

Appendix 6.1

Note on Mitigation Planting Mixes

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1.1 Introduction

- 1.1.1 The overall aspiration for mitigation of environmental effects associated with the Proposed Scheme is to conserve or reinstate the natural habitats, sensitive views and character of the landscape within the A9 corridor. This is to be undertaken by replacing, on a like-for-like basis as far as possible, woodland and other vegetation that will be lost to the Proposed Scheme. This document outlines the proposed species composition for woodland, shrub, heathland and grassland planting as derived by CFJV ecology and landscape specialists, and refined following stakeholder feedback.
- 1.1.2 The various species and sizes of trees and shrubs incorporated in the proposed mitigation design will be arranged in such a way that they create natural woodland characteristics typical of a locality, or form a designed landscape feature. The planting will be based predominantly on native species that have an established presence within the local area. However, in some instances, non-native species would be used in order to reinforce local landscape character (such as woodland policy) where agreed with the Cairngorms National Park Authority (CNPA).
- 1.1.3 Typically, young plant stock will be used for woodland planting as they generally establish more successfully; however, larger plants will be used for initial impact in specific locations, for example where screening is required. A percentage of feathered trees would be included within the Native Woodland /Shrub/Wet Woodland areas of approximately 15% of the tree species included within each habitat type. The planted Native Woodland/ Shrub/ Wet Woodland areas will also be seeded to provide an understorey of wildflowers and grasses based upon a Scotia Seeds Woodland Mix.
- 1.1.4 In some locations, the application of a seed mix for heathland and grassland habitats may not be necessary as there will be existing seed bank, e.g. where vegetation is to be re-instated after construction phase disturbance, and where only light trafficking/ surface damage has occurred. However, some areas of construction disturbance will require seed application where vegetation has been cleared and soils exposed.
- 1.1.5 On areas of 'new habitat' (e.g. embankments, areas around junctions, verges etc.), the use of turves from areas of peat removal (where suitable) will introduce 'live vegetation'. In addition, the use of the upper peat and peaty soils to dress the embankments will include propagules within the peaty material. Such areas are likely to require some extra help with additional seed.
- 1.1.6 Steeper slopes would benefit from introduction of a 'nurse' species (such as an annual grass that is rapidly outcompeted) to stabilise the soils before the native species get established.
- 1.1.7 For areas of heathland creation, the application of heather seed should be considered. The Heather Trust (<http://www.heathertrust.co.uk/>) can provide treated heather seed (smoked to improve germination).
- 1.1.8 Roadside verges will be planted predominantly with Acid Grassland Mix or dry heath.
- 1.1.9 Specification of planting methodology shall be incorporated into construction contract documentation subject to Detailed Landscape Design Specification. Regarding aftercare, rushes and *Deschampsia cespitosa* are quite likely to dominate in the early years and would need topping before setting seed to prevent establishment and to allow the Ericaceous species to become dominant. Areas of wet heath establishment will require monitoring and remedial local water level management may be required (e.g. by measures such as blocking of ditches) to aid establishment.
- 1.1.10 With reference to **ES Chapter 13, Section 13.5**, monitoring and maintenance of planting and seeding of grassland, dry and wet heath and scrub/shrub and native/wet woodland will be carried out in tandem with normal maintenance supervision. Monitoring includes assessment of planting environments; species selection; the use of planting techniques to ensure effective establishment;

the effectiveness of fencing and vegetation protection against sheep, wild fauna, pest infestation, and of the effectiveness of horticultural practice during the required landscape maintenance period (typically five years from construction). Existing woodland health and stability, assessment of the effect of removal of woodland edge on conifer shelterbelts, new understorey planting of trees and shrubs to the woodland edge to ameliorate the effect of wind exposure (in respect to wind throw) are also included within monitoring.

