

Appendix 12.13

Outline Habitat Management Plan

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1 Introduction

1.1 Background

- 1.1.1 This Outline Habitat Management Plan (OHMP) has been prepared to document specific mitigation measures identified through the Ecological Impact Assessment (EclA) of Project 9- Crubenmore to Kincaig, part of the A9 Dualling Programme (hereafter referred to as the Proposed Scheme).
- 1.1.2 Further details of the Proposed Scheme are presented in Environmental Statement (ES) **Chapter 5** in **Volume 1**, and findings of the accompanying EclA are presented in **Chapter 12** in **Volume 1**.

1.2 Purpose and Objectives

- 1.2.1 The purpose of this document is to set out the rationale and methodologies for creation and management of habitats within the extent of the Proposed Scheme. The main objectives are to mitigate for disturbance or loss of notable habitats during construction and to compensate for the permanent loss of habitats to infrastructure. The OHMP also takes into consideration the distribution and ecological requirements of species and assemblages of notable fauna and incorporates measures to deal with invasive non-native species (INNS).
- 1.2.2 The focus of the OHMP is on the mitigation of habitat loss identified in **Chapter 12** in **Volume 1**.
- 1.2.3 The EclA identified significant impacts before mitigation on the following notable habitats: ancient woodland¹ and upland birchwoods which are connected to ancient woodland.
- 1.2.4 Whilst no significant impacts were identified for other notable woodland habitats, the loss of all woodland has been mitigated for in line with the Scottish Government's Policy on Control of Woodland Removal (Forestry Commission Scotland, 2009)². In addition, whilst no significant impact was identified for European dry heath and juniper formations on heaths, given the extent of dry heath lost and the importance of juniper within the Cairngorms National Park (CNP), these Annex 1 habitats have also been considered within the OHMP.
- 1.2.5 The main aims of the OHMP are to:
- Describe the measures that will be taken to avoid and minimise habitat losses and disturbance during construction
 - Set out the means by which habitats that are disturbed during construction will be re-instated in-situ following construction
 - Set out the targets for creation of new habitats to mitigate the permanent losses of habitats as a result of the Proposed Scheme
 - Identify opportunities for enhancements
 - Describe methods for monitoring the success of the proposed measures.

¹ Woodland listed on the Scottish Natural Heritage (SNH) Ancient Woodland Inventory (AWI).

² Forestry Commission (2009) [https://www.forestry.gov.uk/PDF/fcfc125.pdf/\\$FILE/fcfc125.pdf](https://www.forestry.gov.uk/PDF/fcfc125.pdf/$FILE/fcfc125.pdf) (accessed April 2018)

- 1.2.6 The OHMP and subsequent Habitat Management Plan (HMP) will be live documents that will change as design progresses and be updated to take account of the outcome of monitoring. The OHMP complements mitigation identified in the Outline Peat Management Plan (OPMP) (see **Appendix 10.6** in **Volume 2**).
- 1.2.7 A habitat-based desktop review was carried out for the River Spey – Insh Marshes SSSI invertebrate assemblage and vascular plant assemblage; and for the Cairngorms National Park Authority (CNPA) non-protected priority species (see **Chapter 12, Volume 1** and **Appendix 12.1, Volume 2** for details). These features have been considered in **Section 7** of the OHMP.

1.3 Report Structure

1.3.1 The structure of this report is presented as follows:

- Section 2 Ecological Context: summarises the relevant baseline information
- Section 3 Mitigation Requirements: summarises the mitigation commitments made in the ES and provides the rationale for the focus of this OHMP
- Section 4 European Dry Heaths: sets out the objectives and restoration plan for dry heath
- Section 5 Ancient Woodland: sets out the objectives, planting and restoration plans for ancient woodland
- Section 6 Juniper: sets out the objectives, planting and restoration plans for juniper
- Section 7 Other features: sets out the habitat creation proposals to benefit other ecological features
- Section 8 Monitoring: describes the monitoring requirements of habitat restoration
- Section 9 Implementation: describes how the HMP will be implemented.

2 Ecological Context

2.1 Overview

- 2.1.1 The study area of Project 9 is within the CNP, extending from just north of Loch Etteridge near Crubenmore in the south, to the newly established dual carriageway at Meadowside Quarry, near Kincaig, in the north. Most of the study area is low-lying and flat, or of gentle relief, particularly within the extensive floodplain of the River Spey. The slightly more elevated and upland areas are mainly located to the east and south of the existing A9, south of Ruthven, and extending towards Crubenmore.
- 2.1.2 The southern part of the study area comprises habitats typical of upland moorland, with extensive areas of dry dwarf shrub heath to the east of the existing A9. Discrete areas of mire are present, often within the areas of dry dwarf shrub heath.
- 2.1.3 The northern part of the study area is predominantly managed for agriculture, with improved, semi-improved and marshy grasslands.
- 2.1.4 Woodland is present in isolated patches and thin strips throughout the study area and is most extensive in the northern extent, notably between the existing A9 and the B9152.
- 2.1.5 At the start of the Project 9 extent, the River Truim flows to the west of the existing A9 where it merges with the River Spey south of Newtonmore. The River Spey generally runs parallel to the A9 until the carriageway crosses the River Spey at Kingussie. Beyond the crossing, the River Spey flows to the east of the existing A9 through Insh Marshes. The A9 also crosses several of the River Spey's tributaries (e.g. Burn of Inverton and Raitts Burn).
- 2.1.6 As well as the existing A9 carriageway and associated infrastructure, land uses within the study area include rough sheep grazing, grouse moor, arable farmland, woodland and residential/commercial developments at Kingussie and Newtonmore. Most of the vegetation and habitats in the study area have been impacted anthropogenically over time, via muirburn, grazing and drainage, but also forestry and agricultural practices.

2.2 Designated Sites

- 2.2.1 There are a number of sites designated for nature conservation within the study area (**Drawings 12.2 to 12.7 in Volume 3**), summarised in **Table 12.13.1**.

Table 12.13.1: Summary of statutory designated sites within the study area

Name	Interest Features
River Spey Special Area of Conservation (SAC)	Sea lamprey <i>Petromyzon marinus</i> Atlantic salmon <i>Salmo salar</i> Otter <i>Lutra lutra</i> Freshwater pearl mussel (FWPM) <i>Margaritifera margaritifera</i>
Insh Marshes SAC	Transition Mires and quaking bogs Oligotrophic to mesotrophic standing water Alluvial forests Otter
River Spey – Insh Marshes Special Protection Area (SPA)	Osprey <i>Pandion haliaetus</i> , breeding and foraging Wigeon <i>Anas penelope</i> , breeding Wood sandpiper <i>Tringa glareola</i> , breeding Spotted crane <i>Prozana porzana</i> , breeding

Name	Interest Features
	Hen harrier <i>Circus cyaneus</i> , non-breeding Whooper swan, non-breeding
River Spey – Insh Marshes Ramsar	Large, high altitude slow-flowing river (River Spey) Mesotrophic loch Flood-plain mire Assemblage of nationally rare and scarce aquatic plants Assemblage of nationally rare and scarce invertebrates Otter Breeding bird assemblage Whooper swan <i>Cygnus cygnus</i> , non-breeding
River Spey – Insh Marshes Site of Special Scientific Interest (SSSI)	Osprey, breeding Whooper swan, non-breeding Breeding bird assemblage Otter Arctic charr <i>Salvelinus alpinus</i> Flood-plain fen Mesotrophic loch Vascular plant assemblage Invertebrate assemblage
River Spey SSSI	Sea lamprey Atlantic salmon Otter Freshwater pearl mussel
Insh Marshes National Nature Reserve (NNR)	Refer to River Spey-Insh Marshes SSSI qualifying features

2.3 Habitats

2.3.1 Baseline Information and the determination of importance of habitats is presented in **Chapter 12** in **Volume 1**. Vegetation has been mapped using National Vegetation Classification (NVC), shown in **Drawings 12.15** to **12.27** in **Volume 3**.

