12 Ecology and Nature Conservation

12.1 Introduction

12.1.1 This chapter presents the Ecological Impact Assessment (EcIA) of the Proposed Scheme for Project 8 - Dalwhinnie to Crubenmore (Central Section) of the A9 Dualling Programme. The Proposed Scheme under assessment is described in **Chapter 5** in **Volume 1**.

12.1.2 The Design Manual for Roads and Bridges (DMRB) defines ecology as:
"*the scientific study of living organisms, and their relationship both with each other and their environment (e.g. soils, climate, topography). Nature conservation is concerned with maintaining a viable population of the country's characteristic fauna and flora and the communities they comprise. The objectives of nature conservation are:*

- *maintenance of the diversity and character of the countryside, including its wildlife communities and important geological and physical features*
- *maintenance of viable populations of wildlife species, throughout their traditional ranges, and the improvement of the status of rare and vulnerable species".*

12.1.3 Therefore, the aims of this EcIA are to:

- identify the presence and status of ecological features of conservation significance
- evaluate the importance of ecological features in terms of their conservation status
- identify potential impacts upon important ecological features
- present potential mitigation measures to alleviate predicted impacts
- assess the residual impacts following the application of mitigation

12.2 Approach and Methods

Legislation and Policy Context

12.2.1 The conservation significance of ecological features are highlighted through relevant legislation or planning policy. For the purpose of this assessment, the relevant legal framework comprises:

- Convention on Wetlands (otherwise known as the Ramsar Convention)
- European Council Directive 2009/147/EC on the conservation of wild birds (otherwise known as the Birds Directive)
- European Council Directive 92/$£/EEC on the conservation of natural habitats and of wild fauna and flora (otherwise known as the Habitats Directive)
- European Council Directive 2000/60/EC (otherwise known as the Water Framework Directive, or WFD)
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland)
- Nature Conservation (Scotland) Act 2004 (as amended in Scotland)
- Water Environment and Water Services (Scotland) Act (WEWS) 2003
- Wildlife and Countryside Act 1981 (as amended in Scotland)
- Protection of Badgers Act 1992

12.2.2 An assessment of compliance against relevant biodiversity planning policy is present within **Chapter 19** in **Volume 1**.

Scope and Guidance

12.2.3 This EcIA was undertaken in accordance with the following guidance:

- CIEEM (2016) '*Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal'* Chartered Institute for Ecology and Environmental Management
- DMRB. (1993) *Ecology and Nature conservation*. DMRB Volume 11, Section 3, Part 4. Department for Transport (DfT)
- The Highways Agency *et al*. (2010) '*Ecology and Nature Conservation: Criteria for Impact Assessment. Interim Advice Note (IAN) 130/10*'; hereafter referred to as IAN 130/10
- SNH (2013) *A handbook on environmental impact assessment. 'Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment process in Scotland'*. 4th Ed. Scottish Natural Heritage

12.2.4 An assessment of policy compliance is provided within **Chapter 19** in **Volume 1**.

Study Area

12.2.5 A study area has been established to identify important ecological features that could be significantly affected by the Proposed Scheme. The study area encompasses the design earthworks extent plus a proportionate 'zone of influence' (Zol) to consider indirect impacts on designated sites, habitats and species.

12.2.6 The Zol varies between ecological features, depending on their sensitivity to environmental change. For the purpose of this assessment, the following Zol have been applied:

- Designated sites within or hydrologically/ ecologically connected to the existing route corridor
- Phase 1 habitat survey: 150m either side of the existing A9
- National Vegetation Classification (NVC): 250m either side of the existing A9
- Breeding birds (including scarce breeding birds): 500m either side of the existing A9
- Badger: 100m either side of the existing A9
- Otter: watercourses within 100m[1] either side of the existing A9
- Water vole: watercourses within 100m either side of the existing A9
- Red squirrel, pine marten and bats: 50m either side of the existing A9
- European wildcat: encompassed in each of the above study areas

[1] Locally extended to 250m where valuable habitat features are identified.

- Fish habitat (Atlantic salmon and sea lamprey): watercourses crossed by existing A9
- Freshwater pearl mussel (FWPM) habitat within the River Truim.

12.2.7 The study area was developed in line with current professional standards for ecological impact assessment and ecological surveys, and agreed with the relevant statutory environmental bodies through the EIA consultation process. (see **Chapter 7**, **ES Volume 1)**.

Desktop Study

12.2.8 A desktop study was carried out to identify the potential presence, or absence, of important ecological features within the study area. In the first instance, this information has informed the design development via avoidance of designated nature conservation sites wherever possible.

12.2.9 Baseline information was initially sourced from the 'A9 Dualling Programme Strategic Environmental Assessment' (Transport Scotland 2013a). Subsequent consultations were also carried out to acquire records for notable habitats and species from:

- Botanical Society of Britain and Ireland (BSBI)
- British Trust for Ornithology (BTO)
- Cairngorms National Park Authority (CNPA)
- Highland Biological Recording Group (HBRG)
- National Biodiversity Network (NBN) Gateway
- North East Scotland Biological Records Centre (NESBReC)
- Perth Museum Biological Records Centre
- Royal Society for the Protection of Birds (RSPB)
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Scottish Raptor Study Group (SRSG)
- SNHi Information Services (e.g. SiteLink, iMap and Natural Spaces)
- Spey Fishery Board (SFB)

Field Surveys

12.2.10 In line with current professional standards, ecological surveys have been completed within the study area to establish the EcIA baseline (see **Table 12-1**). Survey methodologies were agreed with the relevant statutory environmental bodies through the EIA consultation process. Further details of these methodologies and survey findings are presented in **Appendices 12.2 to 12.9** in **ES Volume 2.**

Table 12-1: Ecological surveys undertaken to inform EIA assessment baseline

Survey	Dates	Appendix
Phase 1 habitats (Preliminary ecological appraisal)	June to September 2014	12.2
Phase 2 habitats (NVC)	June to July 2015	12.3
Breeding bird surveys	May to June 2015	12.4
Protected vertebrates	June and August 2015 and July 2016	12.5 & 12.6
Fish habitat assessment	February to July 2017	12.7
Freshwater pearl mussel	September to October 2015	12.8
Deer Vehicle Collision (DVC) Surveys	July 2016	12.9

CNPA draft priority non-protected species

12.2.11 The Cairngorms National Park is a stronghold for a variety of wildlife; and conservation action for 26 key species are described in the '*Cairngorms Nature Action Plan 2013 – 2018*' CNPA 2013. Through environmental consultation, the Cairngorms National Park Authority (CNPA) provided a draft list of 360 priority non-protected species. Many of these species are not afforded legal protection or included in biodiversity policy; however, they are important to the Cairngorms National Park. The habitat-based list was compiled using desktop information, species experts and local interest groups; and incorporates many of the 26 key species.

12.2.12 To inform the EIA process, CNPA agreed that a broad habitat-based mitigation approach was a suitable means to consider potential impacts on priority non-protected species of invertebrate, bryophyte, lichen and fungus. The CNPA highlighted broad habitat features that could support priority non-protected species using the Phase 1 habitat survey and consultation with key stakeholders. The CNPA classified the resulting habitat features as:

- Red (highest priority) - records of species and habitats within the study area which are of high priority for conservation
- Amber (high priority) - no records, however potential habitat for a particular species or group is present within the study area

Impact Assessment Methodology

12.2.13 Impact significance was assessed taking into account the nature and magnitude of potential impacts (including duration, extent and reversibility) and their consequent effects on important ecological features, using criteria as set out below.

12.2.14 Ecosystems, habitats and species are assigned levels of importance for nature conservation based on the criteria set out in **Table 12-2**. The importance of a feature has also been defined using criteria set out in this table and **paragraphs 12.2.20** to **12.2.21.** Impact characterisation criteria are defined in **Table 12-2** and **Table 12-3**, and in **paragraphs 12.2.20** to **12.2.29.**

Importance

12.2.15 The general approach to defining the importance of ecological features follows that of CIEEM (2016). The approach is also in line with advice given in DMRB IAN 130/10 '*Ecology and Nature Conservation: Criteria for Impact Assessment*' (Department for Transport, 2010).

12.2.16 Ecosystems, habitats and species are assigned levels of importance for nature conservation based on the criteria set out in **Table 12-2**.

12.2.17 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.

12.2.18 Only important ecological features are subject to impact assessment. Therefore, features that do not meet the criteria for at least local importance are not considered in detail in this assessment.

12.2.19 In accordance with IAN 130/10, deer are scoped out from ecological evaluation due to their lack of conservation status and so are not discussed further in that context. However, deer are discussed in this chapter in the context of potential for vehicle collisions during the operational phase of the Proposed Scheme, which could have implications for human safety and animal welfare.

Table 12-2: Importance criteria for ecological impacts

Importance	Criteria
International	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • internationally designated areas or undesignated areas that meet the criteria for designation; and/ or • viable populations of species of international conservation concern **Species** *Species whose presence contributes to:* • 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	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • 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 **Species** *Species whose presence contributes to:* • 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) (Scottish Government, 2013, 2015)
Regional	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • communities and assemblages that occur within regionally important sites or localities listed as being of conservation importance in the Tayside Biodiversity Action Plan (BAP) or Cairngorms Nature Action Plan (CNAP) (including Local Nature Reserves) or within undesignated areas that meet the criteria for such designation; and/ or • viable populations of species of regional conservation concern **Species** *Species whose presence contributes to:* • the maintenance and restoration of biodiversity and ecosystems at a regional level, as defined in the Tayside BAP or CNAP
Authority Area	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • populations of species of conservation concern within the authority area **Species** *Species whose presence contributes to:* • the maintenance and restoration of biodiversity and ecosystems within a relevant area such as Perth and Kinross within the Tayside BAP, or Aviemore in the CNAP
Local	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • populations of species of conservation concern within the local area (for example a Local Nature Reserve (LNR)) **Species** *Species whose presence contributes to:* • the maintenance and restoration of biodiversity and ecosystems at a local level
Less than Local	**Ecosystems and Habitats** • 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 **Species** • features that are considered to be absent or do not meet any of the above criteria

Impact Characterisation

12.2.20 For the purpose of this assessment, the impact descriptors in **Table 12-3** are taken to summarise the overall characterisation of beneficial or adverse impacts in accordance with CIEEM (2016), 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)
- likelihood of occurrence (certain/near certain, probable, unlikely or extremely unlikely)

12.2.21 The character of impacts is defined using the criteria set out in **Table 12-3.** Impact descriptors are identified as High, Medium, Low or Negligible, following the above impact characterisation approach.

Table 12-3: 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 adverse, this type of effect would reduce the integrity of the feature and its conservation status. If beneficial, 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 adverse, this type of effect would have neutral long-term implications for the integrity of the feature or its conservation status. If beneficial, 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

12.2.22 Each feature's importance and the potential impacts upon it have been determined through the above described collection of data and consultation, and also from prior project experience, 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 impacts 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 such sites are designated as nationally important.

12.2.23 CIEEM (2016) notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (adverse or beneficial) on important ecological features. Significant effects are those that are sufficiently important to support or undermine the

conservation status[2] of important ecological features. Knowledge and assessment of construction methods and operational activities, together with the knowledge of ecologists with experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the Proposed Scheme on ecological features.

12.2.24 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 identified impact on the feature in question is significant.

12.2.25 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 2011 – hereafter referred to as the EIA Regulations 2011.

12.2.26 Impacts on internationally important features characterised as 'Low', and 'High' impacts on features of authority area importance, can also be potentially significant. 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.

12.2.27 Under the terms of the EIA Regulations 2011, where significant impacts are identified, mitigation will be developed to reduce impacts where feasible.

12.2.28 Embedded mitigation measures described within the EcIA (**paragraphs 12.4.4** to **12.4.7**) have been incorporated into the design and taken into account in the assessment of the significance of 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.

12.2.29 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 an Environmental Management System (EMS), 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/ typical mitigation methods and mitigation targeted to specific locations.

12.2.30 Mitigation is also designed to aim for a net gain for biodiversity where practicable in line with policy and guidelines (CIEEM, 2016).

12.2.31 Residual impacts have been assessed after mitigation is applied, using the same methodology for assessing impacts pre-mitigation.

[2] 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.
Conservation status for species is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its population within a given geographical area.

Assigning Mitigation

12.2.32 Potential additional mitigation measures to address identified impacts have been considered as part of this assessment and are discussed in **Section 12.5**. Residual impacts are discussed in **Section 12.6** with significant impacts determined post-mitigation using the criteria outlined in **paragraphs 12.2.20** to **12.2.30.**

Limitations to Assessment

12.2.33 Baseline information from key stakeholders generally provides a catalogue of likely species occurring in the area. The reliability of this information cannot be verified due to unknowns such as recorder expertise, accurate species identification and accuracy of location. Records do not provide a comprehensive list of all species present, and a lack of records does not necessarily indicate the absence of a species; the area may simply be under-recorded. This is not a constraint to the EcIA baseline as species accounts have been reviewed against potential habitat features to determine their likely presence using professional judgement.

12.2.34 Ecological surveys were carried out in all reasonably accessible areas where relevant permissions with landowners could be agreed in advance. Inaccessible areas, for example Network Rail land, were subject to visual assessment from adjoining fields. As far as practicable, surveys were carried out during optimal survey conditions for target species.

12.2.35 Surveys present a snapshot of the current ecological baseline in terms of vegetation communities and species distribution within the study area. The extent, structure and function of habitats within the local geographic context, as well as abundance and distribution of species, will fluctuate in response to natural processes, prevailing land management pressures and climate. Given the high altitude, high latitude location of the study area, this is not considered to be a constraint to the EcIA baseline due to the likely timescales required, particularly for habitats, to change significantly from baseline conditions.

12.3 Baseline Conditions

12.3.1 The baseline assessment for the Proposed Scheme is presented below, including the determination of important ecology features. Baseline tables have been prepared separately to record the determination of importance, which is presented as **Appendix 12.1** in **Volume 2** of this report.

Statutory Designated Sites

12.3.2 There are four statutory designated sites within the study area. **Table 12-4** summarises the site and value of these features. The location of the statutory designated sites in relation to the study area are presented on **Drawings 12.1 to 12.6** in **Volume 3**.

Table 12-4: Summary of statutory designated sites within the study area

Name	Importance	Qualifying Features
Drumochter Hills Special Protection Area (SPA)	International	Dotterel *Charadrius morinellus*, breeding Merlin *Falco columbarius*, breeding
Drumochter Hills Special Area of Conservation (SAC)	International	Blanket bog Species-rich grassland with mat-grass in upland areas Wet heaths with cross-leaved heath Dry heaths Plants in crevices on acid rocks Acidic scree Tall herb communities Montane acid grasslands Alpine and subalpine heaths Mountain willow scrub
River Spey SAC	International	Sea lamprey *Petromyzon marinus* Atlantic salmon *Salmo salar* Otter *Lutra lutra* Freshwater pearl mussel (FWPM) *Margaritifera margaritifera*
Drumochter Hills Site of Special Scientific Interest (SSSI)	National	Breeding bird assemblage Fluvial geomorphology of Scotland Montane assemblage Vascular plant assemblage

12.3.3 The Drumochter Hills SPA and SAC are located approximately 200m east of the existing A9 between the Allt Coire Chuirn and the Allt Coire Bhathaich. In this area, the study area overlaps with the Drumochter Hills SPA and SAC.

12.3.4 The River Truim forms part of the River Spey SAC and is located to the west of the existing A9 between the Allt Coire Chuirn and where the River Truim crosses the Highland mainline railway at Lechden plantation, from where it continues to the confluence with the River Spey.

12.3.5 The existing A9 does not cross the River Spey SAC; however, the A9/A889 junction near Dalwhinnie crosses the River Truim. In addition, the SAC boundary extends along the Allt Coire Bhotie to within 10m of the existing carriageway; and the Allt Cuaich to within approximately 20m of the existing carriageway.

12.3.6 Both the SPA and the SAC are included within the Natura 2000 coherent ecological network, which seeks to maintain or, where appropriate, restore the favourable conservation status of habitats and species in their natural range. These sites are designated under the Birds Directive (79/409/EEC) and Habitats Directive (92/43/EEC), transposed into UK law by the Wildlife and

Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) respectively, and are of **international importance**.

12.3.7 From the beginning of the Drumochter Estates access track, the eastern extent of the mainline partially overlaps with the SSSI as far as the Allt Coire Bhathaich. SSSIs are designated through the Nature Conservation (Scotland) Act 2004 therefore, it is of **national importance**.

12.3.8 No other statutory designated sites are present within the study area. The River Spey SAC (River Truim) is hydrologically connected to the River Spey – Insh Marshes SPA/ Ramsar and Insh Marshes National Nature Reserve (NNR), which is situated some 10km downstream of the existing A9 towards Newtonmore. Whilst these sites are considered to be of international and national importance respectively, these features have been scoped out from further assessment based on distance and lack of supporting habitat.

Notable Habitats

12.3.9 Notable habitats are important features identified as a conservation priority though relevant legislation or planning policy. For the purpose of the assessment, this includes:

- internationally important habitat types identified in Annex 1 of Council Directive 92/43/EEC (the Habitats Directive)
- nationally important habitat types identified in the Scottish Biodiversity List (SBL)
- nationally important woodland areas identified in the Ancient Woodland Inventory (AWI)
- regionally important habitat types identified in the Cairngorms Nature Action Plan (CNAP)

12.3.10 A review of the AWI found that no ancient woodland occurs within the study area and, as such, no potential impact on ancient woodland is expected. Therefore, ancient woodland is not discussed any further in this assessment.

Phase 1 Habitat Survey

12.3.11 Broad habitat types identified during the Phase 1 habitat survey are described in the accompanying Preliminary Ecological Appraisal (see **Appendix 12.1**, **ES Volume 2**); and shown in **Drawings 12.7 to 12.12** in **ES Volume 3**.

12.3.12 In summary, the existing roadside verge is characterised by acid grassland and dry dwarf shrub heath. A linear strip of coniferous plantation woodland runs parallel to the east of the route corridor between Allt Coire Chuirn and the Allt Bhathaich, beyond which heather moorland is widespread. Coniferous and mixed plantation woodland, as well as scattered trees/ scrub, is present in areas adjoining both sides of the A9 near Crubenmore.

12.3.13 Valley mire and marshy grassland is present within the River Truim floodplain to the west of the A9. Valley mire and wet dwarf shrub heath is also present over gently sloping ground with locally deep peat deposits to the east of the A9 near Dalwhinnie. Flushes and springs are locally present over steeper slopes to the east of the A9, notably between Allt Cuaich and Crubenmore.

12.3.14 Major watercourses, defined as those included on 1: 50,000 scale OS mapping, that are crossed by the existing A9 occur at the following locations:

- Allt Coire nan Cisteachan (Hydro ID 72)
- Allt Coire Uilleim (Hydro ID 77)
- Allt Coire Bhathaich (Hydro ID 82)

- SSE Aqueduct (Hydro ID 88)
- Allt Cuaich (Hydro ID 104)
- Allt Garbh (Hydro ID 121)

Phase 2 Habitat Survey

12.3.15 Further detailed botanical survey was completed to confirm the presence, extent and importance of notable habitats. National vegetation classification (NVC) communities are described in **Appendix 12.2** in **ES Volume 2**; and shown in **Drawings 12.13 to 12.21** in **ES Volume 3**. Notable habitats recorded within the study area are presented in **Table 12-5**.

