, size of area, connectivity to other areas of ancient woodland etc (see Annex H). Ancient woodland areas were thus assigned a level of importance using the following general criteria:

- **National:** Ancient woodland areas where the majority of the polygon supports semi-natural mature / ancient trees, no or little plantation woodland, a well-developed, usually relatively diverse ground flora and with multiple ancient woodland indicator species, extensive in area, with good connectivity to other areas within the wider ancient woodland inventory;
- **Regional:** Ancient woodland areas which support some semi-natural woodland with mature or ancient trees and a well-developed ground flora, but where much of the polygon does not contain woodland with these features, i.e. much of the ancient woodland is plantation with a generally poorer ground flora and fewer ancient woodland indicator species; or small fragmented and isolated patches of better quality woodland; and
- **Authority Area:** Ancient woodland areas which support predominately plantation woodland with trees that are not of a notable age (i.e. younger plantation lacking mature or veteran trees) and a generally more impoverished ground flora with ancient woodland indicator species very few or absent.

6.5.8 **Step 3:** Areas not assigned nature conservation importance in steps 1 and 2 were then compared to the next level of habitat sensitivity, i.e. Annex I habitats. Areas of extensive and good quality Annex I habitat were assigned a suitable importance level. Residual areas of Annex I habitat located throughout the scheme were for the most part common habitat types for the local and wider area, often present as smaller and fragmented and sometimes degraded habitat patches; all residual areas were deemed to be of Local nature conservation importance due to the intrinsic value of Annex I habitats.

6.5.9 As a result of the process in Step 3 above, a large area of Annex I European dry heath at the northern end of the scheme by Slochd, east of the A9 and southwards to the railway line, was assigned Authority Area importance. The dry heath here is extensive and good quality and is part of a much larger unit of European dry heath extending into the Cairngorms National Park Area. The section within the Study Area contains a mix of dry heath communities, primarily H12 and H16, but also some patches of H10, H18 and intermediate heaths. Some areas are part of rotational muirburn and are at different successional stages of recovery. Within the dry heath there are some small patches of other habitats that form part of a habitat mosaic, but overall dry heath dominates the area. Given the size of this area and its connectivity to the Cairngorms National Park it has been assigned Authority Area importance. It has not been classed of higher importance due the fact the area within the Study Area still represents a small percentage area of this type of habitat locally, regionally or nationally.

6.5.10 All other areas of Annex I habitat (and their corresponding NVC types) recorded within the Study Area and described in Section 6.3 above, i.e. blanket bog, North Atlantic wet heath, alkaline fens, juniper formations, Caledonian forest, transition mires and quaking bogs, alluvial forest, and calcareous grassland, are deemed to be of Local nature conservation importance due to their extent, distribution, fragmentation, widespread nature and in some cases, quality.

6.5.11 **Step 4:** Areas of habitat not assigned nature conservation importance in Steps 1 – 3 were assessed against the next level of habitat sensitivity/importance considered here; SBL priority habitats. Many of the areas of SBL priority habitats, as described in Section 6.4 above, are already covered through the consideration of other sensitivities, for example:

- SBL native pinewoods are covered by ancient woodland areas and Annex I Caledonian forest;
- SBL upland heathland, blanket bog and upland calcareous grassland are covered by the respective Annex I classifications; and
- A number of the upland flushes, fens and swamps are covered by Annex I classifications such as alkaline fens and transition mires and quaking bogs.

6.5.12 However, the SBL covers a wider range of habitats and NVC types and as such some areas exist outwith areas assessed in Steps 1 – 3. These include areas of the following: upland flushes fens and swamps not covered by Annex I habitats, lowland fens, and reedbeds. Given the respective NVC types within these SBL types, their widespread and common distribution, extent, and quality within the Study Area, none are deemed to be of more than Local importance (assigned Local importance due to intrinsic value of being a SBL habitat type).

6.5.13 Many areas of SBL wet woodland, upland birchwoods and upland oakwoods are present within the Study Area but are not covered by any international or statutory designation, Annex I type or were not part of the 100m ancient woodland Study Area (although some areas are still part of the wider SNH ancient woodland inventory). The nature conservation importance of these remaining SBL woodlands (and any *Populus tremula* woodlands¹²) has been determined by considering each area. Where there is overlap between these woodlands and designated sites, or areas of ancient woodland already considered in the 100m Study Area in Step 2, then those sections of woodland have been attributed the same level of importance. The remaining areas of woodland not covered by any of the above were then assigned an appropriate level of nature conservation importance using available information (see Annex H).

6.5.14 Through Steps 1 – 4 all areas or habitats of nature conservation importance have been identified, and a level of importance assigned. As is evident from the above, different values can be assigned to different areas of the same community or habitat type, depending on their respective locations, characteristics, and designations.

6.5.15 **Step 5:** The parts of the Study Area that have not been identified as of Local or greater nature conservation importance through this process in Steps 1 - 4 are all considered to be of Less than Local importance and are not considered further in the assessment. This encompasses common habitats and features of negligible ecological importance specific to the Study Area, including the following types (NVC and non-NVC codes):

- improved grasslands (MG6/MG7);
- acid grasslands (U1/U2/U4/U5/U6);
- neutral grasslands (MG1/MG5/MG9/MG10/MG13/HI/Pa);
- marshy *Juncus* spp. grassland/mires (M23b/Je/MG10);
- dense or scattered scrub (W21/W22/W23);
- fern dominated vegetation (U19/U20/W25/Fn);
- tall herb and weedy vegetation (U16, W24, OV24, OV25, OV27);
- bare ground, soil, rock, shingle, hardstandings (BG);
- bare peat (Pt);
- buildings (BD);

¹² The few stands of *Populus tremula* dominant woodland have also been considered at this stage. due to their similarity to SBL upland birchwoods or oakwoods.

- private gardens/lawns/amenity grassland (PG);
- recently felled woodland (CF);
- planted/introduced shrubbery in built-up areas (SH/Lp/Sr);
- conifer/broadleaved/mixed plantations not covered by designated sites, the AWI, Annex I or SBL definitions (CP/BP/MP);
- arable (AR);
- quarry (QY); and
- refuse tip (R).

6.5.16 Figure 12.8 depicts the results of the above habitats importance evaluation process.

6.6 Summary

6.6.1 Table 6.4 provides a summary of all the NVC communities recorded within the Study Area, and any associated GWDTE, Annex I or SBL sensitivities as described above.

6.6.2 The nature conservation importance of habitats within the Study Area has been determined through the process described above, which has resulted in the identification and classification of several areas ranging from Less than Local to National importance.

Table 6.4: Summary of Study Area NVC communities & sensitivities

NVC Codes Recorded	Potential GWDTE Status	Annex I Habitat Type	SBL Priority Habitat Type
Woodland & Scrub			
W2	Moderate	91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>	Wet woodland
W3	Moderate	-	Wet woodland
W4, W4b, W4c	High	-	Upland birchwoods (for W4 at community level or patches of W4b within larger stands of drier birchwood) <i>or</i> Wet woodland (stands of W4c, and some W4b dependant on local setting)
W6	Moderate	-	Wet woodland
W7, W7a, W7b, W7c	High	91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>	Wet woodland
W9	-	-	-
W11, W11b, W11c, W11d	-	-	Upland birchwoods when dominated by birch <i>or</i> Upland oakwood where oak forms >30% of canopy cover
W17, W17b, W17c, W17d	-	-	Upland birchwoods when dominated by birch

NVC Codes Recorded	Potential GWDTE Status	Annex I Habitat Type	SBL Priority Habitat Type
W18, W18a, W18b, W18c, W18d	-	91C0 Caledonian forest (mature semi-natural stands)	Native pinewoods (semi-natural stands)
W19, W19a, W19b	-	5130 <i>Juniperus communis</i> formations on heaths or calcareous grasslands	-
W21	-	-	-
W22	-	-	-
W23, W23a	-	-	-
W24	-	-	-
W25	-	-	-
Mires & Wet Heath			
M2	-	7130 Blanket bogs	Blanket bog
M3	-	7130 Blanket bogs	Blanket bog
M4	-	7140 Transition mires and quaking bogs	Upland flushes, fens and swamps
M5	High	7140 Transition mires and quaking bogs	Upland flushes, fens and swamps
M6a, M6b, M6c, M6d	High	-	Upland flushes, fens and swamps
M9, M9b	High	7140 Transition mires and quaking bogs	Upland flushes, fens and swamps
M10a	High	7230 Alkaline fens	Upland flushes, fens and swamps
M15, M15a, M15b, M15c	Moderate	4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	Upland heathland
M16, M16d	High	4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> <i>or</i> 7130 Blanket bogs (where peat is greater than 0.5m deep)	Upland heathland <i>or</i> blanket bogs (where peat is greater than 0.5m deep)
M17a, M17b	-	7130 Blanket bogs	Blanket bog
M19, M19a, M19b	-	7130 Blanket bogs	Blanket bog
M20, M20b	-	7130 Blanket bogs	Blanket bog
M23a, M23b	High	-	Upland flushes, fens and swamps (M23a only)
M25, M25a, M25b	Moderate	7130 Blanket bogs (where peat is greater than 0.5m deep – M25a only)	Blanket bog (where peat is greater than 0.5m deep - M25a only)
M27a	Moderate	-	Upland flushes, fens and swamps
M28a	Moderate	-	Lowland fens

NVC Codes Recorded	Potential GWDTE Status	Annex I Habitat Type	SBL Priority Habitat Type
M32b	High	-	Upland flushes, fens and swamps
Dry Heaths			
H9, H9a, H9d	-	4030 European dry heaths	Upland heathland
H10, H10a, H10b, H10c, H10d	-	4030 European dry heaths	Upland heathland
H9-H12 Intermediate	-	4030 European dry heaths	Upland heathland
H10-H12 Intermediate	-	4030 European dry heaths	Upland heathland
H12, H12a, H12b, H12c	-	4030 European dry heaths	Upland heathland
H12b-U6 Intermediate	-	4030 European dry heaths	Upland heathland
H16, H16b	-	4030 European dry heaths	Upland heathland
H18a, H18b, H18c	-	4030 European dry heaths	Upland heathland
H21a	-	4030 European dry heaths	Upland heathland
Calcifugous Grasslands & Fern Dominated Vegetation			
U1	-	-	-
U2, U2a	-	-	-
U4, U4a, U4b, U4d, U4e	-	-	-
U5, U5a, U5b, U5d	-	-	-
U6, U6d	Moderate	-	-
U16, U16c	High	-	-
U19	-	-	-
U20, U20a, U20b, U20c	-	-	-
Mesotrophic Grasslands			
MG1, MG1a, MG1b	-	-	-
MG5	-	-	-
MG6, MG6a, MG6b	-	-	-
MG7	-	-	-
MG9, MG9a	Moderate	-	-
MG10, MG10a	Moderate	-	-
MG13	-	-	-
Calcicolous Grasslands			

NVC Codes Recorded	Potential GWDTE Status	Annex I Habitat Type	SBL Priority Habitat Type
CG10a	High	6230 Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas	Upland calcareous grassland
Swamps and Tall-Herb Fens			
S4	-	-	Reedbeds
S7	Moderate	-	Lowland fens
S9, S9a, S9b	-	-	Upland flushes, fens and swamps <i>or</i> Lowland fens - depending on local setting
S10a	-	-	Lowland fens
S22a	-	-	Lowland fens
S28, S28a, S28c	-	-	Upland flushes, fens and swamps <i>or</i> Lowland fens - depending on local setting
Vegetation of Open Habitats			
OV24a, OV24b	-	-	-
OV25	-	-	-
OV27, OV27b	-	-	-

7. Ecological Impact Assessment & Mitigation

7.1 Overview

7.1.1 This section of the report details the methods used in the impact assessment and then goes on to detail the potential impacts and the effects of the Proposed Scheme on the ecological features identified and describes the associated mitigation measures.

7.1.2 The impact assessment firstly characterises the impacts of construction and operation and then assesses the significance of the residual impact following the implementation of mitigation.

7.2 Impact Assessment Methodology

7.2.1 Ecological features have been subject to nature conservation evaluation (see Section 6). Impact significance has then been assessed taking into account the nature and magnitude of potential impacts (including duration, extent and reversibility) and their consequent effects on important ecological features. The approach to nature conservation evaluation and impact assessment was agreed across the wider A9 Dualling Programme.

Nature Conservation Evaluation

7.2.2 The approach to, and results of, the nature conservation importance evaluation are detailed in Section 6 above, Annex H and Figure 12.8.

Impact Assessment

7.2.3 For the purposes of this assessment, the impact descriptors in Table 7.1 are taken to summarise the overall characterisation of positive or negative impacts in accordance with CIEEM (2016)^{xxiv}, including:

- impact extent/scale (e.g. entire habitat loss, partial habitat loss or indication over specific area affected);
- direct or indirect impact (e.g. direct mortality of individuals from vehicle collisions, or indirect mortality of individuals from reduced prey resources due to pollution of watercourses);
- reversibility of impact (reversible or irreversible);
- frequency of impact (single event, recurring or constant);
- duration of impact (short-term, medium-term, long-term or permanent); and
- likelihood of occurrence (certain/near certain, probable, unlikely or extremely unlikely).

7.2.4 The character of impacts was defined using the criteria set out in Table 7.1 as High, Medium, Low or Negligible, following the above impact characterisation approach.

Table 7.1: Impact Magnitude and Character for Ecological Features

Impact Descriptor	Impact Characterisation
High	An impact resulting in a permanent effect on the distribution and/or abundance of a habitat, species assemblage/community or population, in such a way as to alter the integrity of the feature and its conservation status. If negative, this type of effect would reduce the integrity of the feature and its conservation status. If positive, it would result in an improvement to the conservation status of the feature.
Medium	An impact resulting in a long-term but reversible effect on the distribution and/or abundance of a habitat, species assemblage/community or population. If negative, this type of effect would have neutral long-term implications for the integrity of the feature or its conservation status. If positive, it would not alter the long-term conservation status of the feature.
Low	An impact resulting in a short-term reversible effect on the distribution and/or abundance of a habitat, species assemblage/community or population.
Negligible	No discernible impact on the distribution and/or abundance of a habitat, species assemblage/community or population.

Impact Significance

7.2.5 Each feature's importance and the potential impacts upon it have been determined through surveys and consultation, to provide a robust basis for making a professional decision on the appropriate focus of the impact assessment. The assessment is then focused on those impacts that result in potentially significant effects on important ecological features. For example, an area of amenity grassland would not meet the criteria for local ecological importance and would not progress through the assessment process, as the assessment only includes features of local importance or above. However, any impact on a Site of Special Scientific Interest (SSSI) would progress through the assessment process as these sites are designated as nationally important. Habitats, species and species groups that are considered to have a nature conservation

value of less than local are not considered important ecological features¹³ in the context of this assessment. Any impact on such a feature as a result of the Proposed Scheme is considered unlikely to have a significant effect on the conservation status of such habitats or species on a local, regional, national or international scale. Therefore, features assessed to be of less than local nature conservation value have been scoped out of the ecological impact assessment (EclA).

- 7.2.6 CIEEM (2016)^{xxiv} notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (negative or positive) on important ecological features. Significant effects are those that undermine the conservation status¹⁴ of important ecological features. Knowledge and assessment of construction methods and operational activities, together with the ecological knowledge of ecologists with experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the project on ecological features.
- 7.2.7 Following the above approach, the assessment aims to characterise ecological impacts rather than placing a reliance only on magnitude. The character of an impact is used to inform the determination of whether or not the impact on the feature in question is a significant one.
- 7.2.8 Where impacts on internationally, nationally or regionally important ecological features are characterised as 'Medium' or 'High', they are considered to be potentially significant under the terms of the Environmental Impact Assessment (EIA) Regulations^{xxvii}.
- 7.2.9 Impacts characterised as 'Low' on internationally important features, can be determined as potentially significant as can impacts characterised as 'High' on features of Authority Area importance. There may in addition be a number of impacts on a feature that, whilst not of a character to be significant in themselves, may cumulatively result in a significant effect on that feature.
- 7.2.10 Where significant impacts are identified, mitigation will be developed to reduce impacts where feasible and are taken into account in the assessment of residual effects.

7.3 Potential Impacts

Construction

- 7.3.1 Terrestrial habitats may be affected during construction as a result of:
- permanent habitat loss through land-take. The Proposed Scheme will result in permanent habitat loss due to widening of the A9, the creation of new junctions, and land required for associated drainage (e.g. SuDS ponds) and access tracks;
 - temporary habitat loss. The works will result in temporary habitat loss due to the land required to accommodate site compounds, temporary access tracks, storage of construction materials and temporary SuDS ponds;
 - habitat fragmentation. Terrestrial habitats may be affected by habitat fragmentation as a result of the widened A9 and associated infrastructure. Where smaller areas of habitat are created these may be more vulnerable to loss, damage or change, which may result in reduced species diversity;

¹³ An ecological feature is considered important based on many factors including its rarity, diversity, naturalness, context in the wider landscape, size and distribution as set out in A Nature Conservation Review (Ratcliffe, 1977).

¹⁴ Conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and function as well as the long-term distribution and abundance of its population within a given geographical area.

- disruption to local hydrology. Disruption to drainage patterns such as changes in the flow and the volume of sub-surface water, as a result of construction may alter habitat types through drying or wetting of areas; and
- indirect effects during construction may occur as a result of pollution to watercourses from oil and chemical spills which could in turn result in the loss of plants through the uptake of contaminants. Pollution could also arise from silt, which could smother plants.

Operation

- 7.3.2 Indirect effects during operation may occur as a result of degradation of habitats as a result of pollution from oil and chemical spills.

7.4 Mitigation

- 7.4.1 The principles of the mitigation hierarchy^{xxviii} have been applied when considering potential impacts and subsequent effects on ecological receptors within the EZoI. The principles of the mitigation hierarchy are that impacts on biodiversity should be subject to the following sequential mitigation actions:
- avoidance;
 - mitigation;
 - compensation; and
 - enhancement.
- 7.4.2 For the purpose of this assessment, mitigation refers to measures that are considered essential to avoid and reduce negative impacts of the Proposed Scheme. Compensation refers to measures taken to make up for the loss of, or permanent damage to, biological resources through the provision of replacement areas. Unless otherwise stated, all compensatory measures are considered to be part of the essential mitigation package.
- 7.4.3 The mitigation measures described within this EclA have been incorporated into the design and construction programme and taken into account in the assessment of residual effects. The mitigation aims to avoid or negate impacts on ecological features in accordance with best practice guidance and UK, Scottish and local government environmental impact, planning and sustainability policies. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any negative impacts of the Scheme. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.
- 7.4.4 Mitigation is also designed to produce a net gain for biodiversity where practicable in line with policy and guidelines^{xxiv}.
- 7.4.5 Mitigation measures set out in this Environmental Statement (ES) will be specified as environmental commitments in the contract documents to ensure implementation by the appointed Contractor.
- 7.4.6 Impacts that are not significant (including those where compliance with regulation is required) would be expected to be avoided or reduced through the application of a Construction Environmental Management Plan (CEMP) and best working practice (e.g. mitigation of potential pollution impacts through adherence to standard best practice and guidelines). Significant ecological impacts are expected to be mitigated through a

combination of best practice and typical, proven mitigation methods along with mitigation targeted to specific locations as described in the assessment.

- 7.4.7 A list of standard mitigation measures has been developed for all projects within the A9 Dualling Programme; those related to, or can apply to, habitat or vegetation ecology are detailed below in Table 7.2.
- 7.4.8 In addition to these, scheme specific mitigation measures have also been developed as detailed in Table 7.3. In summary these measures will include the following:
- habitat reinstatement - temporary habitat loss will be mitigated through reinstatement of habitats. This will generally be done on a like for like basis or will aim to provide an enhancement where degraded or ecologically poor habitats are present (e.g. improved grassland), where practicable; and
 - habitat creation - permanent loss of ecologically important habitats, including Annex I and SBL Priority Habitat, will be mitigated for through habitat creation. Where feasible habitats will be replaced on a like for like basis, with habitats of a similar type and character to be created within the vicinity of the area where the loss has occurred. Where this is not possible, habitat creation will occur within other suitable areas within Land Made Available (LMA). Small areas of wet heath and bog habitats will be lost to the Proposed Scheme; however, depending on local hydrology and adjacent habitats some areas may transition back to wet heath or bog habitat (although this habitat would take many years to develop). Taking a precautionary approach, it is assumed that these wet heath and bog habitats will be permanently lost and there is no proposed mitigation to account for their loss due to the complexities in creating this habitat type.
- 7.4.9 In total 195.77ha of habitat reinstatement and creation will be undertaken across the Proposed Scheme; 154.96ha of this is within the LMA, with the remaining 40.81ha in an offsite compensatory woodland creation area. Of this mitigation and compensation, 88.97ha consists of woodland and scrub planting, with the remainder being open heath and grassland habitats.
- 7.4.10 The specific types of habitat reinstatement and creation proposed within the LMA and directly adjacent to the A9 using appropriate species and seed mixes as shown in Figure 13.4 is as follows:
- 5.4ha of *Populus tremula* woodland;
 - 3.69ha of *Betula* woodland;
 - 16.65ha of coniferous woodland;
 - 19.8ha of mixed woodland;
 - 2.62ha of wet woodland;
 - 2.88ha of scrub;
 - 56.05ha of acid grassland;
 - 29.88ha of dry heath;
 - 16.41ha of verge grassland mix; and
 - 1.58ha of wet grassland.
- 7.4.11 In addition to the above, a further 40.81ha of mixed, wet and coniferous woodland habitat creation is proposed within the compensatory planting area, that has been incorporated into the LMA. Specific mitigation measures and details of the proposed

habitat reinstatement and creation areas, including the proposed compensation area, are shown on the Landscape and Ecological Mitigation plan (Figure 13.4).

Table 7.2: A9 Standard Mitigation Commitments

Mitigation Item ¹⁵	Approximate Chainage / Location	Timing of Measure	Description	Mitigation Purpose / Objective	Specific Consultation or Approval Required
SMC-E1	Throughout Proposed Scheme	Pre-Construction	Pre-construction surveys will be undertaken to verify and, where required, update the baseline ecological conditions set out in the ES. The scope of the pre-construction surveys will be confirmed with SNH prior to them being undertaken.	To update the baseline ecological conditions set out in the ES.	SNH
SMC-E2	Throughout Proposed Scheme	Pre-Construction	<p>Prior to construction a suitably qualified (or team of suitably qualified) ECoWs will be appointed and will be responsible for implementation of the Ecological Management Plan. The ECoW will:</p> <ul style="list-style-type: none"> • provide ecological advice over the entire construction programme, at all times as required; • undertake or oversee pre-construction surveys for protected species in the areas affected by the Proposed Scheme; and ensure mitigation measures are implemented to avoid and reduce impacts on ecological features; and • monitor the implementation of the mitigation measures during the construction phase to ensure compliance with protected species legislation and commitments within the ES. <p>The ECoW will be a member of CIEEM and will have previous experience in similar ECoW roles. All ECoWs will be approved by Transport Scotland to be appropriately qualified for the role. The ECoW will be appointed in advance of the main construction programme commencing to ensure pre-construction surveys are undertaken and any advance mitigation measures required are implemented.</p>	To ensure the implementation of the Ecological Management Plan.	None required
SMC-E6	Throughout Proposed Scheme	Pre-Construction & Construction	The Contractor will obtain and comply with the requirements of any protected species derogation licences in respect of works that have the potential to breach applicable	To comply with conservation legislation.	SNH

¹⁵ Only items relevant to designated sites, ancient woodland and habitats are listed

Mitigation Item ¹⁵	Approximate Chainage / Location	Timing of Measure	Description	Mitigation Purpose / Objective	Specific Consultation or Approval Required
			conservation legislation necessary to construct the project. Licensing may be for the UK and/or protected species.		
SMC-E7	Throughout Proposed Scheme	Pre-Construction & Construction	<p>Tree felling and vegetation clearance to be minimised as far as practicable and undertaken outside the core bird nesting season (01 March to 31 August) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection of vegetation to be cleared for nesting birds by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they will be left in situ for their entire nesting period until the young birds have fledged. Alternative approaches to the work will need to be proposed e.g. leaving an exclusion zone around the nest to avoid disturbance.</p> <p>All cleared vegetation will be rendered unsuitable for nesting birds, for example, by covering or chipping depending on the end purpose of the vegetation, or will be removed from the works area.</p>	To protect habitat and fauna during bird nesting season.	None required
SMC-E8	Throughout Proposed Scheme	Pre-Construction & Construction	Any tree felling will be carried out by experienced contractors to reduce direct mortality of protected species according to agreed felling methods between contractors and the ECoW.	To protect fauna during removal of habitat.	None required
SMC-E9	Throughout Proposed Scheme	Pre-Construction, Construction & Post-Construction	Plant and personnel will be constrained to a prescribed working corridor through the use of, where practicable, temporary barriers to minimise the damage to habitats and potential direct mortality and disturbance to animals located within and adjacent to the Proposed Scheme working corridor.	To protect habitats and fauna.	None required
SMC-E11	Throughout proposed scheme	Construction	<p>During construction trees will be protected in line with guidelines provided in 'BS 5837 Trees in relation to Construction^{xxix}. This includes the following:</p> <ul style="list-style-type: none"> establishment of Root Protection Areas (RPA); 	To comply with guidelines provided in 'BS 5837 Trees in relation to Construction' (British Standards Institute, 2012).	None required



Mitigation Item ¹⁵	Approximate Chainage / Location	Timing of Measure	Description	Mitigation Purpose / Objective	Specific Consultation or Approval Required
			<ul style="list-style-type: none"> protective fencing will be erected around the RPA to reduce risks associated with vehicles trafficking over roots system or beneath canopies; selective removal of lower branches of trees to reduce risk of damage by construction plant and vehicles; prevent soil compaction measures; and maintain vegetation buffer strips (where practicable). 		
SMC-E12	Throughout Proposed Scheme	Construction & Post-Construction	Planting will be undertaken to replace any trees that were intended to be retained which are felled or die as a result of construction works. The size, species and location of replacement trees will be approved by Transport Scotland and other relevant stakeholders.	Replacement of trees lost that are to be retained.	Transport Scotland and other relevant stakeholders
SMC-E15	Throughout Proposed Scheme	Construction	<p>The Contractor will describe within the CEMP (Mitigation Item SMC-S1) the strategy to be implemented for the appropriate treatment of invasive, non-native species (INNS).</p> <p>The strategy will set out appropriate construction, handling, treatment and disposal procedures to prevent the spread of INNS in line with recognised best practice.</p>	To prevent the spread of INNS.	None required
n/a (note)	Throughout Proposed Scheme	Construction	Best practicable means will be employed to avoid the disturbance of sensitive species and habitats with noise, dust and air pollution. The Standard Mitigation Measures as detailed in ES Chapter 11 (Road Drainage and the Water Environment), ES Chapter 13 (Landscape and Visual), ES Chapter 16 (Air Quality) and ES Chapter 17 (Noise and Vibration) will be implemented to protect aquatic and terrestrial habitats and species.	To protect aquatic and terrestrial habitats and species.	n/a

Table 7.3: Project Mitigation Commitments

Mitigation Item ¹⁶	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P11-E16	Throughout Proposed Scheme	Pre-Construction & Construction	The working area will be kept to the minimum necessary for construction of the project to reduce habitat loss. A Habitat Management Plan will be produced pre-construction and agreed with SNH. This will include specific plans and measures for working on the border of the Craigellachie SSSI/NNR and Alvie SSSI, as well as other sensitive habitats (such as aspen woodland), detailing avoidance, mitigation and rehabilitation measures to further reduce residual impacts.	To protect all habitats, including those located on the boundary of Craigellachie SSSI/NNR and Alvie SSSI.	SNH
P11-E17	Throughout Proposed Scheme	Pre-Construction & Construction	The removal of any trees identified for retention within the ES should be avoided and, if unavoidable, shall be undertaken in consultation with CNPA. Assessment of the trees at such locations should be undertaken and where any trees that were intended to be retained are identified as requiring felling or die as a result of construction works these will be replaced. Any changes to the extent of tree removal from that assessed within the ES, should be subject to assessment using the same methods as detailed within the ES to determine the appropriate mitigation requirements. Where required, any additional impacts identified will be appropriately mitigated for using the same methods as detailed within the ES. The size and species of replacement trees will be agreed in consultation with SNH, CNPA and relevant stakeholders, and will take account of management plans of immediately adjacent woodland.	To protect retained trees.	SNH, CNPA and Forestry Commission
P11-E18	Throughout Proposed Scheme	Construction	Aspen woodland will be avoided where possible. If felling is required, this shall be undertaken in	To protect aspen and species associated with it (including fungi and invertebrates).	CNPA

¹⁶ Only items relevant to designated sites, ancient woodland and habitats are listed

Mitigation Item ¹⁶	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			consultation with CNPA and deadwood over 75cm circumference will be retained where practicable.		
P11-E19	Throughout Proposed Scheme	Construction	Areas of temporary habitat loss during construction will be reinstated as soon as practicable. The reinstatement and restoration of habitats will generally be done on a like for like basis or where possible will aim to provide an enhancement where degraded or ecologically poor habitats are present (e.g. improved grassland). This may involve the use of appropriate seed mixes to provide a suitable tie-in with local habitats.	To maintain/enhance biodiversity.	None
P11-E20	Throughout Proposed Scheme	Construction	<p>Mitigation and compensation for the loss of ecologically important habitats will occur through habitat creation. This will include roadside planting, where appropriate, as shown on Landscape and Ecological Mitigation plan (Figure 13.4).</p> <p>Where feasible important habitats will be replaced on a like for like basis, with habitats of a similar type and character to be created within the vicinity of the area where the loss has occurred. Where this is not possible, habitat creation will occur within other suitable areas identified within the Proposed Scheme.</p> <p>Landscape planting and newly created habitat will be comprised of locally obtained native species of local provenance, and will comprise a mixture of species.</p> <p>Sowing / planting should be undertaken in the appropriate planting season but as soon as possible following completion of the works to reduce the likelihood of the areas being colonised by invasive, non-native species which are of lower value to wildlife.</p> <p>Replacement habitats will be monitored and managed during the aftercare and operation phase of the Proposed Scheme.</p>	To compensate for the loss of ecologically important habitats (including woodland, dry heath, and blanket bog).	None

Mitigation Item ¹⁶	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			Where practicable habitat creation will fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas.		
P11-E21	Throughout Proposed Scheme	Construction	<p>Planting of new woodland will be undertaken at a variety of locations to mitigate for the loss of ancient woodland which includes a proposed woodland compensation site (see Landscape and Ecological Mitigation plan, Figure 13.4).</p> <p>Soil will be retained from locations of ancient woodland and reused in areas of woodland planting. These soils will be reused in areas of new woodland planting in order to utilise the existing seedbank as much as possible and transfer soil organisms and specialist bacteria that may be adapted to these environments to new areas of woodland. This will include areas that are no longer wooded where appropriate (e.g. areas with a species rich ground layer and associated seed bank).</p> <p>A method statement will be produced detailing the approach to soil translocation and woodland creation. The methodology will be agreed with SNH and CNPA.</p>	To compensate for the loss of ancient woodland.	SNH and CNPA
P11-E22	Throughout Proposed Scheme	Construction	Where practicable, top soil from cleared woodland not on the ancient woodland inventory but still considered important (e.g. aspen woodland or SBL birchwoods) will be stored appropriately for re-use in areas where similar habitat is to be created. See Landscape and Ecological Mitigation plan, Figure 13.4.	To retain the seedbank of cleared woodland (including aspen and SBL birchwoods).	None
P11-E23	Throughout Proposed Scheme	Construction	Where practicable top soils or substrates from areas of Annex I or SBL priority habitat loss, including heath and species rich grassland, will be stored appropriately for re-use in areas where similar habitat is to be created. See Landscape and Ecological Mitigation plan, Figure 13.4.	To retain the seedbank of lost Annex I/SBL priority habitats.	None

Mitigation Item ¹⁶	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P11-E25	Throughout Proposed Scheme	Construction	<p>Where retained, deadwood will be placed in a variety of locations and conditions to benefit a number of species. Deadwood should be stored in a location away from the working area to prevent risk of damage and then placed within areas of retained woodland or woodland planting at an appropriate time.</p> <p>Similarly, where possible, selected, blasted rock material will be incorporated into retained woodland and woodland planting for the benefit of a range of species including pine marten under the direction of an ECoW. Tree stumps will be retained in situ where felled on the edge of working areas where this does not pose a constraint to the works.</p> <p>Edges of woodland will be scalloped where practicable increasing variety of conditions to reduce the risk of windthrow.</p>	To maintain/enhance habitat for species including reptiles, invertebrates, and pine marten.	None
P11-E26	Throughout Proposed Scheme	Construction	<p>If deadwood exists in wooded areas to be lost that are listed within the ancient woodland inventory, this deadwood will be transferred to nearby areas of ancient woodland to be retained or to areas of new woodland creation, to allow the retention and transfer of specialist ancient woodland invertebrates, fungi and bacteria. Ancient or veteran trees to be felled in these areas will also be moved to new woodland creation areas for the same purposes and to act as an input of new deadwood.</p>	To maintain populations of specialist ancient woodland species, including invertebrates, fungi and bacteria.	None
P11-E27	Throughout Proposed Scheme	Construction	<p>During construction permanent and temporary drainage designs will aim to maintain existing and natural flows and pathways for surface and sub-surface water, in order to maintain links and hydrological connectivity with existing habitats dependant on wet conditions.</p>	To maintain hydrological connectivity between habitats.	None

Mitigation Item ¹⁶	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P11-E29	Throughout Proposed Scheme	Construction	<p>Ponds of Local ecological importance or greater and lost to construction will be replaced as near to their original location as practically possible, or within the nearest suitable habitat, whichever is more ecologically advantageous. This will be undertaken at a ratio of 1 pond loss: 1 pond replacement. SuDS and drainage features shall not act to compensate for the loss of any pond; however, SuDS shall be designed to maximise their biodiversity value, in line with the CIRIA SuDS Manual^{xxx}.</p> <p>Replacement ponds will be designed following good practice principles as described by SEPA Guidance on good practice in the management and creation of small waterbodies in Scotland^{xxxi}. An ecological watching brief and fish rescue plan will be instigated in consultation with SNH and SEPA during pond dewatering activities.</p>	To compensate for loss of ponds and maintain/enhance habitats for associated species (including fish and invertebrates).	SNH, CNPA and SEPA
P11-E34	Throughout Proposed Scheme	Pre-Construction & Construction	<p>Species Protection Plans to be produced pre-construction and agreed with SNH. Plans will be produced for the following species: bats, otter, red squirrel, pine marten, great crested newts, reptiles, wildcat, water vole, badger and any other species as deemed necessary from the pre-construction surveys. Where appropriate, the Species Protection Plans will include monitoring plans.</p>	To comply with conservation legislation and to protect fauna.	SNH

7.5 Residual Impacts on Terrestrial Habitats

- 7.5.1 During scheme development, design options have been selected to reduce habitat loss where practicable. Additionally, areas of woodland for retention within the LMA have been identified. However, some permanent habitat loss cannot be avoided. The temporary habitat loss during the construction stage for temporary works areas, access roads and construction drainage and the permanent habitat loss as a result of the Proposed Scheme have been considered together as a single loss to represent the worst-case scenario, in recognition that restoration of temporary works areas may not always result in the same habitat that was in existence at that location pre-disturbance, at least not in the short-term. Overall, it is predicted that there will be a combined total of 240.31ha of permanent and temporary habitat loss¹⁷. These losses apply to various habitat types, of differing conservation importance, along the length of the Proposed Scheme. These losses and the characterisation of the losses in each assessment zone are detailed below in Tables 7.4 to 7.6. However, for reference and clarity, Annex I provides an overview of habitat loss per Phase 1 habitat type for the entirety of the Proposed Scheme, irrespective of nature conservation importance.
- 7.5.2 Indirect pollution and siltation effects will be mitigated through the adoption of best practice with regards to activities such as storage of fuel/substances and refuelling, and through construction drainage, which will include temporary SuDS ponds and silt management. It is considered that these measures will reduce any effects from pollution and silt during the construction phase to a non-significant level.
- 7.5.3 This impact assessment assumes the adoption of the general and project specific mitigation measures detailed above, and as such detailed assessment is only provided on residual impacts. Pre-mitigation impact characterisation is provided for these impacts for clarity.

Designated Sites

Construction

- 7.5.4 There are 14 internationally designated sites with ecological qualifying features present within 10km of the Proposed Scheme, comprising six SACs, seven SPAs, and one Ramsar site. The impact of the Proposed Scheme on these sites is assessed in the Habitats Regulations Assessment for the Proposed Scheme, a summary of which is detailed in ES Chapter 12 - Ecology.
- 7.5.5 There are also seven nationally designated sites with ecological qualifying features within 2km of the Proposed Scheme, comprising six SSSIs and one NNR. There are no LNRs or non-statutory designated sites located within the habitats Study Area.
- 7.5.6 Of the remaining terrestrial sites with habitat related qualifying features, or that have qualifying species or features that are intrinsically linked to certain habitats or plant species (cf. Tables 3.3), only two are present within 250m of the Proposed Scheme. These are Alvie SSSI and Craigellachie SSSI and NNR (Figure 12.1a). Table 7.4 assesses the impacts on these designated sites.
- 7.5.7 All other terrestrial designated sites have been scoped-out of this assessment as due to the distances between the sites and the Proposed Scheme there will be no direct impacts. Furthermore, no indirect impacts are predicted as it is unlikely that the Proposed Scheme will have any indirect impacts on the respective qualifying features or

¹⁷ N.B. There will be 195.77ha of mitigation planting and habitat creation associated with the Proposed Scheme; consisting of 154.96ha of mitigation within the LMA and a further 40.81ha of offsite compensatory planting as per section 7.4 above.

cause changes in any supporting system, such as groundwater flows, at the distances evident. Therefore, these sites are not considered further within this appendix and there are no specific mitigation requirements with respect to these sites.

Table 7.4: Designated Sites - Specific Impacts, Mitigation and Residual Impacts – Construction

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
Craigellachie SSSI & NNR Value: National	Habitat loss	Total area of Craigellachie SSSI & NNR: 379.85 Total habitat loss: 2.66 Woodland: 1.81 Acid grassland: 0.47 Bracken: 0.15 Dry heath & dry heath/acid grassland mosaic: 0.08 Swamp: 0.001 Other habitats (i.e. bare ground and existing road/track): 0.15	Extent: Dualling of the carriageway and associated embankment formation will result in the initial gross loss of 2.66ha of habitat within Craigellachie SSSI & NNR. These losses all border the eastern edge of the SSSI/NNR boundary in narrow strips along the A9 and do not fragment or dissect the SSSI/NNR. The largest portion of the loss is immediately north and south of Loch Puladdern. The loss of 2.66ha equates to 0.7% of the SSSI area. Craigellachie is designated for its upland birch woodland and moth assemblage (Table 3.3). Approximately 1.81ha of woodland will be lost, of which virtually all is upland birchwood (i.e. 1.76ha of W11 & W17). Of this birchwood, 1.46ha is good quality semi-natural woodland and 0.3ha is generally younger and denser roadside shelterbelt plantation. This loss of birchwood represents a minor loss of the sites qualifying feature. Table 3.3 and Annex B indicates that much of the Study Area is suitable for many of the qualifying species within the moth assemblage at both adult and larval stages. Therefore, the habitat loss also represents a minor loss of habitat and food sources for these species. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible	Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15. Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34. Much of the 2.66ha of gross habitat loss predicted is temporary, and 1.93ha of this area is to be replanted or re-seeded as part of the Landscape and Ecological Mitigation plan (Figure 13.4). Mitigation within Craigellachie SSSI consists of the following planting/habitat recreation: <ul style="list-style-type: none"> • 0.92ha of acid grassland; • 0.53ha of <i>Betula</i> woodland; • 0.19ha of mixed woodland; • 0.19ha of wet grassland; • 0.1ha of wet woodland; and • 0.01ha of verge grassland mix. The permanent residual habitat loss after mitigation is predicted to be 0.73ha. This is considered not significant due to the small nature of the permanent losses (0.19% of SSSI	Not significant.

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			Probability: Certain Impact Descriptor: High	area) and that this will not affect site integrity or the conservation status of the species for which it is designated.	
Alvie SSSI Value: National	Habitat loss	Total area of Alvie SSSI: 339.01 Total habitat loss: 1.91 Woodland: 1.5 Clear-fell: 0.06 Improved and semi-improved grassland: 0.05 Other habitats (i.e. existing road/track): 0.29	Extent: Dualling of the mainline carriageway, associated embankment formation, and upgrades to the B9152 road by the new Aviemore South Junction will result in the gross loss of 1.91ha of habitat within Alvie SSSI. These losses will be in three main areas: 1) a section of the westernmost SSSI by the Allt an Fhearna watercourse, 2) where the A9 borders the SSSI at grid reference NH 86600 10035 to the south-east of Ballinluig, and 3) where the SSSI borders the B9152 road north-west of Bogach. The loss of 1.91ha equates to 0.56% of the SSSI area. Alvie SSSI is designated for upland oak woodland and its invertebrate assemblage, specifically net-winged caddis fly and aspen hoverfly (Table 3.3). Of the gross losses; approximately 1.5ha of woodland will be lost, however none of this is upland oak woodland for which the site is designated. The woodland losses flank the respective roads and the Allt an Fhearna and consist of 1.15ha of <i>Betula</i> dominated woodlands (1.1ha semi-natural and 0.05ha plantation) and 0.35ha of <i>Pinus sylvestris</i> and <i>Larix decidua</i> roadside conifer plantation (W18). The areas of loss also do not contain habitats which could support the aspen hoverfly or adult stages of the net-winged caddis fly, however there is some larval	Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15. Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34. Much of the 1.91ha of gross habitat loss predicted is temporary, and 1.36ha of this area is to be replanted or re-seeded as part of the overall mitigation planting and habitat reinstatement strategy. Mitigation within Alvie SSSI consists of the following planting/habitat recreation: <ul style="list-style-type: none"> • 0.69ha of acid grassland; • 0.50ha of conifer woodland; • 0.11ha of mixed woodland; and • 0.06ha of verge grassland mix. The permanent residual habitat loss after mitigation is predicted to be 0.55ha. This is considered not significant due to the small nature of the permanent losses (0.16% of SSSI area) and that this will not affect site	Not significant.



Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>food sources for this species present (i.e. <i>Betula</i> spp.); see also Annex B.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>integrity or the conservation status of the species for which it is designated.</p>	

Operation

- 7.5.8 Indirect effects during operation may occur as a result of pollution to watercourses which flow through ancient woodland from oil and chemical spills, which could in turn result in the loss of plants through the uptake of contaminants. This effect will be mitigated through the built road drainage design and so is not considered further. It is considered that the road drainage design associated with the Proposed Scheme will reduce any effects from pollution to a non-significant level.
- 7.5.9 The air quality assessment for the Proposed Scheme (Appendix 16.1, Air Quality, Tables 3.1 to 3.4) has shown that there are no exceedances of the annual mean NO_x AQS objective of 30 µg/m³ for the protection of vegetation either with and without the Proposed Scheme at all locations within Craigellachie SSSI and Loch Vaa SPA/SSSI. In accordance with IAN 174/13, the impact on these designated ecological sites can be assessed as 'not significant'.
- 7.5.10 Of the designated ecological sites assessed, only one is modelled to have an exceedance of the annual mean AQS objective for NO_x of 30µg/m³. This occurs at the closest point to the road on the Alvie SSSI transect, approximately 11m from the A9 centreline. The change in annual mean NO_x concentration at this receptor (E1) is considered to be 'Large' according to IAN 174/13 (i.e. change greater than 3 µg/m³). The receptor moves further from the road centreline with the Scheme, however there is a considerable increase in traffic flow on the adjacent road link.
- 7.5.11 The maximum total nitrogen deposition calculated within Alvie SSSI for a habitat type of valley mires, poor fens and transition mires is estimated to be 4.5 kg N ha⁻¹ yr⁻¹ (E1), or less than half the most stringent critical load of 10 kg N ha⁻¹ yr⁻¹. This is the same as the upland oak woodland at the location which also has a lower critical load of 10 kg N ha⁻¹ yr⁻¹. The change in nitrogen deposition modelled as a result of the scheme is equal to 6% of the critical load of both habitats.
- 7.5.12 As the total nitrogen deposition rate is below the relevant critical loads, the impact on sensitive habitats within Alvie SSSI can also be assessed as 'not significant'.
- 7.5.13 Furthermore, on the basis that the above designated sites are representative of all areas adjacent to the entire Proposed Scheme, the impacts from NO_x on all vegetation along the Proposed Scheme is assumed to be not significant.

Ancient Woodland

Construction

- 7.5.14 Thirty-two areas listed on the ancient woodland inventory (AWI) are present within the EZol, as shown on Figure 12.2. During route development, design options have been selected to reduce the extent of ancient woodland habitat loss where practicable. Twenty-five areas on the AWI fall within the Proposed Scheme (Table 4.1) and will be subject to permanent habitat loss. It is acknowledged that ancient woodland cannot be replaced so all areas of ancient woodland that are affected, either within the Proposed Scheme footprint or within the areas required to accommodate the Proposed Scheme construction, are considered to be permanent losses.
- 7.5.15 Areas of ancient woodland that will be lost form part of larger woodland habitats. By removing a part of the woodland, this may also result in edge, fragmentation or severance effects on the remaining woodland, which may reduce the suitability of the habitat for woodland species.



- 7.5.16 Of the 25 areas on the AWI subject to permanent loss, parts of AW ID Areas 13 and 28 are within Craigellachie SSSI/NNR and are partially covered by the assessment of designated sites above in Table 7.3. Similarly, a small section of AW ID Area 16 is within Alvie SSSI and is partially covered by the assessment in Table 7.3.
- 7.5.17 Table 7.5 below assesses the impacts on the areas of the AWI that fall within the Proposed Scheme.