2.3.2 Notable habitats were defined in **Chapter 12** as those that are identified as a conservation priority through relevant legislation or planning policy. These include:

- Internationally important habitat types identified in Annex 1 of Council Directive 92/43/EEC (the Habitats Directive)³
- Nationally important woodland areas identified in the Ancient Woodland Inventory (AWI)⁴
- Nationally important habitat types identified in the Scottish Biodiversity List (SBL)⁵
- Regionally important habitat types identified in the Cairngorms Nature Action Plan (CNAP)⁶.

Annex 1 Habitats

2.3.3 The distribution of Annex 1 habitats is shown on **Drawings 12.28** to **12.39** in **Volume 3**.

³ http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf (accessed February 2018)

⁴ <https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI> (accessed February 2018)

⁵ <http://www.biodiversityscotland.gov.uk/advice-and-resources/scottish-biodiversity-list/> (accessed February 2018)

⁶ <http://cairngorms.co.uk/resource/docs/publications/13052013/CNPA.Paper.1898.Cairngorms%20Nature%20Action%20Plan%202013-2018.pdf> (accessed February 2018)

- 2.3.4 European dry heath is the most abundant Annex 1 habitat within the study area. It is particularly widespread and extensive in the southern part of the Proposed Scheme, on the steep slopes east of the existing A9. Most of this vegetation type is represented by the NVC community H12a *Calluna vulgaris-Vaccinium myrtillus* heath, sub-community *Calluna vulgaris*.
- 2.3.5 Northern Atlantic wet heaths occur in the southern part of the study area, east and west of the existing A9. This habitat is characterised by areas of M15b *Scirpus cespitosus-Erica tetralix* wet heath, typical sub-community, however much of the habitat has been affected by burning, grazing and drainage, with many areas suffering from encroachment by birch.
- 2.3.6 Blanket bog is primarily located in the southern part of the study area, where it occurs in small patches next to more extensive areas of wet and dry heath. These areas are mostly characterised by the *Drosera rotundifolia-Sphagnum* spp. sub-community of M17 *Scirpus cespitosus-Eriophorum vaginatum* blanket mire and the M25a *Molinia caerulea-Potentilla erecta* mire, *Erica tetralix* sub-community.
- 2.3.7 One discrete area of alkaline fen was identified within the study area, east of the existing A9 between the Burn of Inverton and Knappach. This area was characterised by the *Carex demissa-Juncus bulbosus/kochii* sub-community of M10 *Carex dioica-Pinguicula vulgaris* mire.
- 2.3.8 Six stands of alluvial forests were identified within the study area (in addition to those within Insh Marshes SAC) and were characterised by NVC woodland community W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemoreum*. These stands are located around the existing Kingussie junction, adjacent to the B970 Ruthven Road (east of the existing A9) and alongside the Burn of Inverton.
- 2.3.9 A single area of transition mire and quaking bog was found within the study area, out with Insh Marshes SAC, and was characterised by NVC mire community M4 *Carex rostrata - Sphagnum recurvum*. This discrete area is located alongside the Burn of Inverton (west of the existing A9).
- 2.3.10 There are a few small and isolated stands of juniper formations in the northern part of the study area. These stands were characterised by NVC community W19 *Juniperus communis* ssp. *communis – Oxalis acetosella* and its sub-community W19a *Vaccinium vitis-idaea – Deschampsia flexuosa*.

Ancient Woodland Inventory (AWI)

- 2.3.11 There is a total of approximately 144 ha of Ancient Woodland Inventory (AWI) sites within the study area. These are characterised by both wet and dry woodland types, with some areas overlapping with conifer plantation. The location of ancient woodland within the study area is shown on **Drawings 12.28 to 12.39** in **Volume 3**.

Scottish Biodiversity List (SBL) habitats

- 2.3.12 The distribution of SBL habitats is shown on **Drawings 12.28 to 12.39** in **Volume 3**.
- 2.3.13 Upland birchwoods are scattered throughout the study area, however they are most extensive at the northern extent. Areas of upland birchwoods are characterised by NVC woodland communities W4 *Betula pubescens – Molinia caerulea*, W11 *Quercus petraea – Betula pubescens – Oxalis acetosella*, W16 *Quercus* spp. – *Betula* spp. – *Deschampsia flexuosa* and W17 *Quercus petraea – Betula pubescens – Dicranum majus*.
- 2.3.14 Lowland deciduous woodland is restricted to the northern extent of the study area and is most extensive around Kerrow. Elsewhere in the study area, this habitat is present in small and isolated patches. Areas of lowland deciduous woodland are characterised by NVC woodland

communities W8 *Fraxinus excelsior* – *Acer campestre* – *Mercurialis perennis* and W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus*.

- 2.3.15 Wet woodlands are scattered throughout the study area, typically in small and isolated patches. However, an extensive strip of wet woodland is present between the Highland Main Line (HML) railway and the B9152 road at the northern extent of the study area. These areas are mostly characterised by NVC community W3 *Salix pentandra* – *Carex rostrata*, however a number of wet woodland stands were characterised by NVC communities W5, W6 and W7 where they did not qualify as Annex 1 habitat alluvial forests.
- 2.3.16 Areas of upland flushes, fens and swamps were characterised by NVC mire communities M6 *Carex echinata* – *Sphagnum fallax/denticulatum* and M23a *Juncus acutiflorus*. M6 is widespread throughout the study area in both upland and lowland settings, mostly as small flushes, runnels or soakways, and along and within including ditches and minor watercourses. M23a is scattered throughout the study area and is mostly associated with surface water movement.
- 2.3.17 Areas of lowland fens were characterised by mire and swamp communities S9 *Carex rostrata* and S10 *Equisetum fluviatile*. This habitat was recorded in small isolated pockets dispersed throughout the study area.
- 2.3.18 A few stands of reedbeds were recorded within the study area along the fringes of Insh Marshes. These areas were characterised by sub-community S4a *Phragmites australis*.

Cairngorms Nature Action Plan (CNAP) priority habitats

- 2.3.19 Small patches of wet grassland are scattered throughout the study area. However, an extensive area surrounds the Burn of Ruthven which flows across Insh Marshes into the River Spey. These areas are characterised by NVC communities MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland and MG10 *Holcus lanatus* – *Juncus effusus* rush-pasture, along with NVC sub-communities MG11a *Lolium perenne* grassland and M23b *Juncus effusus* rush-pasture.

3 Mitigation Requirements

3.1 Introduction

- 3.1.1 The Ecological Impact Assessment (EclA) in **Chapter 12, Volume 1**, describes the nature and extent of impacts on important ecological features. In terms of habitats, the focus of the assessment was on the extent of permanent losses due to the infrastructure of the Proposed Scheme and on the ‘temporary’ construction phase impacts. The chapter acknowledges that construction phase impacts could be permanent (e.g. unavoidable clearance of ancient woodland to allow temporary construction access would result in permanent loss of ancient woodland habitat). The detail of construction phase activities (e.g. the locations of temporary storage compounds, access tracks and SuDS) are not yet known.
- 3.1.2 Therefore, for the purpose of the assessment, all land take as a result of permanent infrastructure will result in permanent habitat loss, and all other areas within the extents of the Proposed Scheme will be subject to some form of disturbance, which could result in temporary or permanent loss depending on the sensitivity of a particular habitats and the nature of construction works.
- 3.1.3 This section uses the data provided in **Chapter 12** to summarise the extent of habitat loss during the construction, and the permanent losses due to infrastructure (operational phase). This information is then used to inform the priorities of this OHMP; **Section 3.4** sets out the rationale for which habitats and ecological features are the focus of this OHMP.