12.3.16 In summary, over 50% of the study area contains Annex I habitat. European dry heaths are the most widespread, which generally occur on steep slopes and dominated by H12a *Calluna vulgaris – Vaccinium mytillus* heath sub-community.

12.3.17 Northern Atlantic wet heaths are also common within the study area, found on gentle slopes and flatter ground over shallow peaty soils, forming mosaics with and transitions into other mires, as well as dry heath and calcifugous grassland. This habitat is typically characterised by M15 *Trichophorum germanicum – Erica tetralix* wet heath on damp peaty soils. Where M15 occurs over deep peat the habitat is considered to be a degraded form of blanket bog. However, these areas are discrete and indicative of locally deep peat deposits within more extensive wet heaths, as opposed to extensive blanket mire ecosystems.

12.3.18 Blanket bogs are locally present throughout the study area and best characterised by stands of M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire and M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire, which are most extensive to the west of the existing A9 over the River Truim floodplain. There is one patch of M17 to the east of the existing A9 near Dalwhinnie where flat ground is present to the north of the Allt Bhathaich. Elsewhere, stands of M25 *Molinia caerulea – Potentilla erecta* mire are present in areas marginal to M17, M19 and areas of wet heath; and are indicative of degraded blanket bog.

Table 12-5: Summary of notable habitats recorded within the study area

Notable Habitat	Conservation Status	Area (ha)	% of the study area	Importance
European dry heaths *(NVC: H10, H12, H16, H18, H21)*	Annex 1	241.37	31.82	**International**
Northern Atlantic wet heaths *(NVC: M15, M16)*	Annex 1	207.84	27.40	**International**
Non-priority grasslands *(NVC: all other U, OV)*	None	153.92	20.29	**Local**
Non-NVC – woodland *(e.g. coniferous plantation)*	None	34.73	4.58	**Less than Local**
Non-NVC – other (*e.g. bare ground*)	None	46.45	6.12	**Less than Local**
Blanket bogs *(M1, M3, M17, M19, M20, M25)*	Annex 1	48.24	3.36	**International**
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M32, M37, S9, S19)*	SBL	12.23	1.61	**Regional**
Upland birchwoods *(NVC: W11, W17)*	SBL	5.27	0.70	**Local**
Transition mires and quaking bogs *(NVC: M4)*	Annex 1	3.12	0.41	**Authority Area**
Wet grasslands *(NVC: MG9, MG10, M23b)*	CNAP	1.62	0.21	**Local**
Non-priority woodlands *(NVC: W18, W23)*	None	0.18	0.02	**Local**

12.3.19 European dry heaths, Northern Atlantic wet heaths and blanket bogs are common habitats within the study area and widespread throughout the Scottish uplands, including the Cairngorms National

Park. Between the Allt Coire Chuirn and the Allt Bhathaich, habitats to the east of the existing road corridor are within the Drumochter Hills SSSI; and generally, out with the Drumochter Hills SPA and SAC. Whilst the condition of habitats in these areas were found to be under pressure from ongoing land management (e.g. muirburn, drainage and grazing), they are qualifying features of the SAC and likely to form supporting habitat to qualifying features of the Drumochter Hills SPA and SSSI and of **international importance**. Where these habitats occur to the north of the Allt Bhathaich, they are not hydrologically connected to habitats within the SAC, SPA or SSSI. Given the proximity of the SPA and SSSI, habitats in these areas could support important species associated with these designated sites and are also determined to be of international importance.

12.3.20 Other Annex I habitats are present within the study area including alkaline fens and transition mires and quaking bogs. Alkaline fens were observed where M10 *Carex dioica - Pinguicula vulgaris* mire has developed over groundwater flushing on sloping ground to the east of the A9. As a result, alkaline fens are not extensive within the study area but form discrete features within other habitats, notably mosaics dominated by wet heath communities. Transition mires and quaking bogs were recorded locally where M4 *Carex rostrata - Sphagnum fallax* mire where develops over waterlogged depressions. Given these habitats are characterised by only a few species-poor NVC communities that are limited in scale, they are of **authority area importance**.

12.3.21 Non-priority grasslands (i.e. vegetation communities that do not correspond with any Annex I, SBL or CNAP priority habitats) account for approximately 20% of the study area. U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland and U5 *Nardus stricta – Galium saxatile* grassland are common within areas adjacent to the A9, side-roads and tracks. These habitats are of **local importance** as they are dominated by common grass species, ubiquitous and easily re-creatable.

12.3.22 Upland flushes, fens and swamps is a broad and variable habitat classification that occur in areas of groundwater flushing or standing water within floodplains. M6 *Carex echinata - Sphagnum fallax/denticulatum* mire and S9 *Carex rostrata* swamp are most common; although, they occur as small stands that are scattered throughout mosaics containing habitats of higher importance, namely wet heaths. These habitats were found to be dominated by common sedge and moss species, limited in scale and of **local area importance**.

12.3.23 Upland birchwoods account for less than 1% of the study area, comprising narrow strips of W11 *Quercus patraea – Betula pubescens – Oxalis acetosella* woodland to the west of the existing A9/A889 junction near Dalwhinnie; and narrow strips of W17 *Quercus patraea – Betula pubescens – Dicranum majus* woodland near Crubenmore. Given these habitats contain little or no oak species, small in scale and isolated from more extensive semi-natural woodland, they are of **local importance**.

12.3.24 Wet grasslands account for less than 1% of the study area and largely characterised by MG10 *Holcus lanatus – Juncus effusus* rush-pasture in low-lying areas of the River Truim floodplain. M23b *Juncus effusus* rush-pasture sub-community is rare, occurring in small depressions to the west of the existing A9. These habitats are of **local importance** as they are dominated by common grass species, ubiquitous and easily re-creatable.

12.3.25 Non-priority woodlands and understorey vegetation are not common within the study area with one extremely small area of W18 *Pinus sylvestris – Hylocomium splendens* woodland present at the existing A9/A889 junction near Dalwhinnie. The presence of W23 *Ulex europaeus – Rubus fruticosus* scrub is extremely limited in scale, often occurring discretely along boundary features of adjoining pasture. Given the limited scale, these are of **less than local importance**.

12.3.26 The majority of the woodland within the study area is coniferous plantation which is generally species poor, homogenous in structure and does not support important populations of notable species. Woodland communities are considered to be of less than local importance in an ecological

context, however, these habitats have still been considered within **Sections 12.4** and **12.5** in line with the Scottish Government's *Policy on Control of Woodland Removal*.

12.3.27 Features that do not correspond with an NVC community are either limited in scale or provide little or no botanical interest and are of **less than local importance**.

Invasive Non-Native Species

12.3.28 Invasive non-native species (INNS) that reduce ecological diversity of habitats include Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*. There are no records of these species within the study area. No sightings have been recorded during any site visits and it is therefore considered that INNS are currently absent from the study area and **not applicable**.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

12.3.29 Groundwater dependent terrestrial ecosystems (GWDTE) are wetlands that depend directly on the water level in, or flow of water from, a groundwater body, and potentially the nutrient inputs from the groundwater body, to be maintained in a favourable ecological condition. These wetlands receive protection from significant damage or deterioration, under European Council Directive 2000/60/EC (otherwise known as the Water Framework Directive, or WFD), which is transposed into Scottish Law through the Water Environment and Water Services (Scotland) Act (WEWS) 2003.

12.3.30 SEPA (2014) has classified a number of NVC communities as being dependent on groundwater. Many of these NVC communities are very common habitat types across Scotland and some are otherwise of low ecological value. Furthermore, some of these NVC communities may be dependent on groundwater only in certain hydrogeological settings.

12.3.31 Potential GWDTE are identified in **Appendix 12.3** in **ES Volume 2** and shown in **Table 12-6**. A separate assessment of potential GWDTE has been carried out to further assess their 'likely' groundwater dependence based on their topographical, geological and hydro-ecological context. This is presented in **Chapter 10**, **ES Volume 1**.

Table 12-6: Potential GWDTE

NVC Code	NVC Community Name
Moderately groundwater dependent:	
M15	*Trichophorum germanicum – Erica tetralix* wet heath
M25	*Molinia caerulea – Potentilla erecta* mire
U6	*Juncus squarrosus – Festuca ovina* grassland
MG9	*Holcus lanatus – Deschampsia cespitosa* grassland
MG10	*Holcus lanatus – Juncus effusus* rush pasture
Highly groundwater dependent	
M6	*Carex echinata – Sphagnum fallax/denticulatum* mire
M10	*Carex dioica - Pinguicula vulgaris* mire
M11	*Carex demissa – Saxifraga aizoides* mire
M16	*Erica tetralix – Sphagnum compactum* wet heath
M23	*Juncus effusus/acutiflorus – Galium palustre* rush pasture
M32	*Philonotis fontana – Saxifraga stellaris* spring
M37	*Palustriella commutata – Festuca rubra* spring

Ornithology

12.3.32 Notable species of bird are important features identified as a conservation priority though relevant legislation or planning policy. For the purpose of the assessment, this includes:

- internationally important bird species identified in Annex 1 of European Council Directive 2009/147/EC (the Birds Directive); as well as regularly occurring migratory species not listed on Annex 1 of the Directive
- nationally important species identified in Schedules 1, 1A and A1 of the Wildlife and Countryside Act 1981 (as amended); or the Scottish Biodiversity List
- regionally important species identified in the Cairngorms Nature Action Plan
- Red or amber list Birds of Conservation Concern (BoCC), or features of locally important bird assemblages of wider conservation importance.

Breeding Birds

12.3.33 Bird Atlas 2007-11 data provided by the British Trust for Ornithology (BTO) highlights rare species that have been observed within 10km hectads that overlap the study area (see **Table 12-7**). Consultation with SNH, RSPB Scotland and the Scottish Raptor Study Group highlighted no historic nest sites belonging to Annex 1 or Schedule 1 birds, or woodland grouse, within 500m of the existing A9.

12.3.34 The existing road corridor is dominated by relatively common grassland habitats that offer negligible potential nesting habitat for most of these species; although, areas of rough or unmanaged grasslands are likely to support small mammals and prey items for kestrel.

12.3.35 Heather moorland located to the east of the existing A9 is largely managed as grouse moor and potential nesting habitat for red grouse is anticipated to be widespread. Where sufficient heather cover is available, there is also potential ground-nesting habitat for raptors such as hen harrier, merlin and short-eared owl. Few waterbodies are present in these areas; therefore, potential ground-nesting habitat for waders is likely to be reduced to discrete low-lying areas. Potential ground-nesting habitat for passerines is assumed to be widespread.

12.3.36 Tree cover within the study area is limited to a narrow conifer thicket to the east of the existing A9 between the Allt Coire Chuirn and the Allt Bhathaich; as well as areas adjoining the existing A9 around Crubenmore. One isolated stand of conifer plantation is present at Lechden near Allt Cuaich. In these areas, the understorey is generally absent and few shrubs are present along the woodland edge or within rides; although, potential black grouse lekking habitat is present in the adjoining heather moorland. The dense tree-canopy provides potential nesting habitat for passerines including crossbill species, redpoll and song thrush. With few broadleaved species and limited structural diversity, nesting opportunities for spotted flycatcher may be locally present or absent.

12.3.37 The River Truim floodplain to the west of the existing A9 contains wetland habitats that could support ground-nesting waders and waterfowl. There are no lochs or lochans within the study area that could support black-throated diver or greylag goose.

12.3.38 Steep ground is present to the east of the existing A9, particularly between the Allt Coire Chuirn and Allt Bhathaich; although, cliffs or crags that could support golden eagle nests are located well beyond the study area (i.e. > 500m).

Table 12-7: Summary of BTO Bird Atlas Data – Breeding birds

Annex 1 Birds	Schedule 1 Birds	CNPA Key Species; Red/ Amber BoCC	
Golden plover *Pluvialis apricaria*	Crossbill species *Loxia spp*.	Greylag goose *Anser anser*	Common sandpiper *Actitis hypoleucos*
Short-eared owl *Asio flammeus*	Dunlin *Calidris alpina*	Teal *Anas crecca*	Black-headed gull *Chroicocephalus ridibundus*
Black throated diver *Gavia arctica*	Black grouse *Tetrao tetrix**	Wigeon *Anas penelope*	Snipe *Gallinago gallinago*
Golden eagle *Aquila chrysaetos**		Red grouse *Lagopus lagopus scotica*	Skylark *Alauda arvensis*
Hen harrier *Circus cyaneus**		Kestrel *Falco tinnunculus*	Ring ouzel *Turdus torquatus*
Merlin *Falco columbarius**		Oystercatcher *Haematopus ostralegus*	Song thrush *Turdus philomelos*
Dotterel *Charadrius morinellus**		Ringed plover *Charadrius hiaticula*	Spotted flycatcher *Muscicapa striata*
		Lapwing *Vanellus vanellus*	Reed bunting *Emberiza schoeniclus*
		Curlew *Numenius arquata*	Lesser redpoll *Carduelis cabaret*
		Redshank *Tringa totanus*	

(*) denotes data provided for 10 km hectad instead of 2 km tetrad

12.3.39 Breeding bird surveys carried out during the 2015 and 2016 breeding season recorded a total of 38 notable species within the study area (see **Appendix 12.5, ES Volume 2**; and shown in **Drawings 12.31 to 12.35** in **ES Volume 3**). No merlin nests were recorded within 1km of the existing A9 during either survey. An adult female merlin was observed on one occasion carrying prey over the study area near Crubenmore in 2015; and a copulating pair was observed on one occasion to the east of the A9 near Crubenmore in 2016 (see **Confidential Appendix 12.13**, **ES Volume 2**).

12.3.40 The breeding population of merlin in Scotland is estimated to be 733 pairs (Ewing *et al*. 2008); and Wilson *et al*. (2015) estimates combined population of 80 breeding pairs within the central highlands and Cairngorms massif area. The presence of a single, possible breeding, pair within the study area accounts for more than 1% of the estimated regional population; however, given the proximity to the SAC, merlin is of **international importance**. Given the distance between these merlin observations and the Drumochter Hills SPA boundary is more than 5km, activity is not considered to be linked to the SPA population of breeding merlin (SNH 2013).

12.3.41 Features of the breeding bird assemblage for the Drumochter Hills SSSI recorded within the study area include golden eagle, wigeon, golden plover, dunlin and ring ouzel. Golden eagle was observed in the wider landscape during 2015 and 2016; although, most flights were located over high slopes well beyond the study area. No evidence of breeding was noted within 1km; although, given the proximity of the SSSI, golden eagle is of **regional importance**.

12.3.42 Golden plover was recorded in low numbers with two breeding pairs recorded to the north of the SSSI in 2015, near the Allt Bhathaich. This is not important at a regional scale (e.g. 6,318 breeding pairs); although, given the proximity and association with the SSSI, they are of **regional importance**.

12.3.43 Ring ouzel was recorded in low numbers within the study area with one possible pair to the north of Allt Bhathaich in 2015 and two possible pairs to the south of Crubenmore in 2016. The population of ring ouzel is not important at a national or regional scale, but are of **regional importance** due to the proximity of the SSSI.

12.3.44 No nests belonging to raptors listed on Annex 1 were recorded within the study area; although, white-tailed eagle, osprey and black-throated diver were all observed flying over the study area during the surveys. It is noted that while some forestry (and potential breeding sites for both osprey and white-tailed eagle) is present within the study area these are all close to the existing A9 and unlikely to be utilised by either species. The presence of Annex 1 birds in the study area is of **regional importance** based on the contribution of individuals to the regional population estimates for each species (Wilson *et al*. 2016).

12.3.45 Crossbill, most likely common crossbill, was recorded possibly breeding in low numbers within coniferous plantation woodland between the Allt Coire Chuirn and Allt Bhathaich; as well as Lechden plantation. Crossbill species have a highly variable population of between 5,000 and 50,000 breeding pairs (Forrester and Andrews 2007). Given the limited extent of potential nesting habitat within the study area, crossbill species are of **local importance**.

12.3.46 Approximately 37 pairs of lapwing, a CNPA key species, were recorded in wetland habitats to the west of the A9 within the River Truim floodplain. In these areas, curlew (red list BoCC), oystercatcher (amber list BoCC) and snipe (amber list BoCC) are numerous; particularly surrounding the Lechden plantation and the Allt Garbh. The Strathspey breeding wader population has declined by 42% between 2010 and 2015 (RSPB Scotland 2017); therefore, aggregations of breeding waders within the study are likely to contribute to the wider Strathspey breeding wader assemblage (see **Table 12-8**) and of **authority area importance**.

Table 12-8: Proportion of Strathspey breeding waders recorded within the study area

Species	Study area (pairs)	Scotland		Regional		Strathspey	
		Population Estimate	Proportion in study area (%)	Population Estimate	Proportion in study area (%)	Population Estimate	Proportion in study area (%)
Lapwing	37	71,500 – 105,600	<1	Unknown	N/A	761	5
Oystercatcher	20	84,500 – 116,500	<1	Unknown	N/A	571	4
Curlew	20	58,800	<1	2,133	<1	332	6
Redshank	1	11,700 – 17,500	<1	Unknown	N/A	223	<1
Snipe	21	34,000 – 40,000	<1	2,304	<1	542	4

12.3.47 A black grouse lek was recorded within the study area to the east of the A9 near Crubenmore in 2015; and another was recorded to the west of the study area near Crubenmore in 2016. The peak count of calling males was five; although, it is not clear if leks contained the same birds. The most recent population survey for black grouse in 2005 estimated 3,344 calling males in Scotland, which highlighted a 29% decline from the 1995-96 baseline (Sim *et al*. 2005). Scotland forms approximately 66% of the UK population and, given their vulnerable conservation status, the presence of five calling males is of **regional importance**.

12.3.48 No evidence of capercaillie was noted within the study area in 2015 or 2016; and they are not considered any further within this assessment.

12.3.49 Other breeding birds observed within the study were typically single pairs except for common gull (91No.), common sandpiper (28No.), lesser redpoll (19No.) and skylark (13No.); and these are of **local importance**.

Non-Breeding Birds

12.3.50 Bird Atlas 2007-11 data provided by the British Trust for Ornithology (BTO) highlights rare species that have been observed within 10km hectares that overlap the study area (see **Table 12-9**). The data shows wintering birds are present in low numbers in proximity to Dalwhinnie.

12.3.51 Kestrel and red grouse are recorded most frequently, which suggests breeding birds are resident in suitable all year round. Wildfowl including whooper swan, mallard and goldeneye occur infrequently and in low numbers, which could indicate that wetland habitats are limited in scale to support larger aggregations of birds; as well as general observations of birds of autumn or spring passage.

12.3.52 Given the high altitude between the Pass of Drumochter and Dalwhinnie, the prevailing local climate during the winter (e.g. frequent snow-fall, freezing temperatures and reduced sun light) will limit potential foraging or roosting habitats. It is anticipated that during periods of hard-frost, wintering birds are likely to seek more extensive wetlands at lower altitude; therefore, wintering birds are of **local importance**.