Table 7.5: Ancient Woodland - Specific Impacts, Mitigation and Residual Impacts – Construction

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
AWI ID Area 1 Value: Authority Area	Habitat loss	Total habitat loss: 14.53 Woodland loss: 6.4 Other habitat loss: 8.13	<p>Extent: Dualling at this location and the creation of Black Mount Junction and associated Tier 3 access will result in the loss of 14.53ha of habitat listed on the AWI, of which only 6.4ha is actually woodland. The woodland loss is comprised of 5.76ha of W18 <i>Pinus sylvestris</i> woodland; of which 4.98ha is young plantation with the remaining 0.78ha being immature self-seeded semi-natural <i>P. sylvestris</i> over dry heath. The remaining 0.64ha of woodland loss is <i>Betula</i> dominated broadleaved and mixed woodland, of which 0.49ha is semi-natural in narrow road edge strips, and the rest is immature plantation.</p> <p>The vast majority of woodland in AWI ID Area 1 is young <i>P. sylvestris</i> plantation and it is dissected by the existing A9. The area has a poor ground flora with reduced diversity of vascular plants and only one ancient woodland indicator species was sparsely recorded in this large area (Annex A).</p> <p>The other habitat loss consists of 2.66ha of dry heath, 1.09ha of dry heath/acid grassland mosaic, 1.07ha of acid grassland, 0.82ha of broom scrub, 0.09ha of wet modified bog, 0.05ha of marshy grassland, 0.04ha of wet heath, and the remainder is of existing A9/A938 carriageways, forestry tracks and bare ground/hardstandings.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>Mitigation across all AWI ID areas includes the below.</p> <p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34.</p> <p>Within the overall AWI habitat loss area there is</p>	Significant
AWI ID Area 2 Value: Authority Area	Habitat loss	Total habitat loss: 1.76 Woodland loss: 0.57	<p>Extent: Dualling at this location and the incorporation of Tier 3 Access will result in the loss of 1.76ha of habitat listed on the AWI, of which 0.57ha is woodland. This woodland loss is comprised of 0.29ha of young semi-natural W11/W17 <i>Betula</i> woodland, 0.22ha young semi-natural W18 <i>Pinus sylvestris</i> woodland, and 0.07ha of <i>P. sylvestris</i> and <i>Larix decidua</i> plantation.</p> <p>AWI ID Area 2 is a mosaic of open ground habitats and mainly young and sometimes scrubby woodland, with only some semi-mature trees; two ancient woodland indicator species were recorded. The 0.22ha of semi-natural W18 <i>P.</i></p>	50.93ha of proposed replanting or re-seeding as part of the overall mitigation planting and habitat reinstatement strategy (Figure	Not significant due to the small nature of woodland loss; which is either young woodland or commercial plantation. The

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
		Other habitat loss: 1.19	<p><i>sylvestris</i> woodland to be lost consists only of immature self-seeded <i>P. sylvestris</i> 1.5-2.5m in height over dry heath and lacks ancient woodland character.</p> <p>The other habitat loss consists of 0.40ha of acid grassland, 0.38ha of marshy grassland, 0.08ha of broom and bramble scrub, 0.03ha of neutral grassland, 0.004ha of improved grassland, 0.01ha of dry heath, and the remainder of existing A9 and minor carriageways, bare ground/hardstanding, and amenity grassland.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>13.4). This mitigation is made up of 22.20ha of woodland creation and 28.73ha of scrub/open habitat recreation and reinstatement.</p> <p>Woodland creation will consist of the following: 12.15ha of coniferous woodland, 6.01ha of mixed woodland, 1.92ha of <i>Populus tremula</i> woodland 1.06 of <i>Betula</i> woodland, and 1.05ha of wet woodland</p>	loss will not affect the integrity of this feature.
AWI ID Area 4 Value: National	Habitat loss	Total habitat loss: 2.64 Woodland loss: 2.08 Other habitat loss: 0.56	<p>Extent: Dualling at this location and widening and amendments to the A95 road to incorporate Granish Junction will result in the loss of 2.64ha of habitat listed on the AWI (SB carriageway). 2.08ha of this is woodland. All woodland to be lost is <i>Betula</i> dominated W17 (1.50ha) and W11 (0.58ha). Of the woodland loss, 1.49ha is semi-natural and 0.59ha is road edge/embankment plantation. The semi-natural woodland is of mature <i>Betula</i> with some ancient trees, it has a well-developed ground flora which is grazed by cattle but retains several ancient woodland indicator species (Annex A).</p> <p>The other habitat loss consists of 0.2ha of acid grassland (U4), 0.03ha of dry heath (H9-H12), 0.01ha of neutral grassland (MG9), and the remainder is of existing carriageways.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>Other habitat creation and reinstatement will consist of the following: 20.68ha of acid grassland, 5.45ha of verge grassland mix, 2.08ha of dry heath, 0.5ha of wet</p>	Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
AWI ID Area 5 Value: National	Habitat loss	Total habitat loss: 3.95 Woodland loss: 2.74 Other habitat loss: 1.21	<p>Extent: Dualling at this location, formation of the Granish Junction, and associated Tier 3 Access, will result in the loss of 3.95ha of habitat listed on the AWI (NB carriageway). 2.74ha of this loss is woodland; 0.07ha is roadside mixed/conifer plantation and 2.68ha is <i>Betula</i> woodland: made up of 0.14ha of younger roadside plantation (W17) and 2.54ha of semi-natural woodland (2.37ha of W11 and 0.16ha of W7 wet woodland).</p> <p>The semi-natural woodland in AWI ID Area 5 is a substantial stand, <i>Betula</i> dominated, and a mosaic of W3/W4/W11/W17; however, the vast majority is W11. The trees are semi-mature to mature with some pockets of ancient trees. There is a well-developed ground storey in which up to six ancient woodland indicator species were recorded (Annex A). The area is grazed by cattle with some ground poached.</p> <p>The other habitat loss consists of 0.51ha of acid grassland (U4), 0.30ha of dry heath (H9 & H9-H12), 0.13ha of dry heath/acid grassland mosaic, 0.23ha of neutral grassland (MG10), and the remainder of existing carriageway and small pond.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	grassland, and 0.02ha of scrub. The reuse of soils from ancient woodland sites will also be undertaken, which will include sites that are no longer woodland where appropriate (e.g. (e.g. areas with a species rich ground layer and associated see bank).	Significant
AWI ID Area 6 Value: National	Habitat loss	Total habitat loss: 3.95 Woodland loss: 2.8 Other habitat loss: 1.15	<p>Extent: Dualling at this location, formation of the Granish Junction, linkage with the B9152 road, Tier 3 tracks, and SuDS ponds will result in the loss of 3.95ha of habitat listed on the AWI (SB carriageway). 2.8ha of this is woodland; 0.04ha is conifer plantation and 2.76ha is <i>Betula</i> dominated woodland: made up of 0.12ha of younger roadside plantation and 2.64ha of semi-natural W11 woodland.</p> <p>The semi-natural woodland in AWI ID Area 6 is of high quality, the majority is W11. Most are stands of <i>Betula</i> woodland, however there are also stands of <i>Quercus petraea</i> woodland or mixed <i>Q. petraea</i> and <i>Populus tremula</i> present. These <i>Q. petraea</i> / <i>P. tremula</i> stands have generally been avoided and there is minimal direct habitat loss to these particular areas (due to Tier 3 access). The majority of areas of woodland loss are <i>Betula</i> dominated. The trees are</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>generally mature with some ancient trees also present; the ground storey is grazed in places but remains generally well-developed and contains up to 11 ancient woodland indicator species (Annex A).</p> <p>The other habitat loss consists of 0.36ha of acid grassland (U4), 0.04ha of improved grassland (MG6), 0.03ha of dry heath (H9-H12 & H12), 0.03ha of scattered bracken, and the remainder is of existing carriageway and bare ground areas.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 8 Value: National	Habitat loss	<p>Total habitat loss: 0.28</p> <p>Woodland loss: 0.11</p> <p>Other habitat loss: 0.17</p>	<p>Extent: Dualling and formation of Tier 3 access at this location will result in the loss of 0.28ha of habitat listed on the AWI, of which 0.11ha is woodland; made up of 0.05ha of immature coniferous roadside shelterbelt plantation, 0.04ha of semi-natural mature <i>Betula</i> woodland and 0.01ha of <i>Betula</i> plantation (W17).</p> <p>The woodland within AWI ID Area 8 has been assigned National value due to the extent of high quality mature <i>Betula</i> woodland of various NVC types with a well-developed field layer containing up to 10 ancient woodland indicator species (Annexes A & H). However, this type of woodland here is subject to minimal loss (i.e. 0.04ha). Instead, most habitat loss is of small sections of lower value shelterbelt plantations which sits between the A9 carriageway and the adjacent minor road to the west, by Rynaclarsach (NH 84560 24170).</p> <p>The remainder of the habitat loss consists of 0.15ha of semi-improved acid grassland (U4), 0.01ha of marshy grassland (M23b), and the remainder is of existing carriageway.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain</p>		Not significant (due to the small nature of the woodland losses – which are mainly of roadside plantation). The loss will not affect the integrity of this feature.

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			Impact Descriptor: High		
AWI ID Area 9 Value: Authority Area - Regional	Habitat loss	Total habitat loss: 0.13 Woodland loss: 0.13 Other habitat loss: 0.00	<p>Extent: Formation of part of a SuDS pond and associated access by Black Mount Junction at this location, north of Ch19200, will result in the loss of 0.13ha of habitat listed on the AWI, which is all woodland. 0.08ha of the woodland loss is W18 <i>Pinus sylvestris</i> plantation; the remainder being 0.05ha of semi-natural <i>Betula</i> dominated W7 wet woodland.</p> <p>The nature conservation importance of AWI ID Area 9 is split as Authority – Regional (see Annex H). The even-aged W18 is assigned Authority importance due to its plantation origin and lack of ancient woodland indicators, whereas the <i>Betula</i> dominated woodland is assigned Regional importance due to the mosaic of W4/W7/W17 and the presence of up to five ancient woodland indicator species (Annex A).</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Not significant (due to the small nature of the woodland loss). The loss will not affect the integrity of this feature.
AWI ID Area 10 Value: National	Habitat loss	Total habitat loss: 1.48 Woodland loss: 0.97 Other habitat loss: 0.51	<p>Extent: Dualling, amendments to the junction with the minor road at Ch22750, the formation of Tier 3 access and SuDS at this location will result in the loss of 1.48ha of habitat listed on the AWI. Of this, 0.97ha is <i>Betula</i> dominated woodland (W7/W11/W17), with 0.84ha semi-natural and 0.14ha plantation.</p> <p>The semi-natural woodland in this area contains a number of NVC types and is part of a much larger area on the AWI, it contains ancient and mature trees with some younger regeneration and a well-developed ground flora with up to six ancient woodland indicator species recorded. The young plantation lacks ancient woodland character.</p> <p>The other habitat losses here consist of 0.16ha of acid grassland, 0.1ha of dry heath, 0.07ha of dry heath/acid grassland mosaic, 0.01ha of scattered trees, and the remainder is of existing carriageways.</p> <p>Effect: Direct negative Duration: Permanent</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>Frequency and timing: Single event</p> <p>Reversibility: Irreversible</p> <p>Probability: Certain</p> <p>Impact Descriptor: High</p>		
<p>AWI ID Area 11</p> <p>Value: Authority Area</p>	Habitat loss	<p>Total habitat loss: 22.61</p> <p>Woodland loss: 13.16</p> <p>Other habitat loss: 9.45</p>	<p>Extent: Dualling throughout AWI ID Area 11 will result in the loss of 22.61ha of habitat listed on the AWI, of which 13.16ha is woodland, the remainder being open ground habitats. Of the woodland loss 10.83ha is conifer plantation, mostly younger plantation. The remaining woodland loss consists of 1.21ha of broadleaved plantation, 0.45ha of semi-natural broadleaves, 0.67ha of mixed plantation and <0.01ha of semi-natural coniferous woodland. The majority of broadleaved woodland is W17.</p> <p>AWI ID Area 11 is an extensive area of mainly <i>Pinus sylvestris</i> plantation which is generally young, although some semi-mature coupes exist within the Study Area. It generally has a relatively low number of ancient woodland indicator species present in the field layer (Annex A). Within this area broadleaved woodland is scarce with only occasional and small semi-natural stands and plantation coupes. This area has been assigned Authority Area importance except for a small area of woodland assigned as National importance situated in Ellan Wood to the east of the A9 near Avingormack (Annex H). However, no habitat loss is predicted here with all loss being in the area assigned Authority Area importance.</p> <p>The other 9.45ha of habitat loss consists of 2.19ha of acid grassland, 1.4ha of gorse/broom scrub, 0.97ha of acid grassland/dry heath mosaic, 0.63ha of dry heath, 0.06ha of scattered coniferous trees, 0.05ha of bracken, 0.04ha of marshy grassland, 0.04ha of swamp, 0.02ha of basin mire and the remaining 4.06ha is of existing carriageways, tracks and bare ground/hardstandings.</p> <p>Effect: Direct negative</p> <p>Duration: Permanent</p> <p>Frequency and timing: Single event</p> <p>Reversibility: Irreversible</p> <p>Probability: Certain</p> <p>Impact Descriptor: High</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
AWI ID Area 12 Value: Authority Area	Habitat loss	Total habitat loss: 2.86 Woodland loss: 1.3 Other habitat loss: 1.56	<p>Extent: Dualling at this location will result in the loss of 2.86ha of habitat listed on the AWI. 1.3ha of this is woodland, of which the majority is 1.16ha of coniferous plantation; the small remainder is 0.11ha of semi-natural broadleaves (<i>Betula</i>) and 0.04ha of broadleaved and mixed plantation. Most of the woodland to be lost is semi-mature <i>Pinus sylvestris</i> plantation which is grazed by sheep and deer and has a low number of ancient woodland indicator species present (Annex A).</p> <p>The remainder of the habitat loss is 0.3ha of recent clear-fell, 0.01ha of acid grassland and 1.24ha of existing carriageway or bare/disturbed ground created by construction works at the end of the Kinncraig section of the scheme.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Significant
AWI ID Area 13 Value: National	Habitat loss	Total habitat loss: 1.11 Woodland loss: 0.65 Other habitat loss: 0.46	<p>Extent: Dualling and formation of embankments at this location will result in the loss of 1.11ha of habitat listed on the AWI, of which 0.65ha is woodland. Of this woodland loss 0.5ha is <i>Betula</i> dominated broadleaves and the remainder is coniferous. Of the total woodland loss only 0.24ha is semi-natural, the remainder mostly broadleaved plantation but also small areas of coniferous and mixed plantation along the roadside.</p> <p>There is a large degree of overlap between AWI ID Area 13 and Craigellachie SSSI/NNR, and as such the area is assigned National value. However, AWI ID Area 13 extends beyond the Craigellachie site boundary and runs much closer to the existing A9 carriageway, even incorporating part of it east of Lynwilg House. The majority of the woodland within AWI ID Area 13 here, and outwith the Craigellachie SSSI/NNR site boundary, is roadside shelterbelt plantation with generally younger trees and fewer ancient woodland characteristics; and it can therefore be considered of lesser value than the woodland within the designated site area. Most of the woodland loss from AWI ID Area 13 is from this roadside plantation outwith the Craigellachie boundary (and thus only a very small proportion that also falls within Craigellachie has been 'double-counted' as it has already been assessed in the designated sites impact assessment in Table 7.3).</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>The other habitat loss consists of 0.19ha of acid grassland, 0.12ha of bracken, 0.03ha of dry heath, and the remainder is existing carriageway.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 14 Value: National	Habitat loss	<p>Total habitat loss: 2.86</p> <p>Woodland loss: 1.32</p> <p>Other habitat loss: 1.54</p>	<p>Extent: Formation of the Aviemore South Junction on the SB carriageway and its linkage to the B9152 road at this location will result in the loss of 2.86ha of habitat listed on the AWI; of which 1.32ha is woodland. Of the woodland 0.08ha is W18 <i>Pinus sylvestris</i> plantation, the remainder is <i>Betula</i> woodland. Of the 1.24ha of W11 and W17 <i>Betula</i> woodland lost; 0.48ha is of younger and denser road edge plantation, while the remaining 0.76ha is of high quality semi-natural W11 woodland. The semi-natural woodland here contains a range of ancient, mature and semi-mature trees with some deadwood and up to seven ancient woodland indicator vascular plant species (Annex A).</p> <p>The other habitat loss consists of 1.10ha of semi-improved acid grassland, 0.02ha of ruderal weedy vegetation, and the remainder is of farm track and existing carriageway associated with the B9152.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Significant
AWI ID Area 15	Habitat loss	Total habitat loss: 0.15	<p>Extent: Formation of embankments associated with Aviemore South Junction at this location will result in the loss of 0.15ha of habitat listed on the AWI. 0.02ha of this is woodland which consists of little more than a few scattered mature <i>Betula</i> within an area of heavily grazed sheep pasture. The remainder of the habitat loss is 0.12ha of semi-improved grassland and 0.01ha of existing farm track.</p>		Not significant (due to the very small nature of woodland loss). The loss

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
Value: Authority Area		Woodland loss: 0.02 Other habitat loss: 0.13	Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High		will not affect the integrity of this feature.
AWI ID Area 16 Value: National	Habitat loss	Total habitat loss: 1.76 Woodland loss: 1.16 Other habitat loss: 0.6	Extent: Dualling at this location will result in the loss of 1.76ha of habitat listed on the AWI. 1.16ha of this is woodland, of which 0.53ha is coniferous plantation and 0.63ha is broadleaves; mostly mature semi-natural <i>Betula</i> spp. (W11) with an established ground flora. The coniferous woodland is semi-mature <i>Pinus sylvestris</i> and <i>Larix decidua</i> shelterbelt plantation. The plantation SB also falls within Alvie SSSI. The remainder of the habitat loss consists of 0.47ha of improved and semi-improved grassland, 0.01ha of dry heath & acid grassland mosaic, 0.01ha of scrub, and the remainder of existing carriageway. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High		Significant
AWI ID Area 19 Value: National	Habitat loss	Total habitat loss: 0.92 Woodland loss: 0.53 Other habitat loss: 0.39	Extent: Dualling at this location, in the vicinity of Ch2000, will result in the loss of 0.92ha of habitat listed on the AWI, mainly on the NB carriageway. 0.53ha of this is woodland, of which 0.2ha is coniferous plantation (W18) and 0.33ha is broadleaves (W11). The coniferous woodland is shelterbelt plantation. The relatively small area of broadleaved woodland that makes up AWI ID Area 19 consists of a mix of W4, W7 and W11 woodlands containing a mix of mature and semi-mature <i>Betula</i> spp., <i>Prunus padus</i> , <i>Quercus petraea</i> and <i>Salix cinerea</i> with a number of ancient woodland indicator species (Annex A). The remainder of the habitat loss consists of 0.17ha of acid and improved grasslands, 0.08ha of scrub, and the remainder of existing carriageway. Effect: Direct negative		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 20 Value: National	Habitat loss	<p>Total habitat loss: 1.93</p> <p>Woodland loss: 0.86</p> <p>Other habitat loss: 1.07</p>	<p>Extent: Dualling at this location will result in the loss of 1.93ha of habitat listed on the AWI (predominately NB). 0.86ha of this loss is woodland. Much of the woodland within AWI ID Area 20 is mature to ancient <i>Betula</i> dominated W11/W17 woodland with a well-developed ground flora and several ancient woodland indicator species; however, parts of the AW area also contain stands of W18 <i>Pinus sylvestris</i> plantation and mixed conifer/broadleaved plantation. Most of the woodland loss has been restricted to plantation areas, with only 0.12ha of semi-natural woodland predicted to be lost; the remaining 0.74ha being plantation.</p> <p>The remainder of other habitat losses consists of, 0.28ha of acid grassland (U4), 0.21ha of dry heath/acid grassland mosaic (U4/H10), 0.12ha of dry heath (H10), 0.08ha of bracken (U20), and the remainder of existing carriageway.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Significant
AWI ID Area 21 Value: National	Habitat loss	<p>Total habitat loss: 0.22</p> <p>Woodland loss: 0.11</p>	<p>Extent: Upgrading of existing tracks for Tier 3 access in the vicinity of Ch12200-Ch12400 NB will result in the loss of 0.22ha of habitat listed on the AWI; of which 0.11ha is woodland. Of this woodland loss 0.09ha is semi-natural broadleaved W11 woodland and 0.02ha is W18 semi-natural coniferous woodland. These woodland losses involve the loss of a small number of trees in a more open canopied woodland along the edge of an existing track at this location.</p> <p>The woodland in AWI ID Area 21 is almost all broadleaved woodland. It is a mixture of W11 and W17 woodland that is dominated by <i>Betula pendula</i> but also</p>		Not significant (due to the small nature of the woodland loss). The loss will not affect the integrity of this feature.

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
		Other habitat loss: 0.11	<p>contains patches of <i>Pinus sylvestris</i>, <i>Prunus avium</i>, <i>P. padus</i> and <i>Salix caprea</i>; with some <i>Juniperus communis</i> in the understorey. The trees are mostly mature but there are younger regenerating and planted trees present, the field layer is also well-established and contains up to six ancient woodland indicator species. Other habitat loss here consists of 0.03ha of neutral grassland (MG9), 0.02ha of bracken (U20), 0.01ha of acid grassland (U4), 0.01ha of flush (M6c), and the remainder being existing tracks.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 22 Value: Regional	Habitat loss	Total habitat loss: 0.63 Woodland loss: 0.38 Other habitat loss: 0.25	<p>Extent: Existing track upgrades for Tier 3 access that links to Kinveachy Lodge at this location will result in the loss of 0.63ha of habitat listed on the AWI (NB). 0.38ha of loss is woodland. Of this woodland loss 0.20ha is semi-natural W11 and W17 <i>Betula</i> woodland, 0.10ha is semi-natural W18 <i>Pinus sylvestris</i> woodland and 0.08ha is W18 <i>Pinus sylvestris</i> conifer plantation.</p> <p>Tree age and the character of AWI ID Area 22 is quite varied. There are areas of younger <i>P. sylvestris</i> plantation, however areas of semi-natural <i>P. sylvestris</i> are present containing mature trees and some ancient specimens. The areas of <i>Betula</i> woodland are mature-ancient and contain some fallen trees and associated deadwood. The area generally has a well-developed ground storey and up to eight ancient woodland indicator vascular species were recorded here (Annex A).</p> <p>Other habitat loss here consists of 0.04ha of <i>Juniperus communis</i> scrub (W19), 0.03ha of acid grassland (U4), 0.02ha of bracken (U20), and the remainder being existing farm track.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			Probability: Certain Impact Descriptor: High		
AWI ID Area 25 Value: National	Habitat loss	Total habitat loss: 0.67 Woodland loss: 0.07 Other habitat loss: 0.6	Extent: Formation of Tier 3 Access associated with, and to the north of, the Aviemore South Junction at this location will result in the loss of 0.67ha of habitat listed on the AWI. 0.07ha of this is edge woodland, around an existing track, which forms part of a much larger block of W11 and W17 <i>Quercus petraea</i> woodland at this location. This woodland is of high quality and contains ancient and mature <i>Q. petraea</i> over a well-established ground flora that contains up to 10 ancient woodland indicator vascular plant species (Annex A). Other habitat loss here consists of 0.47ha of improved and acid grasslands (MG6 & U4), 0.01ha of scattered trees, with the remainder being existing farm track. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High		Not significant (due to the very small nature of the woodland loss). The loss will not affect the integrity of this feature.
AWI ID Area 26 Value: Regional	Habitat loss	Total habitat loss: 0.43 Woodland loss: 0.09 Other habitat loss: 0.34	Extent: Formation of Tier 3 Access associated with the Aviemore South Junction on the NB carriageway at this location by Lynwilg Farm Cottages will result in the loss of 0.43ha of habitat listed on the AWI, of which just 0.09ha is woodland. The woodland loss is of a small number of scattered trees within grazed grassland that are fragmented from the main stand of woodland within AWI ID Area 26. The remainder of the habitat loss consists of 0.34ha of poor and semi-improved acid grasslands. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High		Not significant (due to the very small nature of the woodland loss). The loss will not affect the integrity of this feature.

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
AWI ID Area 27 Value: National	Habitat loss	Total habitat loss: 0.47 Woodland loss: 0.1 Other habitat loss: 0.37	<p>Extent: Dualling at this location, from around Ch11300-Ch11500, will result in the loss of 0.47ha of habitat listed on the AWI, mostly due to widening of the NB carriageway. Only 0.1ha of habitat loss is woodland. Of the woodland losses 0.09ha is mixed W17/W18 semi-natural woodland on the NB carriageway. The remaining 0.01ha of woodland loss is a small area of young, small and scrubby <i>Betula</i> planted on the SB carriageways existing embankment.</p> <p>Other habitat loss consists of 0.18ha of semi-improved acid grassland, 0.08ha of dry heath/acid grassland mosaic, and the remainder of existing A9 carriageway.</p> <p>Effect: Direct negative</p> <p>Duration: Permanent</p> <p>Frequency and timing: Single event</p> <p>Reversibility: Irreversible</p> <p>Probability: Certain</p> <p>Impact Descriptor: High</p>		Not significant (due to the very small nature of woodland loss). The loss will not affect the integrity of this feature.
AWI ID Area 28 Value: National	Habitat loss	Total habitat loss: 1.91 Woodland loss: 1.45 Other habitat loss: 0.46	<p>Extent: Dualling at this location will result in the loss of 1.91ha of habitat listed on the AWI, of which 1.45ha is woodland. Of this loss 0.67ha is <i>Betula</i> dominated semi-natural broadleaved woodland (W11 & W17). The remainder of woodland loss is of 0.38ha broadleaved plantation, 0.24ha mixed plantation and 0.17ha coniferous plantation along the roadside.</p> <p>There is a large degree of overlap between AWI ID Area 28 and Craigellachie SSSI/NNR, and as such the area is assigned National value. AWI ID Area 28 extends beyond the Craigellachie site boundary and runs much closer to the existing A9 carriageway in many areas, although in other areas the ancient woodland boundary is further west and distant to the A9 than the Craigellachie boundary (Figure 12.2). The majority of the woodland within AWI ID Area 28 and outwith Craigellachie SSSI/NNR in the Study Area is roadside shelterbelt plantation with generally younger trees and fewer ancient woodland characteristics; and it can therefore be considered of lesser value than the woodland within the designated site area. Much of the woodland loss from AWI ID Area 28 is from this roadside plantation outwith the Craigellachie boundary (and thus only a very small proportion that also falls within Craigellachie has been 'double-counted' as it has already been assessed in the designated sites impact assessment in Table 7.3 above).</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>The other habitat loss consists of 0.19ha of dry heath, 0.14ha of semi-improved acid grassland, and 0.12ha of bracken, 0.01ha of dry heath/acid grassland mosaic and the remainder is of existing carriageway or bare ground.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 29 Value: Authority Area	Habitat loss	<p>Total habitat loss: 1.21</p> <p>Woodland loss: 0.66</p> <p>Other habitat loss: 0.55</p>	<p>Extent: Dualling at this location, approximately from Ch9700-Ch9900 will result in the loss of 1.21ha of habitat listed on the AWI, mostly SB. 0.66ha of habitat loss is woodland; consisting of 0.62ha of W18 <i>Pinus sylvestris</i> conifer plantation, 0.03ha of W18c semi-natural coniferous woodland and 0.01ha of semi-natural W11 <i>Betula</i> roadside woodland. The conifer plantation here is generally young with signs of forestry disturbance and a limited number of ancient woodland indicators present (Annex A).</p> <p>Other habitat loss consists of 0.26ha of acid grassland (U4), 0.02ha of scattered coniferous trees, 0.01ha of dry heath (H9), 0.02ha of scrub (W23), and the remainder of existing carriageway.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Significant
AWI ID Area 30 Value: Authority Area	Habitat loss	<p>Total habitat loss: 8.1</p> <p>Woodland loss: 3.84</p>	<p>Extent: Dualling at this location, the formation of embankments, upgrading of Tier 3 access and incorporation of SuDS ponds approximately between Ch14550-Ch15650 will result in the loss of 8.1ha of habitat listed on the AWI (NB and SB carriageways). 3.84ha of this loss is woodland. All woodland loss is of young W18 <i>Pinus sylvestris</i> woodland bordering the existing road; 3.81ha is plantation and 0.03ha is young self-seeded coniferous woodland. The woodland here is a continuation of the extensive young conifer plantation to the north and</p>		Significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
		Other habitat loss: 4.26	<p>south and does not exhibit ancient woodland characteristics. Ancient woodland indicator species are absent to sparse (with only two species recorded in one sample area - Annex A).</p> <p>Other habitat loss consists of 1.26ha of acid grassland, 0.57ha of dry heath/acid grassland mosaic, 0.38ha of dry heath, 0.33ha of swamp, 0.05ha of broom scrub, 0.09ha of acid flush, 0.03ha of blanket bog, 0.01ha of wet modified bog, 0.01ha of marshy grassland, 0.01ha of neutral grassland, 0.01ha of basin mire, and the remaining 1.51ha is of existing carriageway and tracks.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
AWI ID Area 31 Value: Authority Area	Habitat loss	<p>Total habitat loss: 0.66</p> <p>Woodland loss: 0.5</p> <p>Other habitat loss: 0.16</p>	<p>Extent: Dualling at this location and formation of Tier 3 access east of Ch5300 will result in the loss of 0.66ha of habitat listed on the AWI on the SB carriageway; 0.5ha of this is woodland. Of the woodland losses, 0.4ha is semi-natural broadleaves (W11 & W17), 0.08ha is broadleaved roadside plantation and 0.02ha is coniferous plantation (W18). This woodland is open to the public and has a low number of ancient woodland indicator species.</p> <p>The remainder of the habitat loss consists of 0.05ha of acid grassland (U4), 0.01ha of bracken, and the remainder of existing carriageway/caravan park.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		Significant

- 7.5.18 The total loss of area that is listed on the AWI is 77.2ha, of which 42.03ha is woodland; the remaining 35.17ha of loss is a mix of various open habitats, scrub and existing carriageways/tracks. The woodland areas are of varying levels of importance from National to Authority Area as per Annex H, Figure 12.8 and Table 7.5; this table also details specific losses per AW ID Area.
- 7.5.19 Overall, in terms of the 42.03ha of woodland losses in the AWI; 28.21ha is plantation woodland and 13.82ha is semi-natural. The plantation woodland loss is made up of 22.92ha of coniferous plantation, 3.68ha broadleaved plantation, and 1.61ha mixed plantation. The semi-natural woodland loss is made up of 12.37ha broadleaved woodland, 1.18ha coniferous woodland, and 0.26ha mixed woodland.
- 7.5.20 Combining the areas of similar woodland communities, irrespective of origin (i.e. plantation versus semi-natural), the above figures correspond to 24.11ha of coniferous woodland, 16.05ha of broadleaved woodland, and 1.87ha of mixed woodland. Areas of coniferous loss are for the most part W18 woodland dominated by *Pinus sylvestris*. Broadleaved losses consists of W11 (64%) and W17 (34%) *Betula* dominated woodland, with only a very small proportion of loss being damper W7 (2%) *Betula* woodland.
- 7.5.21 It can be seen from Table 7.5 that there will be losses of some areas of high quality ancient woodland that contain mature to ancient trees with a well-developed field layer that often contains relatively high numbers of ancient woodland indicator vascular species. Conversely, there are other areas of loss within the AWI that are of poorer quality, these tending to be areas of immature coniferous plantation where many of the local ancient woodland indicator species were absent or infrequent at the time of survey; although many such species may continue to persist in the underlying soils seedbank.
- 7.5.22 The significance of the residual impact of loss of individual areas of ancient woodland varies, as shown in Table 7.5, due to botanical characteristics, size and value. However, it is appropriate to consider the overall impacts of the loss of ancient woodland. Consequently, even though the loss in some specific areas may be minor and not significant in isolation, the cumulative loss of habitat listed on the AWI is 77.2ha, of which 42.03ha is woodland; this is a high impact magnitude effect on receptors valued from Authority Area to National nature conservation importance, and as such the overall effect is significant.
- 7.5.23 It is recognised that it is not possible to mitigate for the loss of ancient woodland. However, in areas where ancient woodland will be lost, the soil will be stripped, translocated, and used within areas of proposed new woodland creation in order to utilise the existing seedbank as much as possible and transfer soil organisms and specialist bacteria that may be adapted to these environments to new areas of woodland. If deadwood exists within areas of woodland loss this deadwood will also be transferred to nearby areas of ancient woodland or to areas of woodland creation, to allow the retention and transfer of specialist ancient woodland invertebrates, fungi and bacteria. Ancient or veteran trees to be felled will also be moved to new woodland creation areas for the same purposes and to act as an input of new deadwood (see full mitigation items within Table 7.2 and Table 7.3).
- 7.5.24 Areas of woodland planting and habitat creation/reinstatement are proposed as part of the Landscape and Ecological Mitigation plan, Figure 13.4. Across the Proposed Scheme approximately 77.2ha of habitat listed on the AWI will be lost, of which 42.03ha is woodland as described above. Within this AWI habitat loss area there is 50.93ha of proposed woodland replanting or open habitat re-seeding as part of the overall mitigation planting and habitat reinstatement strategy (Figure 13.4). This mitigation is made up of 22.20ha of woodland creation and 28.73ha of scrub/open habitat recreation and reinstatement. Woodland creation within the AWI will consist of the following: 12.15ha of coniferous woodland, 6.01ha of mixed woodland, 1.92ha of *Populus tremula*

woodland 1.06ha of *Betula* woodland, and 1.05ha of wet woodland. Other habitat creation and reinstatement will consist of the following: 20.68ha of acid grassland, 5.45ha of verge grassland mix, 2.08ha of dry heath, 0.5ha of wet grassland, and 0.02ha of scrub.

- 7.5.25 Overall, in total 48.16ha of woodland and scrub mitigation planting¹⁸ is proposed within the LMA using tree species and understorey seed mixtures in keeping with local communities and existing areas of ancient woodland. A further 40.81ha of woodland planting is proposed within an offsite compensation area; resulting in a total 88.97ha of woodland and scrub planting for the Proposed Scheme. The strategy explaining how suitable areas were chosen for woodland compensation planting is provided in Annex J. The summary of woodland planting and habitat creation/restoration types for the Proposed Scheme is provided in Section 7.4 above.

Operation

- 7.5.26 Effects as a result of pollution incidents will be avoided and mitigated through the built road drainage design and so is not considered further. It is considered that the road drainage design associated with the Proposed Scheme will reduce any effects from pollution to a non-significant level.

Other Terrestrial Habitats

Construction

- 7.5.27 Outwith designated sites and areas on the AWI, as assessed above, a number of other areas of habitat along the Proposed Scheme will be subject to permanent and temporary land-take and the potential effects. These areas include many common lower value habitats but also areas of Annex I or SBL priority habitat.
- 7.5.28 The remainder of the project area has been split into three separate assessment areas, as follows:
- **dry heath zone**: a substantial area of Annex I European dry heath and SBL upland heathland exists SB by Slochd, from the northern end of the Study Area to around Ch21750. This area is dominated by acid dry dwarf shrub heath communities, with small pockets of other Annex I and SBL habitats (Figures 12.5, 12.7, 12.8). This area has been assigned a nature conservation importance value of Authority Area (Annex H) and has been assessed separately (Table 7.6).
 - **blanket bog/heath zone**: a sizeable area of blanket bog and dwarf shrub heath Annex I and SBL habitats exist alongside the A9 from approximately Ch19300 - Ch21000 NB (Figures 12.5, 12.7, 12.8). Here, it forms part of a much larger mire complex mainly to the south; however, the existing A9 dissects the mire and there is a portion to the north along the SB carriageway. This is the longest stretch of blanket bog along the Proposed Scheme and has been classed as of Local importance. This area has also been assessed separately (Table 7.6).
 - **all remaining areas/habitats in the Study Area**: all areas of residual habitat, once the areas assessed above are removed, have been considered in a final assessment zone. This area spans the length of the Proposed Scheme and includes generally smaller and more fragmented areas of Annex I and SBL habitat (of no greater than Local importance) and those common habitats of Less than Local importance. As per above, effects on receptors of Less than Local value are not considered significant

¹⁸ In addition to 22.20ha of mitigation planting for woodland losses in the AWI, and the total of 48.16ha of woodland mitigation planting adjacent to the A9 within the LMA, there will be further offsite compensatory planting to offset the net loss of woodland to the Proposed Scheme as a whole. This will involve a further 40.81ha of additional compensatory planting which increases the woodland planting total to 88.97ha. It is predicted that overall there will be woodland losses totalling 88.97ha along the Proposed Scheme (see Annex I).

and are not assessed. Table 7.6 details the assessment of effects on the remaining Locally important habitats.

Table 7.6: Other Terrestrial Habitats - Specific Impacts, Mitigation and Residual Impacts – Construction

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
<p>Dry heath zone by Slochd (end of Study Area to c. Ch21750)</p> <p>Value: Authority Area</p>	Habitat loss	<p>Total habitat loss: 20.9</p> <p>The majority due to loss of dry heath: i.e. 17.3ha</p>	<p>Extent: Dualling of the carriageway, associated embankment formation and soil pinning due to steep slopes SB by Slochd will result in the gross loss of 20.9ha of habitat within this zone. This zone has been assessed separately due to the extent of dry heath locally, although it contains small pockets of other habitat types within a wider habitat mosaic.</p> <p>Of the habitat loss here, the majority is of dry heath; i.e. 17.3ha of H12, H9-H12 and H18 (with 16.3ha of this being H12). These are very common types of heath locally and regionally and make up the majority of the dry heath in the area and along the Proposed Scheme. Much of the habitat loss will be a result of creating appropriate embankments and soil pinning on steep slopes and as such not dualling of the road itself. It is likely that with habitat creation, as part of the mitigation strategy, and natural regeneration on these slopes the habitat loss will be temporary and respective dry heath habitats will return in the medium to longer term, as has been seen elsewhere on existing A9 embankments.</p> <p>The remainder of habitat losses in this zone consist of the following, in order of extent:</p> <ul style="list-style-type: none"> • 1.07ha of broadleaved woodland (W17); • 1.02ha of inland cliff/bare rock; • 0.43ha of juniper scrub (W19); • 0.33ha of wet heath (M15/M16); • 0.38ha of acid grassland (U4); • 0.14ha of existing roads/tracks; • 0.09ha of bracken (U20); • 0.08ha of blanket bog (M20); • 0.04ha of acid flush (M6); and • 0.01ha of marshy grassland (Je). 	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34.</p> <p>Habitat restoration and reinstatement within this zone will result in the recreation of 17.42ha of habitat consisting of 15.5ha of dry heath, 1.21ha of mixed woodland, 0.65ha of verge grassland mix and 0.06ha of scrub.</p> <p>After mitigation the total residual net habitat loss is 3.48ha. Residual loss of dry heath is 1.8ha. This loss is not considered significant. However, due to the inherent difficulties in</p>	Significant.

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>Of the broadleaved woodland loss, 0.93ha is semi-natural and 0.14 is plantation; all is of W17 <i>Betula</i> woodland in narrow linear bands flanking the A9. Other Annex I or SBL habitat losses here, i.e. juniper scrub, wet heath, blanket bog and acid flush, are all considered minor due to the small extent of loss.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>creating heathland habitat, and taking a precautionary approach, the overall impact is considered significant.</p>	
<p>Mosaic of habitats within blanket bog/ heath zone (c. Ch19300 - Ch21000)</p> <p>Value: Local</p>	Habitat loss	Total habitat loss: 11.24	<p>Extent: Dualling of the carriageway, formation of embankments, creation of minor roads and SuDS ponds in this area will result in the gross loss of 11.24ha of habitat. This zone has been assessed separately due to the extent of blanket bog and wet heath locally around the A9 here; and is considered to be of Local value. Although, these blanket bog and wet heath habitats are buffered from the existing A9 due to a strip of dry heath and acid grassland which borders most of the road in this area. As a result, the largest habitat loss in this zone is due to the loss of 2.13ha of dry heath (H9/H9-H12/H10/H12), including dry heath/acid grassland mosaics, present mainly along the existing verges and embankments where much of the dualling will take place.</p> <p>The losses to other habitat types within this zone consist of the following, in order of extent:</p> <ul style="list-style-type: none"> • 2.07ha of acid grassland (U4/U5/Je); • 1.86ha of blanket bog (M17/M19/M20); • 1.66ha of existing roads/tracks/infrastructure; • 0.98ha of semi-natural conifer woodland (W18); • 0.71ha of conifer plantation (W18); • 0.59ha of basin mire (M6); • 0.54ha of dry modified bog (M16); 	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34.</p> <p>Habitat restoration and reinstatement within this zone will result in the recreation of 6.62ha of habitat consisting of 3.82ha of dry heath, 0.97ha of verge grassland mix, 0.89ha of scrub, 0.83ha of</p>	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<ul style="list-style-type: none"> • 0.21ha of marshy grassland (Je); • 0.19ha of broom/gorse scrub (W23); • 0.11ha of semi-natural broadleaved woodland (W4/W17); and • 0.18ha of wet heath (M15/M16). <p>The loss of the blanket bog and wet and dry heath communities detailed above, along with losses to other Annex I or SBL habitat types, are primarily as a result of the creation of embankments for the dualled road and the incorporation of SuDS ponds. The losses are a small proportion of these habitat types within this zone, and a very small proportion of these habitats locally. Taking a precautionary approach, it is assumed that blanket bog and wet heath habitat types will be permanently lost, and there is no proposed mitigation to account for the loss to blanket bog or wet heath due to the complexities in creating these habitat types. However, the extent of the losses predicted above is considered minor in the context of the coverage and distribution of these habitat types locally.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	coniferous woodland and 0.1ha of acid grassland.	
All remaining Locally valued areas / habitats in the Study Area Value: Local	Habitat loss	Total habitat loss: 29.72 The majority of the loss is semi-natural broadleaved & mixed woodland: 19.45	Extent: Dualling of the carriageway, formation of embankments, creation of junctions, Tier 3 access roads and SuDS ponds in this remaining zone will result in the loss of 19.45ha of <i>Betula</i> dominated semi-natural broadleaved & mixed woodland. These losses are made up of a large number of small woodland parcels or groups of trees evident throughout the length of the Proposed Scheme; however, the distribution of loss is heavily weighted to the southern half of the Proposed Scheme. The majority of the losses, as would be expected, are in quite narrow or fragmented roadside bands along the A9 mainline route. The most contiguous	Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15. Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21,	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>areas of this woodland loss are NB and SD in the vicinity of Aviemore. These <i>Betula</i> dominated woodlands are common and extensive within the Study Area, and locally within the Spey valley. The quality of these woodland stands can vary markedly from location to location. However, on the whole here, it is considered that the loss of 19.45ha (equivalent to 0.19km²) of this semi-natural broadleaved and mixed woodland represents a minor loss to the total resource locally.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34.</p>	
		<p>Semi-natural coniferous woodland: 0.41</p>	<p>Extent: Dualling of the carriageway, formation of embankments, and creation of Tier 3 access roads in this zone will result in the loss of 0.41ha of semi-natural coniferous woodland (W18) which could be classed as Annex I Caledonian Forest or SBL Native Pinewood. These losses are mainly NB where the existing A9 passes over the Allt Ruighe Magaig watercourse, north of Carrbridge, and NB along the roadside from around Ch12950-Ch13250. Other losses across the Proposed Scheme are restricted to a few isolated very small losses consisting of no more than a single tree or a few trees on the outer edge of potential working areas and which will likely be avoided during construction under guidance from the ECoW. Some off the losses are also attributed to small self-seeded stands of <i>Pinus sylvestris</i>. The loss is spread across a number of stands, which does not result in the disappearance of any stands throughout the length of the Proposed Scheme. The loss of just 0.41ha of this woodland type from the Study Area is considered a minor loss of the local resource.</p> <p>Effect: Direct negative Duration: Permanent</p>	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E7, SMC-E9, SMC-E11, SMC-E12, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E17, P11-E18, P11-E19, P11-E20, P11-E21, P11-E22, P11-E23, P11-E25, P11-E26, P11-E27, P11-E34.</p>	<p>Not significant</p>

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>Frequency and timing: Single event</p> <p>Reversibility: Irreversible</p> <p>Probability: Certain</p> <p>Impact Descriptor: High</p>		
		Dry heath & dry heath/acid grassland mosaics: 8.69	<p>Extent: Dualling of the carriageway, formation of embankments, creation of junctions, Tier 3 access roads and SuDS ponds in this zone will result in the loss of 7.13ha of dry heath and 1.56ha of dry heath/acid grassland mosaics; a combined total of 8.69ha. The largest loss will be around Loch Alvie and south-west of Ballinluig from approximately Ch600-Ch1400 where a stretch of species-poor H9 heath exists NB. Other areas of dry heath loss are small and fragmented, consisting of over 50 very small pockets of dry heath scattered throughout the Study Area. The majority of these losses are of H9, H12 or H9-H12 heaths, which are common and extensive within the Study Area and locally. Most losses are also small patches around existing infrastructure, which in a number of cases are already severed, are secondary habitats resulting from heath formation on embankments for the existing A9 or are part of mosaic areas.</p> <p>The loss of 8.69ha of dry heath and dry heath/acid grassland mosaics of common NVC types within this area is considered to be a minor loss when compared to the extensiveness of dry heath within the Study Area, locally, and regionally.</p> <p>Effect: Direct negative</p> <p>Duration: Permanent</p> <p>Frequency and timing: Single event</p> <p>Reversibility: Irreversible</p> <p>Probability: Certain</p> <p>Impact Descriptor: High</p>	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E9, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E19, P11-E20, P11-E23, P11-E27, P11-E34.</p> <p>Losses predicted in many areas are likely to be temporary in the medium to long-term, as post-construction dry heath and grassland restoration within the LMA will facilitate the regeneration of these communities in certain areas, particularly embankments with thin dry acid soils).</p>	Not significant
		Blanket bog & wet modified bog: 0.21	<p>Extent: Dualling of the carriageway, formation of embankments, creation of Black Mount junction, and Tier 3 access roads in this zone will result in the loss of four patches of habitat amounting to 0.02ha of blanket bog and 0.19ha of wet modified bog. The 0.02ha</p>	Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E9, SMC-E15.	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>of M19 blanket bog loss is the result of a railway underpass in the vicinity of the junction of the railway with the A938 by Black Mount. The 0.19ha of wet modified bog losses consist of the loss of a small patch of isolated and degraded M19 which sits sandwiched between the existing A9 and the A938 north of Black Mount Junction between Ch19200-Ch19300. The remaining losses are of two small patches of M25 mire NB by the banks of the Allt Ruighe Magaig watercourse crossing, north of Carrbridge around Ch17400. The combined loss of 0.21ha of blanket bog and wet modified bog, which is fragmented and largely degraded is considered a minor loss considering the amount of these habitat types locally, many of which are much better quality.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>Project Mitigation Commitments P11-E16, P11-E19, P11-E20, P11-E23, P11-E27, P11-E34.</p>	
		Flashes: 0.08	<p>Extent: Dualling of the carriageway, formation of embankments, and upgrading Tier 3 access roads in this zone will result in the loss of three patches of flush habitat totalling a loss of 0.08ha. All three patches are acid/neutral flushes of the NVC type M6c. This habitat type falls within the SBL upland flushes, fens and swamps category – it is not attributed any further conservation value. M6c is a very common flush type and it is near ubiquitous throughout Scotland, it is also the most species-poor type of M6 flush and in the Study Area rarely amounts to little more than a dense sward of <i>Juncus effusus</i> with a basal layer of the mosses <i>Polytrichum commune</i>, <i>Sphagnum fallax</i> and <i>S. palustre</i>. The loss of 0.08ha of this habitat type is a minor loss of a very common and species-poor habitat type which is well represented in extent throughout the Study Area.</p> <p>Effect: Direct negative Duration: Permanent</p>	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E9, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E19, P11-E20, P11-E23, P11-E27, P11-E34.</p>	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha)	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Residual Impact
			<p>Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>		
		Swamp: 0.88	<p>Extent: The creation of Black Mount Junction, A938 and A95 road upgrades, Tier 3 access and SuDS ponds in this zone will result in the loss of an area of swamp habitat totalling 0.88ha. This habitat type falls within the SBL upland flushes, fens and swamps category.</p> <p>The majority of the loss is of commonplace S9 <i>Carex rostrata</i> swamp, and this loss is evident in a wet basin where part of Black Mount Junction and associated SuDS will be sited (SB); between the A938 and Northern Mainline railway. The total loss of 0.88ha of swamp habitat in the context of the extent of these habitat types locally is considered minor.</p> <p>Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High</p>	<p>Standard Mitigation Commitments SMC-E1, SMC-E2, SMC-E6, SMC-E9, SMC-E15.</p> <p>Project Mitigation Commitments P11-E16, P11-E19, P11-E20, P11-E23, P11-E27, P11-E34.</p>	Not significant

- 7.5.29 The assessment of habitat loss effects presented in Table 7.6 predicts a significant effect on the dry heath by Slochd and no significant effects on the other valued habitats affected in the respective assessment zones.
- 7.5.30 The dry heath zone at Slochd has been assigned an importance value of Authority Area. The gross area to be lost is 20.9ha, which is mainly dry heath (17.3ha) with smaller areas of associated communities. Habitat creation within this area will be undertaken as part of the Landscape and Ecological Mitigation plan (Figure 13.4) and include the recreation of 15.5ha of the dry heath habitat initially lost. Despite the initial loss of 20.9ha of habitat, after mitigation the total residual net habitat loss is 3.48ha with residual loss of dry heath being 1.8ha. However, due to the inherent difficulties in creating and maintaining heathland habitats, a precautionary approach has been taken to the residual impact assessment and this potential loss is considered significant in an Authority Area context.
- 7.5.31 The widening of the A9 is unlikely to create further fragmentation effects as the existing road cuts through many habitats, and habitat connectivity will still occur following the linear route of the road. However, fragmentation of some habitats will occur due to the construction of associated infrastructure, such as junctions and associated access roads and SuDS which will cut through areas of habitat. With respect to access roads and SuDS this is not likely to be significant given the relatively small width of these features which are not likely to be a barrier to seed dispersal.
- 7.5.32 At Granish Junction, woodland loss (Table 7.5) associated with new infrastructure may increase edge effects and fragment some areas. An effort will be made to retain as many trees as possible around this area during construction, this may create small islands of woodland within and surrounding the junction footprint. These islands may be large enough to remain viable as fragments of woodland or scattered trees that will persist and help provide continuity throughout the Proposed Scheme. These areas of woodland will also provide a seedbank for adjoining disturbed and restored habitats. Woodland planting and habitat creation will also be undertaken around this location as part of the Landscape and Ecological Mitigation plan (Figure 13.4). The habitat at this location is also already severed due to the A9, the existing junction to the A95 and minor tracks, therefore the addition of Granish junction is considered unlikely to result in significant additional edge or fragmentation effects.
- 7.5.33 In summary, no significant fragmentation or edge impacts are predicted along the Proposed Scheme. To enhance the existing habitat features, habitat reinstatement and creation will aim to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas, see Landscape and Ecological Mitigation plan (Figure 13.4).
- 7.5.34 Habitat severance due to the widening of the existing A9 is not considered to be significant, given that habitats either side of the road are already severed due to the presence of the existing A9.
- 7.5.35 Disruption to local hydrology has been avoided or reduced as far as practicable through consideration of the location of sensitive habitats at the design stage. This has included avoiding areas which potentially support GWDTE or reducing the Proposed Scheme footprint within the vicinity of these areas. The effect of the Proposed Scheme on GWDTEs is fully considered in ES Chapter 10 Geology: Soils and Groundwater; and not discussed further here.
- 7.5.36 Habitats may be affected during the construction phase as a result of changes in water quality, air pollution from dust, and silt. It is considered that the proposed mitigation measures will address these impacts such that the residual effects will not be significant.

Operation

- 7.5.37 Impacts on habitats through degradation as a result of pollution from road drainage containing oils, chemicals and salts will be mitigated through the measures embedded into the road drainage design for the Scheme, including SuDS ponds. It is also noted that these pollution sources already exist as part of the baseline conditions from the existing A9. The new drainage design and SuDS ponds will be an improvement to the existing situation and as such any current degradation effects are likely to be reduced.

8. Summary

- 8.1.1 NVC surveys were carried out within the Dalraddy to Slochd Study Area from 10th-14th April, 17th-19th April and 1st-5th May 2017 inclusive. The aim of the NVC surveys was to identify and map the vegetation communities present in order to identify those areas of greatest ecological interest: i.e. potential GWDTE, Annex I habitats, SBL priority habitats, and areas or the locations of *Populus tremula* (aspen).
- 8.1.2 The surveys revealed the presence of a wide range of habitat types, totalling 66 NVC community types within the Study Area, along with a wide range of further sub-communities. Twenty-two non-NVC habitat types or features were also recorded.
- 8.1.3 This Appendix has described in detail the vegetation communities found in the Study Area. Survey results have also been compared to a number of sensitivity classifications, indicating the presence of Annex I, SBL and potential GWDTE habitats, as summarised in Table 6.4 above. Aspen was also recorded throughout the Study Area (Annex F).
- 8.1.4 Designated site and ancient woodland characterisation surveys were carried out, in the form of recording target notes with species presence and abundance lists, and qualitative observational data. These surveys were carried out from 15th-19th May and 23rd-25th May 2017 inclusive.
- 8.1.5 A total of 161 TNs were made within the respective designated site and ancient woodland Study Areas (Figure 12.2). A total of 230 species was recorded in these TN plots (176 vascular plants, 49 bryophytes and 5 lichens; Annex A). This Appendix has detailed whether the designated sites Study Areas support, or are likely to support, species or habitats for which the site has been designated (Annex B).
- 8.1.6 In the ancient woodland Study Area, qualitative information was collected and is presented here regarding the approximate maturity of stand, whether the woodland retains ancient woodland characteristics such as a well-developed ground-flora or ancient woodland indicator species, and any notes on disturbance/degradation. Twenty-two of the vascular plant species recorded within ancient woodland TNs are considered ancient woodland indicators (see Annex A).
- 8.1.7 A botanical species list has been compiled for all species recorded within the Study Area while undertaking these surveys (Annex G). The only rare plant recorded during the course of surveys was *Pyrola media*, which was recorded in a few localities (Annex C). This species is classified as vulnerable in the Vascular Plant Red Data List for Great Britain^{xxiii}. No other rare species were recorded; however, this does not preclude their presence from the Study Area.
- 8.1.8 The desk study information and field data collected was used to inform the nature conservation importance evaluation for certain areas and habitats, and the important ecological features within the Study Area, using the methodology as described above in Section 6. Consequently, the Study Area was broken down in to numerous areas, such

as designated sites, ancient woodland areas, and other areas of important habitat and each of these were assigned an importance value (Annex H, Figure 12.8).