- 1.1.11 Standard mitigation commitments **SMC-LV1** to **SMC – LV6** in **Table 13-18** if **Chapter 13** refer to measures required to establish planting, including treatment of topsoil and existing planting. The location and types of planting required are shown on **Environmental Mitigation Drawings 6.1 to 6.12, ES Volume 3**, with should be read in conjunction with this Appendix. Readers should also refer to **Indicative Mitigation Cross Section Drawings 6.13 to 6.19**, also in **ES Volume 3**.

1.2 Native Woodland Planting ~ 69.66 Ha

- 1.2.1 Proposed 'Native Woodland' planting, which requires both broad-leaved and coniferous woodland, will comprise plants which range in size from feathered trees to whips and transplants. The aim is to create multi-layered woodland with a balanced mix of native deciduous and coniferous trees, including native evergreen understorey.
- 1.2.2 The balance between deciduous and evergreen species will be varied to achieve year-round cover and reflect existing woodland local to the various sections of the road. In particular, planting of Scots pine and silver birch will reflect surrounding woodlands, providing a strong mixed woodland framework and habitat for red squirrel and other native species.
- 1.2.3 The percentage/ dominance of species within the planting mix must be tailored depending on the type of woodland being replaced and on what the adjacent woodland species association consists; i.e. if this is NVC W11 (*Quercus petraea* – *Betula pubescens* – *Oxalis acetosella*) then oak and birch must dominate, plus some hazel, rowan and aspen. If it is NVC W18 (*Pinus sylvestris* – *Hylocomium splendens*) then the focus of species mix should be on pine, birch, juniper, rowan.
- 1.2.4 Although not a dominant species, elm should also be included in woodland planting mixes where soils are appropriate, along riparian corridors or where large growing tree species are desirable.
- 1.2.5 The proposed woodland planting is intended to resemble naturally occurring woodland, featuring clumps and glades. Areas towards the edges of woodland areas will be planted with native trees and shrubs with a high percentage of small trees and shrubs, e.g. juniper, goat willow and hazel but no large trees. Where there are currently areas of dry heath interspersed with regenerating native trees and shrubs, a dry heath/ woodland mosaic will be encouraged to resemble the current situation.
- 1.2.6 A typical species mix to be used for native woodland is:
- Scots pine - *Pinus sylvestris*
 - Downy birch - *Betula pubescens*
 - Sessile oak - *Quercus petraea*
 - Wych elm – *Ulmus glabra*
 - Aspen - *Populus tremula*
 - Rowan - *Sorbus aucuparia*
 - Alder - *Alnus glutinosa*
 - Silver birch - *Betula pendula*
 - Holly - *Ilex aquifolium*
 - Goat willow - *Salix caprea*
 - Hazel - *Corylus avellana*
- 1.2.7 To be planted at 1 plant per 2 m² (approx. 1.5 m centres).

1.3 Scrub/ Shrub Planting ~ 10.69 Ha

- 1.3.1 These areas are intended to mature as a mix of native shrubs such as goat willow, hawthorn, hazel and juniper. The scrub planting is intended to resemble naturally occurring planting, with a dense, low to medium height canopy featuring clumps and glades, with species mixes reflecting locally occurring native vegetation.
- 1.3.2 To be planted at 1 plant per 2 m² (approx. 1.5 m centres):
- Goat willow - *Salix caprea*
 - Hazel - *Corylus avellana*
 - Juniper - *Juniperus communis*
- 1.3.3 To be scattered throughout as seed at 30 kg/ hectare:
- Cross leaved heath - *Erica tetralix*
 - Heather - *Calluna vulgaris*

1.4 Wet Woodland Planting ~ 8.72 Ha

- 1.4.1 This should replicate the existing natural regeneration adjoining the River Spey and some of the smaller watercourses, where grazing is restricted. Riparian woodland will be planted adjacent to watercourses, some SuDS ponds where appropriate, and in other areas across flood plains. It will comprise a mix of sizes of plants such as feathered trees, whips and transplants using wetland species such as willow, birch and alder:
- Alder - *Alnus glutinosa*
 - Goat willow - *Salix caprea*
 - Silver birch - *Betula pendula*
 - Rowan - *Sorbus aucuparia*
 - Grey willow - *Salix cinerea*

- 1.4.2 To be planted at 1 plant per 2m² (approx. 1.5 m centres).