Table 12-9: Summary of BTO Bird Atlas Data – wintering (non-breeding) birds

Annex 1 Birds	Schedule 1 Birds	CNPA Key Species; Red/ Amber BoCC	
Whooper swan *Cygnus cygnus*	Black grouse *Tetrao tetrix*	Greylag goose *Anser anser*	Kestrel *Falco tinnunculus*
Hen harrier *Circus cyaneus*	Snow bunting *Plectrophenax nivalis*	Goldeneye *Bucephala clangula*	Tawny owl *Strix aluco*
Merlin *Falco columbarius*	Crossbill species *Loxia spp*.	Mallard *Anas platyrhynchos*	Great grey shrike *Lanius excubitor*
Ptarmigan *Lagopus muta*	Fieldfare *Turdus pilaris*	Teal *Anas crecca*	Reed bunting *Emberiza schoeniclus*
	Redwing *Turdus iliacus*	Red grouse *Lagopus lagopus scoticus*	Lesser redpoll *Carduelis cabaret*
		Woodcock *Scolopax rusticola*	

(*) denotes data provided for 10 km hectad instead of 2 km tetrad

Herptiles (Amphibians and Reptiles)

Reptiles: adder (vipera berus), common lizard (Zootoca vivpara), slow worm (Anguis fragilis)

12.3.53 The study area is dominated by grassland and heathland habitats that could support potential foraging, basking and sheltering reptile habitats. Existing road embankments are characterised by rough grassland and heathland communities with scattered scrub and heather moorland, particularly to the east of the existing A9. These areas along with rough grassland are likely to provide potential basking/ foraging habitat which is widespread throughout the study area. Coniferous plantation, boundary features (e.g. fence lines and stone walls) and grouse butts, may provide potential hibernacula, which are locally present throughout the study area.

12.3.54 Incidental sightings from protected species walkover surveys have confirmed reptiles are present within the study area, including an adder near Allt Cuaich. On this basis, it is assumed that small populations of reptile are locally present throughout the study area, and are determined to be of **local importance**.

Amphibians

12.3.55 In line with Oldham *et al*. (2000), a Habitat Suitability Index (HSI) assessment of four ponds within 250m of the existing A9 was carried out to determine the likely presence of breeding great crested newt (GCN) (see **Drawing 12.55, ES Volume 3**). Using current National Amphibian and Reptile Recording Scheme (NARRS) evaluation criteria, the likely occupancy of breeding GCN in all four ponds is 'poor' as there are few ponds and limited terrestrial cover in the wider landscape (see **Table 12-10**).

12.3.56 In Scotland, GCN are locally present in suitable habitat. Both SNH and CNPA have highlighted that the nearest confirmed GCN breeding site is near Carrbridge, which is approximately 30 km from Dalwhinnie. On this basis, GCN are assumed to be absent and of **less than local importance**.

12.3.57 Whilst few waterbodies have been identified in the study area, discrete areas of flushing in heather moorland and boggy ground provide potential spawn habitat for common toad, palmate newt and smooth newt. Surrounding heather moorland and rough grassland provides potential dispersal/ cover habitat. Coniferous plantations, boundary features (e.g. fence lines and stone walls) and grouse butts may provide potential hibernacula, which are locally present throughout the study area. Common toad is assumed to be present in suitable habitat; and incidental sightings of common toad have been noted during ecological walkover surveys; therefore, common toad are of **local importance**. Other species are assumed to be absent and of **less than local importance**.

Table 12-10: Great crested newt habitat suitability index

Factor	Pond 1		Pond 2		Pond 3		Pond 4	
	Category	HSI	Category	HSI	Category	HSI	Category	HSI
S1 - Location	Zone C	0.01	Zone C	0.01	Zone C	0.01	Zone C	0.01
S2 – Pond Area (m^2)	20	0.05	300	0.6	2458	-	360	0.7
S3 – Pond Drying	Never	0.9	Never	0.9	Never	0.9	Rarely	1
S4 – Water Quality	Good	1	Good	1	Good	1	Moderate	0.67
S5 - Shading	0%	1	0%	1	<5%	1	0%	1
S6 – Fowl Presence	Absent	1	Minor	0.67	Minor	0.67	Absent	1
S7 – Fish Presence	Possible	0.67	Possible	0.67	Possible	0.67	Absent	1
S8 – Ponds within 1km	1	0.45	1	0.45	No other ponds	0.1	No other ponds	0.1
S9 – Terrestrial Habitat	Moderate	0.67	Moderate	0.67	Good	1	Moderate	0.67
S10 – Macrophyte Coverage	5%	0.35	50%	0.8	60%	0.9	50%	0.8
HSI Score	**Poor**	**0.35**	**Poor**	**0.47**	**Poor**	**0.45**	**Poor**	**0.44**

Protected Vertebrates

Bats

12.3.58 A survey was carried out to record the presence of bat roost potential (BRP) features within the study area (see **Appendix 12.5, ES Volume 2**). Trees and man-made features supporting BRP features are detailed in **Table 12-11**.

Table 12-11: Summary of BRP features within the study area

Feature Name	Bat Roost Potential
Wade's Bridge	High
Lechden Plantation	Moderate
Railway Tunnel south of Crubenmore	Moderate
Wind-blown trees at Crubenmore	Low
Allt Coire Bhathaich Culvert	Moderate
Crubenmore Bridge	High/ Moderate

12.3.59 Emergence/ re-entry surveys were carried out at these locations during 2015 and 2016. Passive bat equipment was placed out to analyse bat passes in areas where emergence/ re-entry surveys were not possible. No bats were observed emerging from or entering the features during any of the surveys, and bat activity in the surrounding area was low. Therefore, roosting bats are considered to be absent from these features. A brief description for key species is presented in **paragraphs 12.3.60** to **12.3.65**.

Common pipistrelle (Pipistrellus pipistrellus)

12.3.60 No bat roosts were recorded during ecological surveys in 2015 or 2016. During emergence/ re-entry surveys, activity levels were low with small numbers of common pipistrelle observed foraging near the existing A9/ A889 junction at Dalwhinnie. Potential habitats throughout the study area comprise open ground of limited value to common pipistrelle; therefore, this species is of **local importance**.

Soprano pipistrelle (Pipistrellus pygmaeus)

12.3.61 No bat roosts were recorded during ecological surveys in 2015 or 2016. During emergence/ re-entry surveys, activity levels were low with small numbers of soprano pipistrelle observed foraging near the existing A9/ A889 junction at Dalwhinnie and Lechden plantation. Potential habitats throughout the study area comprise open ground and conifer plantations, which are of limited value to soprano pipistrelle; therefore, this species is of **local importance**.

Other bat species

12.3.62 Nathusius pipistrelle is a very rare bat. No records in the area were identified during the desk study or during 2015/ 2016 field surveys. Nathusius pipistrelle are assumed to be absent and of **less than local importance**.

12.3.63 There is one North East Scotland Biological Records Centre (NESBReC) record for brown long-eared bat, 1.29km from the northern extent of the study area in 1992. They were not recorded within the study area during 2015/ 2016 field surveys. As there are no recent records or sightings of brown long-eared bats, they are assumed to be absent and of **less than local importance**.

12.3.64 There is one NESBReC record of Daubenton's located approximately 300m beyond the study area at Dalwhinnie in 2001. Daubenton's were not recorded within the study area during 2015/ 2016 field surveys. As there are no recent records, Daubenton's are assumed to be absent and of **less than local importance**.

12.3.65 There were no records of Natterer's, Whiskered, Leisler's or Noctule identified within the study area during the desk study. They were not recorded within the study area during 2015/ 2016 field surveys. Natterer', Whiskered, Leisler's and Noctules are assumed to be absent and of **less than local importance**.

European Badger *(Meles meles)*

12.3.66 Badger are protected under the Protection of Badgers Act 1992. Scottish Badgers provided records of badger road mortalities, which indicates this species could be present in the wider landscape. Potential sett habitat within the study area is limited to coniferous plantation woodland to the east of the A9 between the Allt Coire Chuirn and Allt Bhathaich; as well as Lechden plantation and woodland around Crubenmore. No badger setts or evidence of badger activity was recorded within the study area in 2015 or 2016. Given badger are assumed to be present in the wider landscape, they are of **local importance**.

European Otter *(Lutra lutra)*

12.3.67 Highland Biological Recording Group (HBRG) provided one record of otter near the Allt Cuaich in 2010. Riparian vegetation around watercourse crossings provides potential holt habitat and watercourses and wetland areas provide potential foraging habitat.

12.3.68 No otter holts were recorded within the study area in 2015 or 2016. Evidence of otter activity was recorded during ecological surveys with spraints recorded around the River Truim and adjoining tributaries including the Allt Coire nan Cisteachan, Allt Bhathaich and Allt Cuaich. Activity levels are considered to be low overall and it is likely that potential habitats in the study area could be used seasonally when food supply is more abundant (e.g. fish migration).

12.3.69 No other signs of otter shelter (either hover or couch), were recorded. However, as otter evidence was recorded and they are a qualifying species of the River Spey SAC, they are considered to be of **international importance**.

Pine marten (*Martes martes*)

12.3.70 Pine marten are protected under the Wildlife and Countryside Act (1981) and are SBL species. Potential pine marten scat was recorded during the preliminary ecological survey in 2013 near the Allt Bhataich; however, no signs of pine marten were recorded during 2015/ 2016 protected vertebrate walkover surveys. The sheltering habitat and cover is sub-optimal, but can be used by mobile pine marten. As such, they are of **local importance**.

Red squirrel (*Sciurus vulgaris*)

12.3.71 Red squirrel is protected under the Wildlife and Countryside Act (1981). No records of red squirrel were identified during the desk study, and the species was not recorded during the 2015/ 2016 field surveys. The habitat within the study area is sub-optimal for red squirrel. It is considered that red squirrel is currently absent from the study area, and therefore they are **less than local importance**.

European wildcat (*Felis silvestris silvestris*)

12.3.72 European wildcat is an EPS, listed on the SBL and is a CNAP priority species. CNPA has highlighted one verified record of European wildcat where an animal road mortality was observed in 2012 near the Allt Coire nan Cisteachan (see **Drawing 12.37**, **ES Volume 3**). No incidental sightings of European wildcat were recorded within the study area during any of the ecological walkover surveys.

12.3.73 Coniferous plantation woodland, which may provide potential cover habitat for wildcat, is present to the east of the existing A9 between the Allt Coire Chuirn and the Allt Bhathaich. A small isolated area of woodland is present near the Allt Cuaich (Lechden plantation). Around these areas, the woodland edge and scrub, there may be potential commuting habitats. Heathland and grassland are widespread through all sections and may provide potential foraging habitats.

12.3.74 During 2015/ 2016 protected vertebrate surveys, no signs of wildcat were recorded; however, they are a mobile species, having potential to disperse into or through the area and there is some suitable habitat within the study area for them. On this basis, they are considered to be of **regional importance**.

Water vole (*Arvicola amphibius*)

12.3.75 Water vole is protected under the Wildlife and Countryside Act (1981) as amended, and a SBL species. Water vole have been recorded during the Phase 1 habitat survey (2014) at three locations within the study area. These records comprised of burrows, droppings, runs, and a water vole sighting.

12.3.76 During 2015/ 2016 protected vertebrate surveys, droppings consistent with water vole were recorded along a small stream between the HML railway and the A9, north of the Allt Cuaich. While no other field signs were identified within the study area, a few areas of suitable habitat were noted. These areas were re-surveyed in September 2016 and multiple additional field signs were identified within the study area. Water vole are therefore of **authority area importance**.

Atlantic salmon (*Salmo salar*)

12.3.77 Through consultation with SNH, SEPA and Spey Fishery Board (SFB), Atlantic salmon are known to occur throughout the River Truim near Dalwhinnie. In-channel features on the main-stem of the River Truim incorporate fish passage; therefore, Atlantic salmon have been observed spawning upstream of the study area towards Balsporran Cottages.

12.3.78 The Allt Cuaich and Allt Coire Bhathaich are both tributaries to the River Truim. Both watercourses are heavily abstracted as part of the SSE Tummel Hydro-scheme and, as a result, water levels are typically low under normal conditions. Whilst Atlantic salmon has been recorded upstream of the Allt Cuaich, neither watercourse is generally accessible or suitable for spawning Atlantic salmon under current conditions of low water levels and the presence of trash screens preventing upstream movement.

12.3.79 A fish habitat assessment was undertaken in December 2016 to identify and characterise fish habitat within proximity to major watercourse crossings (i.e. on 1:50,000 scale OS map). This included the Allt Coire nan Cisteachan, Allt Coire Uilleim and River Truim.

12.3.80 Substrates within the Allt Coire nan Cisteachan comprise gravels, pebbles and boulders with some deposition at the left side of the current crossing. Water flow is typically fast with riffles, with a typical depth of up to 0.5m. Potential salmonid spawning habitat is present immediately upstream and downstream of the crossing; however, a perched culvert (1.5m vertical drop) is noted where a cycle track crosses the watercourse downstream, which will limit fish access.

12.3.81 Substrates within the Allt Coire Uilleim comprise gravels, pebbles and boulders with some deposition at the south side of the current crossing. Water flow is typically moderate with a typical depth of up to 0.3m. No obvious in-channel barriers to fish passage are present; therefore, potential salmonid spawning habitat is present immediately upstream and downstream of the crossing.

12.3.82 Substrates within proximity to the River Truim comprise sands, gravels, pebbles and boulders; as well as some visible bedrock. Water flow is typically fast with riffles and a typical depth of approximately 1m, with a pool-riffle system visible upstream. No obvious in-channel barriers to fish passage are present; therefore, salmonid spawning habitat is present immediately upstream and downstream of the crossing.

12.3.83 Given that Atlantic salmon are present within the River Truim, they are likely to be present in suitable spawning habitat at the crossing of the River Truim, Allt Coire nan Cisteachan and Allt Coire

Uilleim. Discrete areas of spawning habitat are also likely to occur around the confluence between the River Truim and associated tributaries. Atlantic salmon are a qualifying feature of the River Spey SAC and act as a host species to FWPM larvae, which is also a qualifying feature of the River Spey SAC. On this basis, Atlantic salmon are of **international importance**.

Sea lamprey (*Petromyzon marinus*)

12.3.84 Through consultation with SNH, SEPA and Spey Fishery Board (SFB), there are no records of sea lamprey for the River Truim, with the nearest confirmed record noted downstream on the River Spey towards Newtonmore (APEM 2004). Site condition monitoring (SCM) data for the River Spey SAC, highlights that supporting habitat for sea lamprey is generally sub-optimal upstream of Newtonmore.

12.3.85 During the fish habitat assessments, potential sea lamprey spawning habitat was found in similar areas to those highlighted for Atlantic salmon; however, there was generally a lack of fine sediments (e.g. silt) needed for sea lamprey larval development (Maitland *et al*. 2003). SFB has noted that lamprey species are often encountered during electro-fishing surveys; although they are not target species for electro-fishing surveys and typically identified only to genus level.

12.3.86 Whilst no records of sea lamprey have been identified within the study area, there is potential for this species to be present in spawning habitat. No juveniles are expected to be encountered with optimal nursery habitats located downstream of the River Truim. On the basis of sea lamprey being a qualifying feature of the River Spey SAC and that there could be habitats downstream with hydrological connection, this species is of **international importance**.

Freshwater pearl mussel (*Margaritifera margaritifera*)

12.3.87 Site condition monitoring (SCM) data for the River Spey SAC highlights an historical presence of FWPM within the mid to lower reaches of the River Spey. The River Truim (River Spey SAC) was subject to a shallow-water FWPM walkover survey. In summary, the survey found that in-channel sediments are unstable and mobile and lack the finer sediments needed for juvenile FWPM to bind with. No FWPM were found within the study area and potential habitat was found to be largely unsuitable for FWPM.

12.3.88 A new population of FWPM was discovered on the River Truim (see **Appendix 12.8**, **ES Volume 2**); although this was located beyond the study area, it has direct hydrological connectivity to the crossing under or running directly adjacent to the exiting route corridor.

12.3.89 On the basis of FWPM being a qualifying feature of the River Spey SAC, this species is of **international importance**.

Wood Ant

12.3.90 Four wood ant species are specified in the CNAP including Scottish wood ant *Formica aquilonia*, hairy wood ant *Formica lugubris*, narrow-headed wood ant *Formica exsecta* and the shining guest ant *Formicoxenus nitidulus*. Forestry Commission Scotland notes that Scottish wood ant and hairy wood ant are 'true' mound-building wood ants, with the narrow-headed wooded ant a closely related species which is included on the Scottish Biodiversity List (SBL) and International Union for Conservation of Nature (IUCN) Red List as endangered. Therefore, this assessment will focus on the three *Formica* species.

12.3.91 Whilst the three *Formica* species are broadly associated with woodland habitats, there are differences in habitat preference. As described by the Forestry Commission (2007), nests belonging to Scottish wood ant and hairy wood ant tend to be located within the woodland edge of mature Caledonian pine forests. Furthermore, Scottish wood ant tend to be more tolerant of established

pine forests containing more mature trees and dense understory, with hairy wood ant seeking a more open woodland structure. Nests belonging to narrow-headed wood ant are generally found in habitats beyond the woodland edge that contain native shrubs and naturally regenerating trees.

12.3.92 The Phase 1 habitat survey notes woodland within the study area in a number of locations, generally in the eastern extent, between the Allt Coire Chuirn and the Allt Bhathaich. The coniferous woodland present within the study area comprises a monoculture of sitka spruce *Picea sitchensis*. The limited species and structural diversity offers limited wood ant nest building habitat. Other categories of woodland within the study area include mixed plantation woodland, broadleaved plantation woodland and broadleaved semi-natural woodland. These categories are less frequent and present in small isolated patches or thin strips within the study area.

12.3.93 A search for potential habitat features, including nests, was carried out within accessible areas of woodland. In line with current guidance (Hughes & Broome 2007), the survey included a systematic visual inspection of woodland edges, rides and glades within, and up to 50m from the study area. No wood ant nests were recorded in woodland areas; therefore, they are of **less than local importance**.

CNPA draft priority non-protected species

12.3.94 The CNPA desktop review highlighted three red (highest priority) areas and 11 amber (high priority) areas within the study area. Details of these priority areas and associated interest group (interest groups are made up of various fungi types, invertebrates and plant species which are related to, and dependant on, the relevant habitat types) is provided in **Table 12.12**.