3.2 Construction Phase Habitat Loss

- 3.2.1 **Table 12.13.2** summarises the quantities of notable habitats lost during the construction phase. In terms of area, the habitats that are most affected by the construction phase of the Proposed Scheme are European dry heaths (approximately 14 ha) and upland birchwoods (approximately 16 ha).
- 3.2.2 These areas of notable habitats do not include habitats which are interest features of the Insh Marshes SAC or River Spey – Insh Marshes SSSI (see **Table 12.13.1**). These habitats were assessed separately under the relevant designated site in **Chapter 12, Volume 1**. No significant impacts were identified for construction phase habitat loss of SPA or SSSI habitat; therefore, they are not discussed further in the OHMP.

Table 12.13.2: Summary of habitats lost during construction

Notable Habitat	Total resource within study area (ha)	Area of habitat loss (ha)	Percentage of resource lost within the study area (%)
European dry heaths (NVC: H10, H12)	198.15	13.86	6.99
Northern Atlantic wet heaths (NVC: M15)	49.20	4.47	9.09
Blanket bogs (NVC: M3, M17, M19, M20, M25)	25.77	1.40	5.43
Alkaline fens (NVC: M10)	0.25	0	0
Alluvial forests (<i>out with Insh Marshes SAC</i>) (NVC: W7)	3.28	0.40	12.20
Transition mires and quaking bogs (NVC: M4)	0.03	0	0

Notable Habitat	Total resource within study area (ha)	Area of habitat loss (ha)	Percentage of resource lost within the study area (%)
Juniper formations on heaths (NVC: W19, W19a)	1.07	0	0
Upland birch woods – connected to ancient woodland (NVC: W4, W11, W16, W17)	60.04	4.47	7.45
Upland birch woods – not connected to ancient woodland (NVC: W4, W11, W16, W17)	67.77	11.12	16.41
Total upland birchwoods (NVC: W4, W11, W16, W17)	127.81	15.59	12.20
Lowland mixed deciduous woodland – connected to ancient woodland (NVC: W8, W10)	13.89	0.64	4.61
Lowland mixed deciduous woodland – not connected to ancient woodland (NVC: W8, W10)	5.70	0.22	3.86
Total lowland mixed deciduous woodland (NVC: W8, W10)	19.59	0.86	4.39
Wet woodlands – connected to ancient woodland (NVC: W3, W4b, W6, W7)	3.31	0.05	1.51
Wet woodlands – not connected to ancient woodland (NVC: W3, W4b, W6, W7)	11.07	2.66	24.03
Total wet woodland (NVC: W3, W4, W4b, W6, W7)	14.38	2.71	18.85
Upland flushes, fens and swamps (<i>out with River Spey - Insh Marshes SSSI</i>) (NVC: M6, M23a)	26.66	3.82	14.33
Lowland fens (<i>out with River Spey Insh Marshes SSSI</i>) (NVC: S9, S10, M27)	3.49	0.12	3.44
Reedbeds (NVC: S4a)	2.80	0.26	9.29
Wet grasslands (NVC: MG9, MG10, MG11a, M23b)	31.09	1.66	5.34
Non- priority woodland – connected to ancient woodland (NVC: W9, W18, W23)	1.38	0.03	2.17
Plantation woodland – connected to ancient woodland (Non-NVC feature)	30.89	2.58	8.35

3.2.3

It is of note that these estimates of habitat losses and disturbance during the construction phase are worst case, and that mitigation measures will be implemented during construction to minimise the impacts on notable habitats. These mitigation measures are described in **Table 12.29** of **Chapter 12** in **Volume 1** and include:

- Careful siting of construction compounds, storage and working areas to minimise disturbance of notable habitats, particularly blanket bog, wet heath and woodland. The proposed locations will be reviewed by the Contractor's appointed Ecological Clerk of Works (ECoW) at the planning stage of the construction works
- Plant and personnel will be constrained to a prescribed working corridor through the use of temporary barriers to minimise damage to habitats

- The Contractor will use appropriate ground-protection measures to minimise disruption to surface vegetation, hydrology and soil
- Construction requisite (e.g. imported stone/ material to create temporary access tracks) will be removed from site upon completion of works to facilitate habitat reinstatement/ restoration
- The Contractor will prepare a Construction Environmental Management Plan (CEMP), which will include a biosecurity strategy for the appropriate treatment of invasive non-native species (INNS)
- Avoidance of hydrological damage to notable habitats (e.g. blanket bog and flushes, fens and swamps) through control of sediment and chemical run-off using filter drains, soakaways and oil separators
- Maintaining hydrological connectivity through retention of natural water channels, flushes and wet habitats
- Specific measures to ameliorate any habitats damaged during the construction period will be incorporated into the Contractor’s Habitat Management Plan (HMP)
- Tree felling and vegetation clearance to be reduced as far as possible and will comply with BS 5837 Trees in relation to Construction (British Standards Institute, 2012)⁷
- Trees and woodland (excluding ancient woodland) lost during construction will be re-planted in-situ using native species of local provenance
- Specific areas have been identified for dry heath creation on earthwork slopes (See **Section 4**)
- Specific areas have been identified for woodland creation and translocation of soils to mitigate impacts on ancient woodland lost during construction (see **Section 5**).

3.3 Operational Phase Habitat Loss

3.3.1 **Table 12.13.3** summarises the quantities of notable habitats permanently lost due to the infrastructure of the Proposed Scheme. In terms of area, the habitats that are most affected by new infrastructure as are European dry heaths (approximately 16 ha) and upland birchwoods (approximately 18 ha).

Table 12.13.3: Summary of permanent habitat loss due to new infrastructure

Notable Habitat	Total resource within study area (ha)	Area of permanent loss (ha)	Percentage of resource lost within the study area (%)
European dry heaths (NVC: H10, H12, H18)	198.15	15.58	7.86
Northern Atlantic wet heaths (NVC: M15)	49.20	0.81	1.65
Blanket bogs (NVC: M3, M17, M19, M20, M25)	25.77	0.88	3.41
Alkaline fens (NVC: M10)	0.25	0	0

⁷ British Standards 5837: 2012 Tree Survey.

http://www.eaststaffsbc.gov.uk/MVM.DMS/Planning%20Application/625000/625831/P_2014_01189_Tree%20survey.pdf (accessed April 2018)

Notable Habitat	Total resource within study area (ha)	Area of permanent loss (ha)	Percentage of resource lost within the study area (%)
Alluvial forests (<i>out with Insh Marshes SAC</i>) (NVC: W7)	3.28	0.38	11.59
Transition mires and quaking bogs (NVC: M4)	0.03	0	0
Juniper formations on heaths (NVC: W19, W19a)	1.07	0	0
Upland birchwoods – connected to ancient woodland (NVC: W4, W11, W16, W17)	60.04	6.97	11.61
Upland birchwoods – not connected to ancient woodland (NVC: W4, W11, W16, W17)	67.77	11.74	17.32
Total upland birchwoods (NVC: W4, W11, W16, W17)	127.81	18.71	14.64
Low land mixed deciduous woodland – connected to ancient woodland (NVC: W8, W10)	13.89	0.29	2.09
Low land mixed deciduous woodland – not connected to ancient woodland (NVC: W8, W10)	5.70	0.06	1.05
Total low land mixed deciduous woodland (NVC: W8, W10)	19.59	0.35	1.79
Wet woodlands – connected to ancient woodland (NVC: W3, W4b, W6, W7)	3.31	<0.01	0
Wet woodlands – not connected to ancient woodland (NVC: W3, W4b, W6, W7)	11.07	0.68	6.14
Total wet woodlands – (NVC: W3, W4b, W6, W7)	14.38	0.68	4.73
Upland flushes, fens and swamps (<i>out with River Spey - Insh Marshes SSSI</i>) (NVC: M6, M23a)	26.66	1.23	4.61
Low land fens (<i>out with River Spey Insh Marshes SSSI</i>) (NVC: S9, S10, M27)	3.49	0.06	1.72
Reedbeds (NVC: S4a)	2.80	0	0
Wet grasslands (NVC: MG9, MG10, MG11a, M23b)	31.09	0.94	3.02
Non- Priority woodland- connected to ancient woodland (NVC: W9, W18, W23)	1.38	0.04	2.90
Plantation woodland – connected to ancient woodland (Non-NVC feature)	30.89	3.84	12.43

3.3.2 These areas of notable habitats do not include habitats which are interest features of the Insh Marshes SAC or River Spey – Insh Marshes SSSI (see **Table 12.13.1**). These habitats were assessed separately under the relevant designated site in **Chapter 12, Volume 1**. No significant impacts were identified for permanent habitat loss of SPA or SSSI habitat; therefore, they are not discussed further in the OHMP.