- 8.1.9 Each area has been subjected to an impact assessment, in which the impacts and effects on terrestrial habitats and important ecological features have been described, along with details of the mitigation and compensation measures to be employed to reduce effects where possible, and finally the significance of the residual impact.
- 8.1.10 In summary, significant residual impacts have been identified in relation to ancient woodland and the dry heath zone by Slochd. These impacts will occur during the construction phase; see Table 7.5. Standard and site-specific mitigation will be implemented do reduce impacts where feasible (Table 7.2 and Table 7.3).
- 8.1.11 With respect to ancient woodland, 77.2ha of land listed on the AWI along the length of the Proposed Scheme will be lost, of this 42.03ha is currently woodland. Losses in each ancient woodland area have been assessed in Table 7.5 above, cumulatively this has been identified as a significant impact. In areas of ancient woodland loss throughout the Proposed Scheme the soil will be stripped and re-used within areas of new woodland planting, deadwood will also be retained and translocated to suitable areas as per Table 7.2. It is acknowledged that the loss of ancient woodland cannot be mitigated and as such the loss is identified as a significant effect. However, it is noted that within the AWI habitat loss area there is 50.93ha of proposed woodland replanting or open habitat re-seeding as part of the overall mitigation planting and habitat reinstatement strategy. This mitigation is made up of 22.20ha of woodland creation and 28.73ha of scrub/open habitat recreation and reinstatement. Overall within the LMA 48.16ha of woodland and scrub mitigation planting is proposed, and a further 40.81ha of offsite compensatory planting will take place to offset the net loss of woodland to the Proposed Scheme as a whole.
- 8.1.12 With respect to the dry heath zone at Slochd, 17.3ha of dry heath will be lost. Habitat creation within this area will be undertaken as part of the Landscape and Ecological Mitigation plan (Figure 13.4) and include the recreation of 15.5ha of the dry heath habitat initially lost. After mitigation the total residual net habitat loss is 3.48ha with residual loss of dry heath being 1.8ha.

9. Glossary of Terms

acidophilous: plants/bryophytes that prefer to grow in an acidic environment.

base-poor: environments which have few chemical bases, they are dominated by environmental acids (usually organic acids) and so are acidic.

base-rich: environments which are neutral or alkaline.

base-richness: the level in soil or water of chemical bases, such as calcium or magnesium ions. Chemical bases are alkalis. Many plants and bryophytes are restricted to base-rich or base-poor environments.

basiphilous: plants/bryophytes that prefer to grow in a basic environment.

calcareous: (of soil or water) contains calcium carbonate; calcareous grassland forms on soils that are base-rich.

calcicolous: a plant that grows and thrives in soil rich in lime.

calcifugous: growing or living in acid soil.

circumneutral soil: nearly neutral, having a pH between 6.5 and 7.5.

dicotyledon: a plant that produces flowers and has two cotyledons (i.e. embryonic leaves).

forb: an herbaceous flowering plant that is not a graminoid (grasses, sedges and rushes).

graminoid: grasses; monocotyledonous, usually herbaceous plants with narrow leaves growing from the base. They include the true grasses, of the family Poaceae (also called Gramineae), as well as the sedges (Cyperaceae) and the rushes (Juncaceae).

humic rankers: shallow soils with an organic-rich (humose) surface layer overlying a weakly developed, thin subsoil on to rock.

lagg: zone where water draining a bog meets that from adjoining mineral soils. A characteristic of the lagg zone is that normally it has more available plant nutrients, is more alkaline and hence shows greater species diversity.

mesophytic: a land plant that grows in an environment having a moderate amount of moisture, neither a particularly dry nor particularly wet environment.

mesotrophic grassland: neutral grassland, characterised by vegetation dominated by grasses and herbs on a range of circumneutral soils.

monocotyledons: flowering plants group which have just one cotyledon.

mor: forest humus that forms a layer of largely organic matter distinct from the mineral soil beneath.

mosaic: a pattern of two or more vegetation types disposed in intimate relationships with one another.

oligotrophic: lacking in plant nutrients.

ombrogenous: dependant on rain for its formation. Ombrogenous bog is a peat-forming vegetation community lying above groundwater level: it is separated from the mineral soil and is thus dependent on rain water for mineral nutrients. The resulting lack of dissolved bases gives strongly acidic conditions. Two types of ombrogenous bogs are commonly distinguished: raised bogs and blanket bogs.

plagioclimax community: an area or habitat in which anthropogenic influences have prevented the habitat/ecosystem developing further. It may have been prevented from reaching its full climatic climax or shifted towards a different climax type by activities such as burning, grazing, vegetation clearance etc.

pleurocarpous: A type of moss in which the female sex organs and capsules are borne on short, lateral branches, and not at the tips of branches. Pleurocarpous mosses tend to form spreading carpets rather than erect tufts.

podsol: a soil that develops in temperate to cold moist climates under coniferous or heath vegetation; an organic mat over a grey leached layer.

siliceous: containing abundant silica; (plants) growing in or needing soil rich in silica.

soligenous: where water movements are predominantly lateral. Produced by inflow of surface water or rise of groundwater and not completely by locally precipitated water.

topogenous mire: a type of mire that forms under climatic conditions of reduced rainfall, with consequent lower humidity and summer drought, which restrict the growth of wetland vegetation to areas where precipitation is concentrated (e.g. valley bottoms).

ⁱ Joint Nature Conservancy Council (2010) Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.

ⁱⁱ Scottish Environment Protection Agency (2017) Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Version 3. Issue date: 11/09/2017.

ⁱⁱⁱ Multi-Agency Geographic Information for the Countryside (2016) Interactive Map. Available at: <http://magic.defra.gov.uk/MagicMap.aspx> (Accessed 15/06/2016).

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^{vii} Scottish Natural Heritage (2016) Natural Spaces. Available at: <http://gateway.snh.gov.uk/natural-spaces/index.jsp> (Accessed 15/06/2016).

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^x Rodwell, J.S. (2006) *NVC Users Handbook*. ISBN 978 1 86107 574 1.

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^{xvi} Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D., & Yeo, M. (2004) *An Illustrated Guide to British Upland Vegetation*. JNCC, Peterborough. ISBN 1 86107 553 7.

^{xvii} Rodwell, J. S. (ed.) (1991) *British Plant Communities*. Volume 2. Mires and Heaths. Cambridge University Press, Cambridge.

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- ^{xviii} Elkington, T., Dayton, N., Jackson, D.L., & Strachan, I.M. (2001) National Vegetation Classification: Field guide to mires and heaths. ISBN 1 86107 526 X.
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- ^{xx} Cooper, E.A. (1997) Summary Descriptions of National Vegetation Classification grassland and montane communities. ISBN 1 86107 433 3.
- ^{xxi} Rodwell, J. S. (ed.) (1995) British Plant Communities. Volume 4. Aquatic Communities, Swamps and Tall-Herb Fens. Cambridge University Press, Cambridge.
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Annex A. Designated Site & Ancient Woodland Target Note Data

- A.1.1 Table A.1 below presents the data collected at each specific target note (TN) location within the respective designated site and ancient woodland Study Areas as per Figure 12.2. A total of 161 TNs were recorded in May 2017; 153 in ancient woodland areas, 20 of these were also within designated sites, a further 8 TNs were within a designated site Study Area only.
- A.1.2 In Table A.1 each TN reference (e.g. JA1) is accompanied by a designated site (DS) or ancient woodland (AW) ID reference area. In many cases (n=20), the TN location was within both a DS and AW area.
- A.1.3 At each representative TN location, a 20m diameter plot was searched and a species list compiled. The abundance of each species was recorded using the DAFOR scale, and species were also assigned to separate vegetation layers where these existed, i.e. the canopy, understorey and ground layer. The associated NVC communities at each TN plot were also recorded; many areas were within forestry plantation, and where this is the case the NVC code has been subtended with '(P)'.
- A.1.4 Qualitative data was also collected on the age of canopy (if present), whether the woodlands retained any ancient woodland characteristics such as a well-developed field flora or the presence of recognised ancient woodland indicator species^{viii}, and notes on any signs of disturbance or degradation such as intensive grazing, burning, nutrient enrichment etc.
- A.1.5 Photographs were also taken at each TN location and due to their number (n=645) they have been provided in a separate database.
- A.1.6 The data within Table A.1 is ordered by AW ID area and then by DS ID area. All species recorded have been input for each TN location.
- A.1.7 A total of 230 species were recorded in these TN plots (176 vascular plants, 49 bryophytes and five lichens). 22 species are included in the vascular plant ancient woodland indicator list^{viii} with 7 of these in Class 1 (i.e. found in Scotland mainly in woodland habitats) and 15 in Class 2 (i.e. at least as common in non-woodland habitats).
- A.1.8 The Class 1 species recorded were *Prunus padus*, *Corylus avellana*, *Circaea x intermedia*, *Goodyera repens*, *Gymnocarpium dryopteris*, *Luzula pilosa* and *Mercurialis perennis*.
- A.1.9 The Class 2 species recorded were *Populus tremula*, *Quercus petraea*, *Anemone nemorosa*, *Brachypodium sylvaticum*, *Chrysosplenium oppositifolium*, *Conopodium majus*, *Fragaria vesca*, *Hypericum pulchrum*, *Luzula sylvatica*, *Melampyrum pratense*, *Oxalis acetosella*, *Primula vulgaris*, *Stellaria holostea*, *Trientalis europaea* and *Valeriana officinalis*.
- A.1.10 Table A.2 lists all species that were recorded in sampling of the 161 TNs, along with the frequency of samples present for each species.
- A.1.11 Within Tables A.1 and Table A.2 Class 1 species are highlighted in **bold** and Class 2 species are underlined.



Table A.1: Designated Site & Ancient Woodland Target notes

Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA14	AW - 1	287848	824000	W18a (P)	Canopy	<i>Pinus sylvestris</i>					Young plantation. Signs of forest operations and thinning.	JA14_AW1_C1
					Understorey							
					Ground layer		<i>Hylocomium splendens</i> , <i>Hypnum cupressiforme</i>	<i>Diplophyllum albicans</i> , <i>Plagiothecium undulatum</i> , <i>Polytrichastrum formosum</i>	<i>Dicranum scoparium</i> , <i>Erica cinerea</i> , <i>Erica tetralix</i> , <i>Lophocolea bidentata</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Acer pseudoplatanus</i> seedling, <i>Agrostis capillaris</i> , <i>Calluna vulgaris</i> , <i>Sorbus aucuparia</i> seedling		JA14_AW1_G1
JA15	AW - 1	287827	823989	H12	Ground layer	<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i>	<i>Pleurozium schreberi</i>		<i>Carex binervis</i> , <i>Dicranum scoparium</i> , <i>Hypnum jutlandicum</i> , <i>Lophocolea bidentata</i> , <i>Luzula pilosa</i> , <i>Peltigera hymenina</i> , <i>Polytrichum commune</i> , <i>P. strictum</i> , <i>Sphagnum fallax</i>	<i>Erica tetralix</i>	Browsing by deer.	JA15_AW1_G1, JA15_AW1_G2
JA16	AW - 1	288371	823865	W4c	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>	<i>Pinus sylvestris</i>		Semi-mature canopy. Forest operations.	JA16_AW1_C1, JA16_AW1_C2
					Understorey							JA16_AW1_U1
					Ground layer	<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Polytrichastrum formosum</i>	<i>Dicranum scoparium</i> , <i>Erica tetralix</i> , <i>Hypnum cupressiforme</i> , <i>Polytrichum commune</i> , <i>Polytrichum strictum</i> , <i>Sphagnum fallax</i>	<i>Eriophorum vaginatum</i> , <i>Juncus effusus</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium vitis-idaea</i>	<i>Aulacomnium palustre</i> , <i>Campylopus flexuosus</i> , <i>Eriophorum angustifolium</i> , <i>Pinus sylvestris</i> seedling	JA16_AW1_C2		
JA17	AW - 1	288945	823316	W18c (P)	Canopy		<i>Pinus sylvestris</i>				Young plantation. Previous forestry operations and cattle grazing.	JA17_AW1_C1
					Understorey							JA17_AW1_U1
					Ground layer	<i>Hylocomium splendens</i>	<i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Hypnum cupressiforme</i> , <i>Plagiothecium undulatum</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Diplophyllum albicans</i> , <i>Luzula pilosa</i> , <i>Vaccinium vitis-idaea</i>	<i>Dicranum fuscescens</i> , <i>Galium saxatile</i>			
JA18	AW - 1	289021	823222	H12c/U4a	Ground layer	<i>Calluna vulgaris</i> , <i>Hypnum jutlandicum</i> , <i>Juncus squarrosus</i>	<i>Agrostis capillaris</i> , <i>Galium saxatile</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> ,	<i>Genista anglica</i> , <i>Juncus effusus</i> , <i>Lycopodium clavatum</i>	<i>Carex pilulifera</i> , <i>Luzula pilosa</i> , <i>Pinus sylvestris</i> seedling, <i>Potentilla erecta</i> ,	Poached and grazed by sheep and cattle.	JA18_AW1_G1, JA18_AW1_G2	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
								<i>Polytrichastrum formosum</i>		<i>Rhytidiadelphus triquetrus</i>			
JA19	AW - 1	288445	823949	W18b (P)	Canopy	<i>Pinus sylvestris</i>						Young plantation.	JA19_AW1_C1
					Understorey			<i>Pinus sylvestris</i>					JA19_AW1_U1
					Ground layer		<i>Calluna vulgaris</i>	<i>Agrostis capillaris, Deschampsia flexuosa, Hylocomium splendens, Hypnum jutlandicum, Pleurozium schreberi</i>	<i>Empetrum nigrum, Juncus effusus, J. squarrosus, Lophocolea bidentata, Plagiothecium undulatum, Polytrichum commune, Rhytidiadelphus triquetrus, Vaccinium myrtillus, V. vitis-idaea</i>	<i>Pinus sylvestris</i> seedling, <i>Senecio jacobaea, Sorbus aucuparia</i> seedling			
JA20	AW - 1	288831	823652	W18b (P)	Canopy			<i>Pinus sylvestris</i>			Young plantation.		
					Understorey				<i>Betula pubescens, Pinus sylvestris</i>				
					Ground layer	<i>Calluna vulgaris</i>	<i>Cladonia portentosa, Hylocomium splendens, Pleurozium schreberi, Vaccinium vitis-idaea</i>	<i>Hypnum cupressiforme, Pinus sylvestris</i> seedling	<i>Aulacomnium palustre, Cladonia uncialis, Dicranum scoparium, Lophocolea bidentata, Rhytidiadelphus triquetrus</i>	<i>Sphagnum capillifolium, Vaccinium myrtillus</i>			JA20_AW1_G1, JA20_AW1_G2
JA21	AW - 2	289400	823003	W18b (P)	Canopy	<i>Pinus sylvestris</i>			<i>Betula pendula</i>		Mostly young plantation with occasional semi-natural trees. Limited AW indicators. Historical forestry activities such as old field drains.	JA21_AW2_C1, JA21_AW2_C2	
					Understorey			<i>Pinus sylvestris</i>					
					Ground layer	<i>Calluna vulgaris</i>	<i>Deschampsia flexuosa, Hylocomium splendens, Pleurozium schreberi, Vaccinium vitis-idaea</i>	<i>Hypnum cupressiforme, Vaccinium myrtillus</i>	<i>Dicranum scoparium, Erica cinerea, Lophocolea bidentata, Luzula pilosa, Pinus sylvestris</i> seedling, <i>Pyrola media, Rhytidiadelphus loreus, R. squarrosus</i>	<i>Cladonia portentosa, Cytisus scoparius</i>			JA21_AW2_G1, JA21_AW2_G2
JA22	AW - 2	289402	822861	W18c (P)	Canopy		<i>Larix decidua, Pinus sylvestris</i>				Plantation beside A9 verge. Limited disturbance.	JA22_AW2_C1	
					Understorey								
					Ground layer		<i>Hylocomium splendens, Rhytidiadelphus triquetrus</i>	<i>Agrostis capillaris, Poa trivialis, Pseudoscleropodium purum, Rhytidiadelphus squarrosus,</i>	<i>Calliergonella cuspidata, Cytisus scoparius, Deschampsia flexuosa, Holcus lanatus, Luzula pilosa, Rumex</i>	<i>Ranunculus repens, Viola riviniana</i>			JA22_AW2_G1





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
								<i>Veronica chamaedrys</i>	<i>acetosa</i> , <i>Senecio jacobaea</i> , <i>Taraxacum officinale</i> , <i>Veronica officinalis</i>			
JA23	AW - 2	289338	822994	W17b	Canopy		<i>Betula pendula</i>				Young canopy. Disturbance from verge.	JA23_AW2_C1, JA23_AW2_C2
					Understorey		<i>Cytisus scoparius</i>					
					Ground layer	<i>Hylocomium splendens</i>	<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Erica cinerea</i> , <i>Vaccinium myrtillus</i>	<i>Galium saxatile</i> , <i>Trientalis europaea</i>	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Genista anglica</i> , <i>Holcus lanatus</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Potentilla erecta</i> , <i>Viola riviniana</i>		JA23_AW2_G1
JA24	AW - 2	289374	822953	W23a	Understorey	<i>Cytisus scoparius</i>					Growth of broom on disturbed ground.	JA24_AW2_U1, JA24_AW2_U2
					Ground layer	<i>Hylocomium splendens</i>	<i>Deschampsia flexuosa</i> , <i>Holcus lanatus</i>	<i>Agrostis capillaris</i> , <i>Galium saxatile</i> , <i>Poa trivialis</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Calluna vulgaris</i> , <i>Carex pilulifera</i> , <i>Dicranum scoparium</i> , <i>Erica cinerea</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Rubus idaeus</i> , <i>Viola riviniana</i>	<i>Cirsium palustre</i>		
JA25	AW - 2	289293	822834	W11c/ W17d	Canopy		<i>Betula pendula</i>	<i>Betula pubescens</i>			Young and semi-mature trees present. AW indicator species present. Limited disturbance due to fenced boundary and proximity to A9.	JA25_AW2_C1, JA25_AW2_C2
					Understorey				<i>Cytisus scoparius</i>			JA25_AW2_U1
					Ground layer		<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Erica cinerea</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Agrostis capillaris</i> , <i>Galium saxatile</i> , <i>Pleurozium schreberi</i>	<i>Anthoxanthum odoratum</i> , <i>Luzula pilosa</i> , <i>Vaccinium myrtillus</i>	<i>Rhytidiadelphus squarrosus</i>		JA25_AW2_G1
JA26	AW - 2	289279	822879	H12a	Ground layer	<i>Calluna vulgaris</i>	<i>Betula pubescens</i> seedling, <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Betula pendula</i> seedling, <i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Peltigera membranacea</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Cytisus scoparius</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hypnum jutlandicum</i> , <i>Luzula pilosa</i> , <i>Pinus sylvestris</i> seedling		JA26_AW2_G1	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA100	AW - 3	288192	810213	W11d	Canopy			<i>Betula pendula</i>			Mature. AW indicators. Some light levels of grazing by cattle and sheep, some enrichment.	JA100_AW3_C1, JA100_AW3_C2
					Understorey							
					Ground layer		<i>Conopodium majus</i>	<i>Agrostis capillaris, Anthoxanthum odoratum, Festuca ovina, Holcus lanatus, Ranunculus repens, Rhytidiadelphus squarrosus, Rumex acetosa, R. obtusifolius, Senecio jacobaea, Trifolium repens, Veronica chamaedrys</i>	<i>Anemone nemorosa, Luzula multiflora, Plantago lanceolata</i>	<i>Hypnum cupressiforme, Viola riviniana</i>		
JA101	AW - 3	288227	810274	W7b/W11	Canopy				<i>Betula pendula</i>		Mature trees. AW indicators. Some levels of grazing and nutrient enrichment but at low levels.	JA101_AW3_C1, JA101_AW3_C2
					Understorey							
					Ground layer		<i>Juncus effusus</i>	<i>Carex nigra, Montia fontana, Nardus stricta, Potentilla erecta, Sphagnum fallax, Succisa pratensis, Viola palustris</i>	<i>Agrostis capillaris, A. stolonifera, Aneura pinguis, Anthoxanthum odoratum, Bryum pseudotriquetrum, Calliergonella cuspidata, Cardamine pratensis, Epilobium palustre, Galium palustre, G. saxatile, Holcus lanatus, Hylocomium splendens, Hypnum jutlandicum, Juncus acutiflorus, Luzula multiflora, L. pilosa, Polytrichum commune, Potentilla palustris, Rumex acetosa, Senecio jacobaea, Sphagnum palustre, Stellaria uliginosa, Vaccinium myrtillus</i>	<i>Atrichum undulatum, Betula pubescens seedling, Carex rostrata</i>		
JA74	AW - 4	290151	815624	W17d	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature birch canopy. AW indicators, well established ground flora and diversity. Light browsing, some signs of cattle grazing.	JA74_AW4_C1, JA74_AW4_C2
					Understorey			<i>Betula pendula, Betula pubescens</i>				
					Ground layer		<i>Deschampsia flexuosa, Rhytidiadelphus triquetrus</i>	<i>Calluna vulgaris, Hylocomium splendens, Vaccinium myrtillus</i>	<i>Agrostis capillaris, Anthoxanthum odoratum, Dicranum fuscescens, Luzula</i>	<i>Sorbus aucuparia seedling</i>		





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>pilosa</i> , <i>Melampyrum pratense</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Vaccinium vitis-idaea</i> , <i>Vicia sepium</i> , <i>Viola riviniana</i>			
JA87	AW - 4	290095	815431	W11c	Canopy		<i>Betula pendula</i>				Mature and possibly ancient trees. AW indicators, well-developed ground flora. Some cattle grazing and poaching.	JA87_AW4_C1, JA87_AW4_C2
					Understorey				<i>Betula pendula</i>			
					Ground layer	<i>Anthoxanthum odoratum</i>		<i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>	<i>Deschampsia flexuosa</i> , <i>Luzula pilosa</i> , <i>Ranunculus acris</i> , <i>Senecio jacobaea</i> , <i>Veronica officinalis</i>			
JA88	AW - 4	290158	815234	W11c	Canopy		<i>Betula pendula</i>				Mature trees. AW indicators, developed ground flora subject to grazing. Poaching and grazing pressure from cattle.	JA88_AW4_C1, JA88_AW4_C2
					Understorey							
					Ground layer	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Melampyrum pratense</i> , <i>Veronica chamaedrys</i> , <i>V. officinalis</i>	<i>Calluna vulgaris</i> , <i>Oxalis acetosella</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Vaccinium myrtillus</i> , <i>V. vitis-idaea</i>	<i>Anemone nemorosa</i> , <i>Crataegus monogyna</i> seedling, <i>Lathyrus linifolius</i>			
JA76	AW - 5	289991	815543	H9-H12	Ground layer	<i>Calluna vulgaris</i> , <i>Pleurozium schreberi</i>	<i>Anemone nemorosa</i> , <i>Betula pendula</i> seedling, <i>Deschampsia flexuosa</i> , <i>Galium saxatile</i> , <i>Genista anglica</i> , <i>Hylocomium splendens</i> , <i>Potentilla erecta</i>	<i>Anthoxanthum odoratum</i> , <i>Carex pilulifera</i> , <i>Cladonia portentosa</i> , <i>Cytisus scoparius</i> , <i>Hypochoeris radicata</i> , <i>Juncus squarrosus</i> , <i>Lotus corniculatus</i> , <i>Nardus stricta</i> , <i>Peltigera membranacea</i> , <i>Pilosella officinarum</i> , <i>Plantago lanceolata</i> , <i>Polytrichastrum formosum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Salix repens</i>	<i>Arctostaphylos uva-ursi</i> , <i>Carex panicea</i> , <i>Hypogymnia physodes</i> , <i>Polygala serpyllifolia</i> , <i>Valeriana officinalis</i>	Cattle grazing, slightly poached.	JA76_AW5_G1, JA76_AW5_G2, JA76_AW5_G3	
JA77	AW - 5	289881	815400	W11c	Canopy		<i>Betula pendula</i> , <i>Betula pubescens</i>				Mature and some semi-mature trees. AW indicators, established ground flora.	JA77_AW5_C1, JA77_AW5_C2
					Understorey							





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						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Rhytiadelphus triquetrus</i>	<i>Hylocomium splendens</i> , <i>Lathyrus linifolius</i> , <i>Potentilla erecta</i> , <i>Viola riviniana</i>	<i>Anemone nemorosa</i> , <i>Hypericum pulchrum</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Senecio jacobaea</i> , <i>Succisa pratensis</i> , <i>Vaccinium myrtillus</i> , <i>Veronica chamaedrys</i> , <i>Veronica serpyllifolia</i>	<i>Pyrola media</i> , <i>Sorbus aucuparia</i> seedling, <i>Trientalis europaea</i>	Some levels of cattle grazing but not too intensively.	JA77_AW5_G1, JA77_AW5_G2
JA78	AW - 5	289809	815383	W3/W4b	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i> , <i>Salix cinerea</i>			Mature trees. AW indicators, abundant <i>Sphagnum</i> cover.	JA78_AW5_C1, JA78_AW5_C2
					Understorey				<i>Betula pubescens</i>		Some grazing from cattle and some poached areas.	
					Ground layer	<i>Juncus effusus</i> , <i>Molinia caerulea</i> , <i>Sphagnum fallax</i> , <i>S. palustre</i>	<i>Carex rostrata</i> , <i>Potentilla erecta</i> , <i>Rhytiadelphus triquetrus</i> , <i>Viola palustris</i>	<i>Agrostis canina</i> , <i>Anthoxanthum odoratum</i> , <i>Carex nigra</i> , <i>Cirsium palustre</i> , <i>Dactylorhiza fuchsii</i> , <i>Eriophorum angustifolium</i> , <i>Galium palustre</i> , <i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Lathyrus linifolius</i> , <i>Oxalis acetosella</i> , <i>Rumex acetosa</i> , <i>Sphagnum capillifolium</i> , <i>Stellaria uliginosa</i>	<i>Ranunculus flammula</i> , <i>Salix cinerea</i> seedling		JA78_AW5_G1, JA78_AW5_G2	
JA80	AW - 5	289745	815221	U4b/MG10	Ground layer	<i>Agrostis capillaris</i> , <i>Festuca ovina</i> , <i>Holcus lanatus</i> , <i>Ranunculus repens</i>	<i>Achillea millefolium</i> , <i>Anthoxanthum odoratum</i> , <i>Juncus effusus</i> , <i>Prunella vulgaris</i> , <i>Trifolium repens</i>	<i>Luzula multiflora</i> , <i>Plantago lanceolata</i> , <i>P. major</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Taraxacum officinale</i> , <i>Viola palustris</i> , <i>Viola riviniana</i>		Poached and grazed	JA80_AW5_G1, JA80_AW5_G2	
JA81	AW - 5	289854	815172	W11c	Canopy		<i>Betula pendula</i>	<i>Betula pubescens</i>			Mature and some semi-mature trees.	JA81_AW5_C1, JA81_AW5_C2
					Understorey						AW indicators although some grazing impact.	
					Ground layer	<i>Anthoxanthum odoratum</i> , <i>Holcus lanatus</i> , <i>H. mollis</i>	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i>	<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Lathyrus linifolius</i> , <i>Lophocolea bidentata</i> , <i>Luzula multiflora</i> , <i>L. pilosa</i> , <i>Nardus stricta</i> , <i>Oxalis acetosella</i> , <i>Rhytiadelphus</i>	<i>Betula pubescens</i> seedling, <i>Dicranum fuscescens</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Sorbus aucuparia</i> seedling	Poached and grazed by cattle.	JA81_AW5_G1, JA81_AW5_G2	





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						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>triquetrus</i> , <i>Taraxacum officinale</i> , <i>Trientalis europaea</i> , <i>Vaccinium myrtillus</i> , <i>Veronica officinalis</i>			
JA82	AW - 5	289620	814775	W4b/ W11c	Canopy		<i>Betula pubescens</i>				Mature to ancient trees. AW indicators.	JA82_AW5_C1, JA82_AW5_C2
					Understorey					Poached and grazed by cattle.		
					Ground layer		<i>Agrostis capillaris</i> , <i>Deschampsia flexuosa</i>	<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Juncus effusus</i> , <i>Luzula pilosa</i> , <i>Potentilla erecta</i> , <i>Rhytiadelphus triquetrus</i> , <i>Sphagnum fallax</i> , <i>Trientalis europaea</i> , <i>Viola palustris</i>	<i>Aulacomnium palustre</i> , <i>Calliergonella cuspidata</i> , <i>Cardamine pratensis</i> , <i>Carex panicea</i> , <i>C. pilulifera</i> , <i>Cirsium palustre</i> , <i>Dactylorhiza fuchsii</i> , <i>Epilobium montanum</i> , <i>E. palustre</i> , <i>Galium palustre</i> , <i>Hypochoeris radicata</i> , <i>Juncus articulatus</i> , <i>Lysimachia nemorum</i> , <i>Molinia caerulea</i> , <i>Myrica gale</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus flammula</i> , <i>R. repens</i> , <i>Salix cinerea</i> seedling, <i>Sphagnum capillifolium</i> , <i>Stellaria uliginosa</i>			JA82_AW5_G1, JA82_AW5_G2
JA83	AW - 5	289559	814678	W11c	Canopy		<i>Betula pendula</i>				Mature trees with possible ancient trees in isolated areas.	JA83_AW5_C1, JA83_AW5_C2
					Understorey				<i>Betula pubescens</i>		AW indicators, diverse and well-developed understorey.	
					Ground layer		<i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Deschampsia flexuosa</i> , <i>Oxalis acetosella</i> , <i>Viola riviniana</i>	<i>Anthoxanthum odoratum</i> , <i>Blechnum spicant</i> , <i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Rhytiadelphus squarrosus</i> , <i>R. triquetrus</i> , <i>Succisa pratensis</i> , <i>Vaccinium myrtillus</i>	<i>Lathyrus linifolius</i> , <i>Taraxacum officinale</i> , <i>Veronica chamaedrys</i>	<i>Sorbus aucuparia</i> seedling	Poached and grazed ground storey from cattle.	JA83_AW5_G1, JA83_AW5_G2
JA84	AW - 5	289523	814628	W17b	Canopy		<i>Betula pendula</i>			Mature and some semi-mature trees. AW indicators,	JA84_AW5_C1, JA84_AW5_C2	





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						Dominant	Abundant	Frequent	Occasional	Rare		
					Understorey					<i>Salix cinerea</i>	established ground flora, grazing impacts much less. Low level of cattle grazing, some browsing from deer.	JA84_AW5_G1, JA84_AW5_G2
					Ground layer		<i>Calluna vulgaris, Deschampsia flexuosa, Holcus lanatus, Hylocomium splendens, Pleurozium schreberi, Succisa pratensis</i>	<i>Anemone nemorosa, Anthoxanthum odoratum, Galium saxatile, Pteridium aquilinum, Vaccinium myrtillus</i>	<i>Carex pilulifera, Erica cinerea, Rhytidiadelphus triquetrus, Sorbus aucuparia seedling, Vaccinium vitis-idaea, Viola riviniana</i>	<i>Lathyrus linifolius</i>		
JA90	AW – 6A	290059	814912	M28	Ground layer	<i>Iris pseudacorus</i>	<i>Caltha palustris, Mentha aquatica</i>	<i>Galium aparine, Heracleum sphondylium, Rumex acetosa</i>	<i>Cardamine flexuosa, Carex rostrata, Epilobium montanum, Glyceria fluitans, Juncus effusus, Ranunculus repens, Senecio jacobaea, Urtica dioica</i>		Poached and grazed by cattle.	JA90_AW6_G1
JA91	AW – 6A	290099	814973	W11c	Canopy		<i>Betula pendula</i>	<i>Betula pubescens</i>			Mature possibly ancient trees. AW indicators, established ground flora. Poached and grazed by cattle.	JA91_AW6_C1, JA91_AW6_C2
					Understorey							
					Ground layer		<i>Agrostis capillaris, Anemone nemorosa, Anthoxanthum odoratum, Hylocomium splendens, Rhytidiadelphus triquetrus, Viola riviniana</i>	<i>Dicranum scoparium, Potentilla erecta, Pseudoscleropodium purum</i>	<i>Conopodium majus, Deschampsia flexuosa, Galium saxatile, Lathyrus linifolius, Rhytidiadelphus squarrosus, Veronica chamaedrys, V. officinalis</i>	<i>Oxalis acetosella</i>		JA91_AW6_G1, JA91_AW6_G2
JA92	AW – 6A	290192	815110	W18c	Canopy		<i>Betula pubescens, Pinus sylvestris</i>				Small patch of mature and ancient trees. AW indicators, well established ground flora, Pine dead wood.	JA92_AW6_C1, JA92_AW6_C2, JA92_AW6_C3
					Understorey				<i>Betula pubescens</i>			
					Ground layer		<i>Anthoxanthum odoratum, Holcus lanatus, Rhytidiadelphus squarrosus</i>	<i>Deschampsia flexuosa, Galium saxatile, Hylocomium splendens, Luzula pilosa, Potentilla erecta, Veronica chamaedrys, Viola riviniana</i>	<i>Lathyrus linifolius, Pleurozium schreberi, Rhytidiadelphus triquetrus, Urtica dioica</i>	<i>Oxalis acetosella, Rubus idaeus, Rumex obtusifolius, Sorbus aucuparia seedling</i>	Some poaching and grazing cattle but not too intensive.	JA92_AW6_G1, JA92_AW6_G2
JA93	AW – 6A	290035	814815	W11d	Canopy			<i>Betula pendula</i>			Mature small stand. No AW species.	JA93_AW6_C1, JA93_AW6_C2
					Understorey							





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer	<i>Holcus lanatus</i>	<i>Festuca ovina</i> , <i>Pleurozium schreberi</i> , <i>Rhytiadelphus squarrosus</i>	<i>Heracleum sphondylium</i> , <i>Veronica chamaedrys</i>	<i>Ranunculus repens</i> , <i>Senecio jacobaea</i>	<i>Acer pseudoplatanus</i> seedling, <i>Potentilla erecta</i>	Species-poor, semi-improved, grazed at times.	JA93_AW6_G1, JA93_AW6_G2
JA94	AW – 6A	289977	814853	W11c	Canopy	<i>Quercus petraea</i>					Mature and ancient oak open canopy. AW indicators, well-developed ground flora. No signs of any disturbance apart from light deer browsing.	JA94_AW6_C1, JA94_AW6_C2
					Understorey				<i>Betula pendula</i>			
					Ground layer		<i>Anemone nemorosa</i> , <i>Holcus lanatus</i>	<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Thuidium tamariscinum</i>	<i>Deschampsia flexuosa</i> , <i>Hypnum cupressiforme</i> , <i>Lathyrus linifolius</i>			
JA95	AW – 6A	290036	814941	W11d	Canopy	<i>Populus tremula</i>			<i>Betula pendula</i>		Mature aspen. Some AW indicators, low variety of species. Low levels of disturbance.	JA95_AW6_C1, JA95_AW6_C2
					Understorey			<i>Acer pseudoplatanus</i>	<i>Betula pendula</i> , <i>Rosa canina</i>			
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i>	<i>Acer pseudoplatanus</i> seedling, <i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Deschampsia flexuosa</i> , <i>Pleurozium schreberi</i> , <i>Primula vulgaris</i> , <i>Pteridium aquilinum</i> , <i>Thuidium tamariscinum</i> , <i>Viola riviniana</i>	<i>Holcus lanatus</i> , <i>Rubus idaeus</i>			
JA96	AW – 6A	290066	815067	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature trees. AW indicators, low species variety. No clear signs of disturbance, some evidence of deer browsing.	JA96_AW6_C1, JA96_AW6_C2
					Understorey				<i>Betula pendula</i> , <i>B. pubescens</i>			
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Holcus lanatus</i> , <i>Rhytiadelphus triquetrus</i>	<i>Deschampsia flexuosa</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Rhytiadelphus squarrosus</i>	<i>Acer pseudoplatanus</i> seedling, <i>Conopodium majus</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Polytrichum commune</i> , <i>Ranunculus acris</i> , <i>Senecio jacobaea</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>			
JA97	AW – 6A	290086	815189	H12c	Ground layer		<i>Anthoxanthum odoratum</i> , <i>Betula</i>	<i>Anemone nemorosa</i> , <i>Nardus stricta</i> , <i>Pleurozium</i>	<i>Carex pilulifera</i> , <i>Holcus lanatus</i> , <i>Hypericum pulchrum</i> ,		AW indicators, heathy grassland cover along telephone line corridor in birch	JA97_AW6_G1, JA97_AW6_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
							<i>pubescens</i> seedling, <i>B. pendula</i> seedling, <i>Calluna vulgaris</i> , <i>Hylocomium splendens</i>	<i>schreberi</i> , <i>Potentilla erecta</i> , <i>Rhytidadelphus triquetrus</i>	<i>Luzula pilosa</i> , <i>Polygala serpyllifolia</i> , <i>Senecio jacobaea</i> , <i>Trientalis europaea</i> , <i>Vaccinium myrtillus</i> , <i>V. vitis-idaea</i> , <i>Valeriana officinalis</i> , <i>Veronica chamaedrys</i>		woodland. Signs of deer browsing but otherwise low disturbance levels.		
JA98	AW – 6A	289945	815168	W7/W11d	Canopy		<i>Betula pendula</i>				Mature and some ancient trees.	JA98_AW6_C1, JA98_AW6_C2	
					Understorey						AW indicators, well developed ground flora.		
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Ranunculus repens</i>	<i>Agrostis canina</i> , <i>Juncus effusus</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Pseudoscleropodium purum</i> , <i>Senecio jacobaea</i> , <i>Succisa pratensis</i> , <i>Urtica dioica</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>	<i>Brachythecium rutabulum</i> , <i>Calliergonella cuspidata</i> , <i>Hypnum cupressiforme</i> , <i>Luzula multiflora</i> , <i>Prunella vulgaris</i> , <i>Rhytidadelphus squarrosus</i> , <i>R. triquetrus</i>			JA98_AW6_G1, JA98_AW6_G2	
JA99	AW – 6C	289816	814755	W11c	Canopy	<i>Quercus petraea</i>					Ancient trees. AW indicators, well developed ground flora with some dead wood scattered around.	JA99_AW6_C1, JA99_AW6_C2, JA99_AW6_C3	
					Understorey				<i>Betula pendula</i>			Low levels of disturbance with only deer browsing. Works area very close to woodland.	
					Ground layer		<i>Anemone nemorosa</i> , <i>Deschampsia flexuosa</i> , <i>Holcus lanatus</i> , <i>Oxalis acetosella</i>	<i>Anthoxanthum odoratum</i> , <i>Hypnum cupressiforme</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Rhytidadelphus triquetrus</i> , <i>Trientalis europaea</i> , <i>Veronica chamaedrys</i>	<i>Carex pilulifera</i> , <i>Dicranum fuscescens</i> , <i>Galium saxatile</i> , <i>Hylocomium splendens</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Rhytidadelphus loreus</i> , <i>Rumex acetosa</i> , <i>Sorbus aucuparia</i> seedling, <i>Stellaria holostea</i> , <i>Succisa pratensis</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>			JA99_AW6_G1, JA99_AW6_G2, JA99_AW6_G3, JA99_AW6_G4	
JA45	AW – 7A	291051	817928	W11c	Canopy		<i>Betula pubescens</i>	<i>Betula pendula</i>			Mature trees. AW indicators.	JA45_AW7a_C1, JA45_AW7a_C2	
					Understorey				<i>Juniperus communis</i>			Low disturbance levels, light browsing by deer.	JA45_AW7a_U1
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i>	<i>Anemone nemorosa</i> , <i>Conopodium majus</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Rhytidadelphus</i>	<i>Holcus lanatus</i> , <i>Lathyrus linifolius</i> , <i>Pleurozium schreberi</i> , <i>Pseudoscleropodium purum</i> ,	<i>Ajuga reptans</i>			JA45_AW7a_G1, JA45_AW7a_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
								<i>triquetrus</i> , <i>Vaccinium myrtillus</i> , <i>Viola riviniana</i>	<i>Rhytidiadelphus squarrosus</i>			
JA46	AW – 7A	291084	817961	W17d	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature and ancient trees. AW indicators, well developed ground flora. Low level browsing, very limited signs of disturbance.	JA46_AW7a_C1, JA46_AW7a_C2
					Understorey				<i>Cytisus scoparius</i> , <i>Juniperus communis</i>			
					Ground layer		<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Erica cinerea</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Vaccinium myrtillus</i> , <i>Veronica officinalis</i>	<i>Anemone nemorosa</i> , <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Viola riviniana</i>			JA46_AW7a_G1, JA46_AW7a_G2
JA43	AW – 7B DS - 6	291061	817725	W17d	Canopy			<i>Pinus sylvestris</i>	<i>Betula pubescens</i> , <i>Picea sitchensis</i> , <i>Quercus petraea</i>		Mature canopy. AW indicators, well-developed ground flora. Light browsing, very little disturbance.	JA43_AW7_DS6_C1, JA43_AW7_DS6_C2, JA43_AW7_DS6_C3, JA43_AW7_DS6_C4, JA43_AW7_DS6_C5
					Understorey				<i>Betula pubescens</i>			JA43_AW7_DS6_U1, JA43_AW7_DS6_U2
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Ajuga reptans</i> , <i>Anemone nemorosa</i> , <i>Betula pubescens</i> seedling, <i>Conopodium majus</i> , <i>Dicranum scoparium</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Primula vulgaris</i> , <i>Pteridium aquilinum</i> , <i>Vaccinium vitis-idaea</i> , <i>Viola riviniana</i>	<i>Fagus sylvatica</i> seedling		JA43_AW7_DS6_G1, JA43_AW7_DS6_G2, JA43_AW7_DS6_G3, JA43_AW7_DS6_G4
JA44	DS - 6	291053	817763	W3/S9a/ SW	Canopy		<i>Salix cinerea</i>				Semi-mature canopy. Low disturbance levels. SW = standing water.	JA44_DS6_C1
					Understorey							
					Ground layer	<i>Carex rostrata</i>		<i>Calliergonella cuspidata</i> , <i>Carex nigra</i> , <i>Galium palustre</i> , <i>Lobelia dortmanna</i> , <i>Ranunculus flammula</i> , <i>Sphagnum fallax</i>	<i>Agrostis canina</i> , <i>Cardamine pratensis</i> , <i>Epilobium palustre</i> , <i>Equisetum fluviatile</i> , <i>Glyceria fluitans</i> , <i>Juncus effusus</i>	<i>Potentilla anserina</i>		JA44_DS1_G1, JA44_DS1_G2, JA44_DS1_G3, JA44_DS1_G4
JA1	AW - 8A	284428	824197	W11c	Canopy	<i>Betula pubescens</i>					Semi-mature canopy. AW indicator species present. Lightly grazed.	JA1_AW8a_C1, JA1_AW8a_C2
					Understorey				<i>Juniperus communis</i>			JA1_AW8a_U1
					Ground layer		<i>Rhytidiadelphus squarrosus</i>	<i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Anthoxanthum</i>	<i>Galium saxatile</i> , <i>Hylocomium splendens</i> ,	<i>Lathyrus linifolius</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> ,		JA1_AW8a_G1





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
								<i>odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Trientalis europaea</i>	<i>Pseudoscleropodium purum</i> , <i>Sorbus aucuparia</i> seedling, <i>Succisa pratensis</i>	<i>Senecio jacobaea</i> , <i>Stellaria holostea</i> , <i>Vaccinium myrtillus</i> , <i>Viola riviniana</i>			
JA2	AW – 8A	284541	824134	W11d	Canopy	<i>Betula pubescens</i>						Mature canopy. AW indicators present, low levels of grazing and mature trees.	JA2_AW8a_C1
					Understorey					<i>Corylus avellana</i>	JA2_AW8a_U1		
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Holcus lanatus</i> , <i>Primula vulgaris</i>	<i>Agrostis capillaris</i> , <i>Oxalis acetosella</i> , <i>Stellaria holostea</i> , <i>Viola riviniana</i>	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i> , <i>Hypnum cupressiforme</i> , <i>Juncus effusus</i> , <i>Ranunculus repens</i> , <i>Rhytidiadelphus squarrosus</i> , <i>R. triquetrus</i> , <i>Taraxacum officinale</i> , <i>Thuidium tamariscinum</i> , <i>Urtica dioica</i>	<i>Agrostis stolonifera</i> , <i>Brachythecium rutabulum</i> , <i>Deschampsia cespitosa</i> , <i>D. flexuosa</i> , <i>Lophocolea bidentata</i> , <i>Montia fontana</i> , <i>Pseudoscleropodium purum</i> , <i>Senecio jacobaea</i> , <i>Sorbus aucuparia</i> seedling	JA2_AW8a_G1		
JA3	AW – 8A	284639	824035	U4b	Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Festuca ovina</i> , <i>Rhytidiadelphus squarrosus</i>	<i>Hylocomium splendens</i>	<i>Achillea millefolium</i> , <i>Conopodium majus</i> , <i>Dactylis glomerata</i> , <i>Galium saxatile</i> , <i>Pleurozium schreberi</i> , <i>Rumex acetosa</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>		Low levels of grazing.	JA3_AW8a_U1, JA3_AW8a_U2	
JA4	AW – 8B	284579	823980	W3/W7b	Canopy	<i>Betula pubescens</i>						Mature canopy and mature trees in stand. AW indicators present. Low levels of grazing and nutrient enrichment.	JA4_AW8b_C1
					Understorey			<i>Betula pubescens</i>			JA4_AW8b_U1		
					Ground layer	<i>Carex rostrata</i> , <i>Juncus effusus</i>	<i>Calliergonella cuspidata</i> , <i>Caltha palustris</i> , <i>Deschampsia cespitosa</i> , <i>Glyceria fluitans</i>	<i>Brachythecium rutabulum</i> , <i>Chrysosplenium oppositifolium</i> , <i>Conopodium majus</i> , <i>Epilobium palustre</i> , <i>Filipendula ulmaria</i> , <i>Galium palustre</i> , <i>Lathyrus linifolius</i> , <i>Montia fontana</i> , <i>Primula vulgaris</i> , <i>Ranunculus ficaria</i> , <i>Rhizomnium punctatum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Stellaria uliginosa</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>	<i>Ajuga reptans</i> , <i>Anemone nemorosa</i> , <i>Calliergon giganteum</i> , <i>Cardamine pratensis</i> , <i>Mercurialis perennis</i> , <i>Pellia epiphylla</i> , <i>Ranunculus flammula</i>	JA4_AW8b_U1			