Table 12-12: Potential habitat features – CNPA priority non-protected species

Habitat feature	Interest Group	Red/ Amber	Location
Fen – valley mire	Lepidoptera	Amber	West of A9 between ch. 22,300 to ch. 22,650
Fen – valley mire	Lepidoptera	Amber	East of A9 between ch. 22,950 to ch. 23,550
Wet heath	Lepidoptera	Amber	West of A9 between ch. 23,450 to ch. 23,750
Wet heath	Lepidoptera	Amber	East of A9 between ch. 24,150 to ch. 24,300
Dry heath/ acid grassland	Fungi	Amber	West of A9 between ch. 23,950 to ch. 24,550
Dry heath/ acid grassland	Fungi	Amber	West of A9 between ch. 25,200 to ch. 25,400
Dry dwarf shrub heath – acid	Lepidoptera (if bearberry is present)	Amber	East of A9 between ch. 25,500 to ch. 25,700
Road cutting, abundant bearberry present	Lepidoptera and fungi	Red	East of the A9 at ch. 26,700
Calcareous grassland – semi-improved	Fungi and botanical	Red	West of A9 between ch. 26,900 to ch. 27,700
Dry dwarf shrub heath – basic	Fungi	Amber	East of A9 between ch. 27,850 to ch. 28,000
Calcareous grassland - unimproved	Fungi and botanical	Red	West of A9 between ch. 28,950 to ch. 29,050
Dry dwarf shrub heath – acid	Lepidoptera and fungi (if bearberry present)	Amber	East of the A9 between ch. 29,150 to ch. 30,550
Dry dwarf shrub heath – acid	Mature trees have potential for lichen; as well as lepidoptera and fungi (if bearberry present)	Amber	East of A9 between ch. 30,350 to 31,050

Features scoped out from further assessment

12.3.95 In order to focus the assessment on key constraints, features that are absent or are considered to be of less than local importance within the study area have been scoped out from further assessment including:

- Ramsar sites
- National Nature Reserves
- Local Nature Reserves
- Ancient woodland
- Non-NVC habitat features which do not correlate with notable habitats (excluding non-NVC woodland communities)
- Invasive non-native species
- Capercaillie
- Great crested newt, palmate newt and smooth newt
- Nathusius pipistrelle, brown long-eared, Daubenton's, natterer's, whiskered, Leisler's and noctule bats
- Red squirrel
- Wood ant.

12.4 Potential Impacts

Introduction

12.4.1 The Proposed Scheme has the potential to result in both beneficial and adverse impacts on ecology and nature conservation. Potential beneficial impacts may be associated with the removal of existing barriers to species' movement, as well as the provision of SuDS features to enhance the aquatic environment. Adverse impacts would generally be related to:

- Direct loss of habitat
- Fragmentation and isolation of habitats through severance
- Disturbance of habitats and the water environment, including pollution and sedimentation
- Increased animal road mortality
- Disturbance of species during construction

12.4.2 Impacts can be temporary or permanent in nature. Temporary impacts will occur during the construction phase and are generally short lived. Permanent impacts are associated with those that generally occur during the operational phase of the Proposed Scheme; however, some permanent impacts are associated with land take during construction.

12.4.3 An air quality assessment of the Proposed Scheme has been undertaken on ecological designated sites (see **Chapter 16, ES Volume 1**). The associated impacts for each individual site, as well as for notable habitats, are detailed within the Operational Phase. As faunal species are not sensitive to nitrogen deposition, no adverse impacts are anticipated and are not discussed further. An air quality assessment on temporary construction activities in relation to dust was assessed within 20m and 50m of the Proposed Scheme works boundary.

Embedded Mitigation

12.4.4 Throughout the DMRB Stage 3 iterative design process, a number of environmentally led workshops considered each aspect of the developing design and made recommendations for certain features to be included in the next design iteration. These aspects have been defined as 'embedded mitigation' and, where they are included in the Proposed Scheme, they are considered within the context of the impact assessment as providing mitigation to avoid or reduce environmental impacts, and in some cases, provide environmental benefits and a net gain for biodiversity. The impact assessment therefore assesses the Proposed Scheme design, which includes the embedded mitigation.

12.4.5 With respect to ecological features under consideration in this assessment, the relevant aspects of embedded mitigation include:

- Ecological permeability has been incorporated into watercourse crossings and structures (e.g. bridges). This includes provision of mammal ledges above the 1 in 50 year flood level (see **Table 12-13**). These crossings are designed for medium sized mammals such as otter, badger, wildcat and pine marten. Locations of mammal ledges were identified following a review of exiting crossings and observations of animal road mortalities (e.g. Scottish Badgers).
- Based on review of national deer vehicle collision (DVC) data (see **Appendix 12.9**, **Volume 2**), identification of safe deer crossing opportunities and inclusion of deer provision into crossing designs, where possible, as noted in **Table 12-13**.

- Permeability provisions including existing and embedded mitigation have been identified and can be found in **Table 12.13**.
- Where practicable, natural bed material has been incorporated into the design of watercourse crossings to create suitable hydromorphological habitat for aquatic species such as Atlantic salmon
- The earthworks extent within designated sites and/ or areas of protected/ notable habitat has been avoided in the first instance then reduced as far as possible and therefore encroachment in to designated sites has been minimised

12.4.6 The Proposed Scheme drainage incorporates at least two levels of SuDS treatment (a minimum requirement in line with planning policy and published SEPA guidance), with some places incorporating enhanced treatment via micro-pools and swales (see **Chapter 11**, **ES Volume 1**).

12.4.7 Geomorphological features in the Proposed Scheme design include:

- Scour protection for bridge abutments and culvert inlets/ outlets
- Ensuring low flows under bridges and at outfalls to reduce scour risk (e.g. baffles)
- Setting back of structures from river banks to allow natural channel migration and encourage sediment transfer through the catchment
- Watercourse realignments designed to convey 200 year flows with improved sinuosity to mimic natural sediment regime/ morphological conditions and encourage establishment of natural sediment transfer/ processes
- Cascades follow natural topography where possible
- Inclusion of scour pools upstream and downstream of steep culverts to dissipate energy
- Reduce upstream head cutting to improve stability of channels
- Considered positioning of access tracks to improve watercourse morphology

Table 12-13: Project-wide permeability

Chainage	Hydro ID	Watercourse/ Structure	Structure Height/ Clearance (m)	Culvert Dimensions (mm)	Distance from Previous Crossing Provision (m)
ch. 20,750	72	Allt Coire nan Cisteachan underbridge. Mammal ledge provided. Suitable for medium sized mammals.	~0.6m		-
ch. 21,400	Hydro ID 77	Allt Coire Uilliem underbridge. Suitable for large sized mammals.	~1.4m		650
ch. 22,100	Hydro ID 81	Culvert with mammal ledge provided. Suitable for medium sized mammals.		2700 X 1000 Box (Roof Slab 250)	700
ch. 22,240	Hydro ID 82	Allt Coire Bhathaich underbridge. Mammal ledge provided. Suitable for large sized mammals.	~3m		140
ch. 22,550	access underpass	River Truim overbridge. Suitable for large sized mammals.	~2.2m		310
ch. 22,780	Sheep creep	Sheep creep. Suitable for medium sized mammals.	1.8m		230
ch. 25,400	Hydro ID 100	Culvert with mammal ledge provided. Suitable for small/ medium sized mammals.		2250 x 1500 box [Roof slab 225mm]	2620
ch. 25,850	access underpass	Cuaich Underpass. Suitable for large sized mammals.	~3.3m		450
ch. 26,050	Hydro ID 104	Allt Cuaich Underbridge. Suitable for large sized mammals.	~5-5.8m		200
ch. 26,600	Hydro ID 107	Culvert with mammal ledge provided. Suitable for medium sized mammals.		2000 x 1000 box [Roof slab 225mm]	550

Chainage	Hydro ID	Watercourse/ Structure	Structure Height/ Clearance (m)	Culvert Dimensions (mm)	Distance from Previous Crossing Provision (m)
ch. 26,920	Hydro ID 109	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	320
ch. 27,460	Hydro ID 111	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	540
ch. 27,725	Hydro ID 112	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	265
ch. 27,830	access underpass	Dalannach Underpass. Suitable for large sized mammals	~3.3m		105
ch. 27,900	Hydro ID 114	Culvert with mammal ledge provided. Suitable for medium sized mammals.		2400 x 1000 [Roof slab 225mm]	70
ch. 28,550	Hydro ID 118	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 box [Roof slab 200mm]	650
ch. 29,150	Hydro ID 121	Allt Garbh Underbridge. Suitable for large sized mammals.	~2.3m		600
ch. 29,425	Hydro ID 123	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	275
ch. 29,510	Hydro ID 124	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	85
ch. 29,590	Hydro ID 125	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	80
ch. 30,510	Hydro ID 129	Culvert with mammal ledge provided. Suitable for medium sized mammals.		1500 x 1000 [Roof slab 200mm]	920
ch. 30,650	Hydro ID 130	Allt na ceardaich underpass. Suitable for large sized mammals.	3m		140

Designated Sites

12.4.8 The Proposed Scheme results in unavoidable overlap with statutory designated sites (see **Table 12-14**), which will result in permanent and temporary impacts. Potential impacts on each site are discussed in **Paragraphs 12.4.10** to **12.4.30**.

12.4.9 Separate Habitats Regulations Appraisals (HRA) have been undertaken for the Drumochter Hills SPA, Drumochter Hills SAC and the River Spey SAC. These HRAs concluded that permanent and temporary effects will not result in any adverse effect on site integrity (AESI).

Table 12-14: Summary of encroachment into statutory designated sites

Designated site name (Total area)	Area of designated site temporarily affected by Proposed Scheme (ha)	Percentage of designated site temporarily affected by Proposed Scheme (%)	Area of designated site permanently lost to Proposed Scheme (ha)	Percentage of designated site permanently lost to Proposed Scheme (%)
Drumochter Hills SPA (9,431.89 ha)	0.29	<0.01	0.20	<0.01
Drumochter Hills SAC (9,439.48 ha)	0.29	<0.01	0.20	<0.01
Drumochter Hill SSSI (9,688.13 ha)	9.28	0.09	6.81	0.07
River Spey SAC (5,759.72 ha)	0.07	<0.01	0.03	<0.01

Drumochter Hills SPA

Temporary Impacts – Construction Phase

12.4.10 No merlin nests are present within at least 500m of the existing A9, although they are known to be present in the locality and there is potential for merlin to move into suitable nesting habitat within and adjoining the Proposed Scheme. Localised improvements to the Drumochter Estate access track will be carried out within the SPA, which could result in disturbance to merlin through as a result of increased noise levels and human presence. Therefore, a **Low adverse** impact will occur, which is significant.

Permanent Impacts – Operational Phase

12.4.11 The permanent works boundary extends into the Drumochter Hills SPA, where the Drumochter Estates access track crosses the Allt Coire Chuirn. Localised improvements to the track surface and drainage do not require additional land-take or vegetation clearance beyond previously disturbed ground; therefore, no habitat loss will occur.

12.4.12 Traffic on the Drumochter Estate access track will be extremely light and infrequent, typically used by estate vehicles. Noise modelling carried out for the Proposed Scheme (see **Chapter 17**, **ES Volume 1**) predicts a -1.2 decibel (dB) decrease from the current noise levels within proximity to the SPA in 2026, increasing by 0.1dB by 2041 (see **Drawing 12.56**). This 0.1dB increase is unperceivable and not expected to be discernible to merlin or dotterel in the wider landscape. Therefore, no significant change to noise levels will occur and no permanent disturbance to merlin in the wider landscape is anticipated.

12.4.13 Air quality assessments for the Proposed Scheme have been undertaken in association with the Drumochter Hills SPA. The air quality assessment on the designated site found that nitrogen oxides (NOx) concentrations attributed to the Proposed Scheme will not constitute a significant effect on the designated site, as the Proposed Scheme will not exceed NOx threshold values for relevant habitats which may be utilised by SPA qualifying species (see **Chapter 16**). Therefore, no impacts due to air quality are predicted for the qualifying interests.

12.4.14 A long-term **Negligible** impact will occur on the Drumochter Hills SPA, which is not significant.

Drumochter Hills SAC

Temporary Impacts – Construction Phase

12.4.15 The Drumochter Estate access track borders the SAC boundary (with a small area of encroachment into the SAC at the Allt Coire Chuirn crossing) from the start of the Proposed Scheme extents to ch. 20,600, as shown on **Drawing 12.2** in **ES Volume 3**. The track follows the route of the existing access track used for the construction of the Beauly to Denny Powerline. Construction activities will generally be limited to localised improvements to drainage and the track surface. The re-aligned crossing of the Allt Coire Chuirn may increase habitat disturbance within the SAC from earthworks and drainage; although works will generally be limited to areas disturbed by previous construction work and habitat reinstatement. Therefore, a **Low adverse** impact will occur, which is significant.

Table 12-15: SAC qualifying habitat affected during the construction phase

Annex 1/ SAC Qualifying Interest		NVC recorded in Proposed Scheme	Total Area (ha)	% of total Annex 1 habitat type in the SAC	% of total SAC
Code	SAC Qualifying Habitat (Total area of qualifying habitat within SAC)				
4010	Northern Atlantic wet heaths with *Erica tetralix* (218.05 ha)	M15	0.13	0.06	<0.01 (0.001)
4030	European dry heaths (2,256.98 ha)	H12	0.08	<0.01 (0.003)	<0.01 (0.004)
7130	Blanket bogs (2,166.36 ha)	M17	0.00	0.00	0.00

Permanent Impacts – Operational Phase

12.4.16 The permanent works boundary extends into the Drumochter Hills SAC, where the Drumochter Estates access track crosses the Allt Coire Chuirn. Localised improvements to the track surface and drainage do not require additional land-take or vegetation clearance beyond previously disturbed ground; therefore, no additional habitat loss will occur.

12.4.17 An air quality assessment for the SAC found that oxides of nitrogen (NOx) concentrations, attributed to the Proposed Scheme, will not constitute a significant effect on qualifying habitat within the site, as the Proposed Scheme does not lead to any exceedances of the NOx objective (30µg m-3). Full details can be found in **Chapter 16** in **Volume 1**.

Table 12-16: Permanent loss of SAC qualifying habitat

Annex 1/ SAC Qualifying Interest		NVC recorded in Proposed Scheme	Total Area of permanent loss within SAC (ha)	% of total Annex 1 habitat type in the SAC	% of total SAC
Code	SAC Qualifying Habitat (Total area of qualifying habitat within SAC)				
4010	Northern Atlantic wet heaths with *Erica tetralix* (218.05 ha)	M15	0.02	<0.01	<0.01
4030	European dry heaths (2,256.98 ha)	H12	<0.01	<0.01	<0.01
7130	Blanket bogs (2,166.36 ha)	M17	0.00	0.00	0.00

12.4.18 A long-term **Negligible** impact will occur on the Drumochter Hills SAC, which is not significant.

River Spey SAC

Temporary Impacts – Construction Phase

12.4.19 Construction works may result in an increased risk of sedimentation and water pollution to the SAC. Encroachment into the River Spey SAC may be required to install temporary SuDS features and watercourse crossings, which could affect riparian habitat with a potential decrease in water quality. Undertaking works to install watercourse crossings will result in a temporary increase in noise, vibration and visual disturbance to aquatic species, which may result in temporary fragmentation of habitats used. Construction activities may lead to a short-term incident, but reversible in nature. However, if during construction a serious pollution incident occurred, the impact could have long-term adverse effects on the qualifying features of the site, therefore the Proposed Scheme presents a **Medium adverse** impact, which is significant.

Permanent Impacts – Operational Phase

12.4.20 Permanent encroachment into the River Spey SAC will be required, which will result in extremely localised loss of riparian vegetation to facilitate new SuDS outfalls. No permanent in-channel features will be installed within the main channel of watercourses within the SAC.

12.4.21 The proposed crossing of the River Truim will result in permanent, albeit extremely localised, in-channel shading. The linear nature of the River Truim will be maintained and bankside vegetation will naturally regenerate; therefore, no long-term fragmentation will occur. In-channel scour may occur around new SuDS outfalls; although the effect would be localised and habitats supporting aquatic species are widespread throughout the River Truim, therefore the impact at these locations would be negligible.

12.4.22 The installation of SuDS features would not result in exceedance of Environmental Quality Standards (EQS) threshold values; therefore, no long-term decrease in water quality is expected (see **Chapter 11**, **ES Volume 1**).

12.4.23 A **negligible** impact will occur on the River Spey SAC, which is not significant.

Drumochter Hills SSSI

Temporary Impacts – Construction Phase

12.4.24 During construction, increased noise, vibration, visual disturbance, along with the possible use of lighting for night-time working, could affect the breeding bird assemblage. Impacts upon breeding birds are covered in more detail within **Paragraphs 12.4.54** to **12.4.59**. Works for the Drumochter Estate access track will generally be limited to localised improvements to drainage and the track surface. Earthworks for the re-aligned crossing of the Allt Coire Chuirn, as well as the mainline, will increase habitat disturbance within the SSSI; although works will generally be limited to areas disturbed by previous decommissioning works (removal of former Beauly to Denny power line) and snow-belt tree planting. Affected areas within the SSSI are limited to conifer plantation woodland adjoining the existing A9 corridor; as well as areas of previously disturbed ground adjoining the former BDL construction access track (see **Paragraphs 12.4.37** to **12.4.39**).

12.4.25 From the southern section tie-in, ch. 0 to ch. 22,200, all construction activities to the east of the existing A9 are taking place within the SSSI. No habitats for which the site is designated for occur in these areas; although, habitats that could support the breeding bird assemblage may be disturbed; therefore, a **Medium adverse** impact will occur and is significant.

Permanent Impacts – Operational Phase

12.4.26 Road infrastructure, embankments, SuDs and access tracks will result in the permanent loss of 6.81ha of habitat within the SSSI (approximately 0.07% of the whole SSSI). The total loss is confined to areas within or adjoining the existing A9 corridor, as shown on **Drawings 12.2** in **ES Volume 3**. Therefore, montane assemblages are not expected to be damaged by the Proposed Scheme.

12.4.27 The winter resilience planting is in the place of current tree planting, therefore during works there will be no new encroachment into the SSSI.

12.4.28 Noise modelling carried out for the Proposed Scheme (see **Chapter 17**, **ES Volume 1**) predicts a 0.7dB increase from the current levels, within proximity to the SSSI in 2026, increasing further by 0.3dB by 2041 (see **Drawing 12.56, ES Volume 3**). Given that the breeding bird assemblage is not present within proximity to the mainline, an increase in operational noise is not expected to affect

this notified feature of the SSSI. In addition, traffic expected on the Drumochter Estates access track will be extremely light and infrequent, as it will be used by estate vehicles.

12.4.29 Air quality assessments for the Proposed Scheme have been undertaken in relation to habitats associated with the Drumochter Hills SSSI. Notable habitats within the Proposed Scheme correspond to interest features of the SSSI, therefore the impacts associated with the SSSI apply also to notable habitats. The air quality assessment on the designated site found that nitrogen oxides (NOx) concentrations attributed to the Proposed Scheme will not constitute a significant effect on the designated site, as the Proposed Scheme will not exceed NOx threshold values for relevant habitats (see **Chapter 16**, **ES Volume 1**). Therefore, no impacts due to air quality are predicted for notable habitats.

12.4.30 Permanent loss of habitat from within the SSSI, and in proximity to the existing A9 corridor, will result in a **Medium adverse** impact and is significant.

Notable Habitats

12.4.31 Notable habitats within the temporary and permanent works boundaries are presented in **Table 12-17** and **Table 12-18** respectively. The Proposed Scheme will result in habitat loss within the permanent works boundary where new road infrastructure is to be provided including the new carriageway earthworks and surface, drainage assets, watercourse diversions and structures. In these areas, habitat loss will be permanent. Furthermore, new infrastructure and winter resilience tree-planting has the potential to disrupt hydrology and increase shading, which could affect the composition and structure of vegetation communities within adjoining notable habitats.