3.4 Priorities and Scope of the OHMP

- 3.4.1 The estimates of habitat loss in **Sections 3.2** and **3.3**, and **Table 12.13.4**, indicate that the habitats most affected by the Proposed Scheme are European dry heaths, upland birchwoods and ancient woodland; therefore, these habitats form the focus of this OHMP. However, as previously mentioned, all woodland habitat permanently lost to new infrastructure will be mitigated. Details are provided in **Section 5**.
- 3.4.2 Whilst juniper formations on heaths will not be impacted by the Proposed Scheme, juniper is an important plant species within the CNP; therefore, this habitat has also been targeted in the OHMP and will be incorporated into mitigation measures for woodland and dry heath.
- 3.4.3 Other ecological features which are taken into consideration include: birds, the SSSI invertebrate assemblage, the SSSI vascular plant assemblage and the CNPA non-protected priority species.
- 3.4.4 The management and control of INNS is not considered within the OHMP and will be addressed as part of the CEMP.
- 3.4.5 The rationale for focussing on European dry heath and ancient woodland habitat is as follows:
- These habitats are subject to extensive loss as a result of the Proposed Scheme (although not always significant with respect to conservation status and ecosystem function)
 - There is existing knowledge and experience of restoration of these habitats
 - Restoration of these habitats is in line with the aspirations of the Cairngorms Nature Action Plan
 - Creation and expansion of these habitats will contribute to habitat connectivity on a landscape scale
 - Creation of woodland habitat complies with Scottish Government Policy on Control of Woodland Removal.

Table 12.13.4: Summary of notable habitat loss

Habitat feature	Conservation status	Area of loss (ha)	
		Construction phase	New infrastructure
European dry heaths (NVC: H10, H12)	Annex 1	13.86	15.58
Northern Atlantic wet heathlands (NVC: M15)	Annex 1	4.47	0.81
Blanket bogs (NVC: M3, M17, M19, M20, M25)	Annex 1	1.40	0.88
Alluvial forests (outwith Insh Marshes SAC) (NVC: W7)	Annex 1	0.40	0.38
Upland birchwoods (NVC: W4, W11, W16, W17)	SBL	15.59	18.71
Low land mixed deciduous woodland (NVC: W8, W10)	SBL	0.86	0.35
Wet woodlands (NVC: W3, W4b, W6, W7)	SBL	2.71	0.68
Upland flushes, fens and swamps (outwith River Spey - Insh Marshes SSSI) (NVC: M6, M23a)	SBL	3.82	1.23
Low land fens (outwith River Spey Insh Marshes SSSI) (NVC: S9, S10, M27)	SBL	0.12	0.06
Reedbeds (NVC: S4a)	SBL	0.26	0
Wet grasslands (NVC: MG9, MG10, MG11a, M23b)	CNPA	1.66	0.94
Ancient woodland	Woodland removal policy	6.11	4.67

- 3.4.6 The proposals for habitat restoration and creation described in the rest of this document encompasses four main elements:
- Areas of construction phase disturbance within Proposed Scheme extents
 - European dry heath mitigation areas on earthworks slopes within the Proposed Scheme extent
 - Landscape planting within the Proposed Scheme extent
 - Ancient woodland mitigation areas beyond the Proposed Scheme extent.
- 3.4.7 European dry heath, native woodland (i.e. landscape planting) and ancient woodland mitigation areas are shown on **Environmental Mitigation Drawings 6.1 to 6.12** in **Volume 3**.

4 European Dry Heaths

4.1 Introduction

- 4.1.1 The Annex 1 habitat 4030 European Dry Heaths occupies nearly 200ha of the Project 9 study area. Most of this vegetation type within the study area is characterised by NVCH12a *Calluna vulgaris-Vaccinium myrtillus* heath, sub-community *Calluna vulgaris*.
- 4.1.2 Dry heath is under pressure from ongoing land management (e.g. muirburn, drainage and grazing). The area affected by temporary works during the construction phase of the Proposed Scheme is estimated at 13.86 ha and the permanent habitat lost to new infrastructure is approximately 15.58 ha. Dry heath is sensitive to disturbance but recovers from disturbance more easily than wet heath and blanket bog, as it is not dependent on groundwater and surface hydrology.
- 4.1.3 There are many case studies of the restoration and creation of dry heath vegetation, and various techniques have been trialled throughout the UK and Europe (e.g. Environmental Advisory Unit, University of Liverpool, 1988⁸). SNH Information and Advisory Note Number 44⁹ gives detail on methodologies for establishing heather on mechanically-disturbed areas. In general, the objective of heathland restoration is usually to establish a cover of heather *Calluna vulgaris*, with other component species to re-establish naturally.
- 4.1.4 The objectives for dry heath vegetation in this OHMP are as follows:
- Objective 1: Minimise disturbance of dry heath within construction working areas
 - Objective 2: Reinstatement of areas of dry heath disturbed during construction
 - Objective 3: Create heathland vegetation on earthworks slopes

4.2 Objective 1: Minimise disturbance of dry heath within construction working areas

- 4.2.1 The measures to be taken to achieve this objective are described in **Section 3.2.3**. Vegetation from areas of dry heath that are to be permanently lost to new infrastructure should be harvested in advance of construction, from mid-October to December when the Ericaceous shrubs are ready to set seed (the ECoW should advise on more specific timings by inspecting seed pods). The harvested material should be temporarily stored for re-use as a seed source for restoration of dry heath communities. Further guidance on harvesting and heather is provided in guidance notes Flora Locale (2003)¹⁰ and SNH Information and Advisory Note Number 44⁶.

4.3 Objective 2: Restore areas of dry heath disturbed during construction

- 4.3.1 In areas where dry heathland vegetation is to be damaged or disturbed during construction, measures will be taken to increase the feasibility of reinstating this habitat following disturbance.

⁸ Environmental Advisory Unit, University of Liverpool (1988). Heathland Restoration: A Handbook of Techniques. British Gas, Southampton

⁹ SNH Information and Advisory Note Number 44: Heather re-establishment on mechanically-disturbed areas. <http://www.snh.org.uk/publications/on-line/advisorynotes/44/44.htm> (accessed February 2018)

¹⁰ <https://www.floralocale.org/Harvesting+and+using+heather+seed> (accessed February 2018)

- 4.3.2 In advance of construction, the ECoW will survey the affected areas using NVC methodology and assess the condition of the vegetation using established criteria. The NVC vegetation types will be mapped and photographed as part of this exercise.
- 4.3.3 The methods for reinstatement of disturbed heathland areas following construction activities will depend very much on the nature and extent of the disturbance and damage. The condition of the vegetation following construction is anticipated to be very variable and could comprise anything from extensive excavations and bare ground, to barely discernible damage due to minor or short-lived disturbance. Therefore, the detail of the reinstatement will be worked up by the Contractor as part of the detailed HMP.
- 4.3.4 Possible methods could include:
- re-turfing with intact blocks of soil and plant cover, including whole heather plants
 - using excavated peaty soils from areas of habitat loss, which may include a heather seedbank (see OPMP, **Appendix 10.6 in Volume 2**)
 - direct seeding with harvested heather capsules, litter or cut material (see **4.2.1**)
 - nursery production of heather and planting-out of plug plants
 - application of heat-treated heather seed (may be obtainable from the Heather Trust¹¹).
- 4.3.5 All reinstatement areas will require deer-fencing to protect from grazing while the vegetation becomes established.