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA5	AW – 8A	284676	823957	W17d	Canopy	<i>Betula pubescens</i>					Mature trees. AW indicators present.	JA5_AW8a_C1
					Understorey					<i>Juniperus communis</i>	Very light grazing/nutrient enrichment.	JA5_AW8a_U1
					Ground layer		<i>Anthoxanthum odoratum, Deschampsia flexuosa, Rhytidiadelphus triquetrus</i>	<i>Agrostis capillaris, Calluna vulgaris, Carex pilulifera, Dicranum scoparium, Erica cinerea, Hieracium sp., Hylocomium splendens, Luzula pilosa, Pleurozium schreberi</i>	<i>Helianthemum nummularium, Lotus corniculatus, Potentilla erecta, Senecio jacobaea, Succisa pratensis, Veronica officinalis, Viola riviniana</i>	<i>Conopodium majus, Deschampsia cespitosa, Lathyrus linifolius, Rhytidiadelphus squarrosus, Thymus polytrichus, Veronica chamaedrys</i>		JA5_AW8a_G1
JA11	AW - 9	287688	824169	W18a/b (P)	Canopy	<i>Pinus sylvestris</i>					Plantation, even aged Scot's Pine.	JA11_AW9_C1
					Understorey				<i>Betula pubescens</i>		Signs of former forest operations with forester tracks.	JA11_AW9_U1
					Ground layer		<i>Deschampsia flexuosa, Rhytidiadelphus triquetrus</i>	<i>Calluna vulgaris, Erica cinerea, Hylocomium splendens, Hypnum cupressiforme, Luzula pilosa, Vaccinium myrtillus, V. vitis-idaea</i>	<i>Pleurozium schreberi</i>	<i>Cytisus scoparius, Sorbus aucuparia seedling</i>		JA11_AW9_G1
JA12	AW - 9	287875	824170	W18c (P)	Canopy	<i>Pinus sylvestris</i>					Plantation with occasional semi-mature tree.	JA12_AW9_C1, JA12_AW9_C2
					Understorey						AW indicators, limited grazing signs.	
					Ground layer	<i>Pleurozium schreberi</i>	<i>Deschampsia flexuosa, Galium saxatile</i>	<i>Holcus lanatus, Hylocomium splendens, Oxalis acetosella, Polytrichum commune</i>	<i>Blechnum spicant, Deschampsia cespitosa, Luzula pilosa, Potentilla erecta, Sphagnum girgensohnii, Vaccinium vitis-idaea</i>	<i>Sorbus aucuparia seedling, Veronica officinalis</i>	Forestry operations.	JA12_AW9_G1, JA12_AW9_G2
JA13	AW - 9	287832	824186	W4b/W7b/W11d	Canopy	<i>Betula pubescens</i>					Semi-mature canopy with AW indicators present.	JA13_AW9_C1, JA13_AW9_C2
					Understorey				<i>Salix cinerea</i>		No grazing.	JA13_AW9_U1, JA13_AW9_U2
					Ground layer		<i>Holcus lanatus, Oxalis acetosella, Pleurozium schreberi, Polytrichum commune, Rhytidiadelphus triquetrus</i>	<i>Cardamine pratensis, Hylocomium splendens, Plagiochila asplenioides, Sphagnum fallax</i>	<i>Chrysosplenium oppositifolium, Cirsium palustre, Deschampsia cespitosa, Equisetum palustre, Galium palustre, Kindbergia praelonga, Luzula pilosa, Luzula sylvatica, Plagiomnium undulatum, Ranunculus repens, Rhizomnium</i>		JA13_AW9_G1, JA13_AW9_G2	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
									<i>punctatum</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Rumex acetosa</i> , <i>Stellaria holostea</i> , <i>Stellaria uliginosa</i> , <i>Thuidium tamariscinum</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>				
JA6	AW – 10A	284332	824386	W11d	Canopy	<i>Betula pubescens</i>						Mature trees. AW indicators present.	JA6_AW10_C1
					Understorey					<i>Juniperus communis</i>	Very light grazing/nutrient enrichment.		
					Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Oxalis acetosella</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Stellaria holostea</i> , <i>Viola riviniana</i>	<i>Betula pubescens</i> seedling, <i>Calluna vulgaris</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Sorbus aucuparia</i> seedling, <i>Thuidium tamariscinum</i> , <i>Veronica chamaedrys</i>	<i>Anemone nemorosa</i> , <i>Digitalis purpurea</i>		JA6_AW10_G1, JA6_AW10_G2	
JA7	AW – 10A	284315	824427	U4a	Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Festuca ovina</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus squarrosus</i>	<i>Galium saxatile</i> , <i>Pleurozium schreberi</i> , <i>Stellaria holostea</i> , <i>Viola riviniana</i>	<i>Ajuga reptans</i> , <i>Campanula rotundifolia</i> , <i>Carex pilulifera</i> , <i>Holcus lanatus</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Primula vulgaris</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Senecio jacobaea</i>	<i>Betula pubescens</i> seedling, <i>Cardamine pratensis</i> , <i>Cirsium vulgare</i> , <i>Rumex acetosa</i> , <i>Veronica officinalis</i>	Low grazing levels below heath area, low enrichment levels.	JA7_AW10_G1, JA7_AW10_G2	
JA8	AW – 10A	284218	824533	W3	Canopy				<i>Betula pubescens</i>		Ancient canopy and AW indicator species present.	JA8_AW10_C1, JA8_AW10_C2	
					Understorey						Some evidence of grazing but with low intensity from deer and sheep.		
					Ground layer	<i>Juncus effusus</i>	<i>Calliergonella cuspidata</i>	<i>Carex rostrata</i> , <i>Cirsium palustre</i> , <i>Equisetum fluviatile</i> , <i>Galium palustre</i> , <i>Holcus lanatus</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i>	<i>Aneura pinguis</i> , <i>Caltha palustris</i> , <i>Cardamine pratensis</i> , <i>Epilobium palustre</i> , <i>Montia fontana</i> , <i>Primula vulgaris</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Rumex obtusifolius</i> , <i>Salix cinerea</i> seedling, <i>Sphagnum squarrosum</i> , <i>Taraxacum officinale</i> , <i>Viola palustris</i>	<i>Betula pubescens</i> seedling, <i>Cardamine flexuosa</i> , <i>Dichodontium palustre</i> , <i>Lychnis flos-cuculi</i> , <i>Potentilla erecta</i> , <i>Sphagnum fallax</i> , <i>Tussilago farfara</i>		JA8_AW10_G1, JA8_AW10_G2	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA9	AW – 10A	284180	824668	H10a	Ground layer	<i>Calluna vulgaris</i>	<i>Hylocomium splendens</i>	<i>Cladonia portentosa</i> , <i>Juniperus communis</i>	<i>Deschampsia flexuosa</i> , <i>Erica cinerea</i> , <i>Hypnum jutlandicum</i> , <i>Lathyrus linifolius</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anemone nemorosa</i> , <i>Betula pubescens</i> seedling, <i>Dicranum majus</i> , <i>D. scoparium</i> , <i>Hypericum pulchrum</i> , <i>Plagiothecium undulatum</i>	Evidence of grazing.	JA9_AW10_G1, JA9_AW10_G2
JA10	AW – 10A	284164	824678	W17d	Canopy		<i>Betula pubescens</i>				Young regeneration. AW indicator species present.	JA10_AW10_C1
					Understorey					<i>Juniperus communis</i>	Lightly grazed, no enrichment, lack of mature birch.	
					Ground layer		<i>Calluna vulgaris</i> , <i>Erica cinerea</i> , <i>Hylocomium splendens</i>	<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Blechnum spicant</i> , <i>Dicranum scoparium</i> , <i>Hypericum pulchrum</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Viola riviniana</i>	<i>Carex pilulifera</i> , <i>Lathyrus linifolius</i> , <i>Succisa pratensis</i>		JA10_AW10_G1, JA10_AW10_G2
JA47	AW – 11A	290012	822091	W18b (P)	Canopy	<i>Pinus sylvestris</i>					Young plantation. No AW indicators.	JA47_AW11a_C1, JA47_AW11a_C2
					Understorey				<i>Betula pubescens</i>		Trees are secondary generation with tree stump remains from previous forest operations.	
					Ground layer		<i>Calluna vulgaris</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Vaccinium vitis-idaea</i>	<i>Hypnum cupressiforme</i> , <i>Plagiomnium undulatum</i> , <i>Polytrichum commune</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Sorbus aucuparia</i> seedling	<i>Betula pubescens</i> seedling		JA47_AW11a_G1, JA47_AW11a_G2
JA49	AW – 11A	289682	822395	W11c	Canopy		<i>Betula pubescens</i> , <i>Salix cinerea</i>				Young with some semi-mature trees. AW indicator species present.	JA49_AW11a_C1, JA49_AW11a_C2
					Understorey		<i>Betula pubescens</i>				Located on waste ground of industrial site.	
					Ground layer		<i>Rhytidiadelphus triquetrus</i>	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i>	<i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hypnum cupressiforme</i> , <i>Rubus idaeus</i> , <i>Senecio jacobaea</i> , <i>Viola riviniana</i>	<i>Anemone nemorosa</i> , <i>Cerastium fontanum</i> , <i>Dryopteris dilatata</i> , <i>Vaccinium myrtillus</i> , <i>Veronica officinalis</i>		JA49_AW11a_G1
JA50	AW – 11A	290087	822203	W18b (P)	Canopy		<i>Pinus sylvestris</i>		<i>Betula pubescens</i>		Young plantation with occasional semi-mature tree.	JA50_AW11a_C1, JA50_AW11a_C2
					Understorey				<i>Cytisus scoparius</i>		No AW species.	
					Ground layer		<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> ,	<i>Calluna vulgaris</i> , <i>Vaccinium vitis-idaea</i>	<i>Betula pubescens</i> seedling, <i>Pinus sylvestris</i> seedling, <i>Vaccinium myrtillus</i>	<i>Cladonia uncialis</i> , <i>Dicranum fuscescens</i> ,	Forestry operations.	JA50_AW11a_G1, JA50_AW11a_G1, JA50_AW11a_G2





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						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Pleurozium schreberi</i>			<i>Hypogymnia physodes</i>		
JA52	AW – 11A	290381	821839	CF	Recent conifer plantation clear-fell							
JA53	AW – 11A	289943	822333	W11c	Canopy		<i>Betula pendula</i>		<i>Pinus sylvestris</i>		Semi-mature and mature trees. AW indicator species. Low disturbance apart from forest operations close by.	JA53_AW11a_C1, JA53_AW11a_C2
					Understorey				<i>Betula pendula,</i> <i>Cytisus scoparius</i>			
					Ground layer		<i>Deschampsia flexuosa,</i> <i>Rhytidiadelphus triquetrus</i>	<i>Holcus lanatus,</i> <i>H. mollis, Luzula pilosa,</i> <i>Mnium hornum, Pleurozium schreberi</i>	<i>Dryopteris dilatata,</i> <i>Polytrichastrum formosum, Senecio jacobaea,</i> <i>Sorbus aucuparia seedling,</i> <i>Vaccinium myrtillus,</i> <i>V. vitis-idaea,</i> <i>Veronica officinalis</i>	<i>Betula pubescens</i> seedling, <i>Taraxacum officinale</i>		JA53_AW11a_G1, JA53_AW11a_G2
JA54	AW – 11A	289765	822505	BG	Bare ground							JA54_AW11a_G1, JA54_AW11a_G2
JA59	AW – 11B	290844	820644	W18b (P)	Canopy		<i>Pinus sylvestris</i>				Young plantation with species-poor understorey. Forestry operations.	JA59_AW11b_C1, JA59_AW11b_C2
					Understorey			<i>Betula pubescens</i>				
					Ground layer		<i>Deschampsia flexuosa,</i> <i>Hylocomium splendens,</i> <i>Pleurozium schreberi,</i> <i>Rhytidiadelphus triquetrus,</i> <i>Vaccinium myrtillus</i>	<i>Calluna vulgaris,</i> <i>Hypnum cupressiforme,</i> <i>Luzula pilosa,</i> <i>Vaccinium vitis-idaea</i>	<i>Agrostis capillaris,</i> <i>Anthoxanthum odoratum, Betula pubescens</i> seedling, <i>Dicranum scoparium,</i> <i>Plagiomnium undulatum</i>			JA59_AW11b_G1, JA59_AW11b_G2
JA62	AW – 11B	290731	820567	W18c (P)	Canopy		<i>Pinus sylvestris</i>		<i>Betula pendula</i>		Mostly young plantation with some older plantation. Occasional mature or ancient Scot's Pine trees seen.	JA62_AW11b_C1, JA62_AW11b_C2
					Understorey							
					Ground layer		<i>Hylocomium splendens,</i> <i>Rhytidiadelphus triquetrus</i>	<i>Deschampsia flexuosa, Hypnum cupressiforme,</i> <i>Plagiomnium undulatum,</i> <i>Pleurozium schreberi</i>	<i>Calluna vulgaris,</i> <i>Dicranum fuscescens, Luzula pilosa,</i> <i>Pinus sylvestris</i> seedling, <i>Vaccinium myrtillus,</i> <i>V. vitis-idaea,</i> <i>Veronica officinalis</i>	<i>Betula pendula</i> seedling		JA62_AW11b_G1, JA62_AW11b_G2
JA27	AW – 11B	291109	819677	W17b/ W18b (P)	Canopy		<i>Betula pendula</i>	<i>Betula pubescens,</i> <i>Pinus sylvestris</i>			Young plantation. Light browsing from deer.	JA27_AW11b_C1
					Understorey		<i>Betula pendula,</i> <i>Pinus sylvestris</i>		<i>Salix cinerea</i>			JA27_AW11b_U1
					Ground layer	<i>Hylocomium splendens</i>	<i>Calluna vulgaris</i>	<i>Betula pendula</i> seedling, <i>Deschampsia flexuosa, Pleurozium</i>	<i>Lophocolea bidentata, Luzula pilosa</i>	<i>Anemone nemorosa</i>		JA27_AW11b_G1





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						Dominant	Abundant	Frequent	Occasional	Rare		
								<i>schreberi</i> , <i>Polytrichastrum formosum</i> , <i>Rhytiadelphus triquetrus</i> , <i>Trientalis europaea</i>				
JA28	AW – 11B	291085	819708	W18b (P)	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i> , <i>Pinus sylvestris</i>			Mix of dominant young plantation with some semi-mature trees.	JA28_AW11b_C1
					Understorey						AW indicator species.	JA28_AW11b_U1
					Ground layer		<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Vaccinium myrtillus</i> , <i>Vaccinium vitis-idaea</i>	<i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Hypnum cupressiforme</i> , <i>Pleurozium schreberi</i> , <i>Rhytiadelphus triquetrus</i>	<i>Anemone nemorosa</i> , <i>Galium saxatile</i> , <i>Luzula pilosa</i> , <i>Polytrichastrum formosum</i> , <i>Trientalis europaea</i>	<i>Sorbus aucuparia</i> seedling	No recent disturbance due to close proximity to A9.	JA28_AW11b_G1
JA29	AW – 11B	291107	819748	W17b/ W17d	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>		<i>Pinus sylvestris</i> , <i>Sorbus aucuparia</i>	Semi-mature and mature canopy with AW indicator species present. No recent signs of disturbance.	JA29_AW11b_C1, JA29_AW11b_C2
					Understorey		<i>Betula pubescens</i>	<i>Betula pendula</i>	<i>Pinus sylvestris</i>			JA29_AW11b_U1
					Ground layer	<i>Hylocomium splendens</i>	<i>Vaccinium vitis-idaea</i>	<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Erica tetralix</i> , <i>Plagiothecium undulatum</i> , <i>Pleurozium schreberi</i> , <i>Rhytiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Carex nigra</i> , <i>Dryopteris dilatata</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Polytrichastrum formosum</i> , <i>Sphagnum fallax</i>	<i>Blechnum spicant</i> , <i>Gymnocarpium dryopteris</i> , <i>Mnium hornum</i> , <i>Oxalis acetosella</i> , <i>Sorbus aucuparia</i> seedling, <i>Thuidium tamariscinum</i>		JA29_AW11b_G1
JA30	AW – 11B	291132	819615	W11c/ W17d	Canopy		<i>Betula pendula</i>				Mature trees and canopy. Good quality understorey, some deadwood and AW indicators.	JA30_AW11b_C1, JA30_AW11b_C2
					Understorey			<i>Juniperus communis</i>				JA30_AW11b_U1
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Rhytiadelphus triquetrus</i>	<i>Calluna vulgaris</i> , <i>Erica cinerea</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Vaccinium myrtillus</i> , <i>Vaccinium vitis-idaea</i>	<i>Conopodium majus</i> , <i>Dicranum scoparium</i> , <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Melampyrum pratense</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Pyrola media</i> , <i>Rhytiadelphus squarrosus</i> , <i>Sorbus aucuparia</i> seedling, <i>Succisa pratensis</i> , <i>Trientalis europaea</i> ,		Minimal signs of disturbance, some light browsing from deer.	JA30_AW11b_G1, JA30_AW11b_G2





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						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>Veronica officinalis</i> , <i>Viola riviniana</i>			
JA32	AW – 11B	291142	819496	W18c	Canopy			<i>Betula pendula</i> , <i>Pinus sylvestris</i>	<i>Betula pubescens</i>		Ancient canopy. AW indicator species, good ground flora, ancient trees.	JA32_AW11b_C1, JA32_AW11b_C2, JA32_AW11b_C3
					Understorey				<i>Pinus sylvestris</i>	<i>Juniperus communis</i>	Minimal disturbance, browsing from deer.	
					Ground layer	<i>Deschampsia flexuosa</i>	<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Anemone nemorosa</i> , <i>Conopodium majus</i> , <i>Dactylis glomerata</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> , <i>Rhytiadelphus triquetrus</i>	<i>Galium saxatile</i> , <i>Sorbus aucuparia</i> seedling, <i>Viola riviniana</i>	<i>Acer pseudoplatanus</i> seedling		JA32_AW11b_G1, JA32_AW11b_G2
JA33	AW – 11B	291144	819636	U20a/b	Ground layer	<i>Pteridium aquilinum</i>	<i>Anemone nemorosa</i> , <i>Conopodium majus</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i>	<i>Pleurozium schreberi</i> , <i>Rhytiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Agrostis capillaris</i> , <i>Campanula rotundifolia</i> , <i>Carex pilulifera</i> , <i>Erica tetralix</i> , <i>Galium saxatile</i> , <i>Lathyrus linifolius</i> , <i>Potentilla erecta</i> , <i>Rhytiadelphus squarrosus</i> , <i>Sorbus aucuparia</i> seedling, <i>Succisa pratensis</i> , <i>Trientalis europaea</i> , <i>Viola riviniana</i>		JA33_AW11b_G1, JA33_AW11b_G2	
JA35	AW – 11B	290940	819510	W18c (P)	Canopy		<i>Pinus sylvestris</i>	<i>Betula pendula</i> , <i>Betula pubescens</i>			Young with occasional semi-mature trees.	JA35_AW11b_C1, JA35_AW11b_C2
					Understorey			<i>Betula pendula</i>			AW indicators, some deadwood.	
					Ground layer	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Rhytiadelphus triquetrus</i>		<i>Blechnum spicant</i> , <i>Calluna vulgaris</i> , <i>Erica cinerea</i> , <i>Galium saxatile</i> , <i>Oxalis acetosella</i> , <i>Vaccinium myrtillus</i>	<i>Dicranum scoparium</i> , <i>Diplophyllum albicans</i>	Low disturbance, deer browsing.	JA35_AW11b_G1	
JA68	AW – 11C	290193	816582	W18b/c (P)	Canopy		<i>Larix decidua</i> , <i>Pinus sylvestris</i>				Semi-mature plantation, some dead wood along ground layer.	JA68_AW11c_C1, JA68_AW11c_C2
					Understorey				<i>Betula pubescens</i>		Some AW indicators.	
					Ground layer	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i>	<i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Polytrichum commune</i> , <i>Rhytiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Anthoxanthum odoratum</i> , <i>Betula pubescens</i> seedling, <i>Blechnum spicant</i> , <i>Calluna vulgaris</i> , <i>Carex binervis</i> , <i>Dicranum majus</i> , <i>Dicranum scoparium</i> , <i>Dryopteris dilatata</i> , <i>Galium saxatile</i> ,	<i>Campylopus flexuosus</i> , <i>Sphagnum palustre</i> , <i>Vaccinium vitis-idaea</i>	Evidence of deer browsing, otherwise low disturbance.	JA68_AW11c_G1, JA68_AW11c_G2	





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						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Polytrichastrum formosum</i> , <i>Polytrichum juniperinum</i> , <i>Pteridium aquilinum</i> , <i>Sorbus aucuparia</i> seedling			
JA69	AW – 11C	290073	816105	W18a (P)	Canopy		<i>Pinus sylvestris</i>				Semi-mature plantation. No AW indicator species, but well-developed ground flora. Deer browsing otherwise undisturbed.	JA69_AW11c_C1, JA69_AW11c_C2
					Understorey							
					Ground layer		<i>Calluna vulgaris</i> , <i>Erica cinerea</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Rhytidiadelphus triquetrus</i>	<i>Cladonia portentosa</i> , <i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Vaccinium vitis-idaea</i>	<i>Dicranum fuscescens</i> , <i>Vaccinium myrtillus</i>		JA69_AW11c_G1, JA69_AW11c_G2
JA72	AW – 11C	290286	816118	Lochan and swamp – fenced off and no surveyor access.							JA72_AW11c_G1, JA72_AW11c_G2	
JA73	AW – 11C	290220	815889	W18b/c	Canopy		<i>Pinus sylvestris</i>	<i>Betula pubescens</i>	<i>Betula pendula</i>		Semi-mature canopy. AW indicators, well developed ground layer. Low disturbance levels, deer browsing.	JA73_AW11c_C1, JA73_AW11c_C2
					Understorey							
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i>	<i>Anemone nemorosa</i> , <i>Galium saxatile</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Calluna vulgaris</i> , <i>Carex pilulifera</i> , <i>Luzula pilosa</i> , <i>Polytrichastrum formosum</i> , <i>Pseudoscleropodium purum</i> , <i>Trientalis europaea</i>	<i>Sorbus aucuparia</i> seedling		JA73_AW11c_G1, JA73_AW11c_G2
JA75	AW – 11C	290006	815644	W17c/ W18b (P)	Canopy		<i>Betula pendula</i> , <i>Pinus sylvestris</i>				Semi-mature plantation. AW indicators. Low levels of deer browsing otherwise undisturbed.	JA75_AW11c_C1, JA75_AW11c_C2
					Understorey			<i>Betula pendula</i>				
					Ground layer		<i>Rhytidiadelphus triquetrus</i>	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i>	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Calluna vulgaris</i> , <i>Hypnum cupressiforme</i> , <i>Melampyrum pratense</i> , <i>Trientalis europaea</i> , <i>Vaccinium myrtillus</i> , <i>V. vitis-idaea</i> , <i>Viola riviniana</i>	<i>Cytisus scoparius</i> , <i>Valeriana officinalis</i>		JA75_AW11c_G1, JA75_AW11c_G2
JA79	AW – 11D	289778	815372	W18c (P)	Canopy		<i>Pinus sylvestris</i>		<i>Betula pendula</i>		Semi-mature plantation with occasional birch.	JA79_AW11d_C1, JA79_AW11d_C2
					Understorey				<i>Betula pendula</i>			





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer		<i>Deschampsia flexuosa</i>	<i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Sorbus aucuparia</i> seedling	<i>Agrostis capillaris</i> , <i>Ajuga reptans</i> , <i>Anthoxanthum odoratum</i> , <i>Blechnum spicant</i> , <i>Dicranum fuscescens</i> , <i>Dicranum scoparium</i> , <i>Hylocomium splendens</i> , <i>Hypericum pulchrum</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Vaccinium myrtillus</i> , <i>Viola riviniana</i>	<i>Galium saxatile</i>	Occasional AW indicator species. Fairly undisturbed with light deer browsing.	JA79_AW11d_G1, JA79_AW11d_G2
JA85	AW – 11E	289463	814514	W18b (P)	Canopy		<i>Pinus sylvestris</i>		<i>Larix decidua</i>		Mature and semi-mature some natural and semi-natural. AW indicators, established ground flora. Low level disturbance, deer browsing, no other degradation.	JA85_AW11e_C1, JA85_AW11e_C2
					Understorey							
JA110	AW - 12	285475	809508	W18c (P)	Canopy		<i>Pinus sylvestris</i>	<i>Larix decidua</i>			Semi-mature plantation. Some AW indicators, dead wood along ground. Deer and sheep browsing, A9 construction works close by.	JA110_AW12_C1, JA110_AW12_C2
					Understorey							
JA111	AW - 12	285378	809373	W18c (P)	Canopy			<i>Larix decidua</i> , <i>Pinus sylvestris</i>			Semi-mature plantation. Single AW indicator species present. Grazing by sheep and deer, wind-blown trees and deadwood.	JA111_AW12_C1, JA111_AW12_C2
					Understorey							
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> ,	<i>Dicranum scoparium</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>H. mollis</i> ,	<i>Agrostis capillaris</i> , <i>Betula pubescens</i> seedling, <i>Hypnum cupressiforme</i> , <i>Pinus</i>			JA111_AW12_G1, JA111_AW12_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Hylocomium splendens</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Oxalis acetosella</i> , <i>Polytrichastrum formosum</i>	<i>sylvestris</i> seedling, <i>Plagiothecium undulatum</i> , <i>Pleurozium schreberi</i> , <i>Pseudoscleropodium purum</i>			
JA112	AW - 12	809166	285294	W7b/W11	Canopy		<i>Alnus glutinosa</i>	<i>Betula pubescens</i> , <i>Salix cinerea</i>			Mature to ancient trees. AW indicator species present. Nutrient enrichment, grazed, next to A9 works.	JA112_AW12_C1, JA112_AW12_C2, JA112_AW12_C3
					Understorey				<i>Alnus glutinosa</i>			
					Ground layer		<i>Holcus mollis</i>	<i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Juncus effusus</i> , <i>Luzula sylvatica</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Urtica dioica</i>	<i>Calliergonella cuspidata</i> , <i>Chrysosplenium oppositifolium</i> , <i>Dactylis glomerata</i> , <i>Deschampsia cespitosa</i> , <i>Galium aparine</i> , <i>G. palustre</i> , <i>Kindbergia praelonga</i> , <i>Oxalis acetosella</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Valeriana officinalis</i>	<i>Cardamine flexuosa</i>		
JA113	AW - 12	285288	809192	U4b	Ground layer		<i>Agrostis capillaris</i> , <i>Cirsium arvense</i> , <i>Festuca ovina</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Trifolium repens</i>	<i>Achillea millefolium</i> , <i>Anthoxanthum odoratum</i> , <i>Brachythecium rutabulum</i> , <i>Cerastium fontanum</i> , <i>Poa annua</i> , <i>Prunella vulgaris</i> , <i>Ranunculus repens</i>	<i>Aphanes arvensis</i> , <i>Bellis perennis</i> , <i>Mnium hornum</i> , <i>Plantago major</i> , <i>Veronica serpyllifolia</i>	Semi-improved from sheep grazing and nutrient enrichment.	JA113_AW12_G1, JA113_AW12_G2	
JA157	AW - 12	285611	809391	W11 (P)	Canopy		<i>Alnus glutinosa</i>	<i>Betula pendula</i> , <i>B. pubescens</i>			Possibly semi-mature plantation. AW indicator species. Low level of disturbance, next to A9 roadworks.	JA157_AW12_C1, JA157_AW12_C2
					Understorey							
					Ground layer	<i>Holcus mollis</i>	<i>Rhytidiadelphus triquetrus</i>	<i>Digitalis purpurea</i> , <i>Holcus lanatus</i> , <i>Juncus effusus</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytidiadelphus squarrosus</i>		JA157_AW12_G1, JA157_AW12_G2		
JA158	AW - 12 & DS - 1	285597	809361	W11d	Canopy	<i>Alnus glutinosa</i>		<i>Betula pubescens</i>		Mature to ancient alder canopy. AW indicators, established more alluvial ground cover.	JA158_AW12_DS1_C1, JA158_AW12_DS1_C2,	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
											No direct signs of disturbance, close to A9 works.	JA158_AW12_DS1_C3
					Understorey							
					Ground layer	<i>Holcus mollis</i>		<i>Anthoxanthum odoratum</i> , <i>Luzula sylvatica</i> , <i>Stellaria holostea</i>	<i>Caltha palustris</i> , <i>Chrysosplenium oppositifolium</i> , <i>Conopodium majus</i> , <i>Glyceria fluitans</i> , <i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Juncus effusus</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i> , <i>R. obtusifolius</i> , <i>Urtica dioica</i>	<i>Cardamine flexuosa</i> , <i>Epilobium montanum</i>		JA158_AW12_DS1_G1, JA158_AW12_DS1_G2, JA158_AW12_DS1_G3
JA159	AW – 12	285622	809430	W18c/CP	Canopy		<i>Pinus sylvestris</i>		<i>Alnus glutinosa</i> , <i>Betula pendula</i>		Mature plantation. No AW indicators.	JA159_AW12_C1, JA159_AW12_C2
					Understorey				<i>Alnus glutinosa</i>		Forest operations.	
					Ground layer	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i>	<i>Anthoxanthum odoratum</i> , <i>Galium saxatile</i> , <i>Potentilla erecta</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Campylopus flexuosus</i> , <i>Pleurozium schreberi</i> , <i>Polytrichastrum formosum</i> , <i>Veronica officinalis</i>	<i>Betula pubescens</i> seedling, <i>Cytisus scoparius</i> , <i>Holcus lanatus</i>			JA159_AW12_G1, JA159_AW12_G2
JA145	AW – 13 & DS – 5	288529	810772	W19/ W17b	Canopy		<i>Betula pubescens</i>				AW indicator species, some evidence of enrichment, well established understorey. No direct signs of disturbance although situated next to former quarry.	
					Understorey		<i>Juniperus communis</i>					JA145_AW13&DS5_U1, JA145_AW13&DS5_U2
					Ground layer	<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus squarrosus</i>	<i>Erica cinerea</i> , <i>Pteridium aquilinum</i> , <i>Teucrium scorodonia</i> , <i>Urtica dioica</i>	<i>Anthoxanthum odoratum</i> , <i>Betula pendula</i> seedling, <i>Brachypodium sylvaticum</i> , <i>Campanula rotundifolia</i> , <i>Carex caryophyllea</i> , <i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Festuca ovina</i> , <i>Galium saxatile</i> , <i>Hypnum jutlandicum</i> , <i>Plantago lanceolata</i> , <i>Potentilla erecta</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Rumex acetosa</i> , <i>Viola riviniana</i>	<i>Circaea x intermedia</i> , <i>Dicranum majus</i> , <i>Festuca rubra</i> , <i>Helianthemum nummularium</i> , <i>Lathyrus linifolius</i> , <i>Oxalis acetosella</i> , <i>Succisa pratensis</i> , <i>Thymus polytrichus</i> , <i>Veronica chamaedrys</i>			JA145_AW13&DS5_G1, JA145_AW13&DS5_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA146	AW – 13 & DS – 5	288698	810887	W11/ W18c	Canopy		<i>Betula pendula</i>		<i>Pinus sylvestris</i>		Ancient, mature and young trees. AW indicators, well developed ground flora. Some browsing signs but otherwise low level of disturbance.	JA146_AW13&DS5_C1, JA146_AW13&DS5_C2, JA146_AW13&DS5_C3
					Understorey		<i>Juniperus communis</i>	<i>Betula pendula</i>				
					Ground layer		<i>Holcus mollis</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Pleurozium schreberi</i>	<i>Anemone nemorosa</i> , <i>Calluna vulgaris</i> , <i>Campanula rotundifolia</i> , <i>Carex caryophylla</i> , <i>C. flacca</i> , <i>Conopodium majus</i> , <i>Dicranum scoparium</i> , <i>Erica cinerea</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hypericum pulchrum</i> , <i>Lathyrus linifolius</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Viola riviniana</i>	<i>Succisa pratensis</i>		JA146_AW13&DS5_G1, JA146_AW13&DS5_G2
JA147	AW – 13 & DS – 5	288818	810956	W17d	Canopy		<i>Betula pendula</i>				Semi-mature and mature trees. One AW indicator species. Limited characteristics on the ground in this area. No signs of disturbance visible.	JA147_AW13&DS5_C1, JA147_AW13&DS5_C2
					Understorey		<i>Betula pendula</i>	<i>Juniperus communis</i>				
					Ground layer		<i>Calluna vulgaris</i> , <i>Erica cinerea</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Pteridium aquilinum</i>	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Dicranum scoparium</i> , <i>Frullania tamarisci</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hypericum pulchrum</i> , <i>Hypnum jutlandicum</i> , <i>Teucrium scorodonia</i>	<i>Viola riviniana</i>		JA147_AW13&DS5_G1, JA147_AW13&DS5_G2
JA102	AW - 14	287973	810114	W11d/ W18c (P)	Canopy		<i>Betula pendula</i>	<i>Pinus sylvestris</i>			Young trees. Some AW indicators. Deer browsing otherwise low disturbance levels.	JA102_AW14_C1, JA102_AW14_C2
					Understorey			<i>Betula pendula</i>				
					Ground layer		<i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Holcus lanatus</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>	<i>Conopodium majus</i> , <i>Galium saxatile</i> , <i>Hypericum pulchrum</i> , <i>Hypnum cupressiforme</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> ,	<i>Cytisus scoparius</i> , <i>Hieracium sp.</i> , <i>Pyrola minor</i> , <i>Rubus idaeus</i>		JA102_AW14_G1, JA102_AW14_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>Polytrichum commune, Potentilla erecta, Pseudoscleropodium purum, Rumex acetosa, Senecio jacobaea, Succisa pratensis, Vaccinium myrtillus, V. vitis-idaea, Veronica officinalis</i>			
JA105	AW – 14 & DS - 4	287807	809894	W18b (P)	Canopy		<i>Pinus sylvestris</i>	<i>Betula pendula</i>	<i>Larix decidua</i>		Mature plantation with occasional mature natural Scot's Pine, some planted larch. AW indicators. Deer browsing otherwise low-level disturbance.	JA105_AW14&DS4_C1, JA105_AW14&DS4_C2, JA105_AW14&DS4_C3
					Understorey			<i>Betula pendula</i>				
					Ground layer		<i>Deschampsia flexuosa, Hylocomium splendens, Rhytidiadelphus triquetrus, Vaccinium myrtillus, V. vitis-idaea</i>	<i>Sorbus aucuparia seedling</i>	<i>Calluna vulgaris, Campylopus flexuosus</i>			JA105_AW14&DS4_G1, JA105_AW14&DS4_G2
JA106	AW – 14	287763	809950	W11c	Canopy		<i>Betula pendula</i>				Semi-mature and mature trees with narrow stand of young. AW indicators species present. Sheep grazing.	JA106_AW14_C1, JA106_AW14_C2
					Understorey				<i>Betula pendula</i>			
					Ground layer		<i>Hylocomium splendens, Rhytidiadelphus triquetrus</i>	<i>Agrostis capillaris, Anthoxanthum odoratum, Deschampsia flexuosa, Galium saxatile, Luzula pilosa, Pleurozium schreberi, Potentilla erecta, Trientalis europaea, Valeriana officinalis</i>	<i>Campylopus flexuosus, Conopodium majus, Hypnum cupressiforme, Melampyrum pratense, Polytrichastrum formosum, Sorbus aucuparia seedling, Vaccinium myrtillus, V. vitis-idaea</i>			JA106_AW14_G1, JA106_AW14_G2
JA107	AW – 14	287731	810003	U4b/OV25/MG10	Ground layer		<i>Agrostis capillaris, Dactylis glomerata</i>	<i>Anthoxanthum odoratum, Festuca ovina, Juncus effusus, Ranunculus repens, Trifolium repens, Urtica dioica</i>	<i>Achillea millefolium, Luzula multiflora, Plantago lanceolata, Rhytidiadelphus squarrosus, Veronica chamaedrys</i>	<i>Conopodium majus, Senecio jacobaea, Veronica serpyllifolia</i>	Semi-improved grassland with some nutrient enrichment.	JA107_AW14_G1, JA107_AW14_G2
JA109	AW – 14	287888	810142	W11	Canopy		<i>Betula pendula</i>		<i>Populus tremula</i>		Mature and ancient trees. AW indicators, some old dead wood in understorey.	JA109_AW14_C1, JA109_AW14_C2, JA109_AW14_C3
					Understorey			<i>Betula pendula</i>	<i>Sorbus aucuparia</i>			





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Rhytiadelphus squarrosus</i>	<i>Conopodium majus</i> , <i>Holcus lanatus</i> , <i>Potentilla erecta</i> , <i>Trifolium repens</i> , <i>Veronica chamaedrys</i>	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Ranunculus acris</i> , <i>R. repens</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Trientalis europaea</i> , <i>Urtica dioica</i>	<i>Sorbus aucuparia</i> seedling, <i>Viola riviniana</i>	Grazing from sheep, some nutrient enrichment.	JA109_AW14_G1, JA109_AW14_G2
JA108	AW – 15	287599	810178	W11	Canopy			<i>Betula pendula</i>			Mature and occasional ancient trees.	JA108_AW15_C1, JA108_AW15_C2
					Understorey						Single AW indicator species present.	
					Ground layer	<i>Agrostis capillaris</i> , <i>Dactylis glomerata</i>	<i>Anthoxanthum odoratum</i> , <i>Festuca ovina</i> , <i>Holcus lanatus</i> , <i>Plantago lanceolata</i> , <i>Ranunculus repens</i> , <i>Trifolium repens</i> , <i>Veronica chamaedrys</i>	<i>Achillea millefolium</i> , <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Potentilla erecta</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Stellaria media</i> , <i>Urtica dioica</i>	<i>Conopodium majus</i> , <i>Hypnum jutlandicum</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Rhytiadelphus squarrosus</i> , <i>Viola riviniana</i>	Heavily grazed by sheep.	JA108_AW15_G1, JA108_AW15_G2	
JA151	AW – 16 & DS – 3	286618	810006	W7b	Canopy			<i>Alnus glutinosa</i> , <i>Betula pubescens</i>	<i>Betula pendula</i>		Mature trees. AW indicators, well developed understorey. Some signs of light grazing pressure otherwise low disturbance.	JA151_AW16_DS3_C1, JA151_AW16_DS3_C2, JA151_AW16_DS3_C3
					Understorey				<i>Betula pubescens</i> , <i>Salix cinerea</i>			
					Ground layer	<i>Anemone nemorosa</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Rhytiadelphus squarrosus</i> , <i>R. triquetrus</i>	<i>Calliergonella cuspidata</i> , <i>Caltha palustris</i> , <i>Glyceria fluitans</i> , <i>Juncus effusus</i> , <i>Potentilla erecta</i> , <i>Ranunculus flammula</i> , <i>Viola palustris</i>	<i>Blechnum spicant</i> , <i>Cirsium palustre</i> , <i>Conopodium majus</i> , <i>Crepis paludosa</i> , <i>Dryopteris dilatata</i> , <i>Galium palustre</i> , <i>Hypnum cupressiforme</i> , <i>Mnium hornum</i> , <i>Pellia epiphylla</i> , <i>Plagiomnium undulatum</i> , <i>Ranunculus ficaria</i> , <i>R. repens</i> , <i>Sphagnum palustre</i> , <i>Thuidium tamariscinum</i>	<i>Filipendula ulmaria</i>		JA151_AW16_DS3_G1, JA151_AW16_DS3_G2	
JA153	AW – 16 & DS – 3	286614	809941	W4b/ W11c	Canopy		<i>Betula pubescens</i>	<i>Populus tremula</i>		Mature and possible ancient trees. AW indicators, well established ground flora.	JA153_AW16_DS3_C1, JA153_AW16_DS3_C2,	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
											No visible signs of disturbance.	JA153_AW16_DS3_C3, JA153_AW16_DS3_C4
					Understorey		<i>Populus tremula</i> <i>suckers</i> , <i>Salix cinerea</i>		<i>Betula pubescens</i>			JA153_AW16_DS3_U1
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anemone nemorosa</i> , <i>Caltha palustris</i> , <i>Galium palustre</i> , <i>Glyceria fluitans</i> , <i>Juncus effusus</i> , <i>Oxalis acetosella</i> , <i>Sphagnum fallax</i> , <i>S. palustre</i>	<i>Ajuga reptans</i> , <i>Blechnum spicant</i> , <i>Carex pilulifera</i> , <i>Conopodium majus</i> , <i>Galium saxatile</i> , <i>Hieracium sp.</i> , <i>Holcus lanatus</i> , <i>Luzula multiflora</i> , <i>Melampyrum pratense</i> , <i>Oreopteris limbosperma</i> , <i>Plagiomnium undulatum</i> , <i>Polytrichum commune</i> , <i>Potentilla erecta</i> , <i>Ranunculus acris</i> , <i>R. flammula</i> , <i>R. repens</i> , <i>Rhizomnium punctatum</i> , <i>Trientalis europaea</i>	<i>Atrichum undulatum</i> , <i>Mnium hornum</i>		JA153_AW16_DS3_G1, JA153_AW16_DS3_G2, JA153_AW16_DS3_G3
JA154	AW – 16	286515	809867	W11d	Canopy		<i>Betula pubescens</i>		<i>Betula pendula</i> , <i>Sorbus aucuparia</i>		Mature and possible ancient trees. AW indicators, well established ground flora.	JA154_AW16_C1, JA154_AW16_C2
					Understorey							
					Ground layer		<i>Holcus mollis</i> , <i>Rhytidiadelphus squarrosus</i> , <i>R. triquetrus</i>	<i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> , <i>Veronica chamaedrys</i>	<i>Conopodium majus</i> , <i>Galium saxatile</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Pseudoscleropodium purum</i> , <i>Ranunculus repens</i> , <i>Urtica dioica</i> , <i>Viola riviniana</i>	<i>Luzula pilosa</i>	No clear signs of disturbance.	JA154_AW16_G1, JA154_AW16_G2
JA155	AW – 16	286495	809879	CP	Canopy	<i>Pseudotsuga menziesii</i>			<i>Betula pendula</i>		Semi-mature plantation. No disturbance just wind-blow.	JA155_AW16_C1, JA155_AW16_C2
					Understorey							
					Ground layer				<i>Pteridium aquilinum</i> , <i>Urtica dioica</i>	<i>Galium saxatile</i> , <i>Isoetes myosuroides</i> , <i>Stellaria media</i>		JA155_AW16_G1
JA160	AW – 16	286458	810014	W11d	Canopy		<i>Betula pendula</i> , <i>B. pubescens</i>		<i>Sorbus aucuparia</i>		Mature trees. AW indicators, established ground flora.	JA160_AW16_C1, JA160_AW16_C2
					Understorey							





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Holcus mollis</i> , <i>Rumex acetosa</i> , <i>Veronica chamaedrys</i>	<i>Conopodium majus</i> , <i>Ranunculus acris</i> , <i>Senecio jacobaea</i>	<i>Galium aparine</i> , <i>G. saxatile</i> , <i>Hylocomium splendens</i> , <i>Ranunculus repens</i> , <i>Rhytiadelphus squarrosus</i> , <i>Rumex obtusifolius</i> , <i>Urtica dioica</i>	<i>Viola riviniana</i>	Low level grazing and nutrient enrichment.	JA160_AW16_G1, JA160_AW16_G2
JA161	AW – 16	286504	810121	W11d	Canopy		<i>Quercus petraea</i>		<i>Betula pubescens</i>		Mature and possible ancient trees. AW indicators.	JA161_AW16_C1, JA161_AW16_C2
					Understorey			<i>Corylus avellana</i>	<i>Sorbus aucuparia</i>		Locally improved grassland with sheep grazing and nutrient enrichment.	JA161_AW16_U1, JA161_AW16_U2
					Ground layer	<i>Holcus mollis</i>		<i>Anthoxanthum odoratum</i> , <i>Oxalis acetosella</i> , <i>Veronica chamaedrys</i>	<i>Conopodium majus</i> , <i>Dryopteris dilatata</i> , <i>Hypnum cupressiforme</i> , <i>Isoetes macrospora</i> , <i>Mnium hornum</i> , <i>Poa annua</i> , <i>Rhytiadelphus squarrosus</i> , <i>Rumex acetosa</i> , <i>Stellaria media</i> , <i>Thuidium tamariscinum</i> , <i>Urtica dioica</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>			JA161_AW16_G1, JA161_AW16_G2
JA162	AW – 16	286633	810106	W18c	Canopy		<i>Pinus sylvestris</i>				Semi-mature plantation. Some AW indicators, established ground flora.	JA162_AW16_C1, JA162_AW16_C2
					Understorey							
					Ground layer	<i>Holcus mollis</i>		<i>Anthoxanthum odoratum</i> , <i>Rumex acetosa</i> , <i>Thuidium tamariscinum</i> , <i>Urtica dioica</i> , <i>Veronica officinalis</i>	<i>Conopodium majus</i> , <i>Digitalis purpurea</i> , <i>Epilobium montanum</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Pseudoscleropodium purum</i> , <i>Ranunculus repens</i> , <i>Rhytiadelphus squarrosus</i> , <i>R. triquetrus</i> , <i>Senecio jacobaea</i> , <i>Stellaria media</i> , <i>Veronica chamaedrys</i>	<i>Cardamine flexuosa</i> , <i>Plagiomnium undulatum</i> , <i>Sambucus nigra seedling</i>	Low levels of disturbance, subject to enrichment from farming activities.	JA162_AW16_G1
JA163	AW – 16	286578	810109	MG6/ OV28b	Ground layer		<i>Holcus lanatus</i> , <i>Lolium perenne</i> , <i>Ranunculus repens</i> , <i>Rumex obtusifolius</i> ,	<i>Agrostis capillaris</i> , <i>A. stolonifera</i> , <i>Cirsium arvense</i> , <i>Montia fontana</i> , <i>Poa</i>	<i>Viola riviniana</i>	High level of grazing and nutrient enrichment.	JA163_AW16_G1, JA163_AW16_G2	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
								<i>Trifolium repens</i> , <i>Urtica dioica</i>	<i>annua</i> , <i>Potentilla anserina</i> , <i>Stellaria media</i>			
JA127	AW – 17	286944	810131	CP	Canopy		<i>Pseudotsuga menziesii</i>	<i>Larix decidua</i>		<i>Quercus petraea</i>	Mature plantation. Single AW indicator species, some mature broadleaves.	JA127_AW17_C1, JA127_AW17_C2, JA127_AW17_C3
					Understorey							
					Ground layer				<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Dicranum fuscescens</i> , <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Plagiomnium undulatum</i> , <i>Stellaria media</i>	JA127_AW17_G1, JA127_AW17_G2		
JA128	AW – 17	286921	810100	W11d	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>			Semi-mature and mature trees. Some AW indicators. Signs of grazing.	JA128_AW17_C1, JA128_AW17_C2
					Understorey							
					Ground layer	<i>Conopodium majus</i> , <i>Deschampsia flexuosa</i> , <i>Holcus mollis</i>	<i>Anthoxanthum odoratum</i> , <i>Holcus lanatus</i> , <i>Luzula multiflora</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Veronica chamaedrys</i>	<i>Carex pilulifera</i> , <i>Cerastium fontanum</i> , <i>Cytisus scoparius</i> , <i>Galium saxatile</i> , <i>Pleurozium schreberi</i> , <i>Ranunculus repens</i> , <i>Senecio jacobaea</i> , <i>Urtica dioica</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>		JA128_AW17_G1, JA128_AW17_G2		
JA129	AW – 18	287035	810122	W11/ W17c	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>	<i>Quercus petraea</i>		Mature trees. Some AW indicators. Some evidence of enrichment and grazing.	JA129_AW17_C1, JA129_AW17_C2, JA129_AW17_C3
					Understorey			<i>Betula pubescens</i>				
					Ground layer	<i>Pteridium aquilinum</i>	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Conopodium majus</i> , <i>Holcus mollis</i> , <i>Hypnum cupressiforme</i> , <i>Pleurozium schreberi</i> , <i>Urtica dioica</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>	<i>Campylopus flexuosus</i> , <i>Dicranum fuscescens</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Hypnum andoi</i> , <i>Isoetecium myosuroides</i>	<i>Atrichum undulatum</i> , <i>Circaea x intermedia</i> , <i>Pseudoscleropodium purum</i>		JA129_AW17_G1, JA129_AW17_G2
JA122	AW – 19	286994	810349	W11d	Canopy		<i>Quercus petraea</i>				Mature trees. AW indicators, established ground flora, deadwood. Grazed ground storey but not heavily.	JA122_AW19_C1, JA122_AW19_C2
					Understorey							
					Ground layer		<i>Hylocomium splendens</i> ,	<i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Deschampsia</i>	<i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Campanula rotundifolia</i> , <i>Carex</i>	<i>Viola riviniana</i>		JA122_AW19_G1, JA122_AW19_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Rhytiadelphus triquetrus</i>	<i>flexuosa, Holcus mollis, Luzula multiflora, Oxalis acetosella, Pteridium aquilinum, Rhytiadelphus squarrosus, Rumex acetosa, Stellaria holostea</i>	<i>pilulifera, Cytisus scoparius, Galium saxatile, Holcus lanatus, Hypnum cupressiforme, Mniun hornum, Polytrichum juniperinum, Rumex obtusifolius, Veronica chamaedrys, V. officinalis</i>			
JA123	AW – 19	287016	810304	W11d	Canopy			<i>Betula pendula, Betula pubescens</i>	<i>Quercus petraea</i>		Mature and semi-mature trees. AW indicators. Some enrichment and grazing from farming.	JA123_AW19_C1, JA123_AW19_C2, JA123_AW19_C3
					Understorey							
					Ground layer		<i>Conopodium majus, Holcus mollis, Rhytiadelphus triquetrus, Rumex acetosa</i>	<i>Anthoxanthum odoratum, Oxalis acetosella, Veronica chamaedrys</i>	<i>Agrostis capillaris, Atrichum undulatum, Holcus lanatus, Hylocomium splendens, Hypnum andoi, Kindbergia praelonga, Pteridium aquilinum, Ranunculus repens, Rhizomnium punctatum, Stellaria holostea, S. media, Urtica dioica</i>			JA123_AW19_G1, JA123_AW19_G2
JA124	AW – 19	286925	810245	W4b/W7b	Canopy			<i>Betula pubescens, Prunus padus</i>	<i>Salix cinerea</i>		Mature trees. AW indicators, established ground flora. Sheep grazing, some enrichment.	JA124_AW19_C1, JA124_AW19_C2
					Understorey			<i>Prunus padus</i>	<i>Salix cinerea</i>			
					Ground layer		<i>Agrostis stolonifera, Caltha palustris, Ranunculus repens</i>	<i>Juncus effusus, Ranunculus ficaria, R. flammula, Rumex acetosa</i>	<i>Angelica sylvestris, Callierygonella cuspidata, Cardamine pratensis, Filipendula ulmaria, Luzula multiflora, Pteridium aquilinum, Rumex obtusifolius, Senecio jacobaea, Stellaria uliginosa, Valeriana officinalis, Veronica chamaedrys, Viola riviniana</i>			JA124_AW19_G1, JA124_AW19_G2
JA125	AW – 19	286887	810149	W11d	Canopy	<i>Quercus petraea</i>			<i>Betula pendula</i>		Mature trees. AW indicator species. Some grazing pressure and improvement.	JA125_AW19_C1, JA125_AW19_C2
					Understorey							
					Ground layer		<i>Anthoxanthum odoratum, Conopodium majus, Holcus mollis,</i>		<i>Agrostis capillaris, Holcus lanatus, Kindbergia praelonga, Luzula multiflora, Pleurozium</i>	<i>Taraxacum officinale</i>		JA125_AW19_G1, JA125_AW19_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Ranunculus repens</i> , <i>Rumex acetosa</i>		<i>schreberi</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Senecio jacobaea</i> , <i>Thuidium tamariscinum</i> , <i>Trifolium repens</i> , <i>Veronica chamaedrys</i> , <i>Veronica serpyllifolia</i>			
JA126	AW – 19	286940	810156	U4b	Ground layer		<i>Agrostis capillaris</i>	<i>Lolium perenne</i> , <i>Trifolium repens</i>	<i>Cirsium arvense</i> , <i>Conopodium majus</i> , <i>Festuca ovina</i> , <i>F. rubra</i> , <i>Juncus effusus</i> , <i>Kindbergia praelonga</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Rumex acetosa</i> , <i>Veronica chamaedrys</i>		Evidence of enrichment and high grazing levels.	JA126_AW19_G1, JA126_AW19_G2
JA63	AW - 20	290548	817045	U4b/H12b	Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Festuca ovina</i> , <i>Potentilla erecta</i>	<i>Calluna vulgaris</i> , <i>Campanula rotundifolia</i> , <i>Hieracium sp.</i> , <i>Hypochoeris radicata</i> , <i>Trifolium repens</i>	<i>Holcus lanatus</i> , <i>Lathyrus linifolius</i> , <i>Luzula multiflora</i> , <i>Prunella vulgaris</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i> , <i>Succisa pratensis</i> , <i>Teucrium scorodonia</i> , <i>Vaccinium vitis-idaea</i>	<i>Carex caryophylla</i>	Poached and grazed by cattle.	JA63_AW20_G1, JA63_AW20_G2
JA66	AW - 20	290638	817283	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature and ancient trees. AW indicators, established ground flora. Low level browsing from deer and some small areas poached by cattle.	JA66_AW20_C1, JA66_AW20_C2
					Understorey		<i>Juniperus communis</i>					JA66_AW20_U1
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i>	<i>Carex pilulifera</i> , <i>Conopodium majus</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Viola riviniana</i>	<i>Ajuga reptans</i> , <i>Oxalis acetosella</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Taraxacum officinale</i> , <i>Teucrium scorodonia</i> , <i>Vaccinium myrtillus</i> , <i>Veronica chamaedrys</i>	<i>Holcus lanatus</i> , <i>Succisa pratensis</i> , <i>Veronica officinalis</i> , <i>Vicia sepium</i>		JA66_AW20_G1, JA66_AW20_G2
JA67	AW - 20	290384	816951	W18b (P)	Canopy		<i>Pinus sylvestris</i>		<i>Larix decidua</i>		Semi-mature plantation with occasional mature and ancient trees within woodland. AW indicator species, established ground flora. Low levels of disturbance, deer browsing.	JA67_AW20_C1, JA67_A20_C2, JA67_AW20_C3
					Understorey			<i>Juniperus communis</i>	<i>Betula pendula</i>			
					Ground layer		<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> ,	<i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> ,	<i>Calluna vulgaris</i> , <i>Sorbus aucuparia</i>	<i>Anemone nemorosa</i> , <i>Blechnum spicant</i> , <i>Dryopteris dilatata</i> , <i>Hypnum</i>		





