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 7 – Glen Garry to Dalwhinnie (Central Section) of the A9 Dualling Scheme ('the Proposed Scheme'). The Proposed Scheme under assessment is as described in **Chapter 5**.

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 for 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 within the study area
- 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 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (otherwise known as the Habitats Directive)
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland)
- Nature Conservation (Scotland) Act 2004 (as amended in Scotland)
- 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 presented within **Chapter 19**.

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 (CIEEM)
- DMRB. (1993) '*Ecology and Nature Conservation'*. DMRB Volume 11, Section 3, Part 4. Department for Transport (DfT)
- Highways Agency. (2010) '*Ecology and Nature Conservation: Criteria for Impact Assessment*'. Interim Advice Note (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.

Study Area

12.2.4 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' (ZoI) to consider indirect impacts on designated sites, habitats and species.

12.2.5 The ZoI for the Proposed Scheme varies between ecological features depending on their sensitivity to environmental change. For the purpose of this assessment, the following ZoI have been applied:

- Designated sites within or hydrologically/ ecologically connected to the Proposed Scheme
- Phase 1 habitat survey: 150m either side of the existing A9 road
- National Vegetation Classification (NVC): 250m either side of the existing A9 road
- Breeding birds (including scarce breeding birds): 500m either side of the existing A9 road
- Badger: 100m either side of the Proposed Scheme boundary
- Otter: watercourses within 100m[1] either side of the Proposed Scheme boundary
- Water vole: watercourses within 100m either side of the Proposed Scheme boundary
- Red squirrel, pine marten and bats: 50m either side of the Proposed Scheme boundary
- European wildcat: encompassed in each of the above study areas
- Fish habitat (Atlantic salmon and sea lamprey): watercourses crossed by existing A9 road
- Freshwater pearl mussel (FWPM) habitat within the River Truim.

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

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

Desktop Study

12.2.7 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.

12.2.8 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
- Perth Museum Biological Records Centre
- Royal Society for the Protection of Birds (RSPB)
- Scottish Environment Protection Agency (SEPA)
- Scottish Raptor Study Group (SRSG) (including Tayside Raptor Study Group)
- Scottish Natural Heritage (SNH)
- SNHi Information Services (e.g. SiteLink, iMap and Natural Spaces)
- Spey District Fishery Board (SFB).

Field Surveys

12.2.9 In line with current professional standards, ecological surveys have been completed to update the EcIA assessment baseline for the study area. Survey methodologies were agreed with the relevant statutory environmental bodies through the EIA consultation process (see **Chapter 7**). Details of methodologies and survey findings are presented in the accompanying appendices contained within **Volume 2** (see **Table 12-1**).

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

Survey	Dates	Appendix
Phase 1 habitat survey	June to September 2014	12.2
Phase 2 habitat survey