1.5 Specimen Tree Planting

- 1.5.1 Specimen tree locations and quantities shall be determined via the detailed landscape design specification, to support the construction contract. These will be planted at between Feathered, Light Standard and Heavy Standard sizes, depending on location, with tree stakes and tree guard protection in locations that would benefit from accents and advance growth foliage, such as around lay-bys, car parks, and key gateway areas. These trees will be planted in groups of 3-5 specimens; the spacing will increase further away from other planted areas. Planting method, proposed maintenance and aftercare shall be subject to detailed specification.
- 1.5.2 Appropriate native upland species would include:
- Silver birch - *Betula pendula*
 - Sessile oak - *Quercus petraea*
 - Scots pine - *Pinus sylvestris*
 - Mountain ash - *Sorbus aucuparia*

1.6 Wet Heath ~ 7.33 Ha

1.6.1 Wet heath is a sub-shrub community extensive in the east-central Highlands, occurring in poorly drained moist soils between 200 m and 600 m altitude, and alternating in close proximity with dry heath habitat depending on local soil type and saturation levels. It is dominated by two key plant species:

- Cross leaved heath - *Erica tetralix*
- Heather - *Calluna vulgaris*

1.6.2 Wet heath will be established in sections of the Proposed Scheme where it will be held in check by local climatic conditions, in the absence of burning and grazing, as outlined in **Table A6.1.1** and **Table A6.1.2** below.

Table A6.1.1: Proposed wet heath species mix

Species	Common Name	% of total	Species	Common Name	% of total
Ericaceous shrubs					
<i>Calluna vulgaris</i>	Heather	65	<i>Erica tetralix</i>	Cross-leaved heath	15
Graminoids etc. 10% of total					
<i>Eriophorum angustifolium</i>	Common cottongrass		<i>Trichophorum germanicum</i>	Deergrass	
<i>Molinia caerulea</i>	Purple moor-grass				
Other species 10% of total					
<i>Myrica gale</i>	Bog-myrtle		<i>Polygala serpyllifolia</i>	Heath milkwort	
<i>Narthecium ossifragum</i>	Bog asphodel		<i>Potentilla erecta</i>	Tormentil	

Table A6.1.2: Wet heath Sowing rates

Sowing Rates	
	3g / m ²
OR	30 kg / hectare

1.7 Dry Heath ~ 18.59 Ha

1.7.1 Similar to wet heath, upland dry heath is a sub-shrub community extensive in the east-central Highlands. It normally occurs in free-draining soils between 200 m and 600 m altitude. It will be established in sections of the Proposed Scheme, where it will be held in check by local climatic conditions (in the absence of burning and grazing).

1.7.2 Following the initial establishment phase, no specific long-term maintenance is proposed, as natural succession to scrub and woodland is desirable. Note that bearberry (*Arctostaphylos uva-ursi*) will be increased to more than 5% for some areas (locations to be confirmed at detailed design, in consultation with CNPA) to create stronger patches of bearberry in some places. The proposed method for establishing dry heath is outlined in **Table A6.1.3** and **Table A6.1.4** below.

Table A6.1.3: Proposed dry heath species mix

Species	Common Name	% of total	Species	Common Name	% of total
Ericaceous shrubs					
<i>Calluna vulgaris</i>	Heather	70	<i>Vaccinium myrtillus</i>	Blaeberry	5
<i>Erica cinerea</i>	Bell heather	10			
Graminoids etc. 5% of total					
<i>Agrostis capillaris</i>	Common bent		<i>Festuca ovina</i>	Sheep's fescue	
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass				
Other species 5% of total					
<i>Arctostaphylos uva-ursi</i>	Bearberry	Minimum 5	<i>Potentilla erecta</i>	Tormentil	
<i>Galium saxatile</i>	Heath bedstraw				

Table A6.1.4: Sowing rates

Sowing Rates	
3 g/ m ²	
OR	30 kg/ hectare

1.8 Grassland ~ 48.8 Ha

1.8.1 Grassland shall be made up of acid and wet grassland mixes, the extent of each will be determined via the detailed landscape design specification to support the construction contract.