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						Dominant	Abundant	Frequent	Occasional	Rare			
							<i>Vaccinium myrtillus</i>	<i>Rhytidiadelphus triquetrus</i>	seedling, <i>Vaccinium vitis-idaea</i>	<i>cupressiforme</i> , <i>Luzula pilosa</i>			
JA40	AW - 21	291021	818733	W17d	Canopy	<i>Betula pendula</i>	<i>Pinus sylvestris</i>				Young planted and regenerated, with mature birch and young Scot's Pine. Some AW indicator species present. Low level of disturbance	JA40_AW21_C1, JA40_AW21_C2	
					Understorey		<i>Betula pendula</i>		<i>Cytisus scoparius</i>				
					Ground layer	<i>Calluna vulgaris</i>	<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Potentilla erecta</i> , <i>Trifolium repens</i>	<i>Betula pendula</i> seedling, <i>Erica cinerea</i> , <i>Holcus lanatus</i> , <i>Hypericum pulchrum</i> , <i>Polygala serpyllifolia</i> , <i>Prunella vulgaris</i> , <i>Pyrola media</i> , <i>Racomitrium ericoides</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Senecio jacobaea</i> , <i>Sorbus aucuparia</i> seedling, <i>Taraxacum officinale</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>				JA40_AW21_G1, JA40_AW21_G2
JA41	AW - 21	290967	818640	W11c	Canopy		<i>Betula pendula</i>				Mature trees, some AW indicator species, established ground flora. Low levels of disturbance, low browsing levels.	JA41_AW21_C1, JA41_AW21_C2	
					Understorey				<i>Juniperus communis</i>				JA41_AW_21_U1
					Ground layer		<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Galium saxatile</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Anemone nemorosa</i> , <i>Conopodium majus</i> , <i>Lathyrus linifolius</i> , <i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> , <i>Vaccinium myrtillus</i> , <i>Viola riviniana</i>	<i>Calluna vulgaris</i> , <i>Carex pilulifera</i> , <i>Dicranum scoparium</i> , <i>Potentilla erecta</i>				JA41_AW21_G1, JA41_AW21_G1, JA41_AW21_G2
JA42	AW - 21	290966	818544	W11	Canopy		<i>Betula pendula</i> , <i>Prunus avium</i> , <i>Prunus padus</i>		<i>Salix caprea</i>		Mature birch. AW indicators, established ground flora, some dead wood. Low browsing levels, no disturbance.	JA42_AW21_C1, JA42_AW21_C2	
					Understorey				<i>Prunus padus</i> , <i>Salix caprea</i>				JA42_AW21_U1, JA42_AW21_U2
					Ground layer		<i>Ajuga reptans</i> , <i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Holcus lanatus</i> , <i>Oxalis acetosella</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Thuidium tamariscinum</i>	<i>Hylocomium splendens</i> , <i>Viola riviniana</i>	<i>Deschampsia cespitosa</i> , <i>Dryopteris filix-mas</i> , <i>Luzula pilosa</i> , <i>Polytrichum commune</i>	<i>Digitalis purpurea</i>			JA42_AW21_G1, JA42_AW21_G2





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						Dominant	Abundant	Frequent	Occasional	Rare			
JA34	AW - 22	290945	819430	W7/W18c	Canopy		<i>Pinus sylvestris</i>	<i>Betula pendula</i> , <i>Betula pubescens</i>			Mix of mature, semi-mature and young trees. Occasional ancient Scot's Pine. AW indicators present. Low disturbance levels, some browsing from deer.	JA34_AW22_C1, JA34_AW22_C2	
					Understorey								
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Ajuga reptans</i> , <i>Calliergonella cuspidata</i> , <i>Deschampsia flexuosa</i> , <i>Juncus bulbosus</i> , <i>Luzula pilosa</i> , <i>Plagiomnium undulatum</i> , <i>Polytrichum commune</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus flammula</i>	<i>Aneura pinguis</i> , <i>Cardamine pratensis</i> , <i>Epilobium palustre</i> , <i>Juncus effusus</i> , <i>Molinia caerulea</i> , <i>Montia fontana</i> , <i>Rhizomnium punctatum</i> , <i>Sorbus aucuparia</i> seedling, <i>Stellaria uliginosa</i> , <i>Thuidium tamariscinum</i>				JA34_AW22_G1, JA34_AW22_G2
JA36	AW - 22	290966	819232	W18b	Canopy		<i>Pinus sylvestris</i>				Ancient and mature trees next to young plantation. AW indicators and good understorey. Light browsing by deer but otherwise low disturbance.	JA36_AW22_C1, JA36_AW22_C2	
					Understorey			<i>Juniperus communis</i> , <i>Pinus sylvestris</i>					JA36_AW22_U1
					Ground layer		<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Vaccinium vitis-idaea</i>	<i>Galium saxatile</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Dicranum majus</i> , <i>D. scoparium</i> , <i>Luzula pilosa</i> , <i>Pleurozium schreberi</i> , <i>Sorbus aucuparia</i> seedling, <i>Vaccinium myrtillus</i>				JA36_AW22_G1, JA36_AW22_G2
JA37	AW - 22	290980	819192	H12b	Ground layer		<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Vaccinium myrtillus</i> , <i>Vaccinium vitis-idaea</i>	<i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i>	<i>Anemone nemorosa</i> , <i>Carex pilulifera</i> , <i>Dicranum majus</i> , <i>Hypericum pulchrum</i> , <i>Hypnum jutlandicum</i> , <i>Juniperus communis</i> , <i>Luzula pilosa</i> , <i>Potentilla erecta</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Viola riviniana</i>	Light browsing.	JA37_AW22_G1, JA37_AW22_G2	
JA38	AW - 22	290969	819182	U20a/b	Ground layer	<i>Pteridium aquilinum</i>	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i>	<i>Agrostis capillaris</i> , <i>Conopodium majus</i> , <i>Holcus lanatus</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Thuidium tamariscinum</i> , <i>Trientalis europaea</i> , <i>Vaccinium myrtillus</i>	<i>Hypnum jutlandicum</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Viola riviniana</i>		Light deer browsing.	JA38_AW22_G1, JA38_AW22_G2	
JA39	AW - 22	291015	819198	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature and ancient birch canopy.	JA39_AW22_C1, JA39_AW22_C2, JA39_AW22_C3	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Understorey					<i>Juniperus communis</i>	AW indicators, established ground storey, old fallen birch and deadwood.	JA39_AW22_U1
					Ground layer		<i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Oxalis acetosella</i> , <i>Primula vulgaris</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Viola riviniana</i>	<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Stellaria holostea</i>	<i>Galium saxatile</i> , <i>Rhytidiadelphus loreus</i> , <i>Sorbus aucuparia</i> seedling, <i>Vaccinium myrtillus</i>		Low disturbance, low browsing by deer.	JA39_AW22_G1, JA39_AW22_G2
JA152	AW – 23 & DS – 3	286697	809944	W11d	Canopy		<i>Betula pubescens</i>				Mature and possible ancient trees. AW indicators, well developed ground flora. Some light grazing evident and some nutrient enrichment on woodland edge.	JA152_AW16_DS3_C1, JA152_AW16_DS3_C2
					Understorey							
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Holcus mollis</i> , <i>Oxalis acetosella</i>	<i>Hylocomium splendens</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Rumex acetosa</i>	<i>Anemone nemorosa</i> , <i>Holcus lanatus</i> , <i>Hypnum andoi</i> , <i>H. cupressiforme</i> , <i>Luzula multiflora</i> , <i>Mnium hornum</i> , <i>Potentilla erecta</i> , <i>Ranunculus acris</i> , <i>R. repens</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>	<i>Blechnum spicant</i>		JA152_AW16_DS3_G1, JA152_AW16_DS3_G2
JA86	AW - 24	290361	815540	W11c	Canopy				<i>Betula pendula</i>		Mature and semi-mature trees. AW indicators, established ground flora. Poaching and grazing from cattle.	JA86_AW24_C1, JA86_AW24_C2
					Understorey							
					Ground layer	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Potentilla erecta</i> , <i>Rhytidiadelphus squarrosus</i>	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i> , <i>Veronica chamaedrys</i>	<i>Calluna vulgaris</i> , <i>Hieracium sp.</i> , <i>Hypericum pulchrum</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Vaccinium vitis-idaea</i> , <i>Viola riviniana</i>	<i>Betula pubescens</i> seedling	JA86_AW24_G1, JA86_AW24_G2		
JA89	AW - 24	290290	815377	W11c	Canopy		<i>Betula pendula</i>				Mature trees. AW indicators, established ground flora. Ground poached and grazed by cattle but not intensively.	JA89_AW24_C1, JA89_AW24_C2
					Understorey			<i>Betula pendula</i>				
					Ground layer	<i>Anthoxanthum odoratum</i>	<i>Viola riviniana</i>	<i>Agrostis capillaris</i> , <i>Hylocomium splendens</i> ,	<i>Anemone nemorosa</i> , <i>Calluna vulgaris</i> , <i>Conopodium majus</i> ,	<i>Pyrola minor</i> , <i>Sorbus aucuparia</i> seedling		JA89_AW24_G1, JA89_AW24_G2, JA89_AW24_G3





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
								<i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Veronica chamaedrys</i>	<i>Deschampsia flexuosa</i> , <i>Galium saxatile</i> , <i>Luzula pilosa</i> , <i>Melampyrum pratense</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Valeriana officinalis</i>			
JA116	AW – 25A	287248	810392	W11c	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>			Mature and ancient trees. AW indicators. Heavily grazed ground storey.	JA116_AW25a_C1, JA116_AW25a_C2
					Understorey							
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Viola riviniana</i>	<i>Carex caryophylla</i> , <i>Conopodium majus</i> , <i>Holcus mollis</i> , <i>Potentilla erecta</i> , <i>Prunella vulgaris</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Veronica officinalis</i>	<i>Deschampsia flexuosa</i> , <i>Lathyrus linifolius</i> , <i>Luzula multiflora</i> , <i>L. pilosa</i> , <i>Polygala vulgaris</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Trifolium repens</i>	<i>Helictotrichon pratense</i>		JA116_AW25a_G1, JA116_AW25a_G2
JA117	AW – 25A	287294	810407	W11c	Canopy		<i>Populus tremula</i>		<i>Betula pendula</i>		Mature and ancient trees. AW indicators, established ground flora, deadwood. Grazed by sheep.	JA117_AW25a_C1, JA117_AW25a_C2, JA117_AW25a_C3
					Understorey				<i>Betula pendula</i>			
					Ground layer	<i>Agrostis capillaris</i> , <i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Carex caryophylla</i> , <i>Populus tremula</i> suckers, <i>Potentilla erecta</i> , <i>Vaccinium myrtillus</i>	<i>Danthonia decumbens</i> , <i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> , <i>Hypericum pulchrum</i> , <i>Lathyrus linifolius</i> , <i>Lotus corniculatus</i> , <i>Luzula multiflora</i> , <i>Pilosella officinarum</i> , <i>Polygala serpyllifolia</i> , <i>Pteridium aquilinum</i> , <i>Valeriana officinalis</i>		JA117_AW25a_G1, JA117_AW25a_G2		
JA118	AW – 25A	287665	810483	W11c	Canopy	<i>Quercus petraea</i>					Ancient trees. AW indicators, well established ground storey vegetation. Low level of disturbance, some deer browsing.	JA118_AW25a_C1, JA118_AW25a_C2
					Understorey							
					Ground layer	<i>Anemone nemorosa</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Holcus lanatus</i> , <i>H. mollis</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Thuidium tamariscinum</i>	<i>Campanula rotundifolia</i> , <i>Campylopus flexuosus</i> , <i>Carex caryophylla</i> , <i>Galium saxatile</i> , <i>Hypericum pulchrum</i> , <i>Hypnum cupressiforme</i> , <i>Lathyrus linifolius</i> , <i>Luzula multiflora</i> , <i>L. pilosa</i> , <i>Mnium</i>	<i>Hypnum andoi</i> , <i>Trientalis europaea</i>	JA118_AW25a_G1, JA118_AW25a_G2		





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
									<i>hornum, Oxalis acetosella, Polytrichastrum formosum, Pseudoscleropodium purum, Rhytidiadelphus loreus, R. squarrosus, Sorbus aucuparia seedling, Vaccinium myrtillus, Veronica chamaedrys, Viola riviniana</i>				
JA119	AW – 25A	287768	810535	W17c	Canopy	<i>Quercus petraea</i>						Mature and ancient trees. AW indicators, well established ground flora. Light deer browsing but mainly undisturbed.	JA119_AW25a_C1, JA119_AW25a_C2
					Understorey								
					Ground layer		<i>Rhytidiadelphus loreus</i>	<i>Deschampsia flexuosa, Hylocomium splendens, Melampyrum pratense, Sorbus aucuparia seedling</i>	<i>Blechnum spicant, Calluna vulgaris, Campylopus flexuosus, Dicranum fuscescens, D. majus, Frullania tamarisci, Galium saxatile, Hypnum andoi, H. cupressiforme, Hypogymnia physodes, Mnium hornum, Pleurozium schreberi, Rhytidiadelphus triquetrus, Trientalis europaea, Vaccinium myrtillus</i>	<i>Betula pubescens seedling, Pteridium aquilinum, Quercus petraea seedling</i>	JA119_AW25a_G1, JA119_AW25a_G2		
JA121	AW – 25A	287387	810383	MG6	Ground layer		<i>Bellis perennis, Dactylis glomerata, Lolium perenne, Ranunculus repens, Trifolium repens</i>	<i>Festuca rubra</i>	<i>Agrostis capillaris, Luzula multiflora, Poa annua, Rumex acetosa, Trifolium pratense, Veronica chamaedrys, Veronica serpyllifolia</i>	<i>Cirsium arvense</i>	Grazed by livestock.	JA121_AW25a_G1, JA121_AW25a_G2	
JA115	AW – 25B	287125	810392	W11c	Canopy			<i>Betula pendula</i>				Mature birch. AW indicators. Intensively grazed by sheep.	JA115_AW25b_C1, JA115_AW25b_C2
					Understorey								
					Ground layer	<i>Anthoxanthum odoratum, Hylocomium splendens, Potentilla erecta, Pteridium aquilinum</i>	<i>Agrostis capillaris, Carex caryophylla, Galium saxatile, Lathyrus linifolius, Luzula multiflora, Rhytidiadelphus triquetrus, Viola riviniana</i>	<i>Calluna vulgaris, Conopodium majus, Hypnum jutlandicum, Luzula pilosa, Pilosella officinarum, Polygala serpyllifolia, Prunella vulgaris, Rhytidiadelphus squarrosus, Senecio</i>	<i>Dicranum fuscescens</i>	JA115_AW25b_G1, JA115_AW25b_G2			





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>Jacobaea</i> , <i>Succisa pratensis</i> , <i>Trientalis europaea</i> , <i>Valeriana officinalis</i> , <i>Veronica serpyllifolia</i>			
JA120	AW - 26	287823	810452	W11c	Canopy			<i>Betula pendula</i>	<i>Quercus petraea</i>		Ancient and mature trees. AW indicators, established ground storey. Some light grazing with small areas of enrichment in wider area.	JA120_AW26_C1, JA120_AW26_C2
					Understorey							
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i>	<i>Agrostis capillaris</i> , <i>Deschampsia flexuosa</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Achillea millefolium</i> , <i>Holcus lanatus</i> , <i>Luzula multiflora</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Succisa pratensis</i> , <i>Trifolium repens</i> , <i>Veronica chamaedrys</i> , <i>Viola riviniana</i>			JA120_AW26_G1, JA120_AW26_G2
JA64	AW - 27	290741	817587	W11c	Canopy		<i>Betula pendula</i>				Mature and ancient with occasional semi-mature trees. AW indicators, juniper understorey. Light grazing from cattle with no damage to understorey.	JA64_AW27_C1, JA64_AW27_C2
					Understorey	<i>Juniperus communis</i>						JA64_AW27_U1
					Ground layer	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Festuca ovina</i>	<i>Anemone nemorosa</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i> , <i>Veronica chamaedrys</i>	<i>Calluna vulgaris</i> , <i>Dactylis glomerata</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Senecio jacobaea</i> , <i>Stellaria media</i> , <i>Trientalis europaea</i> , <i>Veronica officinalis</i> , <i>Viola riviniana</i>	<i>Rumex acetosa</i>	JA64_AW27_G1, JA64_AW27_G2		
JA65	AW - 27	290830	817721	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Semi-mature trees. AW indicators, well-developed understorey. Lightly grazed by cattle without damage.	JA65_AW27_C1, JA65_AW27_C2
					Understorey				<i>Juniperus communis</i>			JA65_AW27_U1
					Ground layer	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i>	<i>Ajuga reptans</i> , <i>Anemone nemorosa</i> , <i>Holcus lanatus</i> , <i>Holcus mollis</i> , <i>Lathyrus linifolius</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Senecio jacobaea</i> , <i>Trifolium repens</i> , <i>Veronica chamaedrys</i>	<i>Carex pilulifera</i> , <i>Hylocomium splendens</i> , <i>Plantago major</i> , <i>Potentilla erecta</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> , <i>Rhytidiadelphus squarrosus</i> , <i>R. triquetrus</i> , <i>Trientalis europaea</i> , <i>Viola riviniana</i>	<i>Succisa pratensis</i>	JA65_AW27_G1, JA65_AW27_G2		





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
JA133	AW – 28B & DS – 5	288993	812310	W3/W17b	Canopy		<i>Betula pubescens</i>	<i>Betula pendula</i>			Mature trees. AW indicators, well developed ground flora. Very low disturbance levels, some deer browsing.	JA133_AW28b&DS5_C1, JA133_AW28b&DS5_C2, JA133_AW28b&DS5_C3
					Understorey			<i>Betula pubescens</i> , <i>Myrica gale</i> , <i>Sorbus aucuparia</i>				JA133_AW28b&DS5_U1
					Ground layer		<i>Carex rostrata</i> , <i>Hylocomium splendens</i> , <i>Vaccinium myrtillus</i>	<i>Cardamine pratensis</i> , <i>Carex nigra</i> , <i>Deschampsia flexuosa</i> , <i>Galium palustre</i> , <i>Pleurozium schreberi</i> , <i>Ranunculus flammula</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Sphagnum squarrosum</i> , <i>Stellaria uliginosa</i> , <i>Vaccinium vitis-idaea</i>	<i>Agrostis stolonifera</i> , <i>Anemone nemorosa</i> , <i>Blechnum spicant</i> , <i>Campylopus flexuosus</i> , <i>Conopodium majus</i> , <i>Dicranum fuscescens</i> , <i>Melampyrum pratense</i> , <i>Molinia caerulea</i> , <i>Polytrichum commune</i> , <i>Potentilla erecta</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Sorbus aucuparia seedling</i> , <i>Sphagnum denticulatum</i> , <i>Trientalis europaea</i>	<i>Brachythecium rutabulum</i>		JA133_AW28b&DS5_G1, JA133_AW28b&DS5_G2, JA133_AW28b&DS5_G3
JA134	AW – 28B & DS – 5	288984	812345	W4b	Canopy		<i>Betula pendula</i> , <i>B. pubescens</i>				Semi-mature and mature. AW indicator species, wet area, established ground storey, deadwood. No signs of disturbance.	JA134_AW28b&DS5_C1, JA134_AW28b&DS5_C2
					Understorey			<i>Betula pendula</i> , <i>B. pubescens</i> , <i>Myrica gale</i> , <i>Salix cinerea</i>				JA134_AW28b&DS5_U1
					Ground layer		<i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Sphagnum palustre</i>	<i>Carex nigra</i> , <i>Holcus lanatus</i> , <i>Molinia caerulea</i> , <i>Sphagnum fallax</i>	<i>Aulacomnium palustre</i> , <i>Cardamine pratensis</i> , <i>Galium palustre</i> , <i>Oxalis acetosella</i> , <i>Polytrichum commune</i> , <i>Potamogeton natans</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus flammula</i> , <i>R. repens</i> , <i>Vaccinium myrtillus</i> , <i>V. vitis-idaea</i>	<i>Sorbus aucuparia seedling</i> , <i>Trientalis europaea</i>		JA134_AW28b&DS5_G1, JA134_AW28b&DS5_G1, JA134_AW28b&DS5_G2, JA134_AW28b&DS5_G3
JA135		289019	812531	W4b	Canopy		<i>Betula pendula</i> , <i>B. pubescens</i>			Semi-mature and mature.	JA135_AW28a&DS5_C1, JA135_AW28a&DS5_C2	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
	AW – 28B & DS – 5										AW indicators, mature trees, well developed ground storey. No signs of disturbance.	C2, JA135_AW28a&DS5_C3
					Understorey							
					Ground layer		<i>Hylocomium splendens</i> , <i>Molinia caerulea</i>		<i>Agrostis capillaris</i> , <i>Deschampsia flexuosa</i> , <i>Dicranum majus</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Pseudoscleropodium purum</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Sphagnum fallax</i> , <i>S. palustre</i> , <i>Thuidium tamariscinum</i> , <i>Trientalis europaea</i> , <i>Viola riviniana</i>			JA135_AW28a&DS5_G1, JA135_AW28a&DS5_G2, JA135_AW28a&DS5_G3, JA135_AW28a&DS5_G4, JA135_AW28a&DS5_G5, JA135_AW28a&DS5_G6
JA136	AW – 28B & DS – 5	289014	812737	W4b/ W17b	Canopy		<i>Betula pendula</i> , <i>B. pubescens</i>				Semi-mature trees. Some AW indicators, well developed ground flora. No disturbance signs.	JA136a_AW28a&DS5_C1, JA136a_AW28A&dDS5_C2,
					Understorey		<i>Betula pendula</i> , <i>B. pubescens</i> , <i>Myrica gale</i>					
					Ground layer	<i>Calluna vulgaris</i> , <i>Molinia caerulea</i> , <i>Vaccinium myrtillus</i>	<i>Dicranum majus</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Thuidium tamariscinum</i> , <i>Trientalis europaea</i>	<i>Anemone nemorosa</i> , <i>Campylopus flexuosus</i> , <i>Deschampsia flexuosa</i> , <i>Dryopteris dilatata</i> , <i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>H. mollis</i> , <i>Hypericum pulchrum</i> , <i>Luzula multiflora</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Succisa pratensis</i> , <i>Vaccinium vitis-idaea</i>	<i>Betula pubescens</i> seedling, <i>Blechnum spicant</i> , <i>Sorbus aucuparia</i> seedling			
JA137	AW – 28B & DS – 5	289038	812769	W11c/d	Canopy			<i>Betula pendula</i>			Mature trees. AW indicators, well developed ground flora, dead wood and old stumps of old birch. No clear signs of disturbance or degradation.	JA137_AW28a&DS5C1, JA137_AW28c&DS5_C2, JA137_AW28a&DS5_C3
					Understorey		<i>Betula pendula</i>					





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i>	<i>Danthonia decumbens</i> , <i>Lathyrus linifolius</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Vaccinium myrtillus</i> , <i>Veronica officinalis</i>	<i>Calluna vulgaris</i> , <i>Conopodium majus</i> , <i>Erica cinerea</i> , <i>Galium saxatile</i> , <i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> , <i>Sorbus aucuparia</i> seedling, <i>Succisa pratensis</i> , <i>Viola riviniana</i>			JA137_AW28a&DS5_G1, JA137_AW28a&DS5_G2, JA137_AW28a&DS5_G3, JA137_AW28a&DS5_G4
JA140	AW – 28C & DS – 5	289068	811920	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature trees. AW indicators, well developed ground flora. Low levels of disturbance, low browsing levels.	JA140_AW28c&DS5_C1, JA140_AW28c&DS5_C2
					Understorey				<i>Betula pendula</i>			
					Ground layer		<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i>	<i>Conopodium majus</i> , <i>Oreopteris limbosperma</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Rhytidiadelphus loreus</i> , <i>R. triquetrus</i> , <i>Viola riviniana</i>	<i>Blechnum spicant</i> , <i>Dryopteris affinis</i> , <i>Eurhynchium striatum</i> , <i>Holcus lanatus</i> , <i>Senecio jacobaea</i>	<i>Plagiothecium undulatum</i> , <i>Ptilium crista-castrensis</i> , <i>Ranunculus repens</i>		JA140_AW28c&DS5_G1, JA140_AW28c&DS5_G2
JA141	AW – 28C & DS – 5	289061	811863	W11c	Canopy		<i>Betula pendula</i>		<i>Betula pubescens</i>		Mature trees. AW indicators, established ground flora. No visible signs of disturbance.	JA141_AW28c&DS5_C1, JA141_AW28c&DS5_C2
					Understorey			<i>Sorbus aucuparia</i>	<i>Betula pendula</i>			
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus loreus</i>	<i>Blechnum spicant</i> , <i>Dryopteris affinis</i> , <i>Galium saxatile</i> , <i>Holcus mollis</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Pteridium aquilinum</i> , <i>Vaccinium myrtillus</i>	<i>Dicranum scoparium</i> , <i>Holcus lanatus</i> , <i>Mnium hornum</i> , <i>Oreopteris limbosperma</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Ptilium crista-castrensis</i> , <i>Vaccinium vitis-idaea</i> , <i>Viola riviniana</i>	<i>Dryopteris dilatata</i> , <i>Sorbus aucuparia</i> seedling		JA141_AW28c&DS5_G1, JA141_AW28c&DS5_G2, JA141_AW28c&DS5_G3
JA142	AW – 28C & DS – 5	289075	811820	W9	Canopy		<i>Betula pendula</i>				Mature trees. AW indicators, well developed ground flora. No visible signs of disturbance.	JA142_AW28c&DS5_C1, JA142_AW28c&DS5_C2
					Understorey				<i>Betula pubescens</i> , <i>Sorbus aucuparia</i>			
					Ground layer		<i>Gymnocarpium dryopteris</i> , <i>Holcus mollis</i> , <i>Hylocomium splendens</i> , <i>Mercurialis perennis</i>	<i>Anemone nemorosa</i> , <i>Anthoxanthum odoratum</i> , <i>Conopodium majus</i> , <i>Geum rivale</i> , <i>Oxalis acetosella</i> , <i>Potentilla erecta</i> , <i>Pteridium</i>	<i>Circaea x intermedia</i> , <i>Deschampsia cespitosa</i> , <i>Filipendula ulmaria</i> , <i>Galium palustre</i> , <i>Holcus lanatus</i> , <i>Lysimachia</i>	<i>Calluna vulgaris</i>		JA142_AW28c&DS5_G1, JA142_AW28c&DS5_G2, JA142_AW28c&DS5_G3





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
								<i>aquilinum</i> , <i>Ranunculus acris</i> , <i>Rhytiadelphus triquetrus</i> , <i>Viola riviniana</i>	<i>nemorum</i> , <i>Viola palustris</i>				
JA143	AW – 28C & DS – 5	289112	811556	W11	Canopy		<i>Betula pendula</i>				Mature birch canopy. AW indicators, well established ground flora. No visible signs of disturbance or browsing by deer.	JA143_AW328c&DS5_C1, JA143_AW28c&DS5_C2	
					Understorey			<i>Betula pendula</i>					
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Hylocomium splendens</i>	<i>Agrostis capillaris</i> , <i>Brachypodium sylvaticum</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i> , <i>Potentilla sterilis</i> , <i>Rhytiadelphus triquetrus</i> , <i>Viola riviniana</i>	<i>Atrichum undulatum</i> , <i>Conopodium majus</i> , <i>Dryopteris affinis</i> , <i>D. filix-mas</i> , <i>Filipendula ulmaria</i> , <i>Fragaria vesca</i> , <i>Holcus lanatus</i> , <i>Lathyrus linifolius</i> , <i>Rhytiadelphus loreus</i> , <i>Rubus idaeus</i> , <i>Senecio jacobaea</i> , <i>Teucrium scorodonia</i>	<i>Fraxinus excelsior</i> seedling, <i>Taraxacum officinale</i>			JA143_AW28c&DS5_G1, JA143_AW28c&DS5_G2, JA143_AW28c7DS5_G3
JA148	AW – 28C	288928	811081	W17d	Canopy		<i>Betula pendula</i>				Mature trees. AW indicators, established ground flora. No visible signs of disturbance.	JA148_AW28c_C1, JA148_AW28c_C2	
					Understorey				<i>Juniperus communis</i>				JA148_AW28c_U1
					Ground layer		<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Rhytiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Calluna vulgaris</i> , <i>Campanula rotundifolia</i> , <i>Erica cinerea</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Viola riviniana</i>	<i>Dicranum scoparium</i> , <i>Galium saxatile</i> , <i>Hypericum pulchrum</i> , <i>Hypnum cupressiforme</i> , <i>H. jutlandicum</i> , <i>Juniperus communis</i> , <i>Potentilla erecta</i> , <i>Racomitrium lanuginosum</i> , <i>Succisa pratensis</i> , <i>Teucrium scorodonia</i>	<i>Ajuga reptans</i> , <i>Conopodium majus</i> , <i>Frullania tamarisci</i> , <i>Galium verum</i> , <i>Oxalis acetosella</i>			JA148_AW28c_G1, JA148_AW28c_G2
JA149	AW – 28C & DS – 5	288963	811122	U20a/ W25a	Ground layer	<i>Pteridium aquilinum</i>	<i>Agrostis capillaris</i> , <i>Ajuga reptans</i> , <i>Anemone nemorosa</i> , <i>Carex flacca</i> , <i>Primula vulgaris</i>	<i>Anthoxanthum odoratum</i> , <i>Holcus mollis</i> , <i>Hypnum lacunosum</i>	<i>Calluna vulgaris</i> , <i>Carex pilulifera</i> , <i>Conopodium majus</i> , <i>Deschampsia flexuosa</i> , <i>Erica cinerea</i> , <i>Festuca ovina</i> , <i>Galium saxatile</i> , <i>G. verum</i> , <i>Helianthemum nummularium</i> , <i>Holcus lanatus</i> , <i>Lathyrus linifolius</i> , <i>Molinia caerulea</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> ,	<i>Taraxacum officinale</i> , <i>Urtica dioica</i>	AW indicators, well developed ground flora. No visible signs of disturbance or degradation.	JA149_AW28c_DS5_G1, JA149_AW28c_DS5_G2, JA149_AW28c_DS5_G3, JA149_AW28c_DS5_G4	





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						Dominant	Abundant	Frequent	Occasional	Rare		
									<i>Rhytiadelphus squarrosus</i> , <i>Rubus idaeus</i> , <i>Rumex acetosa</i> , <i>Thymus polytrichus</i>			
JA150	AW – 28C & DS – 5	289037	811242	W11c	Canopy		<i>Betula pendula</i>				Mature trees with some dead wood around. AW indicators, well developed ground flora. No clear signs of disturbance.	JA150_AW28c_DS5_C1, JA150_AW28c_DS5_C2
					Understorey							
					Ground layer		<i>Anthoxanthum odoratum</i>	<i>Conopodium majus</i> , <i>Deschampsia flexuosa</i> , <i>Holcus lanatus</i> , <i>H. mollis</i> , <i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Rhytiadelphus triquetrus</i> , <i>Viola riviniana</i>	<i>Achillea millefolium</i> , <i>Calluna vulgaris</i> , <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Isoetes myosuroides</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i> , <i>Pseudoscleropodium purum</i>	<i>Campanula rotundifolia</i> , <i>Ranunculus acris</i> , <i>Vaccinium myrtillus</i>		JA150_AW28c_DS5_G1, JA150_AW28c_DS5_G2
JA70	AW - 29	290184	816290	W18a/d (P)	Canopy		<i>Pinus sylvestris</i>				Young plantation. Some AW indicators, vegetation shows some areas of disturbance like ditches and Juncus patches. Some signs of disturbance nearby and litter from adjacent lay by.	JA70_AW29_C1, JA70_AW29_C2
					Understorey			<i>Cytisus scoparius</i> , <i>Salix cinerea</i>				
					Ground layer		<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Pteridium aquilinum</i> , <i>Sphagnum fallax</i>	<i>Deschampsia flexuosa</i> , <i>Galium saxatile</i> , <i>Pleurozium schreberi</i> , <i>Potentilla erecta</i>	<i>Agrostis capillaris</i> , <i>Ajuga reptans</i> , <i>Anthoxanthum odoratum</i> , <i>Aulacomnium palustre</i> , <i>Blechnum spicant</i> , <i>Calliergonella cuspidata</i> , <i>Carex binervis</i> , <i>C. nigra</i> , <i>C. panicea</i> , <i>Deschampsia cespitosa</i> , <i>Erica cinerea</i> , <i>Erica tetralix</i> , <i>Filipendula ulmaria</i> , <i>Juncus effusus</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Polytrichastrum formosum</i> , <i>Pseudoscleropodium purum</i> , <i>Rhytiadelphus triquetrus</i> , <i>Salix cinerea</i> seedling, <i>Vaccinium myrtillus</i> ,	<i>Dryopteris filix-mas</i>		JA70_AW29_G1, JA70_AW29_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
									<i>Valeriana officinalis</i> , <i>Viola palustris</i>				
JA71	AW - 29	290282	816233	W18c (P)	Canopy		<i>Pinus sylvestris</i>					Young plantation with occasional semi-mature plantation. AW indicators. Deer browsing otherwise low level of disturbance.	JA71_AW29_C1
					Understorey				<i>Betula pubescens</i>				
					Ground layer		<i>Deschampsia flexuosa</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Hylocomium splendens</i> , <i>Oxalis acetosella</i> , <i>Pleurozium schreberi</i>	<i>Anthoxanthum odoratum</i> , <i>Dicranum fuscescens</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i>	<i>Anemone nemorosa</i> , <i>Betula pubescens</i> seedling, <i>Lathyrus linifolius</i> , <i>Viola riviniana</i>			JA71_AW29_G1, JA71_AW29_G2
JA48	AW - 30	290252	821749	W18d (P)	Canopy		<i>Pinus sylvestris</i>	<i>Betula pubescens</i>				Young plantation. No AW indicators.	JA48_AW30_C1, JA48_AW30_C2
					Understorey				<i>Pinus sylvestris</i>				
					Ground layer		<i>Calluna vulgaris</i> , <i>Polytrichum commune</i>	<i>Deschampsia flexuosa</i> , <i>Erica tetralix</i> , <i>Molinia caerulea</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus loreus</i>	<i>Carex echinata</i> , <i>Eriophorum vaginatum</i> , <i>Hylocomium splendens</i> , <i>Hypnum cupressiforme</i> , <i>Sphagnum denticulatum</i> , <i>S. palustre</i> , <i>S. papillosum</i> , <i>Trichophorum germanicum</i>	<i>Betula pubescens</i> seedling			JA48_AW30_G1, JA48_AW30_G2
JA51	AW - 30	290371	821785	W18d (P)	Canopy	<i>Pinus sylvestris</i>						Young plantation. No AW indicators.	JA51_AW30_C1, JA51_AW30_C2
					Understorey								
					Ground layer		<i>Calluna vulgaris</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Polytrichum commune</i>	<i>Erica tetralix</i> , <i>Hypnum cupressiforme</i> , <i>Molinia caerulea</i> , <i>Vaccinium vitis-idaea</i>	<i>Dicranum scoparium</i> , <i>Lophocolea bidentata</i> , <i>Plagiothecium undulatum</i> , <i>Poa trivialis</i> , <i>Sphagnum capillifolium</i>		JA51_AW30_G1, JA51_AW30_G2		
JA55	AW - 30	290760	820939	W18d (P)	Canopy		<i>Pinus sylvestris</i>					Mature and young plantation.	JA55_AW30_C1, JA55_AW30_C2
					Understorey								
					Ground layer		<i>Calluna vulgaris</i> , <i>Eriophorum vaginatum</i> , <i>Pleurozium schreberi</i> , <i>Polytrichum commune</i> , <i>Sphagnum capillifolium</i>	<i>Erica tetralix</i> , <i>Hylocomium splendens</i> , <i>Vaccinium vitis-idaea</i>	<i>Aulacomnium palustre</i> , <i>Carex echinata</i> , <i>Eriophorum angustifolium</i> , <i>Juncus effusus</i> , <i>Listera cordata</i> , <i>Sphagnum fallax</i> , <i>S. palustre</i>		JA55_AW30_G1, JA55_AW30_G2		
JA56	AW - 30	290752	821035	U4a/M6c	Ground layer		<i>Deschampsia flexuosa</i> , <i>Festuca ovina</i> ,	<i>Agrostis capillaris</i> , <i>Galium saxatile</i> , <i>Hylocomium</i>	<i>Aulacomnium palustre</i> , <i>Carex rostrata</i> , <i>Cirsium</i>	<i>Carex nigra</i> , <i>Potentilla erecta</i>	Disturbance from forestry operations.	JA56_AW30_G1, JA56_AW30_G2	





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						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Nardus stricta</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus squarrosus</i>	<i>splendens</i> , <i>Juncus effusus</i> , <i>Molinia caerulea</i>	<i>palustre</i> , <i>Deschampsia cespitosa</i> , <i>Luzula pilosa</i> , <i>Sphagnum palustre</i> , <i>S. papillosum</i> , <i>Viola palustris</i>			
JA57	AW - 30	290721	821113	W11	Canopy			<i>Betula pendula</i> , <i>Betula pubescens</i>	<i>Picea sitchensis</i> , <i>Pinus sylvestris</i> , <i>Pseudotsuga menziesii</i>		Semi-mature and mature trees. Some AW indicators, species-poor due to conifer plantation woodland surrounding area.	JA57_AW30_C1, JA57_AW30_C2
					Understorey							
					Ground layer		<i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus triquetrus</i>	<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Pseudoscleropodium purum</i>	<i>Blechnum spicant</i> , <i>Carex pilulifera</i> , <i>Holcus lanatus</i> , <i>Polytrichum commune</i>	<i>Calluna vulgaris</i> , <i>Luzula pilosa</i> , <i>Oxalis acetosella</i> , <i>Picea sitchensis</i> seedling		JA57_AW30_G1, JA57_AW30_G2
JA58	AW - 30	290738	820884	M4	Ground layer	<i>Sphagnum palustre</i>	<i>Carex rostrata</i>	<i>Ajuga reptans</i> , <i>Erica tetralix</i> , <i>Ranunculus repens</i> , <i>Sphagnum fallax</i>	<i>Caltha palustris</i> , <i>Cirsium palustre</i> , <i>Equisetum palustre</i> , <i>Galium palustre</i> , <i>Potentilla palustris</i> , <i>Viola palustris</i>	<i>Hydrocotyle vulgaris</i>		JA58_AW30_G1, JA58_AW30_G2
JA60	AW - 30	290540	821219	M19a	Ground layer		<i>Calluna vulgaris</i> , <i>Erica tetralix</i> , <i>Eriophorum vaginatum</i> , <i>Hylocomium splendens</i> , <i>Molinia caerulea</i>	<i>Carex nigra</i> , <i>Eriophorum angustifolium</i> , <i>Polytrichum commune</i> , <i>Sphagnum capillifolium</i>	<i>Betula pubescens</i> seedling, <i>Sphagnum denticulatum</i>	<i>Luzula pilosa</i> , <i>Pinus sylvestris</i> seedling, <i>Rhytidiadelphus triquetrus</i>	Some light browsing and self-seeding Scot's Pine.	JA60_AW30_G1, JA60_AW30_G2
JA61	AW - 30	290592	820966	W18c (P)	Canopy		<i>Pinus sylvestris</i>				Young plantation with AW indicators.	JA61_AW30_C1, JA61_AW30_C2
					Understorey							
					Ground layer		<i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i>	<i>Deschampsia flexuosa</i>	<i>Calluna vulgaris</i> , <i>Dicranum fuscescens</i> , <i>Goodyera repens</i> , <i>Hypnum cupressiforme</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium vitis-idaea</i>	<i>Pinus sylvestris</i> seedling, <i>Vaccinium myrtillus</i>		JA61_AW30_G1, JA61_AW30_G2
JA130	AW - 31	289231	811998	W17d/ W18b	Canopy			<i>Betula pendula</i>	<i>Pinus sylvestris</i>		Mature trees. AW indicator species. Low level disturbance, open to public.	JA130b_AW31_C1, JA130b_AW31_C2
					Understorey			<i>Betula pendula</i> , <i>Sorbus aucuparia</i>				JA130b_AW31_U1
					Ground layer		<i>Hylocomium splendens</i> , <i>Vaccinium myrtillus</i> ,	<i>Calluna vulgaris</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus</i>	<i>Campylopus flexuosus</i> , <i>Deschampsia flexuosa</i> , <i>Dicranum</i>	<i>Molinia caerulea</i> , <i>Potentilla erecta</i> , <i>Pyrola minor</i> , <i>Trientalis europaea</i>		JA130b_AW31_G1, JA130b_AW31_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
							<i>Vaccinium vitis-idaea</i>	<i>triquetrus</i> , <i>Sorbus aucuparia</i> seedling	<i>majus</i> , <i>D. scoparium</i> , <i>Hypnum cupressiforme</i> , <i>Lophocolea bidentata</i> , <i>Luzula pilosa</i> , <i>Plagiothecium undulatum</i> , <i>Rhytidiadelphus loreus</i>			
JA144	AW - 31	289190	811821	W17d	Canopy		<i>Betula pendula</i>				Young to semi-mature. AW indicator species. Location next to A9 lay by and caravan park. Litter from lay by and caravan park, no other disturbance.	JA144_AW31_C1, JA144_AW31_C2
					Understorey			<i>Betula pendula</i> , <i>Sorbus aucuparia</i>				JA144_AW31_U1
					Ground layer		<i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium myrtillus</i>	<i>Calluna vulgaris</i> , <i>Pleurozium schreberi</i> , <i>Sorbus aucuparia</i> seedling, <u><i>Trientalis europaea</i></u> , <i>Vaccinium vitis-idaea</i>	<i>Anthoxanthum odoratum</i> , <i>Betula pubescens</i> seedling, <i>Galium saxatile</i> , <i>Hypnum cupressiforme</i> , <i>Luzula pilosa</i> , <i>Molinia caerulea</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Senecio jacobaea</i>	<i>Veronica officinalis</i>		JA144_AW31_G1, JA144_AW31_G2
JA156	DS – 2	285884	809617	W2b	Canopy			<i>Alnus glutinosa</i> , <i>Betula pubescens</i> , <i>Salix cinerea</i>			Mature trees. AW indicator species. Limited due to aquatic habitat. No visible signs of disturbance.	JA156_DS2_C1, JA156_DS2_C2
					Understorey		<i>Myrica gale</i>					JA156_DS2_U1
					Ground layer	<i>Phragmites australis</i>	<i>Sphagnum fallax</i> , <i>S. palustre</i>	<i>Calliergonella cuspidata</i> , <i>Carex nigra</i> , <i>Molinia caerulea</i> , <i>Myrica gale</i>	<i>Angelica sylvestris</i> , <i>Aulacomnium palustre</i> , <i>Caltha palustris</i> , <i>Cardamine flexuosa</i> , <i>Carex rostrata</i> , <i>Cirsium palustre</i> , <i>Epilobium palustre</i> , <i>Equisetum palustre</i> , <i>Hylocomium splendens</i> , <i>Narthecium ossifragum</i> , <i>Senecio jacobaea</i> , <i>Sphagnum capillifolium</i> , <i>S. denticulatum</i> , <u><i>Valeriana officinalis</i></u>	<i>Aneura pinguis</i> , <i>Betula pubescens</i> seedling, <i>Bryum pseudotriquetrum</i> , <i>Stellaria uliginosa</i> , <u><i>Trientalis europaea</i></u>		JA156_DS2_G1, JA156_DS2_G2
JA103	DS – 4	287983	810081	W17b/ W18b (P)	Canopy		<i>Betula pendula</i> , <i>Pinus sylvestris</i>				Mature plantation. No AW indicator species. Deer browsing otherwise low level of disturbance.	JA103_DS4_C1, JA103_DS4_C2
					Understorey				<i>Sorbus aucuparia</i>			JA103_DS4_U1, JA103_DS4_U2
					Ground layer		<i>Hylocomium splendens</i> , <i>Rhytidiadelphus</i>	<i>Deschampsia flexuosa</i> ,	<i>Hypnum cupressiforme</i> , <i>Pseudoscleropodium</i>	<i>Dicranum majus</i>		JA103_DS4_G1, JA103_DS4_G2





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID	
						Dominant	Abundant	Frequent	Occasional	Rare			
							<i>triquetrus</i> , <i>Vaccinium myrtillus</i> , <i>V. vitis-idaea</i>	<i>Rhytidiadelphus loreus</i>	<i>purum</i> , <i>Sorbus aucuparia</i> seedling				
JA104	DS – 4	287893	809999	W18b (P)	Canopy		<i>Pinus sylvestris</i>	<i>Betula pendula</i>			Semi-mature and mature plantation. No AW indicator species present. Low disturbance levels, deer browsing.	JA104_DS4_C1	
					Understorey			<i>Betula pendula</i>	<i>Sorbus aucuparia</i>				
					Ground layer		<i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Pyrola minor</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Vaccinium vitis-idaea</i>	<i>Deschampsia flexuosa</i> , <i>Dicranum scoparium</i> , <i>Vaccinium myrtillus</i>	<i>Calluna vulgaris</i> , <i>Campylopus flexuosus</i> , <i>Hypnum cupressiforme</i> , <i>Sorbus aucuparia</i> seedling				JA104_DS4_G1, JA104_DS4_G2
JA131	DS – 5	289101	812048	W17b	Canopy		<i>Betula pendula</i>	<i>Pinus sylvestris</i>			Majority semi-mature and mature. Established ground flora, AW indicator species. Low level disturbance, deer browsing, dog walkers.	JA131_DS5_C1, JA131_DS5_C2	
					Understorey			<i>Betula pendula</i> , <i>Sorbus aucuparia</i>					JA131_DS5_U1, JA131_DS5_U2
					Ground layer		<i>Calluna vulgaris</i> , <i>Hylocomium splendens</i> , <i>Pleurozium schreberi</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Vaccinium myrtillus</i>	<i>Deschampsia flexuosa</i> , <i>Pseudoscleropodium purum</i> , <i>Pteridium aquilinum</i> , <i>Sorbus aucuparia</i> seedling, <i>Thuidium tamariscinum</i> , <i>Trientalis europaea</i> , <i>Vaccinium vitis-idaea</i>	<i>Anthoxanthum odoratum</i> , <i>Campylopus flexuosus</i> , <i>Galium saxatile</i> , <i>Lophocolea bidentata</i> , <i>Luzula pilosa</i> , <i>Melampyrum pratense</i> , <i>Nardus stricta</i> , <i>Oxalis acetosella</i> , <i>Polytrichastrum formosum</i> , <i>Potentilla erecta</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Succisa pratensis</i> , <i>Viola riviniana</i>	<i>Anemone nemorosa</i> , <i>Pyrola minor</i>			JA131_DS5_G1, JA131_DS5_G2
JA132	DS – 5	289067	812080	S9a/Mx	Ground layer		<i>Calliergonella cuspidata</i> , <i>Carex rostrata</i>	<i>Agrostis stolonifera</i> , <i>Carex nigra</i> , <i>C. vesicaria</i> , <i>C. viridula</i> , <i>Festuca ovina</i> , <i>Galium palustre</i> , <i>Hydrocotyle vulgaris</i> , <i>Ranunculus flammula</i> , <i>Rhytidiadelphus squarrosus</i> , <i>Viola palustris</i>	<i>Cardamine pratensis</i> , <i>Carex flacca</i> , <i>Juncus effusus</i> , <i>Myrica gale</i> , <i>Nardus stricta</i> , <i>Plantago lanceolata</i> , <i>Ranunculus repens</i> , <i>Rhizomnium punctatum</i> , <i>Salix cinerea</i> seedling, <i>Sphagnum denticulatum</i> , <i>Succisa pratensis</i> , <i>Taraxacum officinale</i> , <i>Trifolium repens</i>	<i>Anemone nemorosa</i> , <i>Persicaria vivipara</i> , <i>Potentilla erecta</i>	No signs of disturbance.	JA132_DS5_G1, JA132_DS5_G2, JA132_DS5_G3	
JA138	DS - 5	289083	813278	W17b	Canopy		<i>Betula pendula</i>				Mature trees with broken stumps from older birch.	JA138_DS5_C1, JA138_DS5_C2, JA138_DS5_C3	