12.4.32 Construction activities within the permanent and temporary works boundaries may result in further habitat loss and/ or deterioration through vehicle movements, temporary storage, temporary SuDS and increased dust. No permanent infrastructure is required to facilitate ancillary works and depending on the sensitivity of affected habitats to short-term disturbance, potential effects may be temporary.

12.4.33 As well as direct loss, new and extended cuttings may intercept groundwater and affect local hydrogeological regimes, which will be most extensive to the east of the existing A9. Pre-earthworks drainage is included within the Proposed Scheme to minimise potential disruption to groundwater; however, short-term and long-term habitat deterioration may occur leading to habitat change or loss beyond the permanent and temporary work boundaries. Therefore, an assessment of potential GWDTE has been carried out to determine potential effects from short-term construction activities and long-term changes to groundwater regimes (see **Appendix 10.2**, **ES Volume 2**).

12.4.34 Vegetation communities are sensitive to air pollution. Therefore, an assessment has been carried out to determine potential effects on notable habitats from temporary elevations in dust and particulates (PM10) during construction. Considering the prevailing climatic conditions in the area (e.g. open landscape with high annual precipitation levels), temporary deposition of construction dust and particulates, temporary effects will be extremely localised and small in scale

12.4.35 An assessment has been carried out to determine long-term increases in nitrogen oxide (NOx) deposition (see **Chapter 16**, **ES Volume 1**). Critical loads for notable habitats have been assessed using pre-determined NOx threshold values for habitats associated with Natura2000 sites and Sites of Special Scientific Interest (e.g. 30 µg/m³).

12.4.36 Permanent and temporary impacts on notable habitats identified within the study area are described in **paragraphs 12.4.37 to 12.4.53**.

Temporary Impacts – Construction Phase

Table 12-17: Summary of temporary disturbance to notable habitats

Notable Habitat	Total resource within study area (ha)	Temporary works		Impact
		Area (ha)	Proportion of total resource (%)	
European dry heaths *(NVC: H10, H12, H16, H18, H21)*	241.37	27.99	11.60	Medium
Northern Atlantic wet heaths *(NVC: M15, M16)*	207.84	16.20	7.79	Medium
Non-priority grasslands *(NVC: M2, U1, U2, U4, U5, U6, U20, OV27)*	153.92	14.59	9.48	Medium
Blanket bogs *(M1, M3, M17, M19, M20, M25)*	48.24	6.85	14.20	Medium
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M29, M32, M37, S9, S19)*	12.23	0.49	4.01	Low
Upland birchwoods *(NVC: W11, W17)*	5.27	0.52	9.87	Medium
Wet grasslands *(NVC: MG9, MG10, M23b)*	1.62	0.28	17.28	Medium
Non-priority woodlands *(NVC: W18, W23)*	0.18	0.06	33.33	High
Transition mires and quaking bogs *(NVC: M4, M5)*	3.12	<0.01 (0.002)	0.10	Low

12.4.37 The extent of European dry heaths could be reduced by approximately 27.99 hectares during the construction phase, primarily as a result of vegetation clearance and disturbance to peaty soils. Impacts will be limited to areas within and directly adjacent to the existing A9 throughout the Proposed Scheme, which account for over 11% of the total dry heath resource in the study area. Dry heaths are sensitive to temporary disturbance, particularly where surface vegetation is damaged or removed, as typical species that characterise dry heath communities may be slow to recover in the short-term. Given the localised scale and temporary nature of disturbance to dry heaths, construction activities will have a **Medium adverse** impact and is significant at the level of the Proposed Scheme. Given that dry heaths are common within the study area, widespread within the adjoining Drumochter Hills and ubiquitous throughout Scotland, this scale is not sufficient to affect the wider integrity or conservation status of European dry heaths.

12.4.38 The extent of Northern Atlantic wet heaths could be reduced by approximately 16.20 hectares during the construction phase, primarily as a result of vegetation clearance and disturbance to peaty soils. Impacts will be limited to areas between ch. 22,200 and ch. 22,900; as well as areas adjoining the former BDL construction access track. Out with these areas, impacts are limited to very small stands indicative of low-lying ground as opposed to an extensive wet heath ecosystem. In total, these impacts account for nearly 8% of the total resource identified within the study area. Wet heaths are sensitive to temporary disturbance, particularly where surface vegetation is damaged or removed, as typical species that characterise wet heath communities may not recover in the short-term. Given the localised scale and temporary nature of disturbance to wet heaths, construction activities will have a **Medium adverse** impact and is significant.

12.4.39 The extent of blanket bogs could be reduced by approximately 6.85 hectares during the construction phase, primarily as a result of vegetation clearance and disturbance to peaty soils. Impacts will be limited to the east of the existing A9 between ch. 22,600 and ch. 23,300; as well as between ch. 24,450 and ch. 24,950. Out with these areas, impacts are limited to very small stands indicative of blanket bog communities over locally deep peat as opposed to an extensive blanket bog ecosystem. In total, these impacts account for some 14% of the total resource identified within the study area. Blanket bogs are very sensitive to temporary disturbance, particularly where surface vegetation is damaged or removed, as typical species that characterise blanket bog

communities may not recover. Given the localised scale and temporary nature of disturbance to blanket bogs, construction activities will have a **Medium adverse** impact and is significant.

12.4.40 Construction activities could reduce the extent of transition mires and quaking bogs by approximately 0.01 hectares, primarily as a result of vegetation clearance and disturbance to peaty soils. Impacts will be limited to a single stand located to the east of the existing A9 areas near ch. 22,150, which accounts for less than 1% of the total resource identified within the study area. Given the extremely localised scale and temporary nature of disturbance, construction activities will have a **Low adverse** impact and is not significant.

12.4.41 Construction activities could reduce upland flushes, fens and swamps by 0.49 hectares, primarily as a result of vegetation clearance and disturbance to soils. Impacts will be limited to localised areas to the west of the existing A9 at ch. 25,600 and ch. 29,500; as well as areas adjoining the former BDL construction access track near ch. 20,100. In total, this accounts for around 4% of the total resource identified within the study area. Given the extremely localised scale and temporary nature of disturbance, construction activities will have a **Low adverse** impact and is not significant.

12.4.42 The extent of non-priority grasslands could be reduced by 14.59 hectares during the construction phase, primarily as a result of vegetation clearance and disturbance to soils. Impacts will occur throughout the Proposed Scheme but limited to areas within and adjoining the existing A9 corridor. In total, this accounts for less than 10% of the total resource identified. Non-priority grasslands are ubiquitous and generally of limited botanical interest; therefore, construction activities will have a **Medium adverse** impact and is not significant.

12.4.43 The extent of upland birchwoods could be reduced by 0.52 hectares as a result of site clearance during the construction phase. Impacts are limited to woodland near Dalwhinnie at ch. 21,400 (existing A9/A889 junction); as well as the northern extent of the Proposed Scheme between ch. 30,500 and ch. 31, 050. In total, this accounts for less than 10% of the total resource identified within the study area. Woodland loss would be permanent; therefore, construction activities will have a **Medium adverse** impact and is not significant.

12.4.44 Construction activities will reduce wet grassland by 0.28 hectares during the construction phase, primarily as a result of vegetation clearance and disturbance to soils. Impacts will occur to the west of the existing A9 at ch. 21, 950, which accounts for approximately 17% of the total resource identified within the study area. Given the localised scale of temporary disturbance, construction activities will have a **Medium adverse** impact and is not significant.

12.4.45 Construction activities will reduce the extent of non-priority woodlands by 0.06 hectares as a result of site clearance during the construction phase. Impacts are limited to a single stand of W18 *Pinus sylvestris – Hylocomium splendens* woodland near Dalwhinnie at ch. 21,400 (existing A9/A889 junction). In total this, this accounts for approximately 33% of the total resource identified in the study area. Woodland loss will be permanent; therefore, construction activities will have a **High adverse** impact and not significant due to their limited conservation status.

Permanent Impacts – Operational Phase

Table 12-18: Summary of permanent loss of notable habitats

Notable Habitat	Total resource within study area (ha)	Permanent infrastructure		Impact
		Area (ha)	Proportion of total resource (%)	
European dry heaths *(NVC: H10, H12, H16, H18, H21)*	241.37	29.47	12.21	Medium
Northern Atlantic wet heaths *(NVC: M15, M16)*	207.84	15.57	7.501	Medium
Non-priority grasslands *(NVC: M2, U1, U2, U4, U5, U6, U20, OV27)*	153.92	12.95	8.41	Medium
Blanket bogs *(M1, M3, M17, M19, M20, M25)*	48.24	4.33	8.98	Medium
Upland birchwoods *(NVC: W11, W17)*	5.27	0.46	8.73	Medium
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M29, M32, M37, S9, S19)*	12.23	0.09	0.74	Low
Non-NVC woodlands *(Plantation: broadleaved/mixed/ conifer)*	34.73	6.18	17.80	Medium

12.4.46 The Proposed Scheme will permanently reduce the extent of European dry heath by 29.47 hectares, which accounts for 12.21% of the total dry heath resource identified in the study area. Loss of this habitat to infrastructure will be irreversible and permanent. Dry heaths are not sensitive to changes in groundwater and no exceedance in NOx threshold values are predicted in adjoining areas of dry heath; therefore, no additional indirect habitat loss or change in species composition is anticipated. Direct losses at the predicted scale will result in a **Medium adverse** impact and is significant at the level of the Proposed Scheme. Given that dry heaths are common within the study area, widespread within the adjoining Drumochter Hills and ubiquitous throughout Scotland, this scale is not sufficient to affect the wider integrity or conservation status of European dry heaths.

12.4.47 The Proposed Scheme will reduce the extent of Northern Atlantic wet heaths by 15.57 hectares, which accounts for 7.50% of the total wet heath resource identified in the study area. Mosaics dominated by wet heath communities will largely be impacted by the land take for the new carriageway and associated infrastructure. The Proposed Scheme could lead to permanent changes to local hydrological regimes; however, no discernible effect is expected beyond the earthworks extent (see **Chapter 10** in **ES Volume 1**); therefore, no indirect loss of wet heath is predicted. No exceedance in NOx threshold values are predicted in adjoining areas of wet heath. Direct losses at the predicted scale will result in a **Medium adverse** impact, which is significant.

12.4.48 The Proposed Scheme will reduce the extent of blanket bog by 4.33 hectares, which accounts for 8.98% of the total blanket bog resource identified in the study area. Loss of this habitat to infrastructure will be irreversible and permanent. The Proposed Scheme could lead to permanent changes to local hydrological regimes; however, no discernible effect is expected beyond the earthworks extent (see **Chapter 10** in **ES Volume 1**); therefore, no indirect loss of blanket bog communities is predicted. No exceedance in NOx threshold values are predicted in adjoining areas supporting blanket bog communities. Direct losses at the predicted scale will result in a **Medium adverse** impact and is significant.

12.4.49 The Proposed Scheme will reduce the extent of upland flushes, fens and swamps by 0.09 hectares, which accounts for less than 1% of the total resource identified within the study area. Loss of a single stand of M6 *Carex echinata – Sphagnum fallax/denticulatum* mire to infrastructure will be irreversible and permanent. The Proposed Scheme could lead to permanent changes to local hydrological regimes; however, no discernible effect is expected beyond the earthworks extent (see **Chapter 10** in **ES Volume 1**); and no indirect loss of upland flushes, fens and swamps is predicted.

No exceedance in NOx threshold values are predicted in adjoining areas supporting associated communities. Direct losses at the predicted scale will result in a **Low adverse** impact and is not significant.

12.4.50 The Proposed Scheme will permanently reduce the extent of non-priority grassland by 12.93 hectares, which accounts for 8.40% of the total resource in the study area. Loss of this habitat to infrastructure will be irreversible and permanent. The Proposed Scheme could lead to permanent changes to local hydrological regimes; however, no discernible effect is expected beyond the earthworks extent (see **Chapter 10** in **ES Volume 1**); therefore, no indirect loss of non-priority grasslands is predicted. No exceedance in NOx threshold values are predicted in adjoining areas supporting non-priority grasslands. On this basis, the Proposed Scheme will have a **Medium adverse** impact and is not significant.

12.4.51 The Proposed Scheme will permanently reduce the extent of upland birchwoods by 0.46 hectares, approximately 8.73% of the total resource in the study area. Loss of this habitat to infrastructure will be irreversible and permanent. The Proposed Scheme could lead to permanent changes to local hydrological regimes; however, no discernible effect is expected beyond the earthworks extent (see **Chapter 10** in **ES Volume 1**); therefore, no indirect loss of woodland is predicted. No exceedance in NOx threshold values are predicted in adjoining woodland areas. Direct losses at the predicted scale will result in a **Medium adverse** impact, which is not significant.

12.4.52 The Proposed Scheme will reduce the permanent loss of non-NVC woodlands by 6.18ha including broadleaved, mixed and conifer plantation woodlands. In total, this would account for 17.80% of the total resource identified in the study area. Direct losses at the predicted scale will result in a **Medium adverse** impact, which is not significant.

12.4.53 No additional direct or indirect impacts on other habitats are predicted (e.g. wet grasslands and non-priority woodlands); therefore, the Proposed Scheme will have **Negligible** impacts on these features and are not significant.

Breeding Birds

Temporary Impacts – Construction Phase

12.4.54 Temporary impacts during construction and subsequent habitat restoration include temporary construction disturbance and temporary habitat loss. Breeding birds may be affected by temporary disturbance at construction stage. Disturbance could include noise and vibration from machinery, light from night-time working or visual disturbance resulting from human activity. Temporary disturbance and displacement can cause breeding attempts to fail through nest abandonment and increased predation on dependant young, particularly for ground-nesting species (Frid & Dill 2002, Gill et al 1996).

12.4.55 The majority of breeding territories are beyond the western extent of the Proposed Scheme, beyond the HML railway. Given the localised scale of encroachment to the west of the existing road, distance between construction activities and breeding birds in the floodplain and probable reversibility of temporary disturbance in the floodplain, temporary effects could occur over two breeding seasons. This could lead to nest abandonment and failed breeding attempts, as well as displacement of birds from traditional nesting sites through disturbance (Cutts *et al*. 2009; Frid and Dill 2002; Gill *et al*. 1996). Given that breeding birds have been assigned different levels of importance, potential impacts are presented in **Table 12-19**.

Permanent Impacts – Operational Phase

12.4.56 There is potential for permanent habitat loss for some of the species listed, this is limited as while the road width will increase significantly, permanent works are retained broadly within the existing A9 alignment and not directly through key areas of breeding habitat. A review of the proposed permanent land take within the Proposed Scheme against breeding bird territories identified by MacArthur Green (2015) indicates that up to three lapwing territories may be lost in addition to one golden plover territory, one curlew territory and one oystercatcher territory. Where the Proposed Scheme encroaches into woodland and scrub habitat notably at Lechden Plantation ch. 25,400, and shelterbelt plantation between ch. 0 – 22,200, there is potential loss of one spotted flycatcher territory, one lesser redpoll territory, one tree sparrow territory, two song thrush territories and potentially a single common crossbill territory. The exact location and number of breeding bird territories is likely to vary year on year; however, these figures provide an insight into habitat loss which may affect breeding birds.

12.4.57 A wider road and altered location of carriageway may lead to some potential for increased operational road noise reaching breeding birds within the study area. Reijnen *et al* (1995), present results which indicate that for species of open grassland, the threshold at which breeding density is affected (reduced) was between volumes of above 43dB to 60dB. Noise modelling data for ecology receptors identifies negligible increases or in some cases decreases in road noise levels are predicted for the receptors identified. A model of effects of disturbance on birds (Hockin *et al*. 1992) highlights that in situations where disturbance is passive and low level, waders and wildfowl become habituated to it over time. This habituation is likely to have already occurred throughout the A9 corridor.

12.4.58 The Drumochter Estates access track currently located uphill of the existing A9. Future traffic on the track is expected to be infrequent; therefore, no significant disturbance or fragmentation will occur.

12.4.59 Given that breeding birds have been assigned different levels of importance, potential impacts are presented in **Table 12-19**.

Table 12-19: Summary of potential impacts on breeding birds

Feature	Importance	Potential Impacts (Temporary)	Potential Impacts (Permanent)
Merlin (breeding)	International	Disturbance of active merlin in the locality from increased noise, vibration and visual disturbance. Displacement of potential commuting and foraging merlin within affected habitats during works. Short-term **Low adverse** impacts are predicted, which are significant.	Affected habitat would result in permanent loss of potential foraging and commuting habitat. Due to the large territories used by breeding merlin (SNH 2013), foraging and commuting habitat will be maintained in the wider landscape. No impact on local conservation status expected. Linear nature of the road will be maintained, no increased fragmentation expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. No impact on local conservation status expected. Long-term **Negligible** impacts are predicted, which are not significant.
White tailed eagle (active)	National	No loss nest sites; although, temporary increase in construction noise could disturb active birds in the locality. **Negligible** impacts are predicted, which are not significant.	New carriageway will be broadly at grade with existing road-levels. No significant increase in noise levels, which will broadly revert to pre-construction levels. **Negligible** impacts are predicted, which are not significant.
Golden eagle (active)	Regional	No loss of nest sites; although, temporary increase in construction noise could disturb active birds in the locality. **Negligible** impacts are predicted, which are not significant.	New carriageway will be broadly at grade with existing road-levels. No significant increase in noise levels, which will broadly revert to pre-construction levels. **Negligible** impacts are predicted, which are not significant.