4.4 Objective 3: Dry heath mitigation areas on earthworks slopes

- 4.4.1 European dry heath lost to infrastructure will be mitigated for via heathland creation on earthwork slopes.
- 4.4.2 Excavated peaty soils will be used to dress road embankments and cuttings, typically no more than 0.5m in depth, as described in the OPMP (**Appendix 10.6 in Volume 2**). The soils to be used in restoration should be from the ‘topsoil’ (see OPMP) and therefore include an Ericaceous seed bank. Therefore, it is expected that heather and other heathland vegetation will re-establish naturally over time. However, in order to accelerate vegetation establishment, it will be necessary to employ the methods listed in **4.3.4** in order to provide a seed source for soils to regenerate.
- 4.4.3 **Table 12.13.5** summarises the areas of earthworks slopes identified for establishment of heathland vegetation. These areas are labelled in **Drawings 6.1 to 6.12 in Volume 3**.

Table 12.13.5: Summary of heathland creation areas on earthworks slopes

Polygon ID	Chainage	Area (ha)	Description
DH2	40,000 - 40,650	2.65	Heathland creation
DH5	40,650 - 41,150	0.85	Heathland creation
DH16	42,550 - 43,200	0.08	Heathland creation
DH17	42,550 - 43,200	0.09	Heathland creation
DH24	47,700 - 47,850	1.02	Heathland creation

¹¹ <http://www.heathertrust.co.uk/> (accessed February 2018)

Polygon ID	Chainage	Area (ha)	Description
DH44	42,750 - 42,800	0.53	Heathland creation
DH45	43,050 - 43,200	1.98	Heathland creation
TOTAL		7.09	

- 4.4.4 Areas of treated earthworks slopes must be protected from grazing by deer-fencing while the vegetation establishes.

5 Woodland

5.1 Introduction

- 5.1.1 A summary of woodland loss (ha) during the construction phase (i.e. felled to facilitate temporary access tracks, SuDS and storage areas) and operational phase (i.e. felled to facilitate permanent infrastructure) is provided in **Table 12.13.6**. The loss of non-priority woodland and plantation woodland which are not connected to ancient woodland are also included in **Table 12.13.7**. Whilst these habitats were scoped out from the EclA (**Chapter 12, Volume 1**) they have been considered within the OHMP.
- 5.1.2 Measures for minimising damage to woodland during construction, as well as mitigation for woodland cleared during works, is detailed in **Section 5.2** and **5.3**. Mitigation for woodland permanently lost to new infrastructure is described in **Section 5.4** and **5.5**.

Table 12.13.6: Summary of woodland loss

Woodland type	Area (ha) lost during construction phase	Area (ha) lost during operational phase
Upland birchwoods	15.59	18.71
Ancient woodland	6.11	4.67
Alluvial forests	0.40	0.38
Low land mixed deciduous woodland	0.86	0.35
Wet woodland	2.71	0.68
Plantation woodland (connected to ancient woodland)	2.58	3.84
Plantation woodland (not connected to ancient woodland)	3.00	3.82
Non-priority woodland (connected to ancient woodland)	0.03	0.04
Non-priority woodland (not connected to ancient woodland)	0	0
TOTAL	31.28	32.49

- 5.1.3 Upland birchwoods are scattered throughout the study area, with the most extensive stands in the northern part of the study area. Ancient woodland occurs throughout the Proposed Scheme, particularly in the northern extent. Wet woodlands are scattered throughout the study area, with a more extensive strip between the HML railway and the B9152 road towards the north. There are six stands of alluvial forest around the existing Kingussie junction, adjacent to the B970 Ruthven Road (east of the existing A9) and alongside the Burn of Inverton. Non-priority woodland and plantation woodland are present in isolated patches throughout the study area.
- 5.1.4 Ancient woodland and upland birchwoods are subject to the largest extent of habitat loss.
- 5.1.5 Birch woodland is the most extensive woodland within Cairngorms National Park (CNAP 2013-2018), but its biodiversity value could be increased by improving the management of these woodlands to encourage regeneration and to retain deadwood and old trees. The national park is the UK stronghold for aspen, which is usually associated with birch woods. Wet woodlands are

also prioritised in the CNAP, occurring on poorly drained and seasonally-wet soils on floodplains (e.g. along the Truim and Spey).

- 5.1.6 Scottish Government policy² has a strong presumption against woodland removal, particularly ancient semi-natural woodland. When woodland removal is approved, there should be clearly-defined public benefits and compensatory planting.
- 5.1.7 Woodlands are complex ecosystems and simply planting trees does not re-create a functioning woodland ecosystem. Translocation of woodland soils from sites that are to be lost to suitable ‘receptor’ sites can accelerate the development of functioning woodland ecosystems, but it is still likely to take several decades (Ryan, 2013¹²).
- 5.1.8 The objectives for woodland vegetation in this OHMP are as follows:
- Objective 1: Minimise disturbance of woodland within construction working areas
 - Objective 2: Reinstatement of trees on areas disturbed during construction
 - Objective 3: Landscape planting within the Proposed Scheme extent
 - Objective 4: Ancient woodland mitigation areas beyond the Proposed Scheme extent

5.2 Objective 1: Minimise disturbance of woodland within construction working areas

- 5.2.1 The measures taken to minimise disturbance to notable habitats during construction are described in **paragraph 3.2.3**.

5.3 Objective 2: Reinstatement of trees on areas disturbed during construction

- 5.3.1 In areas where woodland and scrub are to be damaged, disturbed or felled during construction, measures will be taken to increase the feasibility of reinstating this habitat.
- 5.3.2 This approach of re-planting trees in-situ is not applicable to ancient woodland. The area of ancient woodland lost to facilitate construction (6.11 ha) and new infrastructure (4.67 ha) will be mitigated for via woodland creation in proposed ancient woodland mitigation areas (**Section 5.5**). Areas of ancient woodland that require unavoidable removal should be identified as ‘donor sites’, with the soils from these sites used to facilitate the development of woodland habitats in ancient woodland mitigation areas. Further work will need to be undertaken on the feasibility of soil translocations, as described in **Section 5.5** and **Annex A** Investigations Required for Translocation of Ancient Woodland Soils of this document.
- 5.3.3 The loss of all other woodland types during the construction phase will be mitigated for by re-planting in situ.
- 5.3.4 In advance of construction, the ECoW will survey the affected areas using NVC methodology and assess the condition of the vegetation using established criteria. The NVC vegetation types will be mapped and photographed as part of this exercise.
- 5.3.5 The methods for reinstatement of disturbed woodland and scrub following construction activities will depend very much on the nature and extent of the disturbance and damage. The condition of the vegetation following construction is anticipated to be very variable and could comprise anything from complete clearance of trees and excavations of soils, to limited pruning and

¹² Ryan, L. (2013). Translocation and Ancient Woodland. Woodland Trust, Grantham.

cutting back. Therefore, the detail of the re-planting will be worked up by the Contractor as part of the detailed HMP.

5.3.6 The species to be re-planted should correspond with those that were lost, preferably in the same locations, depending on the condition of the site. Planting will comprise a mix of sizes of plants such as feathered trees, whips and transplants, at 1 plant per 2m². Areas of woodland planting could also be seeded to provide an understorey of wildflowers and grasses (depending on the existing vegetation type).

5.3.7 All reinstatement areas will require deer-fencing to protect from grazing while the vegetation becomes established.

5.4 Objective 3: Landscape planting within Proposed Scheme extent

5.4.1 Woodland permanently lost to infrastructure will be mitigated for by landscape planting within the Proposed Scheme extent. This form of mitigation is not applicable to ancient woodland (see **Section 5.5**). Landscape planting has been proposed on earthwork slopes and areas of improved grassland within the Proposed Scheme extent. Mitigation item SMC-LV5 within Chapter 13 will be followed to protect soil quality for the purposes of landscape planting.