Target Note Ref.	AW/DS ID Area	Easting	Northing	NVC Types	Layer	Species List (DAFOR)					General comments	Photo ID
						Dominant	Abundant	Frequent	Occasional	Rare		
					Understorey						AW indicators, well established ground flora.	
					Ground layer		<i>Anthoxanthum odoratum</i> , <i>Deschampsia flexuosa</i> , <i>Hylocomium splendens</i> , <i>Vaccinium myrtillus</i>	<i>Anemone nemorosa</i> , <i>Calluna vulgaris</i> , <i>Galium saxatile</i> , <i>Vaccinium vitis-idaea</i> , <i>Viola riviniana</i>	<i>Campylopus flexuosus</i> , <i>Carex pilulifera</i> , <i>Dicranum fuscescens</i> , <i>Frullania tamarisci</i> , <i>Holcus mollis</i> , <i>Hypnum jutlandicum</i> , <i>Lathyrus linifolius</i> , <i>Pleurozium schreberi</i> , <i>Pteridium aquilinum</i> , <i>Racomitrium lanuginosum</i> , <i>Sorbus aucuparia</i> seedling	<i>Oxalis acetosella</i>	Low disturbance levels and low deer browsing levels.	JA138_DS5_G1, JA138_DS5_G2, JA138_DS5_G3
JA139	DS - 5	289051	812338	U4b-c	Ground layer		<i>Galium saxatile</i> , <i>Holcus lanatus</i> , <i>Rhytiadelphus squarrosus</i>	<i>Agrostis capillaris</i> , <i>Anthoxanthum odoratum</i> , <i>Carex caryophylla</i> , <i>Festuca ovina</i> , <i>Galium verum</i> , <i>Succisa pratensis</i>	<i>Achillea millefolium</i> , <i>Campanula rotundifolia</i> , <i>Cardamine pratensis</i> , <i>Pleurozium schreberi</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i> , <i>Senecio jacobaea</i> , <i>Veronica chamaedrys</i>		Semi-improved grassland	JA139_DS5_G1, JA139_DS5_G2, JA139_DS5_G3



Table A.2: Species Recorded & Number of TNs Present

Species	Plant group ¹⁹	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)
Acer pseudoplatanus	V	5	Fagus sylvatica	V	1	Pleurozium schreberi	B	95
Achillea millefolium	V	8	Festuca ovina	V	17	Poa annua	V	4
Agrostis canina	V	3	Festuca rubra	V	3	Poa trivialis	V	3
Agrostis capillaris	V	59	Filipendula ulmaria	V	6	Polygala serpyllifolia	V	5
Agrostis stolonifera	V	6	Fragaria vesca	V	1	Polygala vulgaris	V	1
Ajuga reptans	V	14	Fraxinus excelsior	V	1	Polytrichastrum formosum	B	22
Alnus glutinosa	V	6	Frullania tamarisci	B	4	Polytrichum commune	B	21
Anemone nemorosa	V	61	Galium aparine	V	3	Polytrichum juniperinum	B	2
Aneura pinguis	B	4	Galium palustre	V	15	Polytrichum strictum	B	2
Angelica sylvestris	V	2	Galium saxatile	V	65	Populus tremula	V	4
Anthoxanthum odoratum	V	97	Galium verum	V	3	Potamogeton natans	V	1
Aphanes arvensis	V	1	Genista anglica	V	3	Potentilla anserina	V	2
Arctostaphylos uva-ursi	V	1	Geum rivale	V	1	Potentilla erecta	V	67
Atrichum undulatum	B	6	Glyceria fluitans	V	6	Potentilla palustris	V	2
Aulacomnium palustre	B	8	Goodyera repens	V	2	Potentilla sterilis	V	1
Bellis perennis	V	2	Gymnocarpium dryopteris	V	2	Primula vulgaris	V	8

¹⁹ V = vascular plant; B = bryophyte; L = lichen

Species	Plant group ¹⁹	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)
Betula pendula	V	88	Helianthemum nummularium	V	3	Prunella vulgaris	V	7
Betula pubescens	V	77	Helictotrichon pratense	V	1	Prunus avium	V	1
Blechnum spicant	V	18	Heracleum sphondylium	V	2	Prunus padus	V	2
Brachypodium sylvaticum	V	2	Hieracium sp.	V	5	Pseudoscleropodium purum	B	25
Brachythecium rutabulum	B	5	Holcus lanatus	V	67	Pseudotsuga menziesii	V	3
Bryum pseudotriquetrum	B	2	Holcus mollis	V	31	Pteridium aquilinum	V	54
Calliergon giganteum	B	1	Hydrocotyle vulgaris	V	2	Ptilium crista-castrensis	B	2
Calliergonella cuspidata	B	14	Hylocomium splendens	B	127	Pyrola media	V	4
Calluna vulgaris	V	71	Hypericum pulchrum	V	15	Pyrola minor	V	5
Caltha palustris	V	9	Hypnum andoi	B	5	Quercus petraea	V	12
Campanula rotundifolia	V	10	Hypnum cupressiforme	B	48	Racomitrium ericoides	B	1
Campylopus flexuosus	B	14	Hypnum jutlandicum	B	14	Racomitrium lanuginosum	B	2
Cardamine flexuosa	V	6	Hypnum lacunosum	B	1	Ranunculus acris	V	8
Cardamine pratensis	V	13	Hypochoeris radicata	V	3	Ranunculus ficaria	V	3
Carex binervis	V	3	Hypogymnia physodes	L	3	Ranunculus flammula	V	11

Species	Plant group ¹⁹	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)
Carex caryophyllea	V	8	Iris pseudacorus	V	1	Ranunculus repens	V	35
Carex echinata	V	2	Isoethecium myosuroides	B	4	Rhizomnium punctatum	B	6
Carex flacca	V	3	Juncus acutiflorus	V	1	Rhytidiadelphus loreus	B	12
Carex nigra	V	11	Juncus articulatus	V	1	Rhytidiadelphus squarrosus	B	53
Carex panicea	V	3	Juncus bulbosus	V	1	Rhytidiadelphus triquetrus	B	112
Carex pilulifera	V	23	Juncus effusus	V	26	Rosa canina	V	1
Carex rostrata	V	11	Juncus squarrosus	V	3	Rubus idaeus	V	7
Carex vesicaria	V	1	Juniperus communis	V	21	Rumex acetosa	V	33
Carex viridula	V	1	Kindbergia praelonga	B	5	Rumex obtusifolius	V	8
Cerastium fontanum	V	3	Larix decidua	V	8	Salix caprea	V	1
Chrysosplenium oppositifolium	V	4	Lathyrus linifolius	V	37	Salix cinerea	V	12
Circaea x intermedia	V	3	Lobelia dortmanna	V	1	Salix repens	V	1
Cirsium arvense	V	5	Lolium perenne	V	3	Sambucus nigra	V	1
Cirsium palustre	V	9	Lophocolea bidentata	B	11	Senecio jacobaea	V	39
Cirsium vulgare	V	2	Lotus corniculatus	V	3	Sorbus aucuparia	V	51
Cladonia portentosa	L	5	Luzula multiflora	V	20	Sphagnum capillifolium	B	7
Cladonia uncialis	L	2	Luzula pilosa	V	73	Sphagnum denticulatum	B	5

Species	Plant group ¹⁹	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)
Conopodium majus	V	51	Luzula sylvatica	V	3	Sphagnum fallax	B	16
Corylus avellana	V	2	Lychnis flos-cuculi	V	1	Sphagnum girgensohnii	B	1
Crataegus monogyna	V	1	Lycopodium clavatum	V	1	Sphagnum palustre	B	12
Crepis paludosa	V	1	Lysimachia nemorum	V	2	Sphagnum papillosum	B	2
Cytisus scoparius	V	18	Melampyrum pratense	V	10	Sphagnum squarrosum	B	2
Dactylis glomerata	V	7	Mentha aquatica	V	1	Stellaria holostea	V	10
Dactylorhiza fuchsii	V	2	Mercurialis perennis	V	2	Stellaria media	V	8
Danthonia decumbens	V	2	Mnium hornum	B	11	Stellaria uliginosa	V	9
Deschampsia cespitosa	V	10	Molinia caerulea	V	15	Succisa pratensis	V	25
Deschampsia flexuosa	V	97	Montia fontana	V	6	Taraxacum officinale	V	13
Dichodontium palustre	B	1	Myrica gale	V	6	Teucrium scorodonia	V	6
Dicranum fuscescens	B	16	Nardus stricta	V	7	Thuidium tamariscinum	B	17
Dicranum majus	B	11	Narthecium ossifragum	V	1	Thymus polytrichus	V	3
Dicranum scoparium	B	31	Neottia cordata	V	1	Trichophorum germanicum	V	1
Digitalis purpurea	V	4	Oreopteris limbosperma	V	3	Trientalis europaea	V	31

Species	Plant group ¹⁹	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)	Species	Plant group	Frequency (no. of samples with sp.)
Diplophyllum albicans	B	3	Oxalis acetosella	V	66	Trifolium pratense	V	1
Dryopteris affinis	V	3	Pellia epiphylla	B	2	Trifolium repens	V	16
Dryopteris dilatata	V	9	Peltigera hymenina	L	1	Tussilago farfara	V	1
Dryopteris filix-mas	V	3	Peltigera membranacea	L	2	Urtica dioica	V	20
Empetrum nigrum	V	1	Persicaria vivipara	V	1	Vaccinium myrtillus	V	63
Epilobium montanum	V	4	Phragmites australis	V	1	Vaccinium vitis-idaea	V	44
Epilobium palustre	V	7	Picea sitchensis	V	2	Valeriana officinalis	V	11
Equisetum fluviatile	V	2	Pilosella officinarum	V	3	Veronica chamaedrys	V	44
Equisetum palustre	V	3	Pinus sylvestris	V	52	Veronica officinalis	V	30
Erica cinerea	V	22	Plagiochila asplenioides	B	1	Veronica serpyllifolia	V	6
Erica tetralix	V	11	Plagiomnium undulatum	B	9	Vicia sepium	V	2
Eriophorum angustifolium	V	4	Plagiothecium undulatum	B	10	Viola palustris	V	11
Eriophorum vaginatum	V	4	Plantago lanceolata	V	7	Viola riviniana	V	77
Eurhynchium striatum	B	1	Plantago major	V	3			

Annex B. Designated Site Features

- B.1.1 A total of 28 of the TN locations presented in Annex A are within designated sites. Eight are within Alvie SSSI (DS1-DS4 in Figure 12.2), 18 within Craigellachie SSSI/NNR (DS5) and two within Loch Vaa SSSI (DS6).
- B.1.2 In addition to the species data collected above, qualitative data was collected at these locations on whether the area supports, or is likely to support, species or habitats for which the site has been designated. This data and information is summarised below in Table B.1.

Table B.1: Survey Data Correlation to Designated Site Features

Designated Site	Designated Site Polygon ID	Relevant TN IDs	Relevant Qualifying Features	Habitat	Results
Alvie SSSI	1 - 4	JA158 (DS1), JA156 (DS2), JA151 - JA153 (DS3), JA103 - JA105 (DS4)	Upland oak woodland		No oak woodland in relevant study areas.
			Invertebrate assemblage (including):	Associated with woodland, bog, and river shingle habitats.	Polygon DS1 (TN JA158) includes the Allt na Fhearna watercourse which provides some river shingle habitat. Woodland habitats dominate the relevant study areas. No bog habitat found within these areas. Some forest operations going on along edge of A9 (part of the dualling operations) along with other A9 works in close proximity to polygon DS1.
			Net-winged caddis fly (<i>Hagenella clathrata</i>)	Uses edge of lowland raised bog, quaking bog and wet heath. Associated with areas of well-developed tussocks and pools, mainly associates with <i>Molinia caerulea</i> . Larval food: <i>Betula</i> spp.	No lowland raised bog, quaking bog or wet heath in respective study areas (DS1 - DS4). A small amount of <i>Molinia caerulea</i> is present in DS2 around TN JA156; otherwise it is scarce within the respective study areas. <i>Betula</i> spp. are abundant within each study area and around each TN location, therefore there is an abundant larval food source.
			Aspen hoverfly (Hammerschmidtia ferruginea)	Larvae associated with <i>Populus tremula</i> deadwood.	Small amount of <i>Populus tremula</i> found in DS3 around TN JA153; no aspen deadwood found. No <i>P. tremula</i> noted in DS1, DS2, DS4 study areas.
Craigellachie SSSI/NNR	5	JA131 - JA143; JA145 - JA147 & JA149 - JA150	Upland birch woodland		Woodland generally well maintained due to being a nature reserve. Natural woodland with many mature-ancient trees.
			Moth assemblage: Kentish glory <i>Endromis versicolora</i>	Larval foodplant: <i>Betula</i> spp., sometimes <i>Alnus glutinosa</i>	Mature <i>Betula</i> woodland dominates with no <i>Alnus glutinosa</i> recorded within the designated site study area. Abundant larval food source.
			Rannoch sprawler <i>Brachionycha</i>	Confined to areas of old natural <i>Betula</i> woodland. Larval foodplant: <i>Betula</i>	Woodland is natural and dominated by <i>Betula</i> with many of the trees being noted as mature or ancient. Suitable habitat for this species, with abundant larval food source.

Designated Site	Designated Site Polygon ID	Relevant TN IDs	Relevant Qualifying Features	Habitat	Results
			(Asteroscopus) nubeculosa		
			Angle-striped sallow <i>Enargia paleacea</i>	Inhabits heaths and open woodland, larvae feed on <i>Betula</i> spp.	Much of the <i>Betula</i> woodland has an open canopy with a number of areas of dry heath forming part of the ground storey beneath the birch canopy, or is abundantly present in clearings/open areas. Abundant larval food source.
			Scarce prominent Odontosia carmelita	Inhabits mature woodland, larvae feed on <i>Betula</i>	Woodland is natural and dominated by <i>Betula</i> with many of the trees being noted as mature or ancient. Suitable habitat for this species, with abundant larval food source.
			Great brocade <i>Eurois occulta</i>	Feeds on <i>Salix</i> spp. and <i>Betula</i> . Larval foodplant: <i>Myrica gale</i>	<i>Betula</i> is abundant. No <i>Salix</i> spp. were recorded at any of the TN locations; however, it is likely there are some scattered <i>S. caprea/S. cinerea</i> throughout the wider woodland in low abundances. <i>Myrica gale</i> was recorded as infrequent, but relatively dense, patches within DS5. Its presence is usually associated with patches of wetter <i>Betula</i> W3 and W4 NVC type woodlands, which is scattered throughout DS5. <i>Myrica gale</i> was recorded at TN locations JA132, JA133, JA134 and JA136. Therefore, the area contains suitable habitat and food sources for adults and larvae.
			Cousin German Protolampa sobrina	Found in <i>Betula</i> woodland. Larval foodplants: <i>Calluna vulgaris</i> , <i>Vaccinium myrtillus</i> and <i>Betula</i>	Suitable habitat is present throughout. <i>Calluna vulgaris</i> , <i>Vaccinium myrtillus</i> and <i>Betula</i> are all abundant within DS5 study area (see respective TN species lists); therefore, suitable larval foodplants are abundant.
			Netted Mountain Moth <i>Macaria carbonaria</i>	Found on heath above woodland. Larvae feeds on <i>Arctostaphylos uva-ursi</i>	<i>Arctostaphylos uva-ursi</i> not recorded within DS5 TNs or associated study area.
Loch Vaa SSSI	6	JA43 & JA44	Beetle assemblage - aquatic beetles; including:	Habitat includes marshy freshwater ponds. Feeds on algae or decaying matter	Large freshwater pond/swamp covers part of polygon and next to polygon. Contains decaying vegetation. Water levels likely to fluctuate depending on rainfall. Contains <i>Carex rostrata</i> swamp (S9) and <i>C. rostrata</i> woodland



Designated Site	Designated Site Polygon ID	Relevant TN IDs	Relevant Qualifying Features	Habitat	Results
			Water scavenger beetle (<i>Berosus luridus</i>)		(W3). No obvious signs of direct habitat pressures of note. Some suitable habitat for this species.
			Gravel water beetle (<i>Hydrochus brevis</i>), Cyphon punctipennis and Agabus labiatus	No terrestrial phases known	Part of pond on edge of respective study area.

Annex C. NVC List and Description

- C.1.1 Table C.1 lists the NVC codes and the associated description and category.
- C.1.2 The distribution of the NVC codes and categories across the study area is shown on Figure 12.4. Further details of the flora, structure and habitats of these communities and sub-communities are described in Section 5 above.

Table C.1: NVC List and Description

NVC Code	Description	NVC Category
W2	Salix cinerea – Betula pubescens – Phragmites australis woodland	Woodland
W3	Salix pentandra – Carex rostrata woodland	Woodland
W4	Betula pubescens - Molinia caerulea woodland	Woodland
W4b	Betula pubescens - Molinia caerulea woodland, Juncus effusus sub-community	Woodland
W4c	Betula pubescens - Molinia caerulea woodland, Sphagnum spp. sub-community	Woodland
W6	Alnus glutinosa – Urtica dioica woodland	Woodland
W7	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland	Woodland
W7a	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland, Urtica dioica sub-community	Woodland
W7b	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland, Carex remota-Cirsium palustre sub-community	Woodland
W7c	Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum woodland, Deschampsia cespitosa sub-community	Woodland
W9	Fraxinus excelsior – Sorbus aucuparia – Mercurialis perennis woodland	Woodland
W11	Quercus petraea-Betula pubescens-Oxalis acetosella woodland	Woodland
W11 Lsyl	W11 woodland with a field layer of dominant <i>Luzula sylvatica</i>	Woodland
W11b	Quercus petraea-Betula pubescens-Oxalis acetosella woodland, Blechnum spicant sub-community	Woodland
W11c	Quercus petraea-Betula pubescens-Oxalis acetosella woodland, Anemone nemorosa sub-community	Woodland
W11d	Quercus petraea-Betula pubescens-Oxalis acetosella woodland, Stellaria holostea-Hypericum pulchrum sub-community	Woodland
W17	Quercus petraea-Betula pubescens-Dicranum majus woodland	Woodland
W17b	Quercus petraea-Betula pubescens-Dicranum majus woodland, typical sub-community	Woodland

NVC Code	Description	NVC Category
W17c	<i>Quercus petraea</i> - <i>Betula pubescens</i> - <i>Dicranum majus</i> woodland, <i>Anthoxanthum odoratum</i> - <i>Agrostis capillaris</i> sub-community	Woodland
W17d	<i>Quercus petraea</i> - <i>Betula pubescens</i> - <i>Dicranum majus</i> woodland, <i>Rhytidiadelphus triquetrus</i> sub-community	Woodland
W18	<i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland	Woodland
W18a	<i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland, <i>Erica cinerea</i> - <i>Goodyera repens</i> sub-community	Woodland
W18b	<i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland, <i>Vaccinium myrtillus</i> - <i>V. vitis-idaea</i> sub-community	Woodland
W18c	<i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland, <i>Luzula pilosa</i> sub-community	Woodland
W18d	<i>Pinus sylvestris</i> - <i>Hylocomium splendens</i> woodland, <i>Sphagnum capillifolium/quinquefarium</i> - <i>Erica tetralix</i> sub-community	Woodland
W19	<i>Juniperus communis</i> - <i>Oxalis acetosella</i> woodland	Woodland - scrub
W19a	<i>Juniperus communis</i> - <i>Oxalis acetosella</i> woodland, <i>Vaccinium vitis-idaea</i> - <i>Deschampsia flexuosa</i> sub-community	Woodland - scrub
W19b	<i>Juniperus communis</i> - <i>Oxalis acetosella</i> woodland, <i>Viola riviniana</i> - <i>Anemone nemorosa</i> sub-community	Woodland - scrub
W21	<i>Crataegus monogyna</i> – <i>Hedera helix</i> scrub	Woodland - scrub
W22	<i>Prunus spinosa</i> – <i>Rubus fruticosus</i> scrub	Woodland - scrub
W23	<i>Ulex europaeus</i> - <i>Rubus fruticosus</i> scrub	Woodland - scrub
W23a	<i>Ulex europaeus</i> - <i>Rubus fruticosus</i> scrub, <i>Anthoxanthum odoratum</i> sub-community	Woodland - scrub
W24	<i>Rubus fruticosus</i> – <i>Holcus lanatus</i> underscrub	Woodland - scrub
W25	<i>Pteridium aquilinum</i> – <i>Rubus fruticosus</i> underscrub	Woodland - scrub
M2	<i>Sphagnum cuspidatum/fallax</i> bog pool community	Mires, flushes & springs
M3	<i>Eriophorum angustifolium</i> bog pool community	Mires, flushes & springs
M4	<i>Carex rostrata</i> - <i>Sphagnum fallax</i> mire	Mires, flushes & springs
M5	<i>Carex rostrata</i> - <i>Sphagnum squarrosum</i> mire	Mires, flushes & springs
M6a	<i>Carex echinata</i> - <i>Sphagnum fallax/denticulatum</i> mire, <i>Carex echinata</i> sub-community	Mires, flushes & springs
M6b	<i>Carex echinata</i> - <i>Sphagnum fallax/denticulatum</i> mire, <i>Carex nigra</i> - <i>Nardus stricta</i> sub-community	Mires, flushes & springs
M6c	<i>Carex echinata</i> - <i>Sphagnum fallax/denticulatum</i> mire, <i>Juncus effusus</i> sub-community	Mires, flushes & springs
M6d	<i>Carex echinata</i> - <i>Sphagnum fallax/denticulatum</i> mire, <i>Juncus acutiflorus</i> sub-community	Mires, flushes & springs

NVC Code	Description	NVC Category
M9	Carex rostrata – Calliergon cuspidatum/giganteum mire	Mires, flushes & springs
M9b	Carex rostrata-Calliergon cuspidatum/giganteum mire, Carex diandra-Calliergon giganteum sub-community	Mires, flushes & springs
M10a	Carex dioica-Pinguicula vulgaris mire, Carex viridula-Juncus bulbosus/kochii sub-community	Mires, flushes & springs
M15	Trichophorum germanicum-Erica tetralix wet heath	Wet heath
M15a	Trichophorum germanicum-Erica tetralix wet heath, Carex panicea sub-community	Wet heath
M15b	Trichophorum germanicum-Erica tetralix wet heath, typical sub-community	Wet heath
M15c	Trichophorum germanicum-Erica tetralix wet heath, Cladonia spp. sub-community	Wet heath
M16	Erica tetralix-Sphagnum compactum wet heath	Wet heath
M16d	Erica tetralix-Sphagnum compactum wet heath, Juncus squarrosus-Dicranum scoparium sub-community	Wet heath
M17a	Trichophorum germanicum-Eriophorum vaginatum blanket mire, Drosera rotundifolia-Sphagnum spp. sub-community	Mires, flushes & springs
M17b	Trichophorum germanicum-Eriophorum vaginatum blanket mire, Cladonia spp. sub-community	Mires, flushes & springs
M19	Calluna vulgaris-Eriophorum vaginatum blanket mire	Mires, flushes & springs
M19a	Calluna vulgaris-Eriophorum vaginatum blanket mire, Erica tetralix sub-community	Mires, flushes & springs
M19b	Calluna vulgaris-Eriophorum vaginatum blanket mire, Empetrum nigrum ssp. nigrum sub-community	Mires, flushes & springs
M20	Eriophorum vaginatum blanket mire	Mires, flushes & springs
M20b	<i>Eriophorum vaginatum</i> blanket and raised mire, <i>Calluna vulgaris-Cladonia</i> spp. sub-community	Mires, flushes & springs
M23a	Juncus effusus/acutiflorus-Galium palustre rush-pasture, Juncus acutiflorus sub-community	Mires, flushes & springs
M23b	Juncus effusus/acutiflorus-Galium palustre rush-pasture, Juncus effusus sub-community	Mires, flushes & springs
M25	Molinia caerulea-Potentilla erecta mire	Mires, flushes & springs
M25a	Molinia caerulea-Potentilla erecta mire, Erica tetralix sub-community	Mires, flushes & springs
M25b	Molinia caerulea-Potentilla erecta mire, Anthoxanthum odoratum sub-community	Mires, flushes & springs
M27a	Filipendula ulmaria-Angelica sylvestris mire, Valeriana officinalis-Rumex acetosa sub-community	Mires, flushes & springs
M28a	Iris pseudacorus-Filipendula ulmaria mire, Juncus spp. sub-community	Mires, flushes & springs

NVC Code	Description	NVC Category
M32	<i>Philonotis fontana</i> – <i>Saxifraga stellaris</i> spring	Mires, flushes & springs
H9	<i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath	Dry heath
H9a	<i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath, <i>Hypnum cupressiforme</i> sub-community	Dry heath
H9d	<i>Calluna vulgaris</i> - <i>Deschampsia flexuosa</i> heath, <i>Galium saxatile</i> sub-community	Dry heath
H10	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath	Dry heath
H10a	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, typical sub-community	Dry heath
H10b	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, <i>Racomitrium lanuginosum</i> sub-community	Dry heath
H10c	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, <i>Festuca ovina</i> - <i>Anthoxanthum odoratum</i> sub-community	Dry heath
H10d	<i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, <i>Thymus praecox</i> - <i>Carex pulicaris</i> sub-community	Dry heath
H12	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath	Dry heath
H12a	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath, <i>Calluna vulgaris</i> sub-community	Dry heath
H12b	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath, <i>Vaccinium vitis-idaea</i> - <i>Cladonia impexa</i> sub-community	Dry heath
H12c	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath, <i>Galium saxatile</i> - <i>Festuca ovina</i> sub-community	Dry heath
H16	<i>Calluna vulgaris</i> - <i>Arctostaphylos uva-ursi</i> heath	Dry heath
H16b	<i>Calluna vulgaris</i> - <i>Arctostaphylos uva-ursi</i> heath, <i>Vaccinium myrtillus</i> - <i>Vaccinium vitis-idaea</i> sub-community	Dry heath
H18a	<i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath, <i>Hylocomium splendens</i> - <i>Rhytidiadelphus loreus</i> sub-community	Dry heath
H18b	<i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath, <i>Alchemilla alpina</i> - <i>Carex pilulifera</i> sub-community	Dry heath
H18c	<i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath, <i>Racomitrium lanuginosum</i> - <i>Cladonia</i> spp. sub-community	Dry heath
H21a	<i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath, <i>Calluna vulgaris</i> - <i>Pteridium aquilinum</i> sub-community	Dry heath
CG10a	<i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Thymus praecox</i> grassland, <i>Trifolium repens</i> - <i>Luzula campestris</i> sub-community	Grassland - calcicolous
MG1	<i>Arrhenatherum elatius</i> grassland	Grassland - mesotrophic
MG1a	<i>Arrhenatherum elatius</i> grassland, <i>Festuca rubra</i> sub-community	Grassland - mesotrophic

NVC Code	Description	NVC Category
MG1b	Arrhenatherum elatius grassland, Urtica dioica sub-community	Grassland - mesotrophic
MG5	Cynosurus cristatus – Centaurea nigra grassland	Grassland - mesotrophic
MG6	Lolium perenne-Cynosurus cristatus grassland	Grassland - mesotrophic
MG6a	<i>Lolium perenne-Cynosurus cristatus</i> grassland, typical sub-community	Grassland - mesotrophic
MG6b	Lolium perenne-Cynosurus cristatus grassland, Anthoxanthum odoratum sub-community	Grassland - mesotrophic
MG7	<i>Lolium perenne</i> leys and related grasslands	Grassland - mesotrophic
MG9	Holcus lanatus-Deschampsia cespitosa grassland	Grassland - mesotrophic
MG9a	Holcus lanatus-Deschampsia cespitosa grassland, Poa trivialis sub-community	Grassland - mesotrophic
MG10	Holcus lanatus-Juncus effusus rush-pasture	Grassland - mesotrophic
MG10a	<i>Holcus lanatus-Juncus effusus</i> rush-pasture, typical sub-community	Grassland - mesotrophic
MG13	Agrostis stolonifera – Alopecurus geniculatus grassland	Grassland - mesotrophic
U1	Festuca ovina – Agrostis capillaris – Rumex acetosella grassland	Grassland - calcifugous & fern
U2	Deschampsia flexuosa grassland	Grassland - calcifugous & fern
U2a	Deschampsia flexuosa grassland, Festuca ovina-Agrostis capillaris sub-community	Grassland - calcifugous & fern
U4	Festuca ovina-Agrostis capillaris-Galium saxatile grassland	Grassland - calcifugous & fern
U4a	Festuca ovina-Agrostis capillaris-Galium saxatile grassland, typical sub-community	Grassland - calcifugous & fern
U4b	Festuca ovina-Agrostis capillaris-Galium saxatile grassland, Holcus lanatus-Trifolium repens sub-community	Grassland - calcifugous & fern
U4d	Festuca ovina-Agrostis capillaris-Galium saxatile grassland, Luzula multiflora-Rhytidadelphus loreus sub-community	Grassland - calcifugous & fern
U4e	Festuca ovina-Agrostis capillaris-Galium saxatile grassland, Vaccinium myrtillus-Deschampsia flexuosa sub-community	Grassland - calcifugous & fern

NVC Code	Description	NVC Category
U5	<i>Nardus stricta</i> - <i>Galium saxatile</i> grassland	Grassland - calcifugous & fern
U5a	<i>Nardus stricta</i> - <i>Galium saxatile</i> grassland, species-poor sub-community	Grassland - calcifugous & fern
U5b	<i>Nardus stricta</i> - <i>Galium saxatile</i> grassland, <i>Agrostis canina</i> - <i>Polytrichum commune</i> sub-community	Grassland - calcifugous & fern
U5d	<i>Nardus stricta</i> - <i>Galium saxatile</i> grassland, <i>Calluna vulgaris</i> - <i>Danthonia decumbens</i> sub-community	Grassland - calcifugous & fern
U6	<i>Juncus squarrosus</i> - <i>Festuca ovina</i> grassland	Grassland - calcifugous & fern
U6d	<i>Juncus squarrosus</i> - <i>Festuca ovina</i> grassland, <i>Agrostis capillaris</i> - <i>Luzula multiflora</i> sub-community	Grassland - calcifugous & fern
U16	<i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community	Grassland - calcifugous & fern
U16c	<i>Luzula sylvatica</i> - <i>Vaccinium myrtillus</i> tall-herb community, species-poor sub-community	Grassland - calcifugous & fern
U19	<i>Oreopteris limbosperma</i> – <i>Blechnum spicant</i> community	Grassland - calcifugous & fern
U20	<i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community	Grassland - calcifugous & fern
U20a	<i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community, <i>Anthoxanthum odoratum</i> sub-community	Grassland - calcifugous & fern
U20b	<i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community, <i>Vaccinium myrtillus</i> - <i>Dicranum scoparium</i> sub-community	Grassland - calcifugous & fern
U20c	<i>Pteridium aquilinum</i> - <i>Galium saxatile</i> community, species-poor sub-community	Grassland - calcifugous & fern
S4	<i>Phragmites australis</i> swamp and reed-beds	Swamp and tall-herb fen
S7	<i>Carex acutiformis</i> swamp	Swamp and tall-herb fen
S9	<i>Carex rostrata</i> swamp	Swamp and tall-herb fen
S9a	<i>Carex rostrata</i> swamp, <i>Carex rostrata</i> sub-community	Swamp and tall-herb fen
S9b	<i>Carex rostrata</i> swamp, <i>Menyanthes trifoliata</i> - <i>Equisetum fluviatile</i> sub-community	Swamp and tall-herb fen

NVC Code	Description	NVC Category
S10a	Equisetum fluviatile swamp, Equisetum fluviatile sub-community	Swamp and tall-herb fen
S22a	<i>Glyceria fluitans</i> water-margin vegetation, <i>Glyceria fluitans</i> sub-community	Swamp and tall-herb fen
S28	Phalaris arundinacea tall-herb fen	Swamp and tall-herb fen
S28a	Phalaris arundinacea tall-herb fen, Phalaris arundinacea sub-community	Swamp and tall-herb fen
S28c	Phalaris arundinacea tall-herb fen, Elymus repens-Holcus lanatus sub-community	Swamp and tall-herb fen
OV24	Urtica dioica-Galium aparine community	Vegetation of open habitats
OV24a	<i>Urtica dioica-Galium aparine</i> community, typical sub-community	Vegetation of open habitats
OV24b	Urtica dioica-Galium aparine community, Arrhenatherum elatius-Rubus fruticosus agg. sub-community	Vegetation of open habitats
OV25	Urtica dioica – Cirsium arvense community	Vegetation of open habitats
OV27	Chamerion angustifolium community	Vegetation of open habitats
OV27b	Chamerion angustifolium community, Urtica dioica-Cirsium arvense sub-community	Vegetation of open habitats
AR	Arable	Non-NVC habitat
BD	Building	Non-NVC habitat
BG	Bare Ground	Non-NVC habitat
BP	Broadleaved Plantation Woodland	Non-NVC Habitat
BT	Scattered Broadleaved Tree	Non-NVC Habitat
CF	Recently Felled Woodland (coniferous or broadleaved)	Non-NVC Habitat
CP	Coniferous Plantation Woodland	Non-NVC Habitat
DG	Disturbed Ground	Non-NVC Habitat
Fn	Ferns (Non-NVC community of mainly <i>Dryopteris</i> spp. ferns)	Non-NVC Habitat
HI	<i>Holcus lanatus</i> grassland (Non-NVC type of <i>H. lanatus</i> dominated neutral grassland)	Non-NVC Habitat
Je	<i>Juncus effusus</i> acid grassland (Non-NVC type of <i>J. effusus</i> dominated acid grassland)	Non-NVC Habitat
Lp	<i>Lonicera periclymenum</i> scrub (Non-NVC community)	Non-NVC habitat
MB	Muirburn (areas that were very recently burned)	Non-NVC Habitat
MP	Mixed Plantation Woodland	Non-NVC Habitat
Mx	Non-NVC type of small sedge dominated neutral mire (similar to M23 mire but without rushes and has small sedges instead)	Non-NVC Habitat
Pa	<i>Poa annua</i> dominant grassland	Non-NVC habitat



NVC Code	Description	NVC Category
PG	Amenity grassland/Private grounds, lawns, gardens, often with scattered trees	Non-NVC habitat
Pt	Bare Peat	Non-NVC habitat
QY	Quarry	Non-NVC habitat
R	Refuse-Tip	Non-NVC habitat
RI	<i>Racomitrium lanuginosum</i> carpets (Non-NVC type where this moss carpets the ground)	Non-NVC Habitat
SH	Introduced Shrub (planted shrubbery in built up areas)	Non-NVC habitat
Sr	<i>Symphoricarpos rivularis</i> scrub (Non-NVC community)	Non-NVC habitat
SW	Standing Water	Non-NVC habitat
MM-Bd	MasterMap Buildings (existing mapping base layer of buildings)	Non-NVC habitat
MM-IW	MasterMap Inland Water (existing mapping base layer of lochs, rivers etc)	Non-NVC habitat
MM-Rd	MasterMap Roads (existing mapping base layer of roads)	Non-NVC habitat
MM-RI	MasterMap Rail (existing mapping base layer of railways)	Non-NVC habitat
NVC-Ex	Not Surveyed	Not Surveyed
NCAI	Not Classifiable from Aerial Imagery	Not Surveyed

Annex D. NVC Target Notes

D.1.1 A number of target notes were made during the NVC surveys, often to pinpoint springs/flushes, or areas or species of interest. These target notes are shown on Figure 12.4 and detailed in Table D.1 below.

Table D.1: NVC target notes

Target Note ID	Grid Ref	NVC Community	Feature Type	Description
1	NH 83084 26169	M32b	Spring, flush & rill	Bryophyte flush.
2	NH 84094 25459	M32b	Spring	Spring.
3	NH 84061 25351	M32b	Spring	Springs x2.
4	NH 84437 25220	M10a	Flush	Small sedge base-rich flush.
5	NH 84454 25036	M10a	Flush	Small sedge base-rich flush.
6	NH 84532 24831	M32b	Spring	Spring.
7	NH 84537 24801	M32b	Spring	M32 springhead, mosses and <i>Montia fontana</i> .
8	NH 84523 24790	M32b	Flush/spring	Small M32 flush/spring with abundant <i>Philonotis fontana</i> .
9	NH 84549 24653	U5	Uncommon species	<i>Pericaria vivipara</i> in damp <i>Nardus</i> grassland.
10	NH 84725 24464	M32b	Spring, flush & rill	Bryophyte flush.
11	NH 88310 24225	H12b	Tree	Few old <i>Pinus sylvestris</i> .
12	NH 88401 24061	M9	Rill	<i>Carex paniculata</i> (x12) along rill.
13	NH 89452 22945	W18b	Uncommon species	<i>Pyrola media</i> (250+ plants) locally frequent in two colonies.

Target Note ID	Grid Ref	NVC Community	Feature Type	Description
14	NH 89450 22940	W18b	Vascular plant	<i>Goodyera repens</i> (x2).
15	NH 91250 19750	W19a	Vascular plant	Relatively large area of abundant <i>Juniperus communis</i> under open <i>Betula</i> woodland.
16	NH 91141 19557	W11c	Uncommon species	<i>Pyrola minor</i> (x7).
17	NH 90997 19393	W18	Tree	Giant ancient granny <i>Pinus sylvestris</i> with at least three young <i>Pinus sylvestris</i> trees, <i>Betula</i> , <i>Sorbus aucuparia</i> , <i>Calluna</i> and <i>Vaccinium myrtillus</i> growing in the trunk.
18	NH 91281 19251	W11c	Tree	Old hybrid oak - <i>Quercus x rosacea</i> (x2).
19	NH 91290 19179	W11c	Tree	Old hybrid oak - <i>Quercus x rosacea</i> (x2).
20	NH 90838 18935	H12b	Uncommon species	<i>Pyrola media</i> scattered in dry <i>Calluna</i> heath.
21	NH 90977 18408	U4b	Uncommon species	<i>Persicaria vivipara</i> in U4b.
22	NH 90914 18302	H10d	Herb-rich heath	H10d <i>Calluna</i> - <i>Erica</i> heath - with <i>Lathyrus linifolius</i> , <i>Hypericum pulchrum</i> , <i>Plantago lanceolata</i> , <i>Succisa pratensis</i> , <i>Campanula rotundifolia</i> , <i>Viola riviniana</i> , <i>Lotus corniculatus</i> , <i>Pyrola media</i> and <i>Anemone nemorosa</i> .
23	NH 90607 17211	QY	Quarry rock face	Quarry rock face with <i>Rosa canina</i> , <i>Teucrium scorodonia</i> , <i>Narcissus pseudonarcissus</i> , <i>Viola riviniana</i> , <i>Veronica officinalis</i> , <i>Ajuga reptans</i> , <i>Thymus polytrichus</i> , <i>Lathyrus linifolius</i> , <i>Campanula rotundifolia</i> , <i>Alliaria petiolata</i> , <i>Anemone nemorosa</i> , <i>Geranium robertianum</i> , <i>Chamerion angustifolium</i> , <i>Dryopteris filix-mas</i> , <i>D. dilatata</i> , <i>Polypodium vulgare</i> , <i>Ctenidium molluscum</i> , <i>Homalothecium sericeum</i> and <i>Hypnum lacunosum</i> .
24	NH 90270 16060	W18	Vascular plant	Large population of <i>Goodyera repens</i> in this area.
25	NH 89678 15519	M6c	Flush	Flush beneath <i>Pinus sylvestris</i> canopy with scattered <i>Juncus effusus</i> , <i>Sphagnum fallax</i> , <i>S. palustre</i> , <i>S. capillifolium</i> , <i>Potentilla erecta</i> , <i>Oxalis acetosella</i> , <i>Chrysosplenium oppositifolium</i> . Seepage area from burn close by.



Target Note ID	Grid Ref	NVC Community	Feature Type	Description
26	NH 90389 15422	W17d	Tree	Old <i>Pinus sylvestris</i> tree.
27	NH 89433 13686	W3	Wet woodland	Patch of <i>Betula</i> and <i>Salix cinerea</i> woodland with ground layer including <i>Caltha palustris</i> and <i>Iris pseudacorus</i> .

Annex E. General Community Photographs

- E.1.1 The following selected photographs are provided to give a visual representation to a number of the main community types present within the Study Area.

Photograph D1

W2 woodland with *Phragmites australis* field layer, M25 mire with conspicuous *Myrica gale* in foreground



Photograph D2

W3 woodland, few vascular species but abundant *Sphagnum squarrosum*



Photograph D3

W4 woodland, dry stand with dominant *Molinia caerulea*



Photograph D4

W4b woodland with abundant *Juncus effusus* and *Sphagnum fallax*



Photograph D5

W7 woodland with *Alnus glutinosa* canopy



Photograph D6

W11 Mature *Betula* dominated woodland



Photograph D7

W11 *Betula* woodland with lush green graminoid sward of abundant *Holcus* spp.



Photograph D8

W11 woodland with abundant *Pteridium aquilinum*



Photograph D9

W11 *Populus tremula* woodland



Photograph D10

W11 *Quercus petraea* and *Populus tremula* woodland



Photograph D11

Grazing impact on W11 ground storey either side of fence line



Photograph D12

W17b woodland, light browsing, abundant *Calluna* and sub-shrubs



Photograph D13

W17b woodland with *Vaccinium* spp. dominated ground storey lacking *Calluna*



Photograph D14

W17c woodland with frequent grasses amongst sub-shrubs



Photograph D15

W17d woodland dominated by *Rhytidiadelphus triquetrus*



Photograph D16

W18b *Pinus sylvestris* woodland with *Calluna* dominant ground storey



Photograph D17

W18b *Pinus sylvestris* woodland with *Vaccinium* spp. dominant ground storey



Photograph D18

W18c *Pinus sylvestris* woodland with graminoid dominant ground storey



Photograph D19

W19 *Juniperus communis* scrub by Slochd



Photograph D20

W23 scrub dominated by *Cytisus scoparius*



Photograph D21

M2 and M6c within basin mire setting



Photograph D22

M4 and S9 *Carex rostrata* dominated mire and swamp mosaic



Photograph D23

M6b flush vegetation



Photograph D24

M6c flush in steeply sloping rannel, demarcated by line of *Juncus effuses*



Photograph D25

M10a open and stony flush dominated by small *Carex* spp. (sedges) below M32b springhead (brighter green mound). Within wider area of H12 heath – dominated by *Calluna*.



Photograph D26

M19 bog, with example of M2 bog pool in centre



Photograph D27

M23b *Juncus effusus* mire, wet species-poor example within woodland clearing



Photograph D28

M25a *Molinia* mire with abundant *Myrica gale*, surrounded by *Betula* woodland



Photograph D29

M28 *Iris pseudacorus* mire



Photograph D30

M32b springhead, a GWDTE community



Photograph D31

M32 spring and rill



Photograph D32

Two M32b springheads (bright green mounds) in patch of U5 *Nardus* grassland, giving way to *Calluna-Vaccinium* heath and *Juniperus communis* scrub on upper Slochd slopes



Photograph D33

M15b wet heath



Photograph D34

M16d wet heath, very species-poor (only *Calluna* visible in photo), on deeper peat, degraded former bog



Photograph D35

H9 *Calluna* dry heath, acid grassland as lighter patches in distance



Photograph D36

H10 *Calluna* – *Erica cinerea* dry heath with abundant *Cladonia* spp. (lichens)



Photograph D37

H12b dry heath with *Calluna* and *Vaccinium vitis-idaea*



Photograph D38

H12c dry heath



Photograph D39

H16b Calluna – Arctostaphylos uva-ursi dry heath, Vaccinium spp. sub-community



Photograph D40

H18a *Vaccinium myrtillus* dry heath



Photograph D41

U1 acid grassland



Photograph D42

U4 acid grassland



Photograph D43

U4b acid grassland, more semi-improved and heavily grazed; with patches of *Juncus effusus* (MG10a) and *Betula* (W11)



Photograph D44

U4d acid grassland with abundant *Deschampsia cespitosa*



Photograph D45

U5a species-poor *Nardus stricta* grassland (white foreground) with patches of W19 scrub and expanse of H12 heath in distance (brown)



Photograph D46

U5d *Nardus* grassland, heathy sub-community with sub-shrubs and small *Juniperus communis*



Photograph D47

U20, *Pteridium aquilinum* dominates



Photograph D48

Je – *Juncus effusus* acid grassland non-NVC community



Photograph D49

MG1 coarse roadside neutral grassland



Photograph D50

MG6 and MG7 *Lolium perenne* improved neutral grasslands



Photograph D51

MG9 *Deschampsia cespitosa* dominated neutral grassland



Photograph D52

MG10a grazed *Juncus effusus* – *Holcus lanatus* neutral grassland (rushy area)



Photograph D53

S9 *Carex rostrata* swamp



Annex F. Aspen Target Notes

F.1.1 The locations of *Populus tremula* were recorded during the course of undertaking NVC surveys, usually as a TN if the record was of a single or small group of trees. Larger stands of mixed trees, or solely of *P. tremula*, were mapped as polygons. The results are shown in Figure 12.7. The details of the specific TNs are provided in Table F.1 below.

Table F.1: *Populus tremula* Target Notes

TN Ref	Grid Ref	Description
As01	NH 88029 24080	Populus tremula
As02	NH 88029 24079	Populus tremula
As03	NH 89965 22759	Populus tremula (x8)
As04	NH 89502 22457	Scattered <i>Populus tremula</i> within this polygon
As05	NH 90083 22033	<i>Populus tremula</i> along track edge on edge of pine plantation
As06	NH 90968 20861	Large mature <i>Populus tremula</i> and couple of younger ones
As07	NH 90979 20857	Couple of young <i>Populus tremula</i> trees near road edge
As08	NH 90995 20832	Number of mature <i>Populus tremula</i> right on road edge
As09	NH 90992 20829	Populus tremula
As10	NH 90956 20818	Populus tremula
As11	NH 90938 20809	Single <i>Populus tremula</i> tree within pine plantation
As12	NH 90994 20791	Mature <i>Populus tremula</i> tree in pine plantation
As13	NH 90913 20784	Single <i>Populus tremula</i> tree within pine plantation
As14	NH 91038 20713	Populus tremula
As15	NH 91030 20682	Populus tremula
As16	NH 91014 20668	Numerous mature <i>Populus tremula</i> in this area in amongst <i>Betula</i>
As17	NH 90912 20667	Populus tremula
As18	NH 91024 20655	Populus tremula (x2)
As19	NH 91018 20647	Populus tremula
As20	NH 90918 20643	Populus tremula
As21	NH 90947 20575	Populus tremula (x10)
As22	NH 90967 20552	Populus tremula
As23	NH 90962 20523	Populus tremula (x2)
As24	NH 90972 20494	Populus tremula (x10)
As25	NH 90909 20490	Populus tremula (x30)
As26	NH 90975 20361	Populus tremula (x2)
As27	NH 90973 20343	Populus tremula (x12)
As28	NH 91195 19399	Populus tremula (50+)
As29	NH 91082 19266	Number of large mature <i>Populus tremula</i> trees at this location. Just outer side of A9 fence, stretch down to railway.