Feature	Importance	Potential Impacts (Temporary)	Potential Impacts (Permanent)
Osprey (active)	Regional	No loss nest sites; although, temporary increase in construction noise could disturb active birds in the locality. **Negligible** impacts are predicted, which are not significant.	New carriageway will be broadly at grade with existing road-levels. No significant increase in noise levels, which will broadly revert to pre-construction levels. **Negligible** impacts are predicted, which are not significant.
Black throated diver (active)	Regional	Location of active black throated diver unlikely to be affected by any temporary works. Short term **Negligible** impacts are predicted, which are not significant.	Location of active black throated diver unlikely to be affected by any permanent impacts. Long-term **Negligible** impacts are predicted, which are not significant.
Golden plover (breeding)	Regional	Disturbance of breeding golden plover within and adjacent to Proposed Scheme from increased noise, vibration and visual disturbance. Risk of nest abandonment and mortality of dependant young. Displacement of breeding golden plover from affected habitats during works. Short-term **medium adverse** impacts are predicted, which are significant.	Affected nesting habitat would result in displacement of breeding golden plover. Whilst habitat within the locality is considered to be sub-optimal golden plover was also noted in study area; therefore, it is expected that affected golden plover can remain in the locality. Linear nature of the road will be maintained, no increased fragmentation expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. Long-term **Low adverse** impacts are predicted, which are not significant.
Ring ouzel (breeding)	Regional	Disturbance to breeding ring ouzel is possible within and adjacent to the Proposed Scheme from increased noise, vibration and visual disturbance. Risk of nest abandonment and mortality of dependant young. Displacement of breeding ring ouzel from affected habitats during works. Short-term **Medium adverse** impacts are predicted, which are significant.	Given the locations of breeding, no habitat loss affecting the species is predicted. No breeding noted in close proximity to the road which may be affected by local increases in noise. The linear nature of the road will be maintained, no increase in fragmentation will occur. No significant change to road level; therefore, no discernible increase in collision risk. Long-term **Negligible** impacts are predicted, which are not significant.
Common crossbill (nesting)	Local	Loss of nesting and foraging habitat leading to increased risk of killing, injuring, disturbance and displacement to small population of common crossbill; as well as damage or destruction of active nests and mortality of dependant young. Disturbance of breeding common crossbill adjacent to the Proposed Scheme. Short-term **Medium adverse** impacts are predicted, which are not significant.	Affected nesting habitat would result in displacement of breeding common crossbill. Suitable nesting habitat available directly adjacent to the Proposed Scheme and in the wider study area; therefore, it is expected that affected common crossbill can remain in the locality. Linear nature of the road will be maintained, no increased fragmentation expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. Long-term **Low adverse** impacts are predicted, which are not significant.
Breeding birds (Strathspey waders)	Authority area	Loss of nesting and foraging habitat; as well as damage or destruction of active nests. Disturbance to breeding waders within and adjacent to Proposed Scheme from increased noise, vibration and visual disturbance. Risk of nest abandonment and mortality of dependant young. Displacement of breeding waders from affected habitats during works. Short-term **Medium adverse** impacts are predicted, which are not significant.	Affected nesting habitat would result in displacement of breeding waders. Given that majority of breeding waders are located on the River Truim floodplain, and beyond the Proposed Scheme, no displacement expected. Linear nature of the road will be maintained, no increased fragmentation expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. Long-term **Low adverse** impacts are predicted, which are not significant.
Black grouse	Regional	Limited disturbance to lekking black grouse adjacent to Proposed Scheme from increased noise, vibration and visual disturbance. Short-term **Negligible** impacts are predicted, which are not significant.	No loss of lekking habitat is predicted; and no increased noise, vibration or visual disturbance expected. Long-term **Negligible** impacts are predicted, which are not significant.

Feature	Importance	Potential Impacts (Temporary)	Potential Impacts (Permanent)
Breeding birds (General)	Local	Loss of nesting and foraging habitat; as well as damage or destruction of active nests. Disturbance to breeding birds within and adjacent to Proposed Scheme from increased noise, vibration and visual disturbance. Risk of nest abandonment and mortality of dependant young. Displacement of breeding birds from affected habitats during works. Short-term **Low adverse** impacts are predicted, which are not significant.	Affected nesting habitat would result in displacement of breeding birds. Suitable nesting habitat available directly adjacent to the Proposed Scheme and in the wider study area; therefore, it is expected that affected birds can remain in the locality. Linear nature of the road will be maintained, no increased fragmentation expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. Long-term **Low adverse** impacts are predicted, which are not significant.

Non-breeding birds

Temporary Impacts – Construction Phase

12.4.60 Non-breeding birds may be affected by temporary habitat loss due to vegetation clearance to facilitate access and material storage. Elevations in noise, vibration and light levels, as well as increased human presence during construction, could also lead to temporary disturbance. Given non-breeding birding birds occur in low densities, and the prevailing climate during the winter, construction works would result in a **Low adverse** impact, which is not significant.

Permanent Impacts – Operational Phase

12.4.61 Habitat loss could result in displacement of non- breeding birds. Given that the majority of non-breeding birds will aggregate on the River Truim floodplain, and beyond the Proposed Scheme, no displacement is expected. Noise modelling presented in **Appendix 12.10** in **ES Volume 2** illustrates a negligible increase in operational noise across most ecological receptors identified for modelling throughout the scheme. Notable increases in road noise are however reported where the road is elevated across the SSE Aqueduct, there are however no habitat features in this location likely to attract aggregations of overwintering birds. The linear nature of the road will be maintained and therefore no increased fragmentation expected to occur. Non-breeding birds are most likely to congregate only to the west of the proposed scheme in the River Truim floodplain, additionally there is no significant change to road level that birds will not be able to adapt to and therefore no discernible increase in collision risk. **Negligible** impacts are expected in the long-term, which are not significant.

Reptiles – Adder, common lizard and slow-worm

Temporary Impacts – Construction Phase

12.4.62 The species could be affected by temporary disturbance during construction, with the potential for some temporary habitat loss/ displacement. Disturbance may include noise and vibration from machinery, light from night-time working or general disturbance resulting from human activity. Direct mortality is also possible during construction activities such as vegetation clearance, activities during the summer months when adder may use machinery to heat themselves, as well as earthworks movements during hibernation, as locations of reptile hibernacula areas are unknown. The temporary impact on reptiles is short-term reversible as the population is assumed to be large and will recover, therefore, a **Medium adverse** impact is predicted, which is not significant.

Permanent Impacts – Operational Phase

12.4.63 Given that suitable foraging, commuting and hibernating habitat in the wider landscape will be retained, a **Negligible** impact is expected in the operational phase, which is not significant.

Common toad

Temporary Impacts – Construction Phase

12.4.64 Common toad could be affected by temporary disturbance during construction, with the potential for some temporary habitat loss and displacement. Disturbance could include noise and vibration from machinery, light from night-time working (as common toad is nocturnal) or general disturbance resulting from human activity. Direct mortality is also possible during construction activities such as vegetation clearance and disturbance of earthworks, especially during the hibernation period, as locations of hibernacula areas are unknown. Any small bodies of water which might be disturbed during the spring and early summer months could have the potential to affect any toad spawn which may be present.

12.4.65 While potential impacts during construction are temporary in nature (across a limited area of habitat with retention of large areas of habitat in the wider area), the extent of habitat clearance throughout the Proposed Scheme potentially leading to mortality has potential to negatively impact the population in the short term. Therefore, the Proposed Scheme has a **Low adverse** impact on common toad during the construction phase, which is not significant.

Permanent Impacts – Operational Phase

12.4.66 As suitable foraging, commuting and hibernating habitat in the wider landscape will be retained for common toad, there are expected to be limited effects on terrestrial habitat. Throughout the Proposed Scheme, the hand-standing carriageway will use filter drainage for much of the carriageway, reducing the risk of common toad mortality. Any impacts on breeding populations will be localised and population numbers will re-establish, therefore the Proposed Scheme has a **Negligible** impact on common toad, which is not significant.

Bats – Common pipistrelle; soprano pipistrelle

Temporary Impacts – Construction Phase

12.4.67 During construction, these bat species could potentially be displaced from foraging areas as a result of noise and vibration disturbance or disturbance from temporary lighting during night-time working. Bats could also be subjected to habitat fragmentation associated with vegetation clearance, as commuting routes may be severed. Therefore, a **Low adverse** impact is anticipated as a result of short term, but reversible, temporary disturbance and potential habitat fragmentation. This is not a significant impact.

Permanent Impacts – Operational Phase

12.4.68 No bat roosts are within the Proposed Scheme and commuting/ foraging bats will adapt to changed conditions once the road is operational. The linear nature of the A9 will be retained and winter resilience tree planting may provide bats with commuting and foraging route. A **Negligible** impact is expected to occur during the operational phase. This is not a significant impact.

Badger

Temporary Impacts – Construction Phase

12.4.69 The species could be affected by temporary disturbance during construction, with some temporary habitat loss/ displacement. No setts are present within the Proposed Scheme; therefore, no sett disturbance is anticipated. Disturbance could include noise and vibration from machinery, light from night-time working as badger are a nocturnal species or general disturbance resulting from human activity. Although there is plenty of surrounding habitat for badger, temporary works could also introduce barrier effects by dividing populations near the Proposed Scheme, and may lead to an increased risk of collision, if appropriate controls are not implemented. Therefore, a **Low adverse** impact is expected, which is not significant.

Permanent Impacts – Operational Phase

12.4.70 Habitat loss and fragmentation could occur as a result of land-take for road widening, cuttings and embankments, however, this habitat loss is limited in the context of the wider area, with no significant habitat severance due to the presence of the current carriageway. The linear nature of the A9 will be retained, and while the road will be widened, mammal crossing provisions are included within the Proposed Scheme design (and is above the 1 in 50 flood levels), and will allow safe passage of mammals through the Proposed Scheme. Therefore, a **Negligible** impact is predicted, which is not significant.

Otter

Temporary Impacts – Construction Phase

12.4.71 Otter are an inquisitive animal and risk being trapped, injured or killed on site during construction activities. Otter are nocturnal and therefore any construction works at night-time pose a greater risk and a higher impact due to noise and vibration, lighting and general disturbance from human activity.

12.4.72 During construction, habitat fragmentation may occur, especially if temporary fencing is erected, and during any works taking place on culverts and watercourses; preventing free movement to otter in the area, particularly if multiple watercourse crossings are under construction at once. This may also lead to increased risk of vehicle collision due to lack of safe crossing points, forcing otter up onto the live carriageway.

12.4.73 Watercourses provide suitable otter foraging habitat and accidental pollution of watercourses during construction could lead to long term impacts on the species themselves and their food supply. Therefore, a **Medium adverse** impact is expected, which could be significant.

Permanent Impacts – Operational Phase

12.4.74 Otter will actively try to move along the watercourse from one side of the road to the other, and may therefore attempt to use a culvert. Mammal ledges have been incorporated into the Proposed Scheme (see **Table 12-19**) as part of embedded mitigation, encouraging safe passage, and reducing the risk of mortality through road traffic collision.

12.4.75 Noise modelling (see **Chapter 17**, **ES Volume 1**) has been carried out where otter have been recorded, around ch. 22,550 (see **Drawing 12.57** in **ES Volume 3**), where a 0.2dB decrease is noise is predicted for 2026; increasing by 0.8dB by 2041. Noise levels at the SSE Aqueduct culvert (ch. 23,400, see **Drawing 12.58** in **ES Volume 3**) are predicted to increase by 6.0dB for 2026; increasing further by 0.3dB in 2041. At the river crossing at Allt Cuaich (see **Drawing 12.59** in **ES Volume 3**),

noise levels are predicted to increase by 0.1dB for 2026; increasing further by 0.3dB for 2041. The noise levels are calculated at 1.5m above ground level, therefore as noise will disperse, levels within adjacent habitats supporting otter will be lower than those predicted 1.5m above ground level, therefore it is assumed that the change in noise will not adversely affect otter within the area. Mammal ledges have been embedded within the Proposed Scheme and provide regular and safe crossing opportunities; therefore, a **Low beneficial** impact, which is beneficial significant.

Pine marten

Temporary Impacts – Construction Phase

12.4.76 Any construction activities which produce noise and vibration, light emissions and general disturbance could cause displacement of the species from the area. Therefore, a **Low adverse** impact is expected for temporary disturbance of commuting/ foraging pine marten during works, which is not significant.

Permanent Impacts – Operational Phase

12.4.77 Pine marten are not expected to be affected by loss of habitat as there is limited suitable habitat within the Proposed Scheme, and commuting/ foraging will be improved by the inclusion of mammal ledges and a dry tunnel, identified as embedded mitigation. Combined with the linear nature of the road being maintained, with no significant habitat severance due to the presence of the current carriageway and no records of pine marten being killed on the road, no increased fragmentation is expected. Therefore, a **Negligible** impact is expected in the long-term, and not significant.

European wildcat

Temporary Impacts – Construction Phase

12.4.78 Site clearance will remove habitat which potentially provides cover for wildcat. The presence of extensive moorland, particularly within the eastern extent, provides habitat for prey and may support individuals on the edge of their home range. On this basis, increased noise, vibration and visual disturbance could affect foraging and commuting wildcat and dissuade them from potential habitats. Therefore, a **Low adverse** impact is expected due to the cautious nature of the species, which is not significant.

Permanent Impacts – Operational Phase

12.4.79 Moorland prey habitat and sub-optimal woodland cover will be retained in areas adjacent to the Proposed Scheme. Therefore, wildcat is not expected to be affected by habitat loss as there is a lack of suitable habitat within the Proposed Scheme area. Commuting/ foraging will be improved by the inclusion of mammal ledges identified as embedded mitigation and incorporated into the Proposed Scheme design. Combined with the linear nature of the road being maintained, with no significant habitat severance due to the presence of the current carriageway, no increased fragmentation is expected. Safe passage is also provided specifically for animals such as wildcat where at present, there is none. Therefore, a **Low beneficial** impact is expected in the long-term, which is not significant.

Water vole

Temporary Impacts – Construction Phase

12.4.80 Water vole will be affected by site clearance operations that might result in the destruction of burrows and loss of foraging and commuting habitat; and increased mortality. In addition, increased noise, vibration and visual disturbance could lead to disturbance of water vole from burrows retained adjacent to the Proposed Scheme. In addition, construction works present a risk of a pollution event from fuel spills and increased sedimentation, particularly during rainfall events. Therefore, a **Medium adverse** impact is expected during construction, this impact is not significant.

Permanent Impacts – Operational Phase

12.4.81 Noise modelling carried out for the Proposed Scheme (specifically key water vole habitat around ch. 22,550, see **Drawing 12.57** in **ES Volume 3**) predicts (at a level 1.5m above ground level) a decrease of 0.2dB for 2026; increasing by 0.8dB at 2041. Noise will disperse so that levels within adjacent habitats available to water vole will be lower than those predicted 1.5m above ground level. Combined with the linear nature of the road being maintained, no increased fragmentation is expected.

12.4.82 The Proposed Scheme will include the permanent loss of some water vole habitat; however, a **Low adverse** impact is expected due to small-scale loss of riparian habitat and localised watercourse diversions. This is not significant.

Freshwater fish – Atlantic salmon and sea lamprey

Temporary Impacts – Construction Phase

12.4.83 Freshwater fish will be affected by site clearance operations that would result in loss of riparian vegetation (offering cover and resting habitat to migratory and juvenile fish). Increased noise, vibration and visual disturbance could lead to disturbance and fragmentation of fish from available habitats.

12.4.84 Night-works have the potential to create barrier effects to migratory fish that may delay or prevent fish from spawning. In addition, construction works present a risk of a pollution event from fuel spills and increased sedimentation, particularly during rainfall events. The use of construction stage SuDS as embedded mitigation across the Proposed Scheme will reduce the risk of pollution to some extent. Temporary re-wetting of the Allt Cuaich to facilitate the SSE Aqueduct diversion could attract migratory adults, particularly Atlantic salmon, leading to increased mortality by trapping fish within shallow water once water is re-directed through the aqueduct. Therefore, a **High adverse** impact **could occur**, which would be significant.

Permanent Impacts – Operational Phase

12.4.85 The provision of SuDS features, with incorporated spillage containment, will avoid any long-term adverse effects on water quality. The new crossing of the River Truim will result in extremely localised in-channel shading, which is not located over any notable or extensive spawning habitat. No permanent in-channel structures are proposed and culverts have been appropriately sized to avoid creating any new barriers to fish passage. A number of culverts will also incorporate natural-bed materials to facilitate permeability. Further embedded mitigation in the form of scour protection for bridge abutments and culvert outlets along with low flows at outfalls to reduce scour

risk will reduce the risk of damage to fish beds. As this will be an improvement on the current condition, a **Low beneficial** impact is expected, which is beneficial significant.

Freshwater pearl mussel (FWPM)

Temporary Impacts – Construction Phase

12.4.86 Whilst no FWPM are present within the study area, accidental pollution events and increased sedimentation, particularly during rainfall events, could affect FWPM populations located downstream of the Proposed Scheme. As FWPM are susceptible to pollution, and give they are a qualifying feature of the River Spey SAC, construction works could have a **High adverse** impact, which would be significant.

Permanent Impacts – Operational Phase

12.4.87 The provision of SuDS features, with incorporated spillage containment, will avoid any long-term adverse effects on water quality. Further embedded mitigation in the form of scour protection for bridge abutments and culvert outlets along with low flows at outfalls to reduce scour risk will reduce the risk of damage to FWPM. Therefore, a **Low beneficial** impact is expected in the long-term, as SuDS will avoid long-term deterioration in water quality. This is a beneficial significant impact.

Overview of Potential Impacts

12.4.88 **Table 12-20** shows an overview of the importance of ecological features and assessment of impact significance as a result of the Proposed Scheme, during construction (temporary impacts) and post-construction (permanent impacts) before any mitigation is applied.

Table 12-20: Summary of potential impacts on important ecological features

Feature	Importance	Construction Phase	Significance	Operational Phase	Significance
Drumochter Hills SPA	International	**Low adverse**	**Significant**	**Negligible**	**Not significant**
Drumochter Hills SAC	International	**Low adverse**	**Significant**	**Negligible**	**Not significant**
River Spey SAC	International	**Medium adverse**	**Significant**	**Negligible**	**Not significant**
Drumochter Hills SSSI	National	**Medium adverse**	**Significant**	**Medium adverse**	**Significant**
European dry heath	International	**Medium adverse**	**Significant**	**Medium adverse**	**Significant**
Northern Atlantic wet heaths	International	**Medium adverse**	**Significant**	**Medium adverse**	**Significant**
Blanket bogs	International	**Medium adverse**	**Significant**	**Medium adverse**	**Significant**
Transition mires and quaking bogs	Authority Area	**Low adverse**	**Not significant**	**Medium adverse**	**Not significant**
Upland flushes, fens and swamps	Regional	**Low adverse**	**Not significant**	**Low adverse**	**Not significant**
Non-priority grasslands	Local	**Medium adverse**	**Not significant**	**Negligible**	**Not significant**
Upland birchwoods	Local	**Medium adverse**	**Not significant**	**Medium adverse**	**Not significant**
Wet grasslands	Local	**Medium adverse**	**Not significant**	**Negligible**	**Not significant**
Non-priority woodlands	Local	**High adverse**	**Not significant**	**Negligible**	**Not significant**
Non-NVC woodlands	Less than local	**N/A**	**N/A**	**Medium**	**Not significant**
Merlin	International	**Low adverse**	**Significant**	**Negligible**	**Not significant**

Feature	Importance	Construction Phase	Significance	Operational Phase	Significance
White tailed eagle	National	**Negligible**	**Not significant**	**Negligible**	**Not significant**
Golden eagle	Regional	**Negligible**	**Not significant**	**Negligible**	**Not significant**
Osprey	Regional	**Negligible**	**Not significant**	**Negligible**	**Not significant**
Black throated diver	Regional	**Negligible**	**Not significant**	**Negligible**	**Not significant**
Golden plover (breeding)	Regional	**Medium adverse**	**Significant**	**Low adverse**	**Not significant**
Ring ouzel	Regional	**Medium adverse**	**Significant**	**Negligible**	**Not significant**
Common crossbill	Local	**Medium adverse**	**Not significant**	**Low adverse**	**Not significant**
Breeding birds (Strathspey waders)	Authority area	**Medium adverse**	**Not significant**	**Low adverse**	**Not significant**
Black grouse	Regional	**Negligible**	**Not significant**	**Negligible**	**Not significant**
Breeding birds (General)	Local	**Low adverse**	**Not significant**	**Low adverse**	**Not significant**
Non-breeding birds	Local	**Low adverse**	**Not significant**	**Negligible**	**Not significant**
Reptiles	Local	**Medium adverse**	**Not significant**	**Negligible**	**Not significant**
Common toad	Local	**Low adverse**	**Not significant**	**Negligible**	**Not significant**
Bats - Common pipistrelle and soprano pipistrelle	Local	**Low adverse**	**Not significant**	**Negligible**	**Not significant**
Badger	Local	**Low adverse**	**Not significant**	**Negligible**	**Not significant**
Otter	International	**Medium adverse**	**Significant**	**Low beneficial**	**Significant (Beneficial)**
Pine marten	Local	**Low adverse**	**Not significant**	**Negligible**	**Not significant**
European wildcat	Regional	**Low adverse**	**Not significant**	**Low beneficial**	**Not significant**
Water vole	Authority area	**Medium adverse**	**Not significant**	**Low adverse**	**Not significant**
Freshwater Fish	International	**High adverse**	**Significant**	**Low beneficial**	**Significant (Beneficial)**
Freshwater pearl mussel	International	**High adverse**	**Significant**	**Low beneficial**	**Significant (Beneficial)**

12.5 Mitigation

Standard A9 Mitigation

12.5.2 Programme-wide standard mitigation measures are proposed that will avoid or minimise potential impacts on statutory designated sites, notable habitats and species. These standard measures apply to all A9 Dualling Projects and are presented in **Table 12-21.**

Embedded Mitigation

12.5.3 Embedded mitigation has been incorporated into the Proposed Scheme and was considered when identifying potential impacts for relevant ecological features. **Table 12-21** details the locations of culverts and dry tunnels which are included within the DMRB Stage 3 design as embedded mitigation to aid safe mammal passage throughout the Proposed Scheme. **Table 12-21** also details watercourses where natural bed material is incorporated into the crossings.