5.4.2 Areas of proposed native woodland planting within the Proposed Scheme extent are illustrated on **Drawings 6.1 to 6.12** in **Volume 3**. Refer to the **Chapter 13 Landscape, Volume 1** for more details on landscape planting.

5.5 Objective 4: Ancient woodland mitigation areas beyond the Proposed Scheme extent

5.5.1 Ancient woodland permanently lost (total of 10.78 ha) will be mitigated for within proposed ancient woodland mitigation areas beyond the Proposed Scheme extent.

5.5.2 Areas identified for extending and improving woodland habitat include areas of grassland, riverbank and 'lost ancient woodland areas'¹³. The location of ancient woodland mitigation areas is shown in **Drawings 6.1 to 6.12** in **Volume 3** and summarised in **Table 12.13.7**. Lost ancient woodland areas were inspected to record any relevant management considerations.

5.5.3 Some of these areas could be suitable receptor sites for translocation of woodland soils from areas of ancient woodland that are to be lost as a result of the Proposed Scheme. However, further detailed investigations will be required to establish the feasibility of soil translocations. The proposals for these investigations are outlined in **Annex A** Investigations Required for Translocation of Ancient Woodland Soils of this document.

¹³ Ancient Woodland Inventory sites which are not identified as wooded in Forestry Commission Scotland's NFI dataset or on the A9 BLOM aerial imagery or the OS aerial imagery

Table 12.13.7: Summary of ancient woodland mitigation areas beyond the Proposed Scheme extent

Polygon ID	Chainage	Area (ha)	Description	Recommendations for lost ancient woodland areas
AW20/ AW22	44,200 - 45,000	4.42	AW20 partly comprises a lost ancient woodland site. AW22 is also partly lost ancient woodland along the bank of the River Spey. Aspen trees noted nearby.	AW20 could be fenced for natural regeneration as there is a plentiful seed-source of silver and downy birch nearby. Planting to include rowan, alder and bird cherry. AW22 Silver birch and aspen are anticipated to grow from seed or suckers if grazing animals are excluded. Planting to include rowan and goat willow.
AW25	48,200 - 48,550	3.29	Area of U4 grassland near Knappach cottage, part of which is lost AWI. Good opportunity to connect existing ancient woodland and plant areas of lost ancient woodland.	Birch, aspen and pine would recolonise if un-browsed. Planting to include rowan on the drier soils and alder, bird cherry, goat willow and grey willow in the rushy patches.
AW34	52,800 - 53,000	1.70	U4 grassland, adjacent to existing woodland.	Woodland could expand into here from the west, with suitable species for planting including pine, silver birch, downy birch, rowan and juniper.
AW37	54,400 - 54,800	2.24	Area of U4 grassland near Croftcarnoch.	Planted with native woodland with species mix of local province.
TOTAL		11.66		

- 5.5.4 These areas will require further investigation for their potential as receptor sites for woodland soils and for any other planting. Recommendations include vegetation, soil and hydrogeology surveys, as described in **Annex A** Investigations Required for Translocation of Ancient Woodland Soils of this document.
- 5.5.5 All reinstatement areas will require deer-fencing to protect from grazing while the vegetation becomes established.

6 Juniper

6.1 Introduction

6.1.1 Juniper often occurs as low scattered scrub on heathland or acidic grassland and it also forms part of the understorey of birch woodlands. Where juniper is long-established it can form a woodland canopy, often with downy birch and rowan. The classification of the small and isolated stands of juniper in the northern part of the study area as W19 *Juniperus communis* ssp. *communis* – *Oxalis acetosella*, suggest that these stands are long-established and are considered to be representative of the Annex 1 habitat 5130 *Juniperus communis* formations on heaths or calcareous grasslands.

6.1.2 The CNAP includes objectives for the expansion of juniper, and its importance as habitat for species such as ring ouzel *Turdus torquatus* and powdered sunshine lichen *Vulpicida pinastri* is noted.

6.1.3 Juniper is threatened by the pathogen *Phytophthora austrocedrae* (FCS, 2013¹⁴, Defra, 2017¹⁵) and therefore planting proposals should be considered with caution and planned in detail, in order to minimise the spread of the pathogen. Juniper should only be planted on sites which are suitable for it with respect to soil, precursor vegetation and hydrology (Defra, 2017).

6.1.4 The objectives for juniper in this OHMP are as follows:

- Objective 1: Minimise clearance of juniper within construction working areas
- Objective 2: Maximise advantageous site conditions for existing juniper stands
- Objective 3: Plant juniper on earthworks slopes

6.2 Objective 1: Minimise clearance of juniper within construction working areas

6.2.1 The measures to be taken to achieve this objective are described in **section 3.2.3**.

6.3 Objective 2: Maximise advantageous site conditions for existing juniper stands

6.3.1 Given the risks posed to juniper by the spread of the pathogen *Phytophthora austrocedrae*, Defra (2017) advice is that existing populations of juniper should be managed to encourage expansion through natural regeneration. This could include management of grazing and site hydrology and manual creation of microsites for germination. Details on habitat management for juniper will be discussed and developed with CNPA as part of the Steering Group detailed in **Section 9**.

6.4 Objective 3: Plant juniper on earthworks slopes

6.4.1 Where appropriate, juniper will be included in woodland and heathland planting on the earthworks slopes. The measures stated in paragraph **6.3.1** in relation to careful planning of planting, provenance and biosecurity will also apply.

¹⁴ Forestry Commission Scotland (2013). Planting juniper in Scotland: reducing the risk from *Phytophthora austrocedrae*.

[https://www.forestry.gov.uk/pdf/juniper-planting-guidance.pdf/\\$file/juniper-planting-guidance.pdf](https://www.forestry.gov.uk/pdf/juniper-planting-guidance.pdf/$file/juniper-planting-guidance.pdf) (accessed February 2018)

¹⁵ Defra (2017). Juniper: Management Guidelines.

[https://www.forestry.gov.uk/pdf/JuniperManagementGuidelinesSeptember2017Published.pdf/\\$FILE/JuniperManagementGuidelinesSeptember2017Published.pdf](https://www.forestry.gov.uk/pdf/JuniperManagementGuidelinesSeptember2017Published.pdf/$FILE/JuniperManagementGuidelinesSeptember2017Published.pdf) accessed (February 2018)

7 Other Features

7.1 Introduction

- 7.1.1 The creation and restoration of heathland and woodland habitats, as described above, mitigates to some extent the habitat loss of protected species such as red squirrel, reptiles and birds. As the new habitats develop, their value for wildlife will increase and the habitats will be expected to support an increasing diversity of plants, invertebrates, small mammals, amphibians and reptiles.
- 7.1.2 In addition, specific habitat creation measures for breeding waders and invertebrates (CNPA and SSSI) are discussed in the following paragraphs.

7.2 Habitat Features for Birds

- 7.2.1 The following features are proposed to create suitable habitat for breeding waders.
- Compensatory flood storage areas (CFSA) around Nuide farm (east and west of the existing A9 around ch. 46,400) will be designed to create suitable habitat for breeding waders. This will include restoration of existing soils and vegetation where excavation work is required, optimising the area of foraging habitat along the shore line by including shallow profiles and incorporating uneven edges and small peninsula features into the outline of the CFSA. The CFSA should be accessible to grazing animals.
 - The existing River Spey embankment to the west of the existing A9 will be lowered to the same level as the surrounding land. A combination of vegetation and hydrological management will be undertaken to create habitat for breeding waders. Habitats created will reflect those in the surrounding area (e.g. small pools and grazed grassland).
 - Creation of a minimum of 36 ha of breeding wader habitat within Dellmore of Kingussie through a combination of hydrological and vegetation management interventions (see **Appendix 6.3, Volume 1**).
- 7.2.2 Restoration and management of the CFSAs, and the area of lowered embankment, will be targeted for breeding waders using management principals outlined in RSPB's Wet Grassland Practical Manual: Breeding Waders¹⁶. Restoration and ongoing management of these areas will be agreed with SNH and RSPB as part of the Steering Group discussed in **Section 9**.