TN Ref	Grid Ref	Description
		Over <i>Pteridium aquilinum</i> , grasses, mosses, and <i>Vaccinium myrtillus</i>
As30	NH 91262 19174	<i>Populus tremula</i> (x2)
As31	NH 91114 19084	Single large mature <i>Populus tremula</i> tree, broken limbs and rotting sections. Dying
As32	NH 91160 19080	<i>Populus tremula</i> (x8)
As33	NH 91188 19078	<i>Populus tremula</i> (x8)
As34	NH 91330 19040	<i>Populus tremula</i> locally dominant
As35	NH 91101 19003	One very large old <i>Populus tremula</i> and two semi-mature <i>Populus tremula</i> close to road
As36	NH 91111 18997	<i>Populus tremula</i>
As37	NH 91164 18987	<i>Populus tremula</i> (20+)
As38	NH 91093 18967	Large mature <i>Populus tremula</i> within <i>Betula</i> plantation shelter belt only a few metres from road
As39	NH 91089 18757	Within <i>Betula</i> plantation, there is a substantial group of <i>Populus tremula</i> of various ages, mostly quite mature. Couple of dozen trees here
As40	NH 91108 18750	Single mature <i>Populus tremula</i>
As41	NH 91115 18737	Single <i>Populus tremula</i>
As42	NH 91111 18709	Group of 10 mature <i>Populus tremula</i> trees
As43	NH 91084 18655	Group of approx. 10 young <i>Populus tremula</i> in <i>Betula</i> plantation by edge of fence
As44	NH 91093 18646	Large <i>Populus tremula</i>
As45	NH 91095 18627	Two <i>Populus tremula</i> between railway and fence
As46	NH 91169 18426	<i>Populus tremula</i> (c.100)
As47	NH 91227 18354	Mature <i>Populus tremula</i> tree. Loch Vaa fishing sign nailed to it. Right by road edge
As48	NH 91204 18176	<i>Populus tremula</i> (x3)
As49	NH 91085 18120	<i>Betula</i> dominated woodland but around this location there are a number of <i>Populus tremula</i> trees scattered in the woodland. Minimum 12 trees in this area
As50	NH 90658 17616	Grove of <i>Populus tremula</i> including mature specimens and many young suckers
As51	NH 91012 17327	Large <i>Populus tremula</i> tree with smaller <i>Betula</i>
As52	NH 91041 17318	Large <i>Populus tremula</i> in <i>Betula</i> woodland in cemetery
As53	NH 91072 17290	Large numbers of <i>Populus tremula</i> growing with <i>Betula</i> in cemetery area
As54	NH 90455 16599	Patch of younger <i>Populus tremula</i> trees
As55	NH 90045 14976	Numerous <i>Populus tremula</i> at this location
As56	NH 90038 14952	Lot of <i>Populus tremula</i> at this location as grades back into <i>Betula</i> wood. Over grazed U4
As57	NH 89914 14925	Single <i>Populus tremula</i> tree remaining within area of bare/disturbed ground



TN Ref	Grid Ref	Description
As58	NH 89783 14884	Cluster of <i>Populus tremula</i> trees between road verge and fence, number of mature specimens
As59	NH 89932 14880	Lots of mature <i>Populus tremula</i> within a <i>Quercus</i> and <i>Populus tremula</i> woodland. Lots of old mature trees. Grazed field layer
As60	NH 89906 14823	Lots of mature <i>Populus tremula</i> within this area of W11. Grassy field flora, with <i>Anemone nemorosa</i> .
As61	NH 89787 14800	A dense cluster of mature <i>Populus tremula</i> trees within <i>Quercus</i> woodland.
As62	NH 89891 14787	Mature <i>Populus tremula</i> within <i>Quercus</i> woodland
As63	NH 90075 14787	<i>Populus tremula</i> (x2)
As64	NH 89903 14757	Mature <i>Populus tremula</i> trees
As65	NH 89751 14741	A number of mature <i>Populus tremula</i> trees around this location, located within a wider mature <i>Quercus</i> woodland. Over a U4 field layer, moderately grazed. Field layer also contains <i>Anemone nemorosa</i> , <i>Conopodium majus</i> , <i>Potentilla erecta</i> , <i>Anthoxanthum odoratum</i> , <i>Holcus mollis</i> and <i>Deschampsia flexuosa</i>
As66	NH 89703 14381	Group of mature <i>Populus tremula</i> trees
As67	NH 89175 11397	<i>Populus tremula</i> woodland
As68	NH 89180 11370	<i>Populus tremula</i> woodland
As69	NH 89133 11207	<i>Populus tremula</i> trees scattered through mixed woodland of <i>Betula</i> and <i>Pinus sylvestris</i>
As70	NH 89075 11083	<i>Populus tremula</i> trees scattered through plantation <i>Betula</i> woodland
As71	NH 88906 10913	Stand of <i>Populus tremula</i> within <i>Betula</i> woodland
As72	NH 88868 10851	Mature <i>Populus tremula</i> woodland
As73	NH 88679 10783	<i>Populus tremula</i> trees within planted <i>Betula</i> woodland between minor road and A9
As74	NH 88487 10660	<i>Populus tremula</i> trees within planted <i>Betula</i> woodland. Woodland includes other hybridised poplar species
As75	NH 88290 10467	Mature <i>Populus tremula</i> woodland along edge of road carriageway
As76	NH 87976 10381	<i>Populus tremula</i> woodland along verge of A9
As77	NH 88211 10364	Woodland stand dominated by <i>Populus tremula</i> , along with other poplar species along edge of carriageway
As78	NH 87925 10359	Block of <i>Populus tremula</i> woodland along verge of A9 from NH 87925 10340 to NH 87889 10330
As79	NH 88148 10288	<i>Populus tremula</i> woodland with <i>Betula</i> and other poplar species
As80	NH 86417 10128	<i>Populus tremula</i> tree within woodland
As81	NH 87882 10084	<i>Populus tremula</i> within birch woodland with very grazed understorey
As82	NH 87871 10043	<i>Populus tremula</i> within birch woodland in parallel with road verge
As83	NH 86625 09953	Single large mature <i>Populus tremula</i> within <i>Betula</i> woodland

Annex G. Botanical Species List

G.1.1 **Table G.1** below lists all the species recorded within the Study Area during the course of the above surveys. The list is not exhaustive as the surveys did not aim to create a full species inventory, rather map and characterise areas based on the main plant assemblages present. With dedicated searching, it is likely many more plants could be added to this list. The table also provides the common English names for vascular species (n=216), however bryophytes (n=62) are provided in Latin only, as their English names are not in common usage.

Table G.1: Study Area Species List

Latin name	English name	Latin name	English name
<i>Acer campestre</i>	Field maple	<i>Larix decidua</i>	Larch
<i>Acer pseudoplatanus</i>	Sycamore	<i>Lathyrus linifolius</i>	Bitter vetch
<i>Achillea millefolium</i>	Yarrow	<i>Linum catharticum</i>	Fairy flax
<i>Aesculus hippocastanum</i>	Horse chestnut	<i>Lobelia dortmanna</i>	Water lobelia
<i>Agrostis canina</i>	Velvet bent	<i>Lolium perenne</i>	Perennial rye-grass
<i>Agrostis capillaris</i>	Common bent	<i>Lonicera periclymenum</i>	Honeysuckle
<i>Agrostis stolonifera</i>	Creeping bent	<i>Lotus corniculatus</i>	Bird's-foot-trefoil
<i>Ajuga reptans</i>	Bugle	<i>Luzula campestris</i>	Field woodrush
<i>Alchemilla mollis</i>	Lady's mantle	<i>Luzula multiflora</i>	Heath woodrush
<i>Alliaria petiolata</i>	Garlic mustard	<i>Luzula pilosa</i>	Hairy woodrush
<i>Alnus glutinosa</i>	Alder	<i>Luzula sylvatica</i>	Greater woodrush
<i>Anemone nemorosa</i>	Wood anemone	<i>Lychnis flos-cuculi</i>	Ragged robin
<i>Angelica sylvestris</i>	Angelica	<i>Lycopodium clavatum</i>	Stags-horn clubmoss
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	<i>Lysimachia nemorum</i>	Yellow pimpernel
<i>Anthriscus sylvestris</i>	Cow parsley	<i>Lysimachia nummularia</i>	Creeping jenny
<i>Aphanes arvensis</i>	Parsley-piert	<i>Melampyrum pratense</i>	Cow wheat
<i>Arctostaphylos uva-ursi</i>	Bearberry	<i>Mentha aquatica</i>	Water mint
<i>Bellis perennis</i>	Daisy	<i>Menyanthes trifoliata</i>	Bogbean
<i>Betula pendula</i>	Silver birch	<i>Mercurialis perennis</i>	Dogs mercury
<i>Betula pubescens</i>	Downy birch	<i>Molinia caerulea</i>	Purple moor-grass
<i>Blechnum spicant</i>	Hard fern	<i>Montia fontana</i>	Blinks
<i>Brachypodium sylvaticum</i>	False-brome	<i>Myrica gale</i>	Bog myrtle
<i>Calluna vulgaris</i>	Common heather	<i>Narcissus pseudonarcissus</i>	Daffodil
<i>Caltha palustris</i>	Marsh marigold	<i>Nardus stricta</i>	Mat grass

Latin name	English name	Latin name	English name
<i>Campanula rotundifolia</i>	Harebell	<i>Narthecium ossifragum</i>	Bog asphodel
<i>Cardamine flexuosa</i>	Wavy bittercress	<i>Neottia cordata</i>	Lesser twayblade
<i>Cardamine pratensis</i>	Cuckooflower	<i>Oreopteris limbosperma</i>	Lemon-scented fern
<i>Carex acutiformis</i>	Lesser pond sedge	<i>Oxalis acetosella</i>	Wood sorrel
<i>Carex binervis</i>	Green ribbed sedge	<i>Persicaria vivipara</i>	Alpine bistort
<i>Carex caryophyllea</i>	Spring sedge	<i>Phalaris arundinacea</i>	Reed canary-grass
<i>Carex dioica</i>	Dioecious sedge	<i>Phragmites australis</i>	Common reed
<i>Carex echinata</i>	Star sedge	<i>Picea sitchensis</i>	Sitka spruce
<i>Carex flacca</i>	Glaucous sedge	<i>Pilosella officinarum</i>	Mouse-ear hawkweed
<i>Carex nigra</i>	Common sedge	<i>Pinus contorta</i>	Lodgepole pine
<i>Carex panicea</i>	Carnation sedge	<i>Pinus sylvestris</i>	Scots pine
<i>Carex paniculata</i>	Greater tussock-sedge	<i>Plantago lanceolata</i>	Ribwort plantain
<i>Carex pilulifera</i>	Pill sedge	<i>Plantago major</i>	Greater plantain
<i>Carex rostrata</i>	Bottle sedge	<i>Plantago maritima</i>	Sea plantain
<i>Carex vesicaria</i>	Bladder sedge	<i>Poa annua</i>	Annual meadow grass
<i>Carex viridula</i>	Yellow sedge	<i>Poa trivialis</i>	Rough meadow grass
<i>Centaurea nigra</i>	Common knapweed	<i>Polygala serpyllifolia</i>	Heath milkwort
<i>Cerastium fontanum</i>	Common mouse-ear	<i>Polygala vulgaris</i>	Common milkwort
<i>Chamerion angustifolium</i>	Rosebay willowherb	<i>Polypodium vulgare</i>	Common polypody
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved golden saxifrage	<i>Populus tremula</i>	Aspen
<i>Circaea x intermedia</i>	Upland enchanter's nightshade	<i>Potamogeton natans</i>	Pondweed
<i>Cirsium arvense</i>	Creeping thistle	<i>Potentilla anserina</i>	Silverweed
<i>Cirsium palustre</i>	Marsh thistle	<i>Potentilla erecta</i>	Tormentil
<i>Cirsium vulgare</i>	Spear thistle	<i>Potentilla palustris</i>	Marsh cinquefoil
<i>Conopodium majus</i>	Pignut	<i>Potentilla sterilis</i>	Barren strawberry
<i>Corylus avellana</i>	Hazel	<i>Primula vulgaris</i>	Primrose
<i>Crataegus monogyna</i>	Hawthorn	<i>Prunella vulgaris</i>	Selfheal
<i>Crepis paludosa</i>	Marsh hawk's-beard	<i>Prunus avium</i>	Wild cherry
<i>Cynosurus cristatus</i>	Crested dogs-tail	<i>Prunus padus</i>	Bird cherry
<i>Cytisus scoparius</i>	Broom	<i>Prunus spinosa</i>	Blackthorn
<i>Dactylis glomerata</i>	Cocksfoot	<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Dactylorhiza fuchsii</i>	Common spotted orchid	<i>Pteridium aquilinum</i>	Bracken

Latin name	English name	Latin name	English name
<i>Danthonia decumbens</i>	Heath grass	<i>Pyrola media</i>	Intermediate Wintergreen
<i>Deschampsia cespitosa</i>	Tufted hair-grass	<i>Pyrola minor</i>	Common Wintergreen
<i>Deschampsia flexuosa</i>	Wavy hair-grass	<i>Quercus petraea</i>	Sessile oak
<i>Digitalis purpurea</i>	Foxglove	<i>Ranunculus acris</i>	Meadow buttercup
<i>Dryopteris affinis</i>	Golden-scaled male fern	<i>Ranunculus ficaria</i>	Lesser celandine
<i>Dryopteris dilatata</i>	Broad buckler-fern	<i>Ranunculus flammula</i>	Lesser spearwort
<i>Dryopteris filix-mas</i>	Male fern	<i>Ranunculus repens</i>	Creeping buttercup
<i>Empetrum nigrum</i>	Crowberry	<i>Rhinanthus minor</i>	Yellow rattle
<i>Epilobium montanum</i>	Broad-leaved willowherb	<i>Rhododendron ponticum</i>	Rhododendron
<i>Epilobium palustre</i>	Marsh willowherb	<i>Ribes sanguineum</i>	Flowering currant
<i>Equisetum fluviatile</i>	Water horsetail	<i>Rosa canina</i>	Dog rose
<i>Equisetum palustre</i>	Marsh horsetail	<i>Rubus chamaemorus</i>	Cloudberry
<i>Erica cinerea</i>	Bell heather	<i>Rubus fruticosus</i>	Bramble
<i>Erica tetralix</i>	Cross-leaved heath	<i>Rubus idaeus</i>	Raspberry
<i>Eriophorum angustifolium</i>	Common cottongrass	<i>Rumex acetosa</i>	Common sorrel
<i>Eriophorum vaginatum</i>	Hares-tail cottongrass	<i>Rumex acetosella</i>	Sheep's sorrel
<i>Fagus sylvatica</i>	Beech	<i>Rumex crispus</i>	Curled dock
<i>Festuca ovina</i>	Sheep's fescue	<i>Rumex obtusifolius</i>	Broad-leaved dock
<i>Festuca rubra</i>	Red fescue	<i>Salix aurita</i>	Eared willow
<i>Filipendula ulmaria</i>	Meadowsweet	<i>Salix caprea</i>	Goat willow
<i>Fragaria vesca</i>	Wild strawberry	<i>Salix cinerea</i>	Grey willow
<i>Fraxinus excelsior</i>	Ash	<i>Salix repens</i>	Creeping willow
<i>Fumaria muralis</i>	Common ramping-fumitory	<i>Sambucus nigra</i>	Common elder
<i>Galium aparine</i>	Cleavers	<i>Sambucus racemosa</i>	Red-berried elder
<i>Galium palustre</i>	Marsh bedstraw	<i>Senecio jacobaea</i>	Ragwort
<i>Galium saxatile</i>	Heath bedstraw	<i>Sorbus aucuparia</i>	Rowan
<i>Galium verum</i>	Lady's bedstraw	<i>Stachys palustris</i>	Marsh woundwort
<i>Genista anglica</i>	Petty whin	<i>Stellaria holostea</i>	Greater stitchwort
<i>Geranium robertianum</i>	Herb Robert	<i>Stellaria media</i>	Chickweed
<i>Geum rivale</i>	Water avens	<i>Stellaria uliginosa</i>	Bog stitchwort
<i>Glyceria fluitans</i>	Floating sweet-grass	<i>Succisa pratensis</i>	Devils-bit scabious
<i>Goodyera repens</i>	Creeping lady's-tresses	<i>Symphoricarpos rivularis</i>	Snowberry

Latin name	English name	Latin name	English name
<i>Gymnocarpium dryopteris</i>	Oak fern	<i>Taraxacum officinale</i>	Dandelion
<i>Helianthemum nummularium</i>	Common rockrose	<i>Teucrium scorodonia</i>	Wood sage
<i>Helictotrichon pratense</i>	Meadow oat-grass	<i>Thymus polytrichus</i>	Wild thyme
<i>Heracleum sphondylium</i>	Hogweed	<i>Tilia x europaea</i>	Lime
<i>Hieracium sp.</i>	Hawkweeds	<i>Trichophorum germanicum</i>	Deergrass
<i>Hippuris vulgaris</i>	Mare's-tail	<i>Trientalis europaea</i>	Chickweed wintergreen
<i>Holcus lanatus</i>	Yorkshire fog	<i>Trifolium pratense</i>	Red clover
<i>Holcus mollis</i>	Creeping soft grass	<i>Trifolium repens</i>	White clover
<i>Hydrocotyle vulgaris</i>	Marsh pennywort	<i>Tussilago farfara</i>	Coltsfoot
<i>Hypericum pulchrum</i>	Slender St John's-wort	<i>Ulex europaeus</i>	Gorse
<i>Hypochaeris radicata</i>	Catsear	<i>Urtica dioica</i>	Common nettle
<i>Ilex aquifolium</i>	Holly	<i>Vaccinium myrtillus</i>	Bilberry
<i>Iris pseudacorus</i>	Yellow flag iris	<i>Vaccinium vitis-idaea</i>	Cowberry
<i>Juncus acutiflorus</i>	Sharp-flowered rush	<i>Valeriana officinalis</i>	Valerian
<i>Juncus articulatus</i>	Jointed Rush	<i>Veronica chamaedrys</i>	Germander speedwell
<i>Juncus bulbosus</i>	Bulbous rush	<i>Veronica officinalis</i>	Heath speedwell
<i>Juncus effusus</i>	Soft rush	<i>Veronica serpyllifolia</i>	Thyme-leaved speedwell
<i>Juncus squarrosus</i>	Heath rush	<i>Vicia sepium</i>	Bush vetch
<i>Juniperus communis</i>	Juniper	<i>Viola palustris</i>	Marsh violet
<i>Lamiastrum galeobdolon</i>	Yellow archangel	<i>Viola riviniana</i>	Common dog violet
Mosses, Liverworts & Lichens			
<i>Aneura pinguis</i>	<i>Dicranum scoparium</i>	<i>Peltigera hymenina</i>	<i>Rhytidiadelphus loreus</i>
<i>Atrichum undulatum</i>	<i>Diplophyllum albicans</i>	<i>Peltigera membranacea</i>	<i>Rhytidiadelphus squarrosus</i>
<i>Aulacomnium palustre</i>	<i>Eurhynchium striatum</i>	<i>Philonotis fontana</i>	<i>Rhytidiadelphus triquetrus</i>
<i>Brachythecium rutabulum</i>	<i>Frullania tamarisci</i>	<i>Plagiochila asplenioides</i>	<i>Scorpidium revolvens</i>
<i>Bryum pseudotriquetrum</i>	<i>Homalothecium sericeum</i>	<i>Plagiomnium undulatum</i>	<i>Sphagnum capillifolium</i>
<i>Calliergon giganteum</i>	<i>Hylocomium splendens</i>	<i>Plagiothecium undulatum</i>	<i>Sphagnum cuspidatum</i>
<i>Calliergonella cuspidata</i>	<i>Hypnum andoi</i>	<i>Pleurozium schreberi</i>	<i>Sphagnum denticulatum</i>

Latin name	English name	Latin name	English name
Campylium stellatum	Hypnum cupressiforme	Polytrichastrum formosum	Sphagnum fallax
Campylopus flexuosus	Hypnum jutlandicum	Polytrichum commune	Sphagnum girgensohnii
Cladonia impexa	Hypnum lacunosum	Polytrichum juniperinum	Sphagnum palustre
Cladonia portentosa	Hypogymnia physodes	Polytrichum strictum	Sphagnum papillosum
Cladonia uncialis	Isothecium myosuroides	Pseudoscleropodium purum	Sphagnum squarrosum
Ctenidium molluscum	Kindbergia praelonga	Ptilium crista-castrensis	Straminergon stramineum
Dichodontium palustre	Lophocolea bidentata	Racomitrium ericoides	Thuidium tamariscinum
Dicranum fuscescens	Mnium hornum	Racomitrium lanuginosum	
Dicranum majus	Pellia epiphylla	Rhizomnium punctatum	

Annex H. Terrestrial Habitats Nature Conservation Importance Evaluation

- H.1.1 The following table presents the results of the terrestrial habitats nature conservation importance evaluation for the different areas of habitat and different types of habitat recorded throughout the Study Area, subsequently used in the impact assessment.
- H.1.2 Specific areas and habitats have been evaluated using the methodology and criteria detailed in Section 6 above.
- H.1.3 The importance evaluation is supported by the field data collected and described above. In particular the characterisation and evaluation of ancient woodland areas is largely based on additional surveys undertaken in these areas and the collection of extensive target note data (see Figure 12.2 and Annex A).
- H.1.4 The results of this evaluation are shown in Figure 12.8.

Table H.1: Terrestrial Habitats Nature Conservation Importance Evaluation

ID Area Description	Nature Conservation Importance	Reason/Justification
Loch Vaa SPA & SSSI	International	Due to SPA status.
Slochd SAC	International	Due to SAC status.
Alvie SSSI	National	Due to SSSI status.
Craigellachie SSSI & NNR	National	Due to SSSI and NNR status.
Ancient woodland ID area no. 1.	Authority	AW Category: 3 Other. Large area of young <i>Pinus sylvestris</i> plantation (W18) which is dissected by the existing A9 carriageway. Only a small patch of semi-mature <i>Betula</i> woodland present in ID area. Evidence of forest operations and thinning, also deer browsing. Poor ground flora with reduced diversity of vascular plants and only one ancient woodland indicator species sparsely recorded in this large area. Despite size of area it is considered to be of no greater than Authority Area importance.
Ancient woodland ID area no. 2.	Authority	AW Category: 3 Other. Area of woodland and open ground mosaic. Substantial areas of dry heath and <i>Cytisus scoparius</i> scrub within area. Woodland is a mix of patches of younger <i>Pinus sylvestris</i> and <i>Larix decidua</i> plantation, with occasional semi-mature tree, and younger <i>Betula</i> woodland (W11/W17). Only two ancient woodland indicators recorded within this part of Study Area.
Ancient woodland ID area no. 3.	National	AW Category: 3 Other. Although the section within the Study Area is small, this ID area is part of a larger block of ancient woodland. Consists of more open mature <i>Betula</i> woodland (mainly W11) which is grazed but contains up to 35 vascular species, two of which are ancient woodland indicators.

ID Area Description	Nature Conservation Importance	Reason/Justification
Ancient woodland ID area no. 4.	National	AW Category: 3 Other. Area of mature <i>Betula</i> woodland with some ancient trees (W11 & W17). Some patches of open ground with acid grassland, heath, marshy grassland, and neutral grassland. Well-developed ground flora which is grazed by cattle, some patches of poached ground. Up to four ancient woodland indicator species recorded.
Ancient woodland ID area no. 5.	National	AW Category: 3 Other. Ancient woodland block with some open areas of heath and grassland. Woodland is all <i>Betula</i> dominated and a mosaic of W3/W4/W11/W17 - mostly W11. The trees are semi-mature to mature with some pockets of ancient trees. There is a well-developed and relatively diverse ground storey in which up to six ancient woodland indicator species were recorded. The area is grazed by cattle with some ground poached.
Ancient woodland ID area no. 6a/6b/6c.	National	AW Category: 3 Other. Area of semi-natural woodland, mostly W11. Most is <i>Betula</i> dominated with mature and some ancient trees (occasional patches of <i>Populus tremula</i>). However, there are also some sizeable stands of ancient <i>Quercus petraea</i> woodland within this area, often with frequent mature <i>Populus tremula</i> . One small patch of mature-ancient <i>Pinus sylvestris</i> at TN JA92. The ground storey is grazed in places but remains generally well developed and contains up to 11 ancient woodland indicators species in the target note plots (Annex A).
Ancient woodland ID area no. 7a.	National	AW Category: 2b Long-Established. Area of W11 and W17 mature-ancient <i>Betula</i> woodland with a well-developed ground flora with up to four ancient woodland indicator species recorded in the two TN plots (Annex A). Part of a much larger area of ancient woodland in the AWI.
Ancient woodland ID area no. 7b.	International	AW Category: 2b Long-Established. Section within the Study Area is small but is part of a much larger area of woodland in the AWI and is part of the same area as ID Area 7a above. However, this particular section sits within the boundary of Loch Vaa SPA (and SSSI) and is consequently assigned International importance level.
Ancient woodland ID area no. 8a/8b/8c	National	AW Category: 2a Ancient. This is an extensive area of <i>Betula</i> woodland containing NVC types W3, W7, W11 and W17, and is part of a much larger area on the AWI. The woodland contains mature and semi-mature trees; there are small patches of acid grassland within the woodland mosaic. There are relatively low levels of grazing and there is a well-developed ground flora with up to 10 ancient woodland indicator species recorded in the target notes, three of these species are Class 1 indicator species (Annex A).
Ancient woodland ID area no. 9.	Authority – Regional	AW Category: 2a Ancient. This AW ID Area has been split into two importance levels. The majority is W18 even-aged <i>Pinus sylvestris</i> plantation with an occasional semi-mature tree. Evidence of forestry operations also here, and two ancient woodland

ID Area Description	Nature Conservation Importance	Reason/Justification
		indicator species were recorded. This particular area of W18 is assigned Authority Area importance. However, part of the eastern section of this ID Area contains semi-mature <i>Betula</i> woodland (W4/W7/W11 mosaic) with five ancient woodland indicator species, this section has been assigned Regional importance.
Ancient woodland ID area no. 10a/10b.	National	AW Category: 2a Ancient. Area of <i>Betula</i> woodland containing NVC types W3, W11 and W17, and part of larger area on the AWI. Area contains ancient and mature trees with some younger regeneration. Patches of open ground with dry heath and acid grassland present. Low levels of grazing or enrichment, a well-developed ground flora present with up to six ancient woodland indicator species recorded.
Ancient woodland ID area no. 11a.	Authority	AW Category: 2a Ancient. The majority of this area is young <i>Pinus sylvestris</i> plantation (W18) with some patches of clear-fell and bare ground in what appears a former industrial site area. Some young and scrubby <i>Betula</i> are colonising the industrial site area. There is a single very small area of mature/semi-mature <i>Betula</i> and <i>Salix caprea</i> between the A9 and the railway in this ID Area (i.e. TN JA53 in Figure 12.2). Ancient woodland indicators are generally absent to sparse; only two recorded at one target note plot.
Ancient woodland ID area no. 11b.	Authority – National	AW Category: 2a Ancient. This area has been split into two separate areas. The largest section surrounding the A9 is young <i>Pinus sylvestris</i> plantation (W18) with up to just one ancient woodland indicator species; this has been assigned Authority Area importance. A section of the southern portion of this ID area, SB and to the east of the railway, contains a mix of W11, W17 and W18 woodlands which are generally more mature and semi-mature. The patch of <i>Pinus sylvestris</i> at TN JA32 appears more ancient. This area also has a better developed ground flora with up to seven ancient woodland indicator species recorded in this section of AW ID Area 11b. This area has therefore been assigned as of National importance.
Ancient woodland ID area no. 11c.	Authority	AW Category: 2a Ancient. Large area of semi-mature <i>Pinus sylvestris</i> plantation (W18) with some small patches of <i>Larix decidua</i> (W18) and a small area of <i>Betula</i> (W17). Area is dissected by the A9 carriageway. Ancient woodland indicator species levels vary from many areas with none present, to a high of five species in TN JA75 plot of mixed <i>Betula</i> and <i>Pinus sylvestris</i> woodland.
Ancient woodland ID area no. 11d.	Authority	AW Category: 2a Ancient. Small area of semi-mature <i>Pinus sylvestris</i> plantation (W18) within Study Area. Part of a much larger expanse of plantation (AW ID Area 11). One ancient woodland indicator species recorded.
Ancient woodland ID area no. 11e.	Authority	AW Category: 2a Ancient. Plantation of <i>Pinus sylvestris</i> with occasional <i>Larix decidua</i> (W18) with

ID Area Description	Nature Conservation Importance	Reason/Justification
		semi-mature to mature trees, possibly some old semi-natural scattered trees through plantation. Part of a larger plantation block assigned as ancient woodland. Contains four ancient woodland indicator species, including <i>Goodyera repens</i> .
Ancient woodland ID area no. 12.	Authority	AW Category: 2a Ancient. Ancient woodland block is dissected by existing A9 carriageway. Most of the area is semi-mature <i>Pinus sylvestris</i> plantation (W18) with limited ancient woodland indicators present (NB). Some very small patches of mature-ancient broadleaved trees within area, e.g. SB at TN JA158 (Annex A) (although this specific location is covered by Alvie SSSI).
Ancient woodland ID area no. 13.	National	AW Category: 2a Ancient. Part of Craigellachie SSSI & NNR and therefore of National importance. Quite open <i>Betula</i> dominated woodland with some <i>Pinus sylvestris</i> and <i>Juniperus communis</i> . <i>Betula</i> of all ages from young to ancient, ancient woodland indicator species and well-developed ground storey present (Annex A)
Ancient woodland ID area no. 14.	Authority – National	AW Category: 2a Ancient. Ancient woodland ID Area 14 is split into two separate levels of importance. South of the B9152 has been assigned Authority Area importance due to the ancient woodland being <i>Pinus sylvestris</i> plantation, mature W18 with up to three ancient woodland indicators present (however, much of this portion of the ID Area is also in Alvie SSSI and consequently of National importance). North of the B9152 is assigned National importance due to presence of mainly mature <i>Betula</i> woodland (W11) which also contains some semi-mature and ancient trees (and associated deadwood), the ground storey here is grazed but contains up to seven ancient woodland indicator species.
Ancient woodland ID area no. 15.	Authority	AW Category: 2a Ancient. Small area with scattered mature and occasional ancient <i>Betula</i> within heavily grazed sheep pasture. Open habitat, no regeneration, single ancient woodland indicator species. Assigned Authority level due to size and character.
Ancient woodland ID area no. 16.	National	AW Category: 2a Ancient. Ancient woodland block spans both sides of the A9, there are large patches of open ground and some conifer plantation blocks (<i>Pinus sylvestris</i> and <i>Pseudotsuga menziesii</i>). However, the main habitat type is mature-ancient W11 <i>Betula</i> woodland, with small patches of W4 and W7. The canopy is dominated by <i>Betula</i> but also present are <i>Alnus glutinosa</i> , <i>Populus tremula</i> , <i>Quercus petraea</i> and <i>Sorbus aucuparia</i> . Within the broadleaved woodland there is a well-developed ground storey with up to nine ancient woodland indicator species recorded. Part of this ancient woodland block is also within Alvie SSSI (SB).
Ancient woodland ID area no. 17.	Authority	AW Category: 2a Ancient. Mostly mature <i>Pseudotsuga menziesii</i> and <i>Larix decidua</i> plantation with no field flora. A small patch of semi-

ID Area Description	Nature Conservation Importance	Reason/Justification
		mature/mature <i>Betula</i> also present; one ancient woodland indicator species present.
Ancient woodland ID area no. 18.	Regional	AW Category: 2a Ancient. Small patch of mature <i>Betula</i> and <i>Quercus petraea</i> woodland (W11/W17) with up to three ancient woodland indicator species recorded in ground storey.
Ancient woodland ID area no. 19.	National	AW Category: 2a Ancient. Area of mostly mature semi-natural woodland, containing <i>Betula</i> spp., <i>Quercus petraea</i> , <i>Prunus padus</i> and <i>Salix cinerea</i> , with some deadwood. Mostly W11, with some W4 and W7. Well established ground storey with up to seven ancient woodland indicator species; grazed and some nutrient enrichment from farming activities. ID area is split up by some open ground patches and the existing A9 carriageway and farm tracks. Bordering the carriageway there are younger strips of W11 and W18 plantation.
Ancient woodland ID area no. 20.	National	AW Category: 2a Ancient. Mix of woodland and open ground habitats. Majority of woodland is W11 <i>Betula</i> woodland with ancient and mature trees over a well-developed and lightly grazed ground layer. Within this area there is also a patch of semi-mature <i>Pinus sylvestris</i> plantation with frequent <i>Larix decidua</i> (W18) with some scattered mature and ancient trees, this area also retains a well-established ground storey. The ground storey contains up to four ancient indicator species.
Ancient woodland ID area no. 21.	National	AW Category: 2a Ancient. Area of W11 and W17 <i>Betula</i> woodland, mostly mature but with some young planted and naturally regenerating <i>Betula</i> . Also contains some <i>Prunus avium</i> , <i>P. padus</i> , <i>Salix caprea</i> and <i>Pinus sylvestris</i> . Diverse and well-established ground storey which includes up to six ancient woodland indicator species.
Ancient woodland ID area no. 22.	Regional	AW Category: 2a Ancient. More mixed woodland in this area. Contains <i>Pinus sylvestris</i> woodland, mainly planted but possibly some semi-natural trees; mix of young to mature coupes, and a few mature trees. Patch of W11 <i>Betula</i> woodland also present in south of ID area with mature and ancient <i>Betula</i> and some fallen trees and deadwood, also a well-established ground storey with up to eight ancient woodland indicator species. However, part of a wider area of mostly plantation, therefore assigned Regional value.
Ancient woodland ID area no. 23.	National	AW Category: 1a Ancient. Patch of W11 <i>Betula</i> woodland with mature and some possible ancient trees. Well-developed ground storey which is grazed and some light nutrient enrichment, up to three ancient woodland indicator species present. Part of a much larger block of similar woodland within local area and as such is assigned National importance.
Ancient woodland ID area no. 24.	National	AW Category: 1a Ancient. Area of semi-natural W11 <i>Betula</i> woodland with mature and semi-mature trees over a well-developed and grazed ground storey,

ID Area Description	Nature Conservation Importance	Reason/Justification
		which contains up to six ancient woodland indicator species.
Ancient woodland ID area no. 25a/25b	National	AW Category: 1a Ancient. Area of semi-natural <i>Betula</i> spp./ <i>Quercus petraea</i> / <i>Populus tremula</i> woodland which is part of a much larger block of the same (mostly W11 with small areas of W17). Trees are a mix of mature and ancient specimens. Ground storey is well established and subject to varying levels of grazing intensity. Up to 10 ancient woodland indicator species recorded.
Ancient woodland ID area no. 26.	Regional	AW Category: 1a Ancient. Relatively small area of patchy <i>Betula</i> and <i>Quercus petraea</i> woodland with open ground areas, trees are mature to ancient and there is an established ground storey which is grazed and shows some light enrichment from farming. Three ancient woodland indicator species recorded. Assigned as Regional importance and not National due to smaller size and amount of open ground.
Ancient woodland ID area no. 27.	National	AW Category: 1a Ancient. This area contains a mix of acid grassland and <i>Pteridium aquilinum</i> dominated open ground habitats as well as woodland. Plantation woodland exists closest to A9. Set further back from road is the dominant habitat type; semi-natural W11 <i>Betula</i> woodland with a mix of ancient, mature and semi-mature trees and <i>Juniperus communis</i> in the understorey. The ground layer is relatively diverse, well developed and contains up to four ancient woodland indicator species recorded.
Ancient woodland ID area no. 28a/28b/28c	National	AW Category: 1a Ancient. Also, part of Craigellachie SSSI & NNR. Diverse well developed mature broadleaved <i>Betula</i> dominated woodland with many ancient woodland indicator species and well-developed ground storey.
Ancient woodland ID area no. 29.	Authority	AW Category: 1a Ancient. Area of young mostly even-aged <i>Pinus sylvestris</i> plantation (W18) dissected by existing A9 carriageway, some patches more semi-mature. Ditches and disturbance from forestry operations. Up to four ancient woodland indicators species recorded. Small area with some semi-natural W18 and W11 to north of ID area. Overall considered to be no more than Authority Area level importance.
Ancient woodland ID area no. 30.	Authority	AW Category: 1a Ancient. Majority of this area is young <i>Pinus sylvestris</i> plantation (W18) with some patches of grassland and a few mire types (bogs and flushes) in open areas. There are only occasional older trees present. There is one small area of mature/semi-mature trees at TN JA57 (Figure 12.2) where a mix of <i>Betula</i> , <i>Pinus sylvestris</i> , <i>Picea sitchensis</i> , and <i>Pseudotsuga menziesii</i> were recorded (W11). The area is mainly a continuation of young plantation present to the north and south. Ancient woodland indicators are generally absent to sparse; only two recorded at one target note plot.

ID Area Description	Nature Conservation Importance	Reason/Justification
Ancient woodland ID area no. 31.	Authority	AW Category: 1a Ancient. Relatively small area of mature <i>Betula</i> and <i>Pinus sylvestris</i> woodland (W17/W18) at the southern end of Aviemore. Open to public, part of area is a caravan park. Only two ancient woodland indicators species recorded. Part of a larger block of ancient woodland.
Ancient woodland ID area no. 32.	Less than Local	AW Category: 2a Ancient. A very small part of the 100m Study Area falls within this ID area on the AWI. The portion within the Study Area is only a few sq. m in size and consists of grazed acid grassland of Less than Local importance. There are no trees in this area.
Dry heath zone by Slochd (end of Study Area to c. Ch21750)	Authority	This is a substantial area to the east of the A9 at the northern end of the scheme around Slochd. Dry heath here is extensive, good quality, and is part of a much larger unit of European dry heath. The area contains a mix of dry heath communities, primarily H12 and H16, but also some patches of H10 and H18; there is some rotational muirburn and heath at different successional stages of recovery. Within the expanse of dry heath there are some small patches of other habitats which form part of a habitat mosaic, many of these are patches of other Annex I habitats such as blanket bog and wet heath. Given the size of this area and its connectivity to the Cairngorms National Park and Slochd SAC it has been assigned as Authority Area importance. It has not been classed of any higher importance due the fact the extent within the Study Area still represents a small percentage area of this type of habitat locally, regionally, or nationally.
Blanket bog/heath zone (c. Ch19300 - Ch21000)	Local	This area of blanket bog and dwarf shrub heath represents the longest contiguous section of these habitat types along the Proposed Scheme and contains NVC types H12, M15, M16, M17, M20 and M25 (with some M6 flushes) in a bog and heath mosaic. This area of habitat has been assigned Local importance, given its intrinsic value as Annex I and SBL priority habitat, but recognising that the area within the Study Area is a small proportion of these habitat types locally.
All other Annex I habitat areas	Local	All other areas of Annex I habitat have been assessed as of no greater than Local importance due to their extent, distribution, fragmentation, widespread nature and in some cases, quality.
SBL - woodlands (including wet woodland, upland birchwoods and upland oakwoods), and <i>Populus tremula</i> dominated woodlands	Local	Stands of these woodland types that are not covered by any designated site, are not part of the AWI, or are not already covered by an Annex I classifications, have been classed as Local importance. The quality of these woodlands varies from young scrubby stands to more mature stands that are similar to some of the <i>Betula</i> dominated AW ID areas described above, and to which some areas are ecologically connected. However, given the relative abundance of these types of woodlands locally and regionally, and thus the relative small proportion which sits within the Proposed Scheme and Study Area, and in the



ID Area Description	Nature Conservation Importance	Reason/Justification
		absence of any designation or overlap with the AWI, these areas are assigned Local importance.
SBL - Upland flushes, fens and swamps; lowland fens; and reedbeds, which are not covered by Annex I classifications	Local	Within these SBL types, given their widespread and common distribution, extent, and quality within the Study Area, none are deemed to be of more than Local importance (assigned Local importance due to intrinsic value of being a SBL habitat type).
All other habitat types not covered by the above.	Less than Local	<p>The parts of the Study Area that have not been identified as of Local or greater nature conservation importance through the process above are all considered to be of Less than Local importance.</p> <p>This encompasses common habitats and features of negligible ecological importance, or low nature conservation importance, specific to the Study Area and includes the following types (NVC and non-NVC codes): improved grasslands (MG6/MG7); acid grasslands (U1/U2/U4/U5/U6); neutral grasslands (MG1/MG5/MG9/MG10/MG13/HI/Pa); marshy <i>Juncus</i> spp. grassland/mires (M23b/Je/MG10); dense or scattered scrub (W21/W22/W23); fern dominated vegetation (U19/U20/W25/Fn); tall herb and weedy vegetation (U16, W24, OV24, OV25, OV27); bare ground, soil, rock, shingle, hardstandings (BG); bare peat (Pt); buildings (BD); private gardens/lawns/amenity grassland (PG); recently felled woodland (CF); planted/introduced shrubbery in built-up areas (SH/Lp/Sr); conifer/broadleaved/mixed plantations not covered by designated sites, the AWI, Annex I or SBL definitions (CP/BP/MP); arable (AR); quarry (QY); and Refuse tip (R). Further details on the character of these habitat types is provided in Section 5 above.</p>

Annex I. Phase 1 Habitat Type Losses

I.1.1 Table I.1 below details the total habitat loss, due to permanent and temporary land-take, predicted for the construction of the entire Dalraddy to Slochd Proposed Scheme, per Phase 1 habitat type, and irrespective of nature conservation importance. The site-specific correlation of these Phase 1 habitat types to the NVC communities recorded within the Study Area is provided above in Table 5.1.

Table I.1: Proposed Scheme Habitat Loss Per Phase 1 Habitat Type

Phase 1 Code	Phase 1 Habitat Type	Habitat Loss (ha)
A1.1.1	Broadleaved Semi-Natural Woodland	33.90
A1.1.2	Broadleaved Plantation Woodland	15.04
A1.2.1	Coniferous Semi-Natural Woodland	2.57
A1.2.2	Coniferous Plantation Woodland	34.02
A1.3.1	Mixed Semi-Natural Woodland	0.69
A1.3.2	Mixed Plantation Woodland	2.75
A2.1/A2.2	Dense/Continuous & Scattered Scrub	6.62
A3.1/A3.2	Scattered Broadleaved/Coniferous Tree	1.53
A4.1	Recently Felled Broadleaved Woodland	0.49
A4.2	Recently Felled Coniferous Woodland	0.03
B1.1/B1.2	Unimproved & Semi-Improved Acid Grassland	41.07
B2.1/B2.2	Unimproved & Semi-Improved Neutral Grassland	2.78
B4	Improved Grassland	9.98
B5	Marsh/Marshy Grassland	2.74
B6	Poor Semi-Improved Grassland	2.25
C1.1/C1.2	Continuous/Scattered Bracken	1.50
C3.1	Tall Herb & Fern: Ruderal	0.07
C3.2	Tall Herb & Fern: Non-Ruderal	0.004
D1.1	Acid Dry Dwarf Shrub Heath	28.17
D2	Wet Dwarf Shrub Heath	0.55
D5	Dry Heath/Acid Grassland Mosaic	7.59
E1.6.1	Blanket Bog	1.99
E1.7	Wet Modified Bog	0.28
E1.8	Dry Modified Bog	0.54
E2.1	Acid Neutral Flush	0.22
E3.2	Basin Mire Fen	0.62
F1	Swamp	1.25
G1	Standing Water	0.12
I1.1	Natural Acid/Neutral Inland Cliff	1.05
I2.1	Quarry	2.20



Phase 1 Code	Phase 1 Habitat Type	Habitat Loss (ha)
J1.1	Arable	0.56
J1.2	Amenity Grassland	0.13
J3.6	Building	0.02
J4	Bare Ground	2.55
MM-lw/MM-Rd/MM-RI/NVC-ex/NCAI	Other - existing roads/tracks/railway/water & Aviemore built up area NVC exclusion zone	34.45
Total		240.31

Annex J. Woodland Compensation Strategy

J.1.1 This Annex provides a summary of the desk study and subsequent site survey to identify and review potential woodland compensation sites for the Proposed Scheme.

Background

Ancient woodland compensation strategy

J.1.2 Ancient woodland has been identified as an irreplaceable national resource in the Strategic Environmental Assessment for the A9 Dualling Programme.

J.1.3 An “agreed approach” to a compensation strategy for unavoidable losses of ancient woodland was finalised through discussion with the A9 Environmental Steering Group and documented in the Transport Scotland note dated November 2016²⁰. An agreed approach was necessary to achieve consistency between the three consultants undertaking selection of candidate compensation sites across the A9 Dualling Programme. This approach included the following steps to inform the selection of candidate compensation sites:

J.1.4 “1. Map the 2014 /2015 Forestry Commission Scotland National Forest inventory (FCS NFI), NWSS21 and verified Ancient Woodland Inventory (AWI) which includes the following files:

- AWI verified against 2014 NFI.shp;
- AWI verified against 2014 NFI and OS aerial imagery.shp;
- AWI verified against 2014 NFI and 2013 BLOM aerial imagery.shp; and
- Lost AWI Compared to Source AWI dataset.shp.

J.1.5 2. Overlay the design info for each Project to identify affected areas of woodland

- Identify local and total impact (quantity at each affected woodland location (in ha) and a total woodland impact (in ha) for the Project)
- Use above datasets and survey findings to identify woodland type, and consider a site-specific sensitivity

J.1.6 3. Use the mapping to identify ancient woodland affected by the Project and consider opportunities to compensate by utilising Lost AWI in proximity to areas affected.”

Consolidated woodland compensation strategy

J.1.7 All areas shown on the AWI and any other woodland identified during the National Vegetation Community surveys (NVC) undertaken for the project, are included in the total area of woodland. By considering all woodland, not just that which is listed on the AWI, it ensures that all types of woodlands and their associated values are addressed in the compensation strategy. This includes aspen communities and capercaillie habitat that have been highlighted as priority species that may be impacted by the project, and enables a full assessment of candidate compensation sites in terms of potential

²⁰ A9 Woodland Connectivity. Ancient Woodland Compensation Strategy.

²¹ Native Woodland Survey of Scotland.

improvements to ecological functionality. Furthermore, this approach ensures that compensatory woodland planting will be provided for all woodland lost, which is required under the Scottish Government's policy on Control of Woodland Removal²².

Extent of Woodland Loss and Compensation Planting

- J.1.8 The current compensation approach is based on optimising the connectivity, functionality and quality of woodland within the scheme study area, while ensuring compliance with Control of Woodland Removal policy (providing replacement woodland at a 1:1 ratio to that being lost).
- J.1.9 These dual objectives have been addressed by firstly selecting and assessing candidate compensation areas that make the greatest gains to connectivity, functionality and quality of woodlands as defined by the ecological criteria listed in section 2.1 below. The resulting areas of potential compensation planting were then compared to the potential area of woodland loss associated with the Scheme to check that the objectives of the Control of Woodland Removal policy were being met.
- J.1.10 The estimated extent of woodland loss (as per step 2 of the agreed approach) and woodland mitigation for the Proposed Scheme, is shown on Figure 13.4, Landscape and Ecological Mitigation plan, and summarised below.
- J.1.11 The total area of woodland to be lost from the Proposed Scheme is 88.97ha²³.
- J.1.12 The total area listed on the AWI to be lost within the Proposed Scheme is 77.20ha²⁴. Of this area, 40.23ha is woodland and 35.17ha is non-woodland. The majority (~65%) of woodland listed on the AWI that will be lost is Authority Area importance dominated by plantation or immature trees with no or few ancient woodland features. There are also substantial (~35%) areas of National/Regional importance with mature and ancient trees, diverse ground layer and ancient woodland indicator species.
- J.1.13 The Landscape and Ecological Mitigation plan (Figure 13.4) includes provision for the establishment of 48.16ha of woodland²⁵ within the Proposed Scheme immediately adjacent to the A9 (shown on Figure 13.4). This includes 22.4ha of woodland planting on sites listed on the AWI as per step 3 of the agreed approach.
- J.1.14 Therefore, based on the current design, it is estimated that an additional 40.81ha of offsite woodland compensation planting will be required meet the requirements of the Control of Woodland Removal policy.
- J.1.15 This net loss could be accommodated by the addition of woodland plantings in areas adjacent to the immediate road corridor. However, the impact on ancient woodlands as a result of the Proposed Scheme, even with mitigation, will be significant at a National level due to the irreplaceable nature of ancient woodland. Therefore, a more strategic landscape-scale assessment of candidate compensation sites is required to address the significance of the loss.

²² Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal [[https://www.forestry.gov.uk/PDF/fcfc125.pdf/\\$FILE/fcfc125.pdf](https://www.forestry.gov.uk/PDF/fcfc125.pdf/$FILE/fcfc125.pdf)].

²³ Derived from Annex I above and includes total area of broadleaved, coniferous and mixed semi-natural and plantation woodlands (Phase 1 codes A1.1.1, A1.1.2, A1.2.1, A1.2.2, A1.3.1, A1.3.2)

²⁴ All areas in this paragraph derived from Table 7.5.

²⁵ This mitigation area includes aspen, coniferous, birch, mixed and wet woodland and does not include scrub, scattered trees and other open habitats.

Approaches for Identification and Assessment of Candidate Woodland Sites

J.1.16 The approach detailed below sets out the steps taken to identify and evaluate candidate sites in terms of their suitability for woodland planting.

Assessment Criteria

J.1.17 Criteria for the assessment of potential sites for woodland planting were developed to enable evaluation of, and comparison between, candidate sites. The criteria were used in both the desk and site assessments, although not all criteria could be fully evaluated in the desk study due to the limitations of available information.

J.1.18 The criteria developed, which were based on ecological and landscape principles and other land management considerations, are listed below and informed by the objectives in the draft Cairngorms National Park Forest Strategy 2018 (draft CNPAFS)²⁶.

J.1.19 Ecological considerations:

- Improved ecological functionality and connectivity. This included providing connectivity or expansion of existing fragmented woodland habitats or core woodland area. In addition, the location of core woodland areas and primary (500m) and secondary (2km) buffers were used as a measure of potential connectivity with existing core woodland areas (core>primary>secondary>outside). The buffers are based on dispersal distances of woodland species and are the same as the zones used in the woodland connectivity assessment for the Glen Garry – Dalraddy section of the A9²⁷.
 - Habitat type and associated condition (composition etc.) within the candidate site. Includes ground and (if present) tree layer and ability to regenerate and provide appropriate high value woodland type and associated broad soil type.
 - Impacts on existing habitat's ecological values (e.g. no adverse impacts on high priority peat, ground water dependent terrestrial ecosystems (GWDTEs), high diversity heaths, priority sites for wading birds or other important habitats).
 - Provision of suitable habitat for other values requiring compensation or mitigation (e.g. capercaillie or invertebrate habitat).

J.1.20 Landscape considerations:

- Compatibility with existing landscape character.
- Influence on visual amenity.
- Location, relative to the A9 and proximity of impacts.

J.1.21 Management considerations:

- Potential cost, including ease of management and ability to regenerate native woodland species.
- Ecological constraints from current management to woodland establishment e.g. arable land may make it harder to establish full suite of ground layer biota compared to less intensively managed land.

²⁶ URL: <http://cairngorms.co.uk/consultation/foreststrategy/>

²⁷ CH2M/Fairhurst – 19/1/2015. A9, Connectivity Assessment – Assessment Overview. Technical Memorandum prepared for Transport Scotland.

- Access required for establishment and maintenance (e.g. lack of tracks, topographical constraints).
- Compliment and not conflict with other land uses as listed in the draft CNPAFS e.g. avoid in-by agricultural land. Relevant landholders were consulted to determine if the proposed candidate areas conflicted with existing landholder management strategies.