1.8.2 Acid grassland seeding will merge with adjacent areas of similar habitat and the complement of species will depend on factors such as soil moisture, gradient and the nature of surrounding vegetation. The final percentages of seed mix will be determined following consultation with SNH/ CNPA. Based on Scotia Seeds Highland Grassland Mix, acid grassland would include:

- Purple Moor Grass – *Molinia caerulea*
- Nardus - *Nardus stricta*
- Yarrow - *Achillea millefolium*
- Heath Bedstraw - *Galium saxatile*
- Birdsfoot Trefoil - *Lotus corniculatus*
- Tormentil - *Potentilla erecta*
- Meadow Buttercup - *Ranunculus acris*
- Lesser Stitchwort - *Stellaria graminea*
- White Clover - *Trifolium repens*
- Common Speedwell - *Veronica officinalis*
- Common Bent - *Agrostis capillaris*
- Sweet Vernal Grass - *Anthoxanthum odoratum*
- Wavy Hair Grass - *Deschampsia flexuosa*
- Red Fescue - *Festuca rubra*
- Heather - *Calluna vulgaris*
- Blaeberry (to be planted as seed) - *Vaccinium myrtillus*
- Alpine Lady's Mantle - *Alchemilla alpina*
- Lady's Bedstraw - *Galium verum*
- Ribwort Plantain - *Plantago lanceolata*
- Selfheal - *Prunella vulgaris*
- Sheep's Sorrel - *Rumex acetosella*
- Devils-bit Scabious - *Succisa pratensis*
- Germander Speedwell - *Veronica chamaedrys*
- Common Dog Violet - *Viola riviniana*
- Brown Bent - *Agrostis vinealis*
- Crested Dogs Tail - *Cynosurus cristatus*
- Sheeps Fescue - *Festuca ovina*
- Heath Wood Rush - *Luzula multiflora*

1.8.3 Wet grassland seeding will be based upon a Scotia Seeds Wet Meadow Mix, to be applied to areas in or adjacent to water courses, SuDS/flood attenuation basins and/or areas of disturbed ground that may revert to a blanket bog habitat or merge with adjacent areas of existing blanket bog, including SuDS basins where shown on the **Environmental Mitigation Drawings 6.1-6.12**

and **Indicative Cross Sections 6.13 to 6.19** in **Volume 3**. Species and sowing rates will be as listed in **Table A6.1.5** and **Table A6.1.6** below.

Table A6.1.5: Scotia Seeds Wet Meadow Mix

Species	Common Name	% by weight	Species	Common Name	% by weight
Wildflowers (20%)					
<i>Achillea ptarmica</i>	Sneezewort	0.1	<i>Lotus uliginosus</i>	Greater trefoil	0.1
<i>Centaurea nigra</i>	Common Knapweed	1.4	<i>Plantago lanceolata</i>	Ribwort Plantain	0.5
<i>Cirsium palustre</i>	Marsh Thistle	0.1	<i>Prunella vulgaris</i>	Selfheal	1.5
<i>Filipendula ulmaria</i>	Meadowsweet	2.9	<i>Ranunculus acris</i>	Meadow Buttercup	1.5
<i>Geranium pratense</i>	Meadow Cranesbill	1.5	<i>Rhinanthus minor</i>	Yellow Rattle	1
<i>Geum rivale</i>	Water Avens	2	<i>Rumex acetosa</i>	Common Sorrel	1.4
<i>Hypericum tetrapterum</i>	Square-stemmed St John's Wort	0.3	<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	1
<i>Hypochaeris radicata</i>	Cat's Ear	0.2	<i>Silene flos-cuculi</i>	Ragged Robin	1
<i>Iris pseudacorus</i>	Yellow Flag Iris	2	<i>Succisa pratensis</i>	Devils-bit Scabious	0.5
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	1			
Grasses & Rushes (80%)					
<i>Agrostis capillaris</i>	Common Bent (c)	10	<i>Juncus squarrosus</i>	Heath Rush	0.1
<i>Alopecurus pratensis</i>	Meadow Foxtail (c)	3	<i>Deschampsia caespitosa</i>	Tufted Hair Grass	5
<i>Carex ovalis</i>	Oval Sedge	0.2	<i>Festuca rubra ssp. commutata</i>	Chewings Fescue (c)	35
<i>Juncus articulatus</i>	Jointed Rush	0.1	<i>Poa pratensis</i>	Smooth-stalked Meadow Grass (c)	26.6