7.3 Habitat Features for CNPA Non-Protected Priority Species

- 7.3.1 The following paragraphs describe habitat features that will be incorporated into the mitigation measures for European dry heath and woodland; and SuDS features, to provide benefit for CNPA non-protected priority species. Details on habitat management for CNPA non-protected priority species will be discussed and developed with CNPA as part of the Steering Group detailed in **Section 9**.
- 7.3.2 Heathland creation on earthwork slopes (**paragraph 4.4**) will incorporate bearberry *Arctostaphylos uva-ursi* and bog myrtle *Myrica gale* in the species mix. As bog myrtle is associated with damp areas, it will only be included where ground conditions are appropriate. These plant species will

¹⁶ RSPB (2015). Wet Grassland Practical Manual: Breeding Waders. Available at: https://ww2.rspb.org.uk/Images/wetgrasslandmanual_tcm9-132779.pdf (Accessed July 2018).

provide suitable habitats for Lepidoptera species such as, netted mountain moth *Macaria carbonaria* and small dark yellow underwing *Anarta cordigera*.

- 7.3.3 Landscape planting (**paragraph 5.4**) and woodland creation in proposed ancient woodland mitigation areas (**paragraph 5.5**) will incorporate birch *betula* spp. within the species mix which will provide suitable habitat for Lepidoptera species. Aspen *Populus tremula* will also be included in the species mix as decaying aspen bark is important for aspen hoverfly *Hammerschmidtia ferruginea* larvae.
- 7.3.4 In addition, aspen trees identified during the 2015 NVC survey (see **Appendix 12.3, Volume 2**) due to be removed as part of the Proposed Scheme will be translocated, where practicable, to a location identified in advance of tree removal. Areas of aspen within the Proposed Scheme are labelled on **Environmental Mitigation Drawing 6.12** in **Volume 3**.
- 7.3.5 Drainage for the Proposed Scheme incorporates SuDS features, many of which will be permanent waterbodies. These features will be planted with vegetation, sediment, water, species, etc. from existing waterbodies which may be lost to the scheme and will provide suitable habitat for the Northern damselfly *Coenagrion hastulatum*.

7.4 Habitat Features for SSSI Invertebrate Assemblage

- 7.4.1 Invertebrates associated with the SSSI invertebrate assemblage includes 12 species, comprising of true flies (Diptera), a beetle (Coleoptera), moths (Lepidoptera) and a spider (Araneae). **Table 12.3.8** summarises suitable habitat within the study area which could support components of the SSSI invertebrate assemblage. Details of the habitat based desktop review are provided in **Appendix 12.1, Volume 2**.

Table 12.13.8: Components of the SSSI invertebrate assemblage and associated habitat type

SSSI invertebrate species	Associated broad habitat type/ NVC communities within the study area
<i>Wabassoreplicates</i> <i>Hybomitra lurida</i>	Sw amp and tall herb fens - S4a S9a S10 S10a S10b S11a
	Mires and flushes - M6a M6d M23a M25a M25c M27 M27a
	Wet heaths - M15b
<i>Donacia aquatica</i>	Sw amp and tall herb fens - S4a S9a S10 S10a S10b S11a
	Standing water - Non NVC community SW
<i>Tipula marginella</i>	Sw amp and tall herb fens - S4a S9a S10 S10a S10b S11a
	Wet woodland habitat that has potential to support carr habitat - W3 W6 W6b W7 W7a
	Mires and flushes - M6a M6d M23a M25a M25c M27 M27a
	Wet heaths - M15b
<i>Hammerschmidia ferruginea</i>	Wet woodland - Aspen is present in two areas of W3, located at the northern extent between the HML railway and B9152 road
	Birch woodland - Aspen is present in one area of W11d, located at the northern extent between the HML railway and B9152 road
<i>Brachionycha nubeculosa</i>	Wet woodland - W3 (where birch is present)
	Deciduous broadleaved woodland - W10 (predominantly oak woodland however, may also support birch trees)
	Birch woodland - W11 W11d W6e
<i>Protolampra sobrina</i>	Wet woodland - W3 (where birch is present)
	Deciduous broadleaved woodland - W10 (predominantly oak woodland however, may also support birch trees)
	Birch woodland - W11 W11d W6e
	Mires and flushes - M6a M6d M23a M25a M25c M27 M27a
	Wet heaths - M15b
<i>Rhadiurgus variabilis</i>	Semi-natural coniferous woodland - W18c
	Conifer plantation - Non NVC community CP (habitat sub-optimal for species but may provide some suitable habitat)
	Standing water - Non NVC community SW
<i>Thereva inornata</i> <i>Tachydromia acklandi</i> <i>Limonia omissinervis</i> <i>Rhabdomastix laeta</i>	Running Water (where shingle and sandy banks are present) – Non NVC community

7.4.2

Tree planting and woodland creation will incorporate birch within the species mix which will provide suitable habitat for moth species *B. nubeculosa* and *P. sobrina*. Aspen will also be included in the species mix as decaying aspen bark is important for *H. ferruginea* larvae. Alder *Alnus glutinosa* will be included in the species mix where ground conditions are appropriate (i.e.

damp), likely along the banks of the River Spey. Wet woodland may provide additional habitat for fly species *T. marginella*.

- 7.4.3 Drainage for the Proposed Scheme incorporates SuDS features, many of which will be permanent waterbodies. These features will be planted with marginal vegetation and will provide suitable habitat for the beetle species *D. aquatic* and *R. variabilis*.

7.5 SSSI Vascular Plant Assemblage

- 7.5.1 Details of the desktop review undertaken for the SSSI vascular plant is provided in **Appendix 12.1, Volume 2**, which include areas of the Insh Marshes NNR at Ruthven (between ch. 49,250 and ch. 50,750) and Lynchat (between ch. 51,700 and ch. 52,200). In summary the following NVC communities, which correlate with components of the SSSI vascular plant assemblage, were recorded within the study area:

- S9 - *Carex rostrata* swamp
- S11 - *Carex vesicaria* swamp
- M5 - *Carex rostrata*-*Sphagnum squarrosum* mire
- MG9 - *Holcus lanatus*-*Deschampsia cespitosa* grassland
- W3 - *Salix pentandra*-*Carex rostrate* woodland
- W4 - *Betula pubescens*-*Molinia caerulea* woodland
- W7 - *Alnus glutinosa*-*Fraxinus excelsior*-*Lysimachia nemorum* woodland
- W11 - *Quercus petraea*-*Betula pubescens*-*Dicranum majus* woodland

- 7.5.2 Of these, five NVC communities occur discretely within the Proposed Scheme comprising S9, MG9, W3, W7 and W11. These areas are present within Insh Marshes NNR and outwith the SSSI boundary, with the exception a watercourse diversion near the Highland Wildlife Park (ch. 55,500), which is located along the edge of a small woodland/ swamp parallel to the B9152 road.
- 7.5.3 Mitigation for impacts on these woodland areas are included in **Section 5**. Reinstatement of wetland and grassland habitats in these areas will be described in more detail within the Contractor's CEMP.

8 Monitoring and Post-Construction Management

8.1 Introduction

8.1.1 Monitoring will be carried out both during construction and post-construction. Ongoing management of habitats is essential to ensure that the target vegetation types are achieved. Management proposals are outlined below, but management prescriptions will be worked up in detail by the Contractor and are subject to change, depending on the results of monitoring.

8.2 Monitoring during Construction

8.2.1 The ECoW will undertake monitoring during the construction period to ensure that the measures detailed in both the CEMP, Peat Management Plan (PMP) and Habitat Management Plan (HMP) are adhered to.

8.3 Post-construction Monitoring

8.3.1 The purpose of post-construction monitoring is to measure the success of habitat creation and restoration and to enable changes to be made to ongoing management ('adaptive management') if required.