Desk Study

- J.1.22 An initial list of candidate compensation sites was derived in accordance with steps 1 and 3 of the agreed approach detailed above, which included the selection of areas greater than 1ha that were mapped on the AWI but no longer support woodland. This provided a number of sites, although many with constraints that prevented woodland planting, such as little ecological functionality and/or small total areas relative to the total area of woodland compensation required. Therefore, other candidate sites were selected from areas identified that were greater than 1ha, support open vegetation, were adjacent to existing woodland and may be suited to planting or woodland regeneration. These latter areas included aspirational new habitat for capercaillie shown on mapping provided by RSPB²⁸.
- J.1.23 The resulting candidate sites were evaluated in a desk study against the assessment criteria listed above to determine those sites to take forward for a site based review. The information used in the desk study included the following.
- Habitats shown on D-S Stage 3 NVC mapping or for those sites that occurred outside the 250m buffer that was mapped a review of aerial photography was undertaken to interpret the likely habitat present.
 - Expert knowledge about the ability of woodland to be established and managed on different habitats types (e.g. peats).
 - The extent of, and connectivity to, existing woodland shown in AWI mapping or visible on aerial photography.
 - The location of primary (500m) and secondary (2km) buffers around “core forest” areas shown on the Integrated Habitat Network (IHN) mapping for native woodland²⁹. Target areas for woodland creation in the draft CNPAFS were also considered, although the small scale of this mapping limited its applicability to smaller candidate sites.
 - Aerial photography, topographic information and associated line of sights and known landscape features to assess landscape values.
 - Advice on potential constraints from the occurrence of peat, forestry operations and existing land management.

Site Survey

- J.1.24 A site assessment of the areas selected from the desk based assessment was carried out during 2017-2018 by members of the ecological and landscape teams. Target notes were collected at representative locations at each candidate site on existing habitat including NVC (vegetation) types, dominant plant species, existing management, potential for woodland establishment and appropriate species, potential ecological connectivity with existing woodland communities on and adjacent to the site and landscape character and potential visual receptors. Using the details collected from the

²⁸ RSPB Scotland (2015). Map of aspirational habitat creation, attached to a letter dated 12th April 2015 to Robin Smith, A9 Dualling Project Team Stakeholder Manager.

²⁹ Forestry Commission (2016) Native woodland. Integrated Habitat Network. FC.S_FGA_TA_NAT_WOOD_IHN).

site visit potential opportunities and constraints for each site have been identified as detailed in the Results section below.

Results

Desk Study

- J.1.25 The locations of the selected candidate sites in relation to the Proposed Scheme are presented in Figure 13.4, Landscape and Ecological Mitigation plan. A summary of the results of the desk study evaluation of the candidate sites is tabulated in Table J.1.
- J.1.26 The desk study identified 12 discrete sites totalling about 130ha, which are mapped on the AWI but no longer support woodland, and eight sites, totalling about 150ha which support open vegetation but have good connectivity to existing woodland. A further five sites totalling over 5000ha, which were identified as aspirational capercaillie habitat by the RSPB, were also included in the desk assessment.
- J.1.27 Eight sites, totalling 700ha, were selected for site based review following the desk study evaluation. Those selected for site based review were largely in locations that would provide either a significant expansion to existing woodland or enhanced connections with other woodland areas. The sites selected included parts of four of the areas identified by RSPB that were that were closest to the A9 and adjacent to existing woodland. All the sites selected for site based review, except for site 19, were outside of the Stage 3 NVC survey area.
- J.1.28 The sites not selected for site based review were generally located in areas that were incompatible with woodland establishment (such as those with potentially high levels of peat or those within arable land) or those which were small in extent and as such would provide limited increases in woodland area or improved connectivity to existing woodland.

Site Survey

- J.1.29 A summary of the main constraints and opportunities for the eight sites assessed by field survey are listed in Table J.2. This table is listed in order of preference based on ecological and landscape criteria, access constraints and following consultation, landholder management requirements.
- J.1.30 A more detailed description of the opportunities and constraints at each site is provided after Table J.2.
- J.1.31 Site 13 has been identified as the most suitable location to provide woodland compensation. This site has been incorporated into the Proposed Scheme and its location and indicative planting layout is shown in Figure 13.4, Landscape and Ecological Mitigation plan (sheet 18).
- J.1.32 Establishment of woodland at this site will complement and consolidate the extensive areas of mature woodland and regeneration already present on the site and, combined with the grassland and loch habitats that also occur there will create a structural diverse habitat. The new woodland will enhance and extend forest connectivity with areas of core woodland to the north³⁰ and riparian woodland bordering the River Spey which occurs on the southern boundary of the site. Landholder consultation indicated support for this site as woodland establishment at this site fitted the current management of the

³⁰ As denoted on the draft CNPAFS

area which includes promoting natural regeneration in areas adjacent to the proposed woodland establishment.

- J.1.33 The indicative planting area (shown on Figure 13.4, Landscape and Ecological Mitigation plan) on the proposed compensation site is approximately 44ha. When combined with the mitigation planting within the Proposed Scheme this will meet or exceed the requirements for no net loss of woodland under the Policy on Control of Woodland Removal. While the mitigation and compensation planting cannot replace the ancient woodland loss associated with the Proposed Scheme, they will mitigate this loss over time as the forests develop.
- J.1.34 The other seven sites selected for site based review provided varying opportunities and constraints. However, opportunities were restricted as compared with the preferred site or, during landholder consultation proved to have various incompatibilities with current management.

Conclusions

- J.1.35 The total area of woodland loss associated with the Proposed Scheme is currently estimated to be 88.97ha, while the woodland mitigation planting within the immediate road corridor is about 48.16ha. Thus, an additional 40.81ha of offsite woodland planting is needed to meet the requirements of the Control of Woodland Removal policy.
- J.1.36 The above loss includes 42.03ha of woodland that is listed on the AWI. The expected loss of ancient woodland will be significant at a National level due to its irreplaceable nature. Therefore, an offsite compensation area, based on a strategic landscape scale assessment, is required to address the total area and significance of the woodland loss.
- J.1.37 Following desk study and field survey candidate site number 13 has been identified as the most suitable location to provide compensation and ensure there is no net loss of woodland cover associated with the Proposed Scheme. This site is located near to the Proposed Scheme and provides good ecological connection to existing woodlands, and is compatible with current land management in the area. This candidate site has been incorporated into the Proposed Scheme.

Table J.1: Summary of Desk Based Assessment of Candidate Woodland Compensation Sites

Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
1	Yes	Eastern part within secondary (Integrated Habitat Network) IHN woodland buffer zone and enhances and expands existing woodland including areas that are fragmented. Within area identified by RSPB as aspirational new habitat for Capercaillie and connects to area identified as Capercaillie woodland on Figure 12.24g.	Elevation on higher parts may impede tree growth. May include areas of deep peat that could prevent woodland establishment.	Heath, grassland, some mire	575	15-700m	380-560
2	Yes	Western part within secondary IHN woodland buffer zone and enhances and expands existing woodland including areas that are fragmented. Within area identified by RSPB as aspirational new habitat for Capercaillie.	Elevation on higher parts may impede tree growth. May include areas of deep peat that could prevent woodland establishment. Adjacent to area of high scenic amenity.	Heath, grassland, some mire	332	10-600m	350-390
3	No	None identified.	Elevation on higher parts may impede tree growth. Too remote from A9 to provide mitigation of impacts and therefore not recommended for site survey.	Heath, grassland	3018	>5km	350-470
4	No	Within primary/secondary IHN woodland buffer zone and connect to and expands existing woodland/plantations. Connects to area identified as Capercaillie woodland on Figure 12.24g.	Elevation on higher parts may impede tree growth. Deep peat soils likely to prevent woodland establishment over large part of area and therefore not recommended for site survey.	Heath (50%), mire swamp (50%)	15	220-750m	340-360

³¹ The proportion of each habitat type is shown in brackets for areas located within DS stage 3 NVC mapping

Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
5	No	Area listed in the AWI but no longer wooded. Within primary/secondary IHN woodland buffer zone.	Provides minimal improvement in connectivity of existing large coniferous plantation woodland. Peaty soils likely to prevent woodland establishment over large part of area and therefore not recommended for site survey.	Mire/ grassland, heath/ ex-woodland on higher area	17	0.6-1.8km	300-320
6	No	Within primary IHN woodland buffer zone. and connects to area identified as Capercaillie woodland on Figure 12.24g.	Long narrow strip that provides minimal improvement in connectivity of existing coniferous plantation woodland. Potential Ground Water Dependant Terrestrial Ecosystem (GWDTE). Peaty soils may prevent woodland establishment. Not recommended for site survey.	Heath (50%), mire/swamp (30%), grassland (10%), woodland (10%)	12	220-550m	300-320
7	Yes	Large scope for providing additional woodland within primary/secondary IHN woodland buffer zone. Direct connectivity to areas identified by RSPB as Capercaillie forest. Within area identified by RSPB as aspirational new habitat for Capercaillie.	Likely to be areas of peaty gley and blanket bog in the south-east of site that would prevent tree growth.	Heath, grassland	723	3.2-4km	340-450
8	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone that is adjacent and provides connectivity to areas identified by RSPB as Capercaillie forest. Adjacent to area identified by RSPB as aspirational new habitat for Capercaillie which is included as part of site 7 (above).	Limited access and elevation may limit woodland establishment. Likely to be mix of blanket peat and peaty gleys that could prevent tree growth. Does not add connectivity to adjacent woodlands that are part of a very large well-connected area.	Heath, unimproved grassland	37.6	2.6-3.2km	350-400

Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
			Therefore, not recommended for site survey.				
9	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone. Directly adjacent to Proposed Scheme.	Provides only limited improvement in connectivity to existing woodlands. Peaty soils and bogs likely to prevent woodland establishment over large part of area and therefore not recommended for site survey.	Mire/swamp (80%), woodland (10%), heath (10%)	11.6	0-550m	270
10	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone that is adjacent and provides connectivity to areas identified by RSPB as Capercaillie forest area and provides stepping stone to isolated woodlands.	Likely to have large areas of deep peat and cultivated land that are incompatible with woodland establishment and therefore not recommended for site survey.	Heath, unimproved grassland	40	1.5-2.4km	240-250
11	No	Area listed in the AWI but no longer wooded. Within "core forest"/primary IHN woodland buffer zone. Connects to area identified as Capercaillie woodland on Figure 12.24g.	Provides minimal expansion to existing large area of woodland and therefore not recommended for site survey.	Heath, unimproved grassland	3.3	0.7-1.3km	230-240
12	No	Area listed in the AWI but no longer wooded. Within "core forest"/primary IHN woodland buffer zone.	Provides minimal expansion to existing large area of woodland and therefore not recommended for site survey.	Heath, unimproved grassland	3.3	1.4-1.6km	235
13	Yes	Good connectivity with existing woodland and close to areas identified as capercaillie habitat and increases linkages between woodland in the uplands with River Spey which runs along southern boundary of the area. Within "core forest"/primary IHN woodland buffer zone. Landholder has indicated a preference for this area for woodland establishment due to	May included peaty soils in parts that could prevent tree growth. Rail and Speyside walking path along northern boundary disrupt connectivity with capercaillie woodlands further north.	Heath, unimproved grassland	60	1.1-1.5km	225

Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
		compatibility with existing management and land use.					
14	Yes	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone that is adjacent and provides connectivity to areas identified by RSPB as Capercaillie forest area and the Craigellachie NNR.	Adjacent woodlands are part of a very large already well-connected area. May included peaty soils in parts that could prevent tree growth.	Heath	27.2	0.9-1.5km	340-430
15	Yes	Scattered woodland common along southern edge. Within primary IHN woodland buffer zone that is adjacent to area identified by RSPB as aspirational new habitat for Capercaillie and included as part of site 13 (above). Large area containing multiple options therefore recommended for site survey.	May include areas of peat that will preclude woodland establishment in parts. Higher areas may preclude tree growth and have landscape amenity constraints due to being located on Craigellachie NNR.	Heath, grassland	609	1.0-1.5km	240-350
16	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone.	Potential GWDTE. Small expansion to existing large area of woodland provides so provides little ecological benefit and therefore not recommended for site survey.	Grassland (90%), woodland (10%), potential GWDTE	4.5	0-320m	220
17	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone.	Small expansion to existing large area of woodland and therefore not recommended for site survey.	Grassland (50%), woodland (40%) roads (10%)	1	50-180m	220
18	No	Open area that the land owner has previously indicated willingness to dispose of. Within secondary IHN woodland buffer zone.	Potential GWDTE. Narrow elongated strip adjacent to A9 that is isolated on all sides by roads, rail or house. Provides limited ecological benefit and therefore not recommended for site survey.	Marsh/ marshy grassland/ unimproved grassland (90%), some fringing broad-leaved/ coniferous woodland (10%)	1.1	30-250m	220

Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
19	Yes	Within primary IHN woodland buffer zone and provides linkages with adjacent woodland along creek and hill slopes.	Potential GWDTE. Half of area included as a proposed SuDS.	Marsh/ marshy grassland, unimproved grassland	1.26	10-250m	220
20	Yes	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone and provides good linkage from woodlands in uplands to those along Spey River.	Limited ecological benefit due to small size.	Woodland, grassland, wet heath	3	0.9-1.3m	220
21	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone.	Semi-improved grassland adjacent to arable land that is not compatible with woodland establishment. Therefore, not recommended for site survey.	Semi - improved grassland	13.6	750-1100m	290-300 moderate slope
22	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone.	Occurs wholly within a plantation and does not provide additional connectivity. Appears to be required for quarry expansion. Therefore, not recommended for site survey.	Grassland, heath	3	300-480m	230 flat
23	No	Within primary IHN woodland buffer zone and provides potential buffer to Spey River with existing broad-leaved woodland and coniferous plantation.	Improved grassland/arable land that is not compatible with woodland establishment. Therefore, not recommended for site survey.	Improved grassland	7	740-1200m	230 flat
24	No	Within primary IHN woodland buffer zone.	Provided limited improvement to woodland connectivity. Cultivated land that is not compatible with woodland establishment. Therefore, not recommended for site survey.	Cultivated land	3	100-750m	230 flat



Site Label	Site-Based Review	Opportunities	Constraints	Existing Vegetation ³¹	Area (ha)	Distance from Proposed Scheme	Elevation (m)
25	No	Area listed in the AWI but no longer wooded. Within primary IHN woodland buffer zone.	Some potential enhancements may be possible but additionality may be limited as much of the areas is already lightly wooded. Therefore, not recommended for site survey.	Semi open woodland, grassland	3.3	950-1300m	240 flat-medium



Table J.2: Summary of Opportunities and Constraints for Woodland Candidate Sites Subject to Field Survey

Site Reference, Location and Indicative Area	Opportunities	Constraints
<p>13 – Kinchurdy Moor. North east of Aviemore. ~220ha with indicative net woodland establishment area of 44ha</p>	<p>Establishment of woodland at this site will complement and consolidate the extensive areas of mature woodland and regeneration already present on the site and, combined with the grassland and loch habitats that also occur will create a structural diverse habitat. The new woodland will enhance and extend forest connectivity with areas of core woodland to the north and riparian woodland bordering the River Spey which occurs on the southern boundary of the site. Landholder consultation indicated support for this site as woodland establishment at this site fitted the current management of the area which includes promoting natural regeneration in areas adjacent to the proposed woodland establishment.</p>	<p>Includes some areas of bogs and lochs but these have been excluded from the indicative planting areas. Builds on areas of core woodland. The Speyside rail line and walking path that occur on the adjacent to the northern boundary disrupt connectivity with capercaillie woodlands further north.</p> <p>The site is relatively remote (~3.2km) from A9 compared to some other candidate sites.</p>
<p>7 – South-west of Carrbridge and to the west of the Beananach Wood ~130ha with indicative net woodland establishment area of 40ha</p>	<p>Provides connectivity to Beananach Wood and woodland establishment on western part provides linkages with existing woodlands to the west. The adjacent woodlands have been identified by RSPB as capercaillie forest and the site is within an area identified by RSPB as aspirational new habitat for capercaillie.</p> <p>Woodland establishment is compatible with and supports the objectives of, the Kinveachy Forest SSSI which the site is located within and the Kinveachy SPA and SAC which abuts the site on the northern boundary and overlaps the site on the southern boundary.</p> <p>Area proposed for woodland establishment on eastern end of site could be achieved by natural regeneration.</p> <p>Land holder consultation indicate support for this areas as it complements existing fencing/regeneration already occurring.</p>	<p>It would be desirable to maintain the contrast of enclosure and exposure for users of General Wade’s military road to the north east by avoiding planting in this area.</p> <p>Parts of the site which are characterised by scattered trees, providing diversity and a more naturalistic appearance in the landscape, would not be considered suitable for woodland planting.</p> <p>Extensive areas of bogs with peaty soils also need to be avoided.</p> <p>The site is relatively remote (~3.2km) from A9 compared to some other candidate sites.</p> <p>Requires Habitat Regulation Assessment (HRA) to confirm any effects of woodland establishment on designated site qualifying features.</p>
<p>1 – West of Slochd on the slopes of the Carn na Lair and fringing the Allt Ruighe an t-</p>	<p>This site provides enhancement and connectivity with existing fragmented woodland around burn and large coniferous plantation to east.</p> <p>Located near Slochd adjacent (150-1200m) to the A9 and within the</p>	<p>Landholder consultation indicated strong objections to this site due to incompatibility with current management strategy for the area. On this basis this site was treated as a</p>

Site Reference, Location and Indicative Area	Opportunities	Constraints
<p>Sahail watercourse 55ha with indicative net woodland establishment area of 40ha</p>	<p>Cairngorm National Park and an area identified by the RSPB as a potential woodland site for enhancing capercaillie habitat. Connects to area identified as Capercaillie woodland on Figure 12.24g.</p>	<p>lower priority for woodland compensation than the preferred sites.</p> <p>Overhead powerlines, burns areas of peat, archaeological remains and areas used for sheep grazing may pose some constraints. Further refinement that is sensitive to these constraints is likely to be required.</p> <p>Woodland planting in some areas restricted by need to maintain the open character of the hilltops which are visible from surrounding areas. Areas of bogs with peaty soils need to be avoided.</p>
<p>19 - 3km to south-west of Aviemore on the north bound side of the A9 and adjacent to Allt na Creiche watercourse ~1.2ha</p>	<p>The location provides connection and extension to existing woodland along the watercourse and adjacent scrub and woodland to the north. Extends and reinforces the character of Craigellachie adjacent to the A9.</p> <p>The site is located immediately adjacent (20-230m) to the A9 and proposed roadside planting. Areas of wet scrub and woodland around the proposed SuDS can benefit a range of wildlife.</p>	<p>Only a small area and therefore provides limited benefits compared to other sites. Half of the site is proposed for SuDS which constraints the total amount of land available for compensatory planting.</p>
<p>14 – Immediately to the north of the Craigellachie NNR ~30ha</p>	<p>Provides improved connectivity between the adjacent woodlands which have been identified by RSPB as Capercaillie forest and the Craigellachie NNR to the south.</p>	<p>Limited ecological benefit compared to above listed sites because adjacent woodlands are part of a very large, already well-connected, area. Areas of bogs with peaty soils need to be avoided.</p> <p>The site is relatively remote (1-1.5km) from the A9 although within the Cairngorms National Park.</p>
<p>2 – North of Slochd on the slopes of Carn nam Bain-tighearana to the east of the A9 and adjacent rail line ~20ha</p>	<p>Provides enhancement and connectivity to existing relatively small and somewhat fragmented coniferous plantations and birch woodland, connecting these areas to more extensive woodlands to the east.</p> <p>Located near Slochd immediately adjacent (20-560m) to the A9 and within the Cairngorm National Park and an area identified by the RSPB as a potential woodland site for enhancing capercaillie habitat.</p>	<p>After survey and due to iterative changes in the Proposed Scheme, it was apparent that access to this site would be blocked and there was no practical alternative. On this basis this site was treated as a low priority for woodland compensation. The site is also situated adjacent to a Special Landscape Area (SLA), which is characterised by homogenous views across spacious open moorland. However, it is</p>

Site Reference, Location and Indicative Area	Opportunities	Constraints
	Potential to provide forest approaching natural tree line.	considered that the qualities of the SLA would not be diminished through woodland planting in this area as the site is mostly outwith the SLA and slopes face away from that area.
20 – 1km to south east of Aviemore ~3ha	Extends and enhances ecological connection between woodlands of the uplands and along the Spey River. Site listed of the AWI, but no longer woodland and as such may have associated ecological and cultural values.	<p>Located on the Rothiemurchus Estate and largely included within the recently approved An Camas Mòr development (CNPA Ref 09/155/CP) which is likely to severely constrain the use of the area for compensation.</p> <p>Limited ecological benefits compared to other candidate sites because the proposal is for a relatively small area in a narrow strip.</p> <p>The site is located away from the A9 (850-1400m) to the east of the Spey River.</p> <p>The designated asset of Rothiemurchus Enclosure lies close to the proposed planting area, which would therefore require consultation with and approval by Historic Environment Scotland.</p>
15 – North-eastern part of Craigellachie NNR (~ 150ha)	Site well suited to woodland establishment to complement existing values.	Unlikely to be accepted by stakeholders as a mitigation site because there is little opportunity to provide additional benefits at this location as woodland regeneration is well underway and is part of the management proposal for the nature reserve.

Site Survey Summary

Site 1 – Carn na Lair

Location and area

- J.1.38 Indicative area – 55ha with net woodland establishment area of 40ha.
- J.1.39 Located to west of Slochd on the slopes of the Carn na Lair. The General Wades Military Road runs along the eastern boundary of the site.
- J.1.40 The area is owned by owned by Seafield & Strathspey Estate, which turn let to Foregin LLP as tenant limited Duration Tenancy (15 years) and sublet to an agricultural tenant on Short LDT (less than 5 years).

Habitats present

- J.1.41 Gentle slopes with European dry heath (H10-12, U2³²) dominated by heather (*Ericaceae* spp.) and bracken (*Pteridium aquilinum*). Scattered birch (*Betula* spp.) or patches of scrub (A2, W19) dominated by juniper (*Juniperus communis*) also occur. Ares of blanket bog (M19) occur on deep peat dominated by heather and sedges, marsh/marshy grassland (MG10) on flushes and glens, particularly in lower parts of the site. There are also moderately sized areas of unimproved acid grassland (U4, U5).
- J.1.42 Relatively fragmented areas of mature birch woodland line a small stream along the Allt Ruighe an t-Sahail in the northern part of the site and around the railway line to the south east. Mature Scots pine (*Pinus sylvestris*) planation occurs along the Military Road to the east of the site which forms the western boundary of an extensive woodland.

Landscape and visual context

- J.1.43 The site is situated to the south of Slochd pass, which is renowned for its open, rocky character and as a gateway to the national park from the north. The Highland Main Line Railway (HMLR) and the A9 are situated to the north east. The upper areas of the site around the hilltops are more open and are predominantly covered in heather moorland which is consistent with the character of the surrounding area.

Current management

- J.1.44 Light grazing by sheep and deer with use for sports shooting.

Proposed woodland

- J.1.45 Heath areas are suitable for planting with Scots pine, birch and rowan (*Sorbus aucuparia*) with an understory of juniper. Species such as birch and juniper could be established on the edges of blanket bog areas, although the bogs are not suited to woodland establishment because of disturbance to peat as well as an inability to grow woodland.
- J.1.46 Areas closer to the gully could be planted with birch, rowan and possibly aspen (*Populus tremula*), especially as the presence of bracken suggests that the soils are deep and moderately fertile and the local climate sufficiently sheltered for trees to thrive. Ideally planting would concentrate on areas of dense bracken leaving the heathland as open habitat and for natural regeneration.

³² Equivalent NVC codes are in brackets

Opportunities and constraints

- J.1.47 During consultation, the landholders indicated that establishment of woodland in this area would be incompatible with current land management. This is because the area was extending woodland into a largely non-woodland area. Due to the importance of avoiding land use conflicts for the long term and suitable management of the area, this lowered the priority of this area below the preferred area.
- J.1.48 The proposed indicative mitigation areas would provide significant enhancement and connectivity with the currently fragmented mature birch woodland surrounding the small stream along the Allt Ruighe an t-Sahail in the northern part of the site. These areas would also consolidate the scattered juniper with birch woodland to south and dense young birch along railway embankment to east. The proposed area to the south would connect to and extend the coniferous plantation to the east of the site. The location of the site within the Cairngorm National Park, adjacent (150m-1.2km) to the A9 and within an area identified by the RSPB as a potential woodland site for enhancing capercaillie habitat increases its value as a mitigation area. Connects to area identified as Capercaillie woodland on Figure 12.24g.
- J.1.49 Planting predominantly broadleaf/conifer woodland in this area is consistent in character to adjoining areas of woodland and would accentuate the contrast between the open hilltops and the wooded slopes which is already evident in views for these receptors.
- J.1.50 Woodland planting at the site may provide some benefit to natural flood management and water quality.
- J.1.51 There are archaeological remains, observed during the site survey and listed in the Highland Council Historic Environmental Record, present on the site. These have been avoided in the indicative areas and further sensitive design including planting in clumps and groves to create a glade setting around the archaeological sites and drawing focus to their qualities could be undertaken. Further consultation (with Council Archaeologist and Historic Scotland) would be required to ascertain the extent to which woodland could be planted around this area and it is likely that a walk over survey may be requested in advance of planting.
- J.1.52 The overhead powerlines and areas of grassland that appear to support sheep grazing may also pose some constraints to woodland establishment. These areas can also be readily avoided (for example by leaving an appropriate wayleave corridor along the route of the powerlines and restricting woodland to areas used for rough grazing) and by creating a break in the woodland, would allow for a mosaic of habitats to be created which would increase the value for wildlife. The grassland areas would be well suited to tree growth if their value for sheep grazing did not pose a significant constraint.
- J.1.53 Woodland planting in the northern part of the site would need to focus on the lower areas where tree cover is already present, because the elevation in these parts would start to slow tree growth but also to maintain the open character of the hilltops, which are visible from the A9, the HMLR and properties at Rynaclarsach.
- J.1.54 Planting that obscures rock outcrops may also conflict with designation of parts of the site as the Slochd Geological Conservation Review Site. Therefore, liaison with SNH and British Geological Society (BGS) would be required although the geological values associated with the site are likely to be compatible with restricting planting to lower slopes.

Site 2 – Carn nam Bain-tighearna

Location and area

- J.1.55 Indicative net area – 60ha with net woodland establishment area of 25ha.
- J.1.56 Located to the north of Slochd on the slopes of Carn nam Bain-tighearna to the east of the A9 and adjacent rail line.
- J.1.57 The area is owned by owned by Seafield & Strathspey Estate, which are in turn let to Foregin LLP as tenant limited Duration Tenancy (15 years) and sublet to an agricultural tenant on Short LDT (less than 5 years).

Habitats present

- J.1.58 Steep slopes falling to southeast with European dry heath (H10-12, H18 U20) dominated by heather and bracken and some blanket bog (M19) on the lower slopes.
- J.1.59 Small rectilinear areas of Scots pine planation occur within and immediately adjacent to the site. Scattered Scots pine regeneration occurs, particularly in areas adjacent plantations. A strip of birch woodland occurs at the bottom of the slope to south east of the site and adjacent to the rail line.

Current management

- J.1.60 Extensive areas are subject to small-patch burning for grouse management and the associated heaths appear to be floristically impoverished by repeated burning. The area if used for seasonal sport shooting. Evidence of deer grazing was observed on the site, but some regeneration of Scots pine is occurring.

Landscape and visual context

- J.1.61 The site comprises a south east facing slope situated to the east of Slochd pass, which is renowned for its open, rocky character and as a gateway to the national park from the north. The intersection of the A9, National Cycle Network Route 7 and the HMLR at Slochd Beag is situated to the south.
- J.1.62 The site is situated adjacent to the edge of the Drynachan, Lochindorb and Dava Moors Special Landscape Area (SLA), which is characterised by homogenous views across spacious open moorland.

Proposed woodland

- J.1.63 It would be appropriate to plant mixed woodland with an increasing percentage of coniferous species heading north west to the tie-in with the adjacent plantation and increasing the percentage of broadleaf species towards the south east at the tie-in with the area of birch. There is a large tract of coniferous plantation woodland to the east, on the opposite side of the HMLR that any proposed woodland on the slope should tie in with to ensure a coherent landscape pattern.
- J.1.64 Natural regeneration is occurring in some areas although may be restricted by current burning practices. Enhancements by planting rowan, juniper and possibly aspen and goat willow (*Salix caprea*) would enrich the developing woodland. Scots pine would easily establish here in the absence of burning, and birch and rowan could be planted especially in the areas of bracken that mark out the better soils. Willows could be added along the stream-sides.

Opportunities and constraints

- J.1.65 After survey and due to iterative changes in the Proposed Scheme, it was apparent that access to this site would be blocked and there was no practical alternative. On this basis this site was treated as a low priority for woodland compensation.
- J.1.66 The proposed indicative mitigation areas would provide significant enhancement and connectivity to the currently relatively small and somewhat fragmented coniferous plantations and birch woodland, connecting these areas to more extensive woodlands to the east. The location of the site within the Cairngorm National Park, immediately adjacent (0-560m) to the A9 Scheme and will have to allow for a buffer around the proposed cuttings and drainage works. The site is within an area identified by the RSPB as a potential woodland site for enhancing Capercaillie habitat increases its value as a compensation area.
- J.1.67 Whilst woodland planting could extend north east from the existing block of conifer plantation woodland, this could not extend so far as to negatively influence the open moorland character of the wider setting of the hills to the north east. Although woodland planting could conflict with the characteristics of the SLA, the site is mostly outwith the SLA boundary and the slope faces away from the SLA. Therefore, it is considered that the qualities of the SLA would not be diminished through woodland planting in this area. Areas of bogs with peaty soils that are not compatible with woodland planting need to be avoided.
- J.1.68 The site has good access although steep slopes may make translocation of soils more difficult (if this is required).

Area 7 – Beananach Wood (R-b)

Location and area

- J.1.69 Indicative net area – 130ha with indicative net woodland establishment area of 40ha.
- J.1.70 Located on to the south west of Carrbridge and to the west of the Beananach Wood.
- J.1.71 The area is owned by the Strathspey Estate although the arrangements regarding any sporting tenants are not known.
- J.1.72 The area occurs wholly within the Kinveachy Forest Site of Special Scientific Interest (SSSI) and directly abuts (along the northern boundary) or overlaps (at the southern boundary) the Kinveachy Forest Special Protection Area (SPA) and the Kinveachy Forest Special Area of Conservation (SAC). The small stream along the Feith na Doire, in the southern part of the site is included part of the Spey River SAC.
- J.1.73 The Kinveachy Forest SPA qualifying features are Scottish crossbill (*Loxia scotica*) and capercaillie (*Tetrao urogallus*) which are specialist of native pinewoods. The qualifying features for which the Kinveachy Forest SAC are Caledonia forest and bog woodland. The notified natural features for the Kinveachy Forest SSSI are its breeding bird assemblage and native pinewood. Qualifying species for the Spey River SAC include the otter (*Lutra lutra*).

Habitats present

- J.1.74 European dry heath (H9, H10, H12), wet heaths (M16) and blanket bog (M17, M3) on areas of level ground with wet, peaty soil. Wet heath areas include moderate potential for GWDTE and some areas are notably lichen-rich. Abundant scattered Scots pines occur, singly and in groves although there are many dead trees in parts. In some areas Scots pine seedlings occur, although there are generally no middle size classes present.
- J.1.75 A large area of Scots pine woodland occurs in Beananach Wood directly abutting the east of the site. The rolling hill slopes on the north-eastern corner of the site, which overlaps with the Kinveachy Forest SAC, includes some areas of predominantly Scots pine and some birch, which are regenerating naturally after the establishment of deer proof fencing. Mixed broadleaved and coniferous woodland, that surround the River Dulnain, occur to the north-west of the site.

Current management

- J.1.76 Intensive small-patch burning for grouse management. Evidence of light deer grazing. On the southern part of the site, which overlaps the Kinveachy Forest SAC, slopes that have been fenced to exclude deer grazing, support areas of Scots pine regeneration.

Landscape and visual context

- J.1.77 The individual mature specimens of Scots pine punctuating the landscape to the north of the site, prevent the impression of an open expanse.
- J.1.78 The site is visible from the access road to the north that runs parallel to the River Dulnain to Dalnahaitnach, and from part of General Wade's military road to the north east.

Proposed woodland

- J.1.79 The area on the slopes abutting the existing deer fencing in the north-eastern corner of the site, is most suited to woodland establishment. This could be readily achieved by extension of the existing deer proof fencing to the south which would lead to natural regeneration of predominantly Scots pine with some birch, rowan and juniper.

Opportunities and constraints

- J.1.80 The proposed woodland would extend connectivity between existing forests and regenerating areas in the north with other woodlands to the south. This supports many of the objectives of the designated sites that are on or immediately adjacent to the site. These includes the Kinveachy SAC objectives of ensuring integrity of the site processes supporting the Caledonian forest qualifying habitat and the SPA objective to maintain structure, function and supporting process of habitats supporting the Capercaillie and Scottish crossbill. Compatible objectives of the SSSI include managing grazing and trampling pressures to enable native woodland.
- J.1.81 The proposed indicative mitigation areas would provide significant connectivity to Beananach Wood which has been identified on the RSBP as Capercaillie forest as well as other woodland habitats to the south.
- J.1.82 The site is within an area identified by RSPB as aspirational new habitat for Capercaillie. The large size of this site, provides flexibility for negotiations with the land holder on suitable woodland planting locations within the site.
- J.1.83 Landholder consultation confirmed that the proposed woodland would be compatible with existing management. However, further consultation would be required with SNH to ensure that any proposed planting met with the objectives of the designated sites and a HRA is required to confirm that proposal would not have any significant effects on the qualifying features.
- J.1.84 The site is relatively remote (~3-3.5km) from the A9 compared to other sites assessed although it is still within the Cairngorm National Park the adjacent forest link directly to the A9.
- J.1.85 It would be desirable to maintain the contrast of enclosure and exposure for users of General Wade's military road to the north east. However, this could be achieved whilst planting woodland further south on the site.
- J.1.86 The lower parts of the site to the west contain extensive areas of bogs and peat soils, which need to be avoided. Any planting on the south-western part of the site should be lower in density and should reflect similar patterns to the existing trees on the adjacent hill slopes. Planting in this style would help to soften the rectilinear edges of conifer plantation woodland and encourage a greater diversity in species.

Area 13 – Kinchurdy Moor

Location and area

- J.1.87 Indicative net area – 220ha with indicative net woodland establishment area of 47ha.
- J.1.88 Located 1.3 km to north east of Aviemore on the Strathspey Estate.

Habitats present

- J.1.89 Mainly gentle slope with dry heath (H10-H12) dominated by heather and heath species. Area within the sites, adjacent to where woodland establishment is proposed includes mature birch, and areas of blanket bog (M18), semi-improved grassland (U2) and lochs. There is patchy birch and some Scots pine regeneration scattered across the area.
- J.1.90 The site is adjacent to other areas of woodland and connected on its southern boundary to woodland along the Spey River.

Current management

- J.1.91 Deer grazing identified. One area of semi-improved grassland that may provide some grazing for sheep has been excluded for the proposed planting areas.

Landscape and visual context

- J.1.92 The site is visible from the adjacent Speyside walking track and the Spey Valley, although the area already has mature and regenerating woodlands.

Proposed woodland

- J.1.93 Woodland could be established by controlling grazing to facilitate growth of natural regeneration, mainly birch, Scots pine, rowan and some juniper on slopes. This would provide a more diverse age structure and less soil disturbance than planting. However supplementary planting may be appropriate in some areas, including birch and rowan and juniper in areas where natural regeneration is less likely, as well as aspen and goat willow (in smaller grassy patches) and eared willow and bird cherry on some of the wetter fringing areas to increase diversity.
- J.1.94 Woodland establishment is not proposed in existing areas of regeneration, blanket bogs, semi-improved grassland.

Opportunities and constraints

- J.1.95 Establishment of woodland at this site will compliment and consolidate the extensive areas of mature woodland and regeneration already present on the site and, combined with the grassland and loch habitats that also occur there will create a structural diverse habitat. The new woodland will enhance and extend forest connectivity with areas of core woodland to the north and riparian woodland bordering the River Spey which occurs on the southern boundary of the site.
- J.1.96 Landholder consultation indicated support for this site as woodland establishment at this site fitted the current management of the area which includes promoting natural regeneration in areas adjacent to the proposed woodland establishment.
- J.1.97 The site includes some areas of bogs and lochs but these have been excluded from the indicative planting areas. Builds on areas of core woodland. The Speyside rail line and

walking path that occur on the adjacent to the northern boundary disrupt connectivity with capercaillie woodlands further north.

J.1.98 The site is relatively remote (~3.2km) from A9 compared to some other candidate sites.

Area 14 – north of Craigellachie

Location and area

J.1.99 Indicative net area – 30ha.

J.1.100 Located immediately to the north of the Craigellachie National Nature Reserve on the Strathspey Estate.

Habitats present

J.1.101 Mainly east facing gentle slope with dry heath (H12, H18, H21) dominated by heather and heath species, and areas of wet heath (M15) and blanket bog (M17). There is patchy Scots pine and birch regeneration scattered across the area.

J.1.102 The site is surrounded on three sides by extensive coniferous plantations. Heath with bogs and regenerating birch occurs on the rocky slopes of the nature reserve to the south (see Site 14 in 0).

J.1.103 The site occurs within an area mapped as ancient woodland of semi-natural origin on the AWI, which has since been lost.

Current management

J.1.104 Deer grazing identified. The patches of Vaccinium heath among the swards of heather suggest a history of higher levels of grazing than in within the Craigellachie NNR.

Landscape and visual context

J.1.105 The site is highly visible from the adjacent Craigellachie NNR although is already surrounded on three sides by extensive areas of coniferous plantation woodland.

Proposed woodland

J.1.106 Woodland could be established by controlling grazing to facilitate growth of natural regeneration, which is already producing a mosaic of regeneration and open ground in this area. This would promote a diversity in age of trees within the resulting woodland. It would be possible to plant rowan and juniper to provide a seed-source for a woodland understory if these species are not already present. Planting in blanket bogs and other areas of deep peat should be avoided as these will not support woodland development.

Opportunities and constraints

J.1.107 The proposed indicative compensation area would provide enhancement of the existing coniferous plantations adjacent to the site which have been identified by RSBP as capercaillie forest and the proposed woodland improves ecological linkages between the Craigellachie NNR woodland habitat.

J.1.108 The reestablishment of woodland on an area listed on the AWI may be associated with a richer ground flora and soils ecological processes than other prospective mitigation sites. Therefore, this site may allow for higher quality woodland at least in the shorter

term. Some cultural value may be realised through re-planting on the site due to historical woodland associations.

J.1.109 The planting of predominantly coniferous species with a higher proportion of birch adjacent to the edge of Craigellachie NNR would be appropriate across the entirety of the site with regard to the existing woodlands in the landscape.

J.1.110 The site provides limited ecological benefit when compared to the other candidate sites because the adjacent woodlands are part of a very large, already well-connected, area. The site is relatively remote (1-1.5km) from the A9 although within the Cairngorms National Park.

Area 15 – Craigellachie

Location and area

J.1.111 Indicative net area – 150ha.

J.1.112 Occurs in the northern-eastern part of Craigellachie NNR.

Habitats present

J.1.113 A rocky ridge and plateau at the upper edge of the birch woodland of Craigellachie NNR, with European dry heath (H12, H16, H21) clothing thin peaty soils on the slopes. Wet heath (M15) and blanket bog (M17) occur on hillside benches and in hollows or glens on northern boundary. Dominated by heather and other heath species with abundant natural regeneration of Scots pine and birch with smaller amounts of rowan, grey willow and juniper. Some of the wet heath is notably lichen-rich.

J.1.114 Young and mature birch woodland occurs on the nature reserve to the east and commercial Scots pine plantations occur to the north west and west. Abundant birch and some Scots pine regeneration is present in the heaths, and what looks like (from a distance) grey willow (*Salix cinerea*) in the flushes within the lower lying boggy areas.

Current management

J.1.115 Evidence of light deer grazing was observed, no stock visible and natural regeneration of woodland species.

Landscape and visual context

J.1.116 The site is situated within and adjacent to the Craigellachie NNR, which is a locally prominent rocky outcrop renowned for its birch woodland.

J.1.117 A path to the summit is part of a signposted trail regularly used by walkers. The contrast between walking up the wooded slopes and arriving at the open summit with views across Aviemore to the National Scenic Area is important to the user experience. The slopes to the south east of the summit are widely visible from the surrounding area, including the A9 and the character of these slopes is a distinctive feature in the local landscape.

Proposed woodland

J.1.118 The site is ideal for restoring woodland by natural regeneration, by keeping grazing at an appropriate level by, either by fencing or by reducing deer numbers, to allow the trees to grow. There might be scope for some enrichment planting of juniper, rowan and grey

and eared willows to establish a seed-source for a woodland understory. Any planting should avoid blanket bogs or other areas of deep peat.

Opportunities and constraints

- J.1.119 It was apparent from the site inspection that the woodland regeneration process is well underway and this is in a lot of areas as detailed in the management proposal for the area³³. Therefore, it seems unlikely that this site would be acceptable for compensation as there appears to be limited scope for providing any additional ecological benefits to those already being achieved through the current site management.
- J.1.120 Woodland planting at the site may provide some benefit to natural flood management and water quality.
- J.1.121 Woodland establishment on the higher slopes is also constrained due to elevation but also possibly because of the need to maintain the current visual open nature of these areas. The cairns on the summits are listed on the Historic Environment Record which may also constrain woodland establishment in these areas. Any measures to promote regeneration should be focused on the slopes to the north west of the summit, where birch or mixed woodland could tie in with areas of conifer plantation woodland to the north.

³³ Scottish National Heritage (2011) The proposals for Craigellachie NNR 2011 – 2017.

Area 19 – Allt na Criche

Location and area

- J.1.122 Indicative net area – 1.3ha.
- J.1.123 Occurs 3km to south west of Aviemore on the northbound side of the A9 and adjacent to Allt na Criche.
- J.1.124 The area is owned by Clouds Estate, but is isolated from the main part of that estate by the existing A9.
- J.1.125 The D-S scheme (refresh 5) proposal is for a SuDS on the southern half of the site.

Habitats present

- J.1.126 This is a wet field with marsh/marshy grassland (MG10) dominated by soft rush and herbs. The ground is level and the soil poorly-drained with standing water in wheel tracks and moderate potential for GWDTE.
- J.1.127 The area is enclosed by trees on all sides. There is a line of alder and birch on Allt na Criche to the south-east and dense young birch on the embankment of the existing A9 road to the south. There is an access road along the northern boundary although beyond this there is extensive birch woodland on the steep slopes to the north that extend into the Craigellachie NNR.

Current management

- J.1.128 Light stock grazing to not currently grazed.

Landscape and visual context

- J.1.129 The site is a triangular shaped field at the foot of the slopes of Craigellachie NNR, bound by Allt na Criche to the south west and the A9 to the south east.
- J.1.130 Glimpsed views into the site are afforded from the A9 through a line of birch screening, but it is not widely visible from elsewhere in the adjacent landscape.

Proposed woodland

- J.1.131 This would be an ideal site to reinstate wet woodland, giving visual and ecological continuity between the streamside alders and the birch woodland on the drier, steeper slopes of the nature reserve to the north. Suitable species for planting would be downy birch, alder, grey willow and eared willow, with some rowan and possibly aspen on any areas of better-drained soil. Planting in clumps and patches would allow for future natural regeneration and the development of a diverse habitat.

Opportunities and constraints

- J.1.132 Establishment of woodland on the site would connect and extend the existing line of alder and birch along the Allt na Criche to the south-east and the dense young birch on the embankment of the A9 (or any proposed mitigation plantings in this area) to the south. There is an access road along the northern boundary although there would still be ecological connectivity with the extensive birch woodland on the steep slopes of Craigellachie NNR to the north. The proposed planting of wet woodland at the site will not impinge on the potential GWDTE indicated by the existing vegetation at the site.

- J.1.133 The site is located immediately adjacent to the A9 and abuts the proposed road side plantings. The proposed SuDS ponds reduces the areas available for compensation but creates an opportunity to increase existing areas of wet woodland, utilising a high proportion of birch to connect to the NNR and the Allt na Criche. Areas of wet scrub and woodland around these locations can benefit a range of wildlife³⁴.
- J.1.134 Planting woodland within the site would reinforce the character of the wooded Craigellachie slopes extending down into the adjacent landscape.

³⁴ RSPB and WWT (2012) Sustainable Drainage systems. Maximising the potential for people and wildlife. A guide for local authorities and developers.

Area 20 – Rothiemurchus (F)

Location and area

- J.1.135 Indicative net area – 3ha.
- J.1.136 Located 1km to the east of Aviemore within the valley of the Spey River.
- J.1.137 The area is owned by Rothiemurchus Estate.

Habitats present

- J.1.138 Gorse and broom scrub (W23) in mosaic with European dry heath (H12) and acid grassland (U4). Level to gently-sloping ground between the River Spey and a semi-natural birch wood. Scattered larch, birch and other coniferous species occur across and adjacent to the site. There is an extensive area of semi-natural birch grading to coniferous woodlands to the east. The site is adjacent to arable fields to the north and south although there are small strips of woodland present to the west.
- J.1.139 This site is identified within the Ancient Woodland Inventory as long-established of plantation origin, although is no longer wooded.

Current management

- J.1.140 Lightly grazed with cropping to north and south.

Landscape and visual context

- J.1.141 Larch and birch are present on the site as scattered individuals, but the spacing between trees is too low to afford a wooded character.
- J.1.142 The site is situated within a National Scenic Area but is not widely visible from publicly accessible areas and the connection of existing woodland blocks would not represent a perceptible change in the wider landscape character.

Proposed woodland

- J.1.143 The soils appear to be well-drained and reasonably fertile (indicated by bird's-foot trefoil (*Lotus corniculatus*) growing in the grasslands) and could be planted with Scots pine, birch, aspen, rowan and juniper.
- J.1.144 As much of this area already has tree cover, only approximately 50% of it would be appropriate for tree planting. High density planting would not be appropriate and the existing diversity of understorey planting should be retained. A mixture of coniferous and broadleaf species would be appropriate to plant on this site, with an increasing percentage of coniferous species heading east to the tie-in with the adjacent plantation and the percentage of broadleaf species increasing to the west at the tie-in with existing areas of broadleaf woodland.

Opportunities and constraints

- J.1.145 Establishment of woodland on the site would extend the ecological connection between the existing birch and Scots pine woodlands to the east with the riparian woodlands along the River Spey via the small strips of woodland to the west. This would increase the cohesion of the existing landscape pattern.

- J.1.146 The re-establishment of woodland on an area listed on the AWI that is no longer wooded may be associated with a richer ground flora and soils ecological processes than other prospective mitigation sites. Therefore, this site may allow for higher quality woodland at least in the shorter term. Some cultural value may be realised through re-planting on the site due to wooded history of the site.
- J.1.147 Woodland planting at the site may provide some benefit to natural flood management and water quality.
- J.1.148 The area is largely included within the recently approved An Camas Mòr development (CNPA Ref 09/155/CP). While there may be opportunities to expand the planting to adjacent areas, this development is likely to severely constrain the use of the site as a compensation site.
- J.1.149 The designated asset of Rothiemurchus Enclosure lies close to the proposed planting area, which would therefore require consultation with, and approval by, Historic Scotland.
- J.1.150 The site is located away from the A9 (~1km) to the east of the Spey River. The proposal has lower ecological value than other areas because the site is a relatively small area in a narrow strip.

Area 13 – Kinchurdy Moor

Location and area

- J.1.151 Indicative net area – 220ha with indicative net woodland establishment area of 47ha.
- J.1.152 Located 1.3 km to north east of Aviemore on the Strathspey Estate.

Habitats present

- J.1.153 Mainly gentle slope with dry heath (H10-H12) dominated by heather and heath species. Area within the sites, adjacent to where woodland establishment is proposed includes mature birch, and areas of blanket bog (M18), semi-improved grassland (U2) and lochs. There is patchy birch and some Scots pine birch regeneration scattered across the area.
- J.1.154 The site is adjacent to other areas of woodland and connected on its southern boundary to woodland along the Spey River.

Current management

- J.1.155 Deer grazing identified. One area of semi-improved grassland that may provide some grazing for sheep has been excluded for the proposed planting areas.

Landscape and visual context

- J.1.156 The site is visible from the adjacent Speyside walking track and the Spey Valley, although the area is already has mature and regenerating woodlands.

Proposed woodland

- J.1.157 Woodland could be established by controlling grazing to facilitate growth of natural regeneration, mainly birch, pine rowans and some juniper on slopes. This would provide a more diverse age structure and less soil disturbance than planting. However, supplementary planting may be appropriate in some areas, including birch and rowan and juniper in areas where natural regeneration is less likely, as well as aspen and goat willow (in smaller grassy patches) and eared willow and bird cherry on some of the wetter fringing areas to increase diversity.
- J.1.158 Woodland establishment is not proposed in existing areas of regeneration as well as blanket bogs, semi-improved grassland and juniper to provide a seed-source for a woodland understory if these species are not already present.

Opportunities and constraints

- J.1.159 Establishment of woodland at this site will compliment and consolidate the extensive areas of mature woodland and regeneration already present on the site and, combined with the grassland and loch habitats that also occur there will create a structural diverse habitat. The new woodland will enhance and extend forest connectivity with areas of core woodland to the north and riparian woodland bordering the River Spey which occurs on the southern boundary of the site.
- J.1.160 Landholder consultation indicated support for this site as woodland establishment at this site fitted the current management of the area which includes promoting natural regeneration in areas adjacent to the proposed woodland establishment.
- J.1.161 The site includes some areas of bogs and lochs but these have been excluded from the indicative planting areas. Builds on areas of core woodland rather than extending forest

into new areas compared to sites 1 and 2. The Speyside rail line and walking path that occur on the adjacent to the northern boundary disrupt connectivity with capercaillie woodlands further north.

J.1.162 The site is relatively remote (~3.2km) from A9 compared to some other candidate sites.