Project Specific Mitigation

12.5.4 Following the impact assessment for the Proposed Scheme, specific mitigation has been identified to further minimise or compensate for potentially significant impacts. These measures are presented in **Table 12-21**.

CNPA draft priority non-protected species

12.5.5 The Proposed Scheme will affect fourteen areas identified by CNPA that could support fungi, invertebrates and plant species (see **Table 12-12**). Mitigation for affected habitats have been incorporated into the outline habitat management plan (OHMP).

Monitoring Requirements

12.5.6 During the operational phase, on-going monitoring of mitigation should be undertaken to assess and verify the accuracy of impact predictions and determine the effectiveness of mitigation measures. This monitoring would be undertaken by a suitably qualified ecologist on behalf of the Trunk Road Operating Company.

Summary of Mitigation Requirements

12.5.7 **Table 12-21** collates and numbers the mitigation requirements, which have been incorporated into the Schedule of Environmental Commitments, presented in **Chapter 21**, **Volume 1**.

Table 12-21: Summary of Mitigation Requirements

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
Standard A9 Mitigation					
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	Prior to construction a suitably qualified (or team of suitably qualified) Ecological Clerk of Works (ECoW) will be appointed by the Contractor and will be responsible for implementation of the Ecological Management Plan. The ECoW will: • provide ecological advice over the entire construction programme • 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 • monitor the implementation of the mitigation measures during the construction phase to ensure compliance with protected species legislation and commitments within the ES. The ECoW will be a member of the Chartered Institute of Ecology and Environmental Management (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 and compliance will be monitored by the employer's ecologist. 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.	To ensure the implementation of the Ecological Management Plan.	Consultation with the relevant salmon fisheries board
SMC-E3	At watercourses throughout Proposed Scheme	Construction	Noise and vibration will be reduced by working back from the river bank where possible or working within a dry area to avoid implications to fish, such as avoidance of areas and hearing damage. In addition, soft-start techniques will be applied to piling work procedures to enable sensitive species to evacuate the area.	To protect fish species from noise and vibration.	None required.
SMC-E4	At watercourses throughout Proposed Scheme	Construction	Where areas are required to be temporarily dewatered to permit construction activities, fish will be removed by means of electrofishing and relocated prior to dewatering (SFCC, 2007).	To protect fish species during de-watering of watercourse sections and in-stream works.	CAR Licence approved by SEPA
SMC-E5	At watercourses throughout Proposed Scheme	Construction	Water flow/passage will be sufficiently maintained to permit movement of all fish species past areas of dewatering and/or significant alteration of water movement during any construction works within the watercourses. Suitable temporary channels or gravity fed flumes/pipes may be implemented so that movement between areas of habitat can be maintained. Where any over pumping is required, screens will be used to prevent fish from entering pumps.	To protect fish species during de-watering of watercourse sections and in-stream works.	CAR Licence approved by SEPA
SMC-E6	Throughout Proposed Scheme	Pre-Construction	The Contractor will obtain and comply with the requirements of any protected species derogation licences in respect of works necessary to construct the proposed scheme that are likely to breach all applicable conservation legislation. Licensing may be for the UK and/or European protected species.	To comply with conservation legislation.	SNH

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
SMC-E7	Throughout Proposed Scheme	Pre-Construction & Construction	Tree felling and vegetation clearance to be reduced 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. 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.	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-E10	Throughout Proposed Scheme	Construction	A construction lighting plan and method statement will be developed by the Contractor. The plan, part of the Species Protection Plans, will detail specific mitigation requirements and taking into account guidance on lighting (e.g. Bat Conservation Trust (2009), Institution of Lighting Professionals (2001) and the Royal Commission on Environmental Pollution (2009)). The construction lighting design will take into account the need to avoid illuminating sensitive fish and mammal (e.g. for bats, otter and badger) habitats in locations such as: adjacent to watercourses; along woodland edges; and, where there is known activity identified through pre-construction ecological surveys (refer to Mitigation Item E1). Where this is not possible the Contractor will agree any exceptions with SNH.	To protect sensitive mammal habitats from illumination.	Exceptions to be agreed with SNH
SMC-E11	Throughout Proposed Scheme	Construction	During construction trees will be protected in line with guidelines provided in 'BS 5837 Trees in relation to Construction' (British Standards Institute, 2012). This includes the following: • establishment of Root Protection Areas (RPA); • 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).	To comply with guidelines provided in 'BS 5837 Trees in relation to Construction' (British Standards Institute, 2012).	None required

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
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-E13	Throughout Proposed Scheme	Construction	Trenches, holes and pits will be kept covered at night or provide a means of escape for mammals that may become entrapped. Gates to compound areas will be designed sensitively to prevent mammals from gaining access and will be closed at night.	To avoid mammals becoming entrapped in and around compound areas during construction.	None required
SMC-E14	Throughout Proposed Scheme	Construction	Temporary mammal-resistant fencing will be provided around construction compounds following a specification agreed through consultation with Transport Scotland.	To avoid mammals becoming entrapped in and around compound areas during construction.	Transport Scotland
SMC-E15	Throughout Proposed Scheme	Construction	The Contractor will describe within the CEMP (**Mitigation Item S1**) the biosecurity strategy to be implemented for the appropriate treatment of invasive, non-native species (INNS). The strategy will set out appropriate construction, handling, treatment and disposal procedures to prevent the spread of INNS in line with recognised best practice.	To prevent the spread of INNS.	None required
n/a (note)	Throughout Proposed Scheme	Construction	*Further to the above, the mitigation detailed in Table 11-10 (Road Drainage and the Water Environment), Table 13-17 (Landscape and Visual), Table 16-12 (Air Quality) and Table 17-19 (Noise and Vibration) will be implemented to protect aquatic and terrestrial habitats and species.*	*To protect aquatic and terrestrial habitats and species.*	*n/a*
Project-Embedded Mitigation					
P08 – E1	ch. 20,750/ Hydro ID 72 ch. 21,400/ Hydro ID 77 ch. 22,100/ Hydro ID 81 ch. 22,240/ Hydro ID 82 ch 22,780 ch. 25,400/ Hydro ID 100 ch. 26,600/ Hydro ID 107 ch. 26,920/ Hydro ID 109 ch. 27,460/ Hydro ID 111 ch. 27,725/ Hydro ID 112 ch. 27,900/ Hydro ID 114 ch. 28,550/ Hydro ID 118 ch. 29,425/ Hydro ID 123 ch. 29,510/ Hydro ID 124 ch. 29,590/ Hydro ID 125 ch. 30,510/ Hydro ID 129	Design Construction	Mammal crossings to be provided in the form of a dry ledge or dry crossing (where no watercourse is present) above the 1 in 50 flood level. Mammal crossings large enough for deer passage provided at the Allt Coire Uilleim (ch. 21,400) and the Allt Coire Bhathaich (ch. 22,250) (shown in **Drawing 12.46 to Drawing 12.54**, **ES Volume 3**)	To reduce the risk of mortality, allow safe passage of mammals and prevent habitat severance.	None required

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08– E2	ch. 20,150/ Hydro ID 65 ch. 21,350/ Hydro ID 76 ch. 21,750/ Hydro ID 79 ch. 22,100/ Hydro ID 81 ch. 22,700/ Hydro ID 85 ch. 23,400/ Hydro ID 90 ch. 25,400/ Hydro ID 100 ch. 25,750/ Hydro ID 102 ch. 26,200/ Hydro ID 106 ch. 26,600/ Hydro ID 107 ch. 26,900/ Hydro ID 109 ch. 27,450/ Hydro ID 111 ch. 27,800/ Hydro ID 112 ch. 27,900/ Hydro ID 114 ch. 28,050/ Hydro ID 115 ch. 28,300/ Hydro ID 116 ch. 28,550/ Hydro ID 118 ch. 28,800/ Hydro ID 119 ch. 29,450/ Hydro ID 123 ch. 29,500/ Hydro ID 124 ch. 29,600/ Hydro ID 125 ch. 30,500/ Hydro ID 129	Design Construction	Watercourse/ culvert crossings where natural bed material will be incorporated.	To create suitable hydro-morphological habitat for aquatic species.	None required

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
Project Specific Mitigation					
P08-E3	ch. 20,400 to ch. 20,900 ch. 21,400 to ch. 21,800 ch. 22,400 to ch. 22,600 (Truim crossing) ch. 24,400 to ch. 25,000 ch. 26,000 to ch. 26,200 (Allt Cuaich) ch. 26,700 to ch. 27,400 ch. 30,300 to ch. 31,050	Construction Works avoided: October to June for Atlantic salmon June to July for sea lamprey	Where temporary in-channel works are required in the Spey catchment, sensitive Atlantic salmon migration/ spawning/ breeding seasons must be avoided (October to June). Percussive construction works must be avoided in proximity to suitable watercourses during sensitive salmon and sea lamprey migration/ spawning periods (October to June for Atlantic salmon; June to July for sea lamprey). Should avoidance of works/ works rescheduling not be possible during these seasons, suitable exclusion zones should be defined and implemented through consultation with SNH. Upstream/ downstream permeability should be maintained throughout any in-channel works. Works associated with the re-wetting of the Allt Cuaich will be programmed to minimise the risk of Atlantic salmon migrating upstream of the crossing and becoming trapped when water levels return to normal conditions. Atlantic salmon could become trapped between October and June and therefore electrofishing should be undertaken and any fish found should be translocated to an appropriate receptor site downstream. Riparian vegetation must be retained where practicable. Fish rescue plan prepared to outline relevant control measures for encountering fish where working in water is unavoidable. The Spey Fishery Board will be provided with advance notice of any proposed in-channel working.	To prevent disturbance and mortality to Atlantic salmon and sea lamprey during important life stages and to prevent adverse effects on site integrity to the River Spey SAC.	Consultation with SNH and Spey Fisheries Board
P08-E4	Throughout Proposed Scheme	Design Construction	Temporary construction stage SuDS features will comply with current standards: Scottish Planning Policy (SPP), 2014 and Planning Advice Note (PAN) 61: Planning & SUDS; The SuDS Manual, Construction Industry Research and Information Association (CIRIA) C753, 2015 SUDS for Roads, WSP, 2009; Regulatory Method (WAT-RM-08), Sustainable Urban Drainage Systems (SUDS or SUD Systems), Scottish Environment Protection Agency (SEPA), v6, 2014 and Supporting Guidance (WAT-SG-53) Environmental Standards for Discharges to Surface Waters 6, SEPA, 2015 Any within-channel works must adopt appropriate sediment control measures to prevent a reduction in water quality downstream Sediment control barriers will be used in works areas adjacent to all watercourses to prevent sediment runoff These barriers will be regularly inspected and maintained; removing large sediment build up and repairing fencing when compromised More information on water quality management and control can be found in **Chapter 11**	To prevent pollution events in the Tay Catchment, and in the Spey Catchment to prevent adverse effects on site integrity to the River Spey SAC and River Garry	Consultation with SEPA
P08-E5	Throughout Proposed Scheme	Pre-construction	Minimise disturbance of habitats through careful siting of construction compounds and storage of construction materials, particularly avoiding blanket mire or wet heath The siting of compounds, storage areas and working areas will be reviewed by the ECoW at the planning stage of the construction works	To reduce impact on notable habitats within the temporary works boundary	Consultation with SNH

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08-E6	Throughout Proposed Scheme	Pre-construction Construction	Restrict movement of traffic and personnel to working corridor using temporary barriers to minimise damage to habitats, avoiding sensitive habitats such as blanket bog, flushes and springs	To reduce impact on notable habitats within the temporary works boundary	N/A
P08-E7	Throughout Proposed Scheme	Pre-construction Construction	Avoid hydrological damage through control of sediment and chemical run-off using filter drains, soakaways and oil separators The use of sediment capture barriers will be in place around all areas of exposed soil/ peat to prevent sedimentation runoff into surrounding habitats. These barriers will be inspected monthly by the site ECoW in areas beyond 10m of a watercourse and weekly within 10m of a watercourse and will be maintained by the Contractor; removing large sediment build up and repairing fencing when compromised Water quality monitoring will continuously be in place in strategically important areas downstream of working areas. These water quality stations will be in permanent place throughout construction, data will be logged and reviewed weekly by the site ECoW. In the event pollution incidents occur, this will be investigated to ensure the cause is determined and prevented in future construction works A visual water quality assessment will be made on all tributaries where in-channel works or works are required within 10m of the watercourse where turbidity will be monitored as well as any leaks/ spills from construction works. In the event water becomes turbid or a leak/ spill is suspected, all works must cease and the water quality stations reviewed for significant increases Refuelling and machinery maintenance will only be permitted in designated areas in site compounds with containment facilities to manage leaks and spills More information on water quality management and control can be found in **Chapter 11**	To reduce impact on notable habitats within the temporary works boundary and prevent adverse effects on site integrity of Drumochter Hills SAC, Drumochter Hills SSSI and River Spey SAC	N/A
P08-E8	Throughout Proposed Scheme	Pre-construction Construction	A minimum buffer zone of 10m will be in place around watercourses where there are no works currently being undertaken to reduce risk of pollution events or sedimentation Any works within the 10m buffer zone should be supervised by an ECoW and works should be planned to maintain water flow through the area This buffer zone will also include areas of flowing surface water such as flushes and springs, which should be marked out and avoided if possible, to prevent loss of hydro-connectivity	To prevent pollution events in watercourses and to prevent adverse effects on site integrity to the River Spey SAC	N/A
P08-E9	Throughout Proposed Scheme	Construction	Maintain hydrological connectivity through retention of natural water channels, flushes and wet habitats Where watercourses require in channel works that involve the alteration of the channel, a temporary watercourse diversion will be built to ensure channel connectivity, the diversion will be supervised by the ECoW and a fish rescue undertaken when the diversion takes place	To prevent pollution events in watercourses and to prevent adverse effects on site integrity to the River Spey SAC	N/A
P08-E10	Throughout Proposed Scheme	Construction	Any extraction of peat would require careful handling and storage to retain structure and integrity Store peat separately from other excavated material and keep wet, in line with **Chapter 10, Appendix 10.6 (Outline Peatland Management Plan)**	To allow the successful reinstatement of peat habitats such as blanket bog and heath habitats	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08-E11	Throughout Proposed Scheme	Construction Post-construction	To facilitate the restoration of blanket bog and wet heath in areas which have been impacted by the Proposed Scheme, the water table will be maintained by the blocking of grips and drains by peat turve dams or plastic piling and restriction of grazing in these areas, is essential at least until the vegetation is established again. Temporary fencing and cessation of burning is required to aid vegetation establishment. Mulching and re-seeding should be carried out where suitable to aid the restoration process.	To reduce impact on notable habitats within the temporary works boundary and prevent adverse effects on site integrity of Drumochter Hills SAC and the Drumochter Hills SSSI	Consultation with SNH and SEPA
P08-E12	Throughout Proposed Scheme	Pre-Construction, Construction & Post-Construction	The Contractor will develop information presented in the Outline Species Protection Plan (see **Appendix 12.12** (**Volume 2**)), including an update from pre-construction surveys/ activities, to detail the works methods, control measures and monitoring requirements for works affecting protected species and their habitats.	To avoid damage or destruction of structures used for temporary shelter or protection; and avoid disturbance to protected species.	Consultation with SNH
P08-E13	Throughout Proposed Scheme	Pre-construction Construction	The ECoW will monitor ground nesting bird activity before and during the works, and advise on any further control measures which should be adopted by The Contractor	To prevent the unlawful damage or destruction of active nests and breeding birds.	N/A
P08-E14	Throughout Proposed Scheme	Pre-construction Construction	Clearance work of all woodland will be programmed to be undertaken between September – December Immediately (within 24 hours) prior to woodland removal these will be surveyed for crossbill due to their varied breeding activity If the presence of breeding crossbill is identified, the ECoW will follow the **Outline Species Protection Plan** (see **Appendix 12.12**)	To prevent the unlawful damage or destruction of active nests and breeding birds and to prevent disturbance to breeding crossbill	N/A
P08-E15	Throughout Proposed Scheme ch. 23,600 – ch.30,000 on the western extent	Pre-construction Construction	Access track construction between ch. 0 and ch. 20,700 which are present within the SSSI and near to the SPA will be undertaken outside of the breeding season Phasing construction activities will be required to avoid works near any reported merlin nest site during the breeding season Site clearance and particularly disruptive activities will be programmed to minimise disturbance to breeding birds during the nesting season (March to August inclusive). Applying visual screening according to BS 5228-1:2009+A1:2014 – code of practice for noise and vibration on construction and open sites, noise: to avoid disturbance to breeding merlin along an appropriate area (as defined through consultation with SNH) The location of potential mitigation for this species will be determined where necessary following pre-construction surveys / during construction phase monitoring The extent of visual screening required is likely to be in the region of 500m from an active nest	To prevent disturbance to breeding merlin and to ensure no adverse effects on site integrity of Drumochter Hills SPA. To prevent disturbance to breeding bird species associated with Drumochter Hills SSSI.	Consultation with SNH