8.3.2 Transport Scotland will carry out or procure a programme of monitoring, to be carried out by qualified ecologists (and hydrologists if appropriate). The programme for monitoring will be detailed in the HMP and will focus on heathland, juniper and woodland habitats and will employ field survey methods such as permanent quadrats and periodic photography of vegetation development. Stands of existing and planted juniper will be checked for evidence of *Phytophthora austrocedrae*. Hydrological monitoring may be required in some habitats (e.g. wetland habitats for birds and wet alder woodland). The duration of the monitoring programme will be agreed by the Steering Group, but it is recommended that monitoring of woodland habitats extends over a minimum of 20 years (Anderson, 2003¹⁷).

8.3.3 The methodology and programme for monitoring will be agreed with the Steering Group. Results of monitoring will be presented to the Steering Group (at intervals to be agreed), and the need for any remediation measures discussed and agreed, to ensure that the objectives of the original HMP are met. Transport Scotland will be responsible for securing any additional longer-term monitoring and adaptive management.

8.4 Management of Habitats

8.4.1 Management measures to be considered in detailed management prescriptions are outlined in **Table 12.13.9** below. The purpose of these measures is to ensure successful establishment of the target vegetation, and then to maintain the target habitats for the duration of the management and monitoring period. The techniques outlined below are indicative, as management requirements will depend on the starting vegetation, speed and success of establishment, connectivity with other habitats and location of the different management blocks. For example, creation of wet woodland on the banks of the Burn of Inverton will require different

¹⁷ Anderson, P (2003). Habitat Translocation – A Best Practice Guide. CIRIA.

interventions to ensure establishment and maintenance, to those needed to establish and maintain dry birch woodland.

Table 12.13.9: Indicative management for establishment and maintenance of target vegetation types

Habitat	Locations	Management Techniques	Estimated Frequency and/ or duration
Heathland	Areas disturbed during construction	Protection from grazing during establishment.	0-5 years
		Remove fencing to allow 'background' grazing (deer and rabbits).	5 years +
		Consider cutting or mowing, depending on success of establishment and background grazing levels.	Every 10-20 years
	Earthworks	Protection from grazing during establishment.	0-5 years
		Remove fencing to allow 'background' grazing (depending on location – fencing may be required for safety).	5 years +
		Consider cutting or mowing, depending on slope, success of establishment and background grazing levels.	Every 10-20 years
Woodland	Areas disturbed during construction	Protection from grazing during establishment	0-10 years
		Ongoing maintenance to include removal of INNS (e.g. rhododendron), thinning and coppicing as appropriate. Deadwood to be left in situ.	5 years +
	Landscape planting	Protection from grazing during establishment.	0-10 years
		Ongoing maintenance to include removal of INNS (e.g. rhododendron), thinning and coppicing as appropriate.	5 years +
	Ancient woodland mitigation areas	Protection from grazing during establishment.	0-10 years
		Ongoing maintenance to include removal of INNS (e.g. rhododendron), thinning and coppicing as appropriate. Deadwood to be left in situ.	5 years +
Juniper	All	Protection from grazing during establishment.	0-10 years
		Ongoing management of grazing levels.	10 years +
		Additional interventions may be required if <i>Phytophthora austrocedrae</i> is detected	0 years +

9 Implementation of the Habitat Management Plan

9.1 Introduction

- 9.1.1 Prior to the commencement of construction, the Contractor will develop information contained in this OHMP document to produce a Habitat Management Plan (HMP) that will contain more detailed prescriptions of areas for mitigation and specific requirements for habitat creation, restoration and management. The HMP will be agreed with the CNPA, SNH, Scottish Environment Protection Agency (SEPA) and Royal Society for the Protection of Birds (RSPB) Scotland.
- 9.1.2 Management objectives will be agreed to establish success criteria for habitat restoration. Based on the findings of the EIA, draft management objectives and restoration techniques have been identified in principle to identify ancient woodland mitigation areas that will be acquired through the statutory compulsory purchase order (CPO) for the Proposed Scheme.
- 9.1.3 Monitoring against the agreed management objectives is essential for evaluating effective habitat restoration, as well as identifying the need to undertake adaptive management. On this basis, the agreed Habitat Management Plan will function as a live document, where success criteria and management prescriptions may be subject to revision based on monitoring findings.

9.2 Steering Group

- 9.2.1 A Steering Group of key stakeholders may be established to oversee the implementation of the agreed HMP. The purpose of the Steering Group would be to meet at the end of each monitoring cycle to (i) review and evaluate monitoring results, and (ii) approve proposed amendments to the HMP.
- 9.2.2 As required, the Steering Group should consider representation from each of the following stakeholders:
- Transport Scotland (the Client)
 - Project Ecologist (the Client's representative)
 - The Principal Contractor
 - Ecological Clerk of Works (the Principal Contractor's representative)
 - Cairngorms National Park Authority
 - Scottish Natural Heritage
 - Scottish Environment Protection Agency
- 9.2.3 In due course, the Steering Group may include representation from other interest groups including the Deer Commission Scotland, Forestry Commission Scotland and RSPB Scotland may be appropriate.

Annex A

Investigations Required for Translocation of Ancient Woodland Soils

Annex A Investigations Required for Translocation of Ancient Woodland Soils

A.1 Introduction

Woodland habitat creation will be achieved through a combination of new tree planting and the salvage and translocation of soils from ancient woodlands that are to be lost as a result of the Proposed Scheme. The seed bank within the salvaged soils will enable regeneration of woodland flora. In addition, it may also be appropriate to translocate understory shrubs, coppice stools and dead wood.

Further guidelines on translocation of ancient woodland soils are provided in Anderson (2003¹⁸) and Ryan (2013¹⁹).

The following text provides more detail on the investigations and surveys that may be required to further inform the feasibility of salvage and translocation. The purpose of these investigations is to establish whether or not translocation is likely to be successful. If it is determined that the translocation of soils is unlikely to result in establishment of a woodland vegetation type (e.g. lack of a viable seed bank at the donor sites or there are insufficient compatible receptor sites for all the potential donor sites), then a decision may be made not to proceed with translocation of all (or any) of the sites.

A.2 Investigations of the Donor Sites

The following investigations may need to be undertaken on the areas of ancient woodland that are to be lost as a result of the Proposed Scheme:

- National Vegetation Classification (NVC) survey and mapping of the woodland to sub-community level
- Soil characteristics, including soil texture, total depth, horizon thickness, rooting depth, structure, pH, available nutrient levels (nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg)) and other variables that may subsequently be identified
- Investigation of geology and hydrogeology by sinking boreholes etc.
- Presence and abundance of species of woodland plants with bulbs and rhizomes to inform soil depths to be moved
- Physical characteristics of the site, including drainage, slope, aspect and microtopography
- Abundance and distribution of dead wood habitat, coppice stools and saplings suitable for salvage
- Protected species surveys
- Invasive non-native species surveys

¹⁸ Anderson, P (2003). Habitat Translocation – A Best Practice Guide (C600). CIRIA.

¹⁹ Ryan, L. (2013). Translocation and Ancient Woodland. Woodland Trust, Grantham.

- Analysis of the soil seed bank (e.g. by taking samples of soils and germinating the seed therein).
- Presence of mature aspen trees to be lost, informing where timber can be retained.

A.3 Investigations of the Receptor Sites

The following investigations may need to be undertaken on the sites proposed as receptors for salvaged soils:

- National Vegetation Classification (NVC) survey and mapping of the existing vegetation
- Soil characteristics, including soil texture, total depth, pH, available nutrient levels (N, P, K, Mg) and other variables that may subsequently be identified
- Investigation of geology and hydrogeology by sinking boreholes etc.
- Physical characteristics of the site, including drainage, slope, aspect and microtopography
- Protected species surveys
- Invasive non-native species surveys.
- When planting on grassland, a check must be made for other interests that may suffer if habitat is changed.