(c) = cultivated origin

Table A6.1.6: Sowing Rates

Sowing Rates	
3 g/ m ²	
OR	30 kg/ hectare

1.9 Understorey Seeding Mix ~ 88.01 Ha

The seeding strategy for areas of understorey planting would be to pre-seed all proposed Native Woodland/ Shrub/ Wet Woodland areas with a Scotia Seeds Woodland Mix appropriate to the Cairngorms. The mix should be tailored to suit each NVC type, depending on the vegetation being replaced, as noted in **1.2 Native Woodland** above. NVC W18 should include heather, blaeberry and grasses. NVC W11 should include grasses, violets, primrose, wood sage and bugle. Foxgloves will be included within all areas, but in general wildflower species should be used in more sheltered areas of the site, and sparingly elsewhere. The proportions and final species to be included in specific areas will be advised via the Detailed Landscape Design Specification to support construction contract documents.

- 1.9.1 Note that woodland areas adjacent to bog and heathland habitats could be under-sown with the wet heath or dry heath mixes where appropriate.

- 1.9.2 Species will be based upon Scotia Seeds Woodland Mix, tailored to the Cairngorms environment, as suggested in **Table A6.1.7** below.

Table A6.1.7: Tailored Scotia Seeds Woodland Mix

Species	Common Name	% by weight	Species	Common Name	% by weight
Wildflowers (20%)					
<i>Ajuga reptans</i>	Bugle	0.2	<i>Primula vulgaris</i>	Primrose	0.5
<i>Campanula latifolia</i>	Giant Bellflower	1	<i>Silene dioica</i>	Red Campion	2.9
<i>Circea lutetiana</i>	Enchanters Nightshade	0.12	<i>Silene flos-cuculi</i>	Ragged Robin	1
<i>Digitalis purpurea</i>	Foxglove	2.4	<i>Stachys sylvatica</i>	Hedge Woundwort	1.5
<i>Fragaria vesca</i>	Wild Strawberry	0.2	<i>Teucrium scorodinia</i>	Wood Sage	0.1
<i>Geranium robertianum</i>	Herb Robert	2	<i>Torilis japonica</i>	Upright Hedge Parsley	2
<i>Geum urbanum</i>	Herb Bennet	2.5	<i>Vicia sepium</i>	Bush vetch	0.5
<i>Hypericum pulchrum</i>	Slender St John's Wort	0.1	<i>Viola riviniana</i>	Common Dog Violet	0.8
<i>Luzula sylvatica</i>	Greater Woodrush	0.5			
Grasses (80%)					
<i>Agrostis capillaris</i>	Common Bent (c)	10	<i>Poa nemoralis</i>	Wood Meadow Grass (c)	20
<i>Cynosurus cristatus</i>	Crested Dog's Tail (c)	10	<i>Poa pratensis</i>	Smooth-stalked Meadow Grass (c)	20
<i>Festuca rubra ssp commutata</i>	Chewings Fescue (c)	20			

(c) = cultivated origin

- 1.9.3 Sowing Rate 30 kg/ha.