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08-E16	Throughout Proposed Scheme	Pre-construction Construction	To mitigate impacts on reptiles, if works are carried out between 1st April and 31st October, phased strimming/ mowing down of any rough grassland, tall herb and heath and removal of all arisings should be carried out prior to commencement of works, under the supervision of the ECoW Once cut, any holes on exposed ground should be hand dug under supervision of the ECoW to ensure no reptiles are sheltering within Prior to movement, any machinery, stored materials and objects should be checked throughout construction operations, especially in the spring and summer months as reptiles may use these as refuges and basking Storage of materials and equipment should be kept on pallets and not on ground level or suitable habitat, this is to reduce the likelihood of them being used by reptiles for shelter Should reptiles or amphibians be found during clearance works, the ECoW will carefully move them from the works area to a nearby area of quality habitat with suitable linkages to the wider area where they can disperse from construction activities	To ensure no reptile or amphibian mortality during construction	N/A
P08-E17	Throughout Proposed Scheme	Pre-Construction Construction	Work on major watercourses within the Proposed Scheme should be staggered to allow otter alternative major watercourses for movement and so their commuting routes and habitat does not become fragmented, potentially pushing them up and over the road as an alternative where they run the risk of road mortality	To reduce risk of otter road mortality as a result of working on watercourse crossings where otter would otherwise cross	N/A
P08-E18	ch. 20,750/ Hydro ID 72 ch. 21,400/ Hydro ID 77 ch. 22,100/ Hydro ID 81 ch. 22,250/ Hydro ID 82 ch. 23,240 ch. 25,400/ Hydro ID 100 ch. 26,600/ Hydro ID 107 ch. 26,920/ Hydro ID 109 ch. 27,460/ Hydro ID 111 ch. 27,725/ Hydro ID 112 ch. 27,900/ Hydro ID 114 ch. 28,550/ Hydro ID 118 ch. 29,425/ Hydro ID 123 ch. 29,510/ Hydro ID 124 ch. 29,590/ Hydro ID 125 ch. 30,510/ Hydro ID 129	Construction Post-construction	To ensure effective use of underpasses, minimum of 100m otter-proof fencing will be provided in advance of the operational stage for crossing where mammal ledges are provided Deer-proof fencing 500m either side will be incorporated into boundary fencing installed at the Allt Coire Uilleim (ch. 21,400) and the Allt Coire Bhathaich (ch. 22,250) as shown on **Drawing 12.47** and **Drawing 12.48 (ES Volume 3)**, designed to allow for permeability of small mammals, to access culverts and underpasses.	To reduce risk of otter road mortality and DVC	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08-E19	Throughout Proposed Scheme	Pre-construction Construction Trapping or fencing requirements, can only be undertaken between March - April	As a large amount of water vole habitat has been identified within the Proposed Scheme, displacement or translocation will be required during construction The preferred method and the details needs to be discussed and agreed with SNH, and suitable receptor sites need to be found Any translocation undertaken will be done under a mitigation licence and in agreement with SNH Preconstruction surveys for water vole will be required to be undertaken in the active season prior to construction, this will allow the planning and implementation of any trapping or fencing requirements, which can only be undertaken between March - April (dependent on weather conditions) in advance of works (Dean, M. et al, 2016). Any site works will need to be planned to take account of this narrow time-frame. No tracking with heavy machinery should be undertaken until it can be confirmed by the ECoW, as far as reasonably practicable, that water vole are no longer present in the works area This will ensure water vole are not affected by direct mortality or indirect mortality through being trapped inside a burrow All watercourse diversions and works around watercourses will ensure that all remediation of the banksides and morphology be suitable for water vole re-establishment once works in these areas are complete This will include but not be limited to; slow flowing water where possible as this is more favourable to water vole, densely planted banksides (suitable to the local area) to provide vegetation cover, large rocks placed at regular intervals within the watercourse for territory marking and soft banksides for burrow establishment	To prevent unlawful destruction of water vole burrows and risk of mortality to water vole	Consultation and licence obtained from SNH
P08-E20	Throughout Proposed Scheme	Construction Post-construction	An **Outline Habitat Management Plan (OHMP)** has been prepared to detail specific mitigation measures to reinstate and restore notable habitats impacted by the Proposed Scheme (see **Appendix 12.11**, **ES Volume 2**) where they are already present. Prior to construction, the Contractor will refine, develop and implement the OHMP for implementation during construction as the construction stage Habitat Management Plan (HMP)	To prevent the loss of notable habitat throughout the Proposed Scheme	Consultation with SNH
P08-E21	Throughout Proposed Scheme ch. 0 – 22,200	Construction Post-construction	Restore dry heath on embankments and in temporary works areas using peaty soils, peat turves and increasing the abundance and distribution of ericoid shrubs and bearberry. Prohibit tree planting, grazing and muirburn until habitat is established.	To reduce the loss of notable habitat throughout the Proposed Scheme and prevent adverse effects on site integrity of the Drumochter Hills SAC and SSSI	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P08-E22	Throughout Proposed Scheme and Drumochter Estate access track ch. 0 – 22,200	Construction Post-construction	Restore wet heath on embankments and in temporary works areas by increasing the abundance and distribution of ericoid shrubs, particularly cross-leaved heath *Erica tetralix* and re-use of peaty soils/ shallow peat. Prohibit tree planting, grazing and muirburn until habitat is established.	To reduce the loss of notable habitat throughout the Proposed Scheme and prevent adverse effects on site integrity of the Drumochter Hills SAC and SSSI	N/A
P08-E23	Throughout Proposed Scheme and Drumochter Estate access track ch. 0 – 22,200	Construction Post-construction	Reinstate/ restore blanket mire/ degraded blanket mire by re-use of shallow/ deep peat within and adjacent to areas of degraded blanket mire. Increase the abundance of *Sphagnum* sp.	To reduce the loss of notable habitat throughout the Proposed Scheme and prevent adverse effects on site integrity of the Drumochter Hills SAC and SSSI	N/A
P08-E24	ch. 30,600 to 31,050	Post-construction	Increase abundance and distribution of native tree species such as downy birch *Betula pubescens*, aspen *Populus tremula* and Scot's pine *Pinus sylvestris*. Areas for potential planting include ch. 30,600 to ch. 31,050 and ch. 25,400	To reduce the loss of broadleaved woodland and native tree species	N/A
P08-E25	Throughout Proposed Scheme	Post-construction	In line with the Control of Woodland Removal Policy and in-conjunction with landscape plans, tree planting will take place in the locations identified within **Environmental Mitigation Drawings 6.1- 6.8** (**Volume 3**)	To prevent loss of woodland habitats and encourage woodland regeneration	Consultation with SNH
Project Monitoring Requirements					
P08-E25	Throughout Proposed Scheme	Post-construction	Inspections of mammal ledges and tunnels will be undertaken during operational years 1,3, 5 and 10 Inspections need to include checking for evidence of use on the lead up to and in and around the ledges This will include footprints, spraint, feeding remains and any other field signs which will indicate their use	To understand the suitability and usage of the mammal mitigation.	N/A
P08-E26	Throughout Proposed Scheme	Post-Construction	Reinstated and restored habitats will be monitored for compliance with the managed objectives set out in the **Outline Habitat Management Plan** (OHMP). It is anticipated that this will be required during operational years 1, 3 and 10 Monitoring for compliance with the managed objectives will also be required during the operational years 6, 12 and 18	To identify trends in habitat condition in line with site condition monitoring (SCM) cycles.	SNH Transport Scotland/ Operating Company

12.6 Residual Impacts

Drumochter Hills SPA, SAC

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.1 With the implementation of construction stage mitigation **Table 12-21** (mitigation items **P08-E11; P08-E15**) and monitoring of habitat restoration (mitigation item **P08-E26**), no significant impacts are expected in the long-term on areas temporarily affected by construction activities within the Drumochter Hills SPA and SAC, as no new habitat loss will occur out with previously disturbed ground.

River Spey SAC

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.2 The use of pollution prevention measures as detailed in **Table 12-21** (mitigation items **P08-E3**; **P08-E4**; **P08-E7**; **P08-E8** and **P08-E9**) will ensure the risk of pollution to the water environment is managed for the construction of the Proposed Scheme. The loss of riparian habitat along the SAC is short term in nature (2 – 5 years) and will become established in time, therefore, no significant residual impacts are predicted.

Drumochter Hills SSSI

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.3 With the implementation of mitigation (see **Table 12-21**, mitigation items **SMC-E7**; **SMC-E8**; **P08-E12**; **P08-E13**; **P08-E14** and **P08-E15**) to protect breeding birds, including timing of works within the SSSI and applying screening, no significant adverse impacts are expected in the long-term on the breeding bird assemblage.

12.6.4 With the implementation of construction-stage mitigation (see **Table 12-21**, mitigation items **P08-E7**; **P08-E11**; **P08-E20**; **P08-E21**; **P08-E22**; **P08-E23** and **P08-E26**), and monitoring of habitat restoration, the scale of permanent habitat loss within the SSSI will be limited to areas adjoining existing woodland or previously disturbed ground. Therefore, no significant adverse residual impacts will occur.

Notable Habitats

Temporary Impacts – Construction Phase

12.6.5 Construction activities will result in unavoidable temporary disturbance to notable habitats through loss of surface vegetation, compaction of soils, disruption to groundwater regimes and elevations in construction dust. European dry heaths, Northern Atlantic wet heaths and blanket bogs are particularly sensitive to disturbance. Depending on the scale and duration of disturbance, these habitats may be slow to recover. Mitigation measures identified in **Table 12-21** (mitigation items **P08-E5**; **P08-E6**; **P08-E7**; **P08-E10**; **P08-E11**; **P08-E20**; **P08-E21**; **P08-E22** and **P08-E23)** seek to minimise the extent and duration of disturbance during works; and improve the restoration potential of affected vegetation communities in the long-term. It is anticipated that temporary

disturbance to notable habitats will be reinstated/ restored; therefore, construction activities will not result in significant impacts.

Permanent Impacts – Operational Phase

12.6.6 Embedded mitigation for the Proposed Scheme has minimised encroachment into notable habitats. With the implementation of construction-stage mitigation, no additional loss of notable habitat will occur. The extent of blanket bog and wet heath will increase in the long-term through restoration over sections of the former BDL construction access track (see **Table 12-22**). There will be a residual loss of European dry heath from the edge of more extensive mosaics adjoining the existing A9 corridor, woodland and previously disturbed ground.

12.6.7 In these areas, vegetation communities are not the best examples of habitats recorded in the surrounding landscape, which themselves are subject to land management pressures that limit their vegetation composition and structure. Therefore, whilst the permanent residual loss is important at the level of the Proposed Scheme, the residual loss of a ubiquitous habitat is not sufficient in scale to affect the integrity or conservation status of dry heaths within the Cairngorms National Park, Scotland or Europe; therefore, no significant residual impact will occur.

Table 12-22: Residual impacts for notable habitats

Notable habitat	Target restoration	Residual impact
	Area (ha)	Area (ha)
European dry heaths	29.47	5.32 (loss)
Northern Atlantic wet heaths	15.57	10.52 (gain)
Blanket bogs	4.33	5.20 (gain)

Breeding birds

Temporary Impacts – Construction Phase

12.6.8 Construction works will result in unavoidable temporary habitat loss and disturbance to breeding birds. This assessment takes into account an assumption that construction activities will be able to respond and adapt to the presence of breeding merlin should they be present within 500m of construction activities to avoid disturbance to this species (see **Table 12-21**, mitigation items **SMC-E1**; **SMC-E7; P08-E12** and **P08-E15**). As a result, no significant residual impacts are predicted.

Permanent Impacts – Operational Phase

12.6.9 Embedded mitigation has minimised encroachment into potential habitat features; and the new carriageway will be broadly at grade with existing road-levels. No significant increase in noise levels are predicted in the wider landscape, which will broadly revert to pre-construction levels. Therefore, no significant impacts are predicted.

Non-breeding birds

Temporary Impacts – Construction Phase

12.6.10 Construction works will result in unavoidable temporary habitat loss and disturbance to non-breeding birds. Given that wintering birds occur in low numbers, the prevailing climate, and with mitigation (see **Table 12-21**, mitigation items **SMC-E1** and **P08-E12**), no significant residual impacts are likely to occur.

Permanent Impacts – Operational Phase

12.6.11 Embedded mitigation has minimised encroachment into potential habitat features; and the new carriageway will be broadly at grade with existing road-levels. No significant increase in noise levels are predicted in the wider landscape, which will broadly revert to pre-construction levels. Therefore, no significant impacts are predicted.

Herptiles (Reptiles and amphibians)

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.12 With the implementation of construction-stage mitigation, there will be no significant impacts in the short and long-term.

Bats

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.13 With the implementation of construction-stage mitigation, there will be no significant impacts on bat species in the short and long-term.

Badger

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.14 With the implementation of construction-stage mitigation, there will be no significant impacts on badger.

Otter

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.15 With the implementation of construction-stage mitigation (see **Table 12-21**, mitigation items **SMC-E1**; **SMC-E10**; **SMC-E13**; **SMC-E14**; **P08-E1, P08-E12** and **P08-E17**, the provision of mammal ledges and SuDS features, there will be a significant beneficial residual impact.

Pine marten

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.16 With the implementation of construction-stage mitigation, there will not be a significant residual impact.

European wildcat

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.17 With the implementation of construction-stage mitigation, and the provision of mammal ledges there will be a beneficial residual impact, which is not significant.

Water vole

Temporary Impacts – Construction Phase

12.6.18 With the implementation of construction-stage mitigation (see **Table 12-21**, mitigation items **SMC-E1**; **SMC-E6**; **SMC-E13**; **P08-E1**; **P08-E12** and **P08-E19**), including acquisition of SNH licensing to facilitate works, there will not be a significant impact.

Permanent Impacts – Operational Phase

12.6.19 Upon completion of works, reinstatement of disturbed riparian habitats is likely to recover in the short term. Water vole will be at increased risk of predation until vegetation becomes established; however, no significant residual impacts are predicted.

Freshwater fish – Atlantic salmon and sea lamprey

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.20 With the implementation of construction-stage mitigation (see **Table 12-21**, mitigation items **SMC-E3; SMC-E4; SMC-E5; P08-E2; P08-E3; P08-E4; P08-E7; P08-E8; P08-E9; P08-E12**), no significant adverse residual effects are expected. The placement of natural bed material in culverts will improve the habitat for freshwater fish. In the short-term (2 – 5 years), there will be a loss of riparian vegetation supporting freshwater fish along watercourses, however this is expected to recover, leading to a beneficial significant residual impact.

Freshwater pearl mussel

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.21 With the implementation of construction-stage mitigation (see **Table 12-21,** mitigation item **SMC-E1**; **SMC-E2**; **P08-E3**; **P08-E4**; **P08-E7**; **P08-E8**; **P08-E9** and **P08-E12**), and the provision of SuDS features will reduce potential pollution incidences, a beneficial significant impact is predicted.

Summary

12.6.22 The findings of this evaluation are summarised **Table 12-23** and **Table 12-24**, which shows an overview of the residual impacts on ecological features recorded within the Proposed Scheme.

Table 12-23: Overview of temporary residual significance of the Proposed Scheme

Feature	Importance	Pre-mitigation significance	Mitigation	Post-mitigation significance
Drumochter Hills SPA	International	Significant	Habitat reinstatement/ restoration	Not significant
Drumochter Hills SAC	International	Significant		Not significant
River Spey SAC	International	Significant	Construction best practice and monitoring	Not significant
Drumochter Hills SSSI	National	Significant	Habitat reinstatement/ restoration	Not significant
European dry heath	International	Significant	Habitat reinstatement/ restoration	Not significant
Northern Atlantic wet heaths	International	Significant		Not significant
Blanket bogs	International	Significant		Not significant

Feature	Importance	Pre-mitigation significance	Mitigation	Post-mitigation significance
Merlin	International	Significant	Phasing construction activities Pre-works checks Applying screening	Not significant
White tailed eagle	National	Not significant	None proposed	Not significant
Golden eagle	Regional	Not significant		Not significant
Osprey	Regional	Not significant		Not significant
Black throated diver	Regional	Not significant		Not significant
Golden plover	Regional	Significant	Pre-works checks Site clearance programmed to minimise disturbance Monitor activity before and during works Avoid sensitive seasons	Not significant
Ring ouzel	Regional	Significant		Not significant
Common crossbill	Local	Not significant	Pre-works checks Avoid sensitive seasons Follow the OSPP	Not significant
Breeding birds (Strathspey waders)	Authority area	Not significant	Pre-works checks Site clearance programmed to minimise disturbance Monitor activity before and during works	Not significant
Black grouse	Regional	Not significant	None proposed	Not significant
Breeding birds (General)	Local	Not significant	Pre-works checks Avoid sensitive seasons Site clearance programmed to minimise disturbance	Not significant
Non-breeding birds	Local	Not significant	Apply screening	Not significant
Herptiles	Local	Not significant	Avoid sensitive seasons Watching brief	Not significant
Bats -Common pipistrelle and soprano pipistrelle	Local	Not significant	Pre-works checks	Not significant
Badger	Local	Not significant	Pre-works checks	Not significant
Otter	International	Significant	Pre-works checks Phasing construction activities Pollution prevention	Not significant
Pine marten	Local	Not significant	Pre-works checks	Not significant
European wildcat	Regional	Not significant	Pre-works checks	Not significant
Water vole	Authority area	Not significant	SNH Licensing Pre-works checks	Not significant
Freshwater fish	International	Significant	Avoid percussive construction in proximity Exclusion zones Avoid sensitive seasons Pollution prevention	Not significant
Freshwater pearl mussel	International	Significant	Pre-works checks Pollution prevention	Not significant

Table 12-24: Overview of operational residual significance of the Proposed Scheme

Feature	Importance	Pre-mitigation significance	Mitigation	Post-mitigation significance
Drumochter Hills SPA	International	Not significant	Habitat reinstatement/ restoration	Not significant
Drumochter Hills SAC	International	Not significant		Not significant
River Spey SAC	International	Not significant		Not significant
Drumochter Hills SSSI	National	Significant		Not significant
European dry heath	International	Significant		Not significant
Northern Atlantic wet heaths	International	Significant		Not significant
Blanket bogs	International	Significant		Not significant
Merlin	International	Not significant	None proposed	Not significant
White tailed eagle	National	Not significant	None proposed	Not significant
Golden eagle	Regional	Not significant	None proposed	Not significant
Osprey	Regional	Not significant	None proposed	Not significant
Black throated diver	Regional	Not significant	None proposed	Not significant
Golden plover	Regional	Not significant	None proposed	Not significant
Ring ouzel	Regional	Not significant	None proposed	Not significant
Common crossbill	Local	Not significant	None proposed	Not significant
Breeding birds (Strathspey waders)	Authority area	Not significant	None proposed	Not significant
Black grouse	Regional	Not significant	None proposed	Not significant
Breeding birds (General)	Local	Not significant	None proposed	Not significant
Non-breeding birds	Local	Not significant	None proposed	Not significant
Herptiles	Local	Not significant	None proposed	Not significant
Bats - Common pipistrelle and soprano pipistrelle	Local	Not significant	None proposed	Not significant
Badger	Local	Not significant	None proposed	Not significant
Otter	International	Significant	None proposed	Significant (Beneficial)
Pine marten	Local	Not significant	None proposed	Not significant
European wildcat	National	Not significant	None proposed	Not significant
Water vole	Authority area	Not significant	None proposed	Not significant
Freshwater fish	International	Significant	None proposed	Significant (Beneficial)
Freshwater pearl mussel	International	Significant	None proposed	Significant (Beneficial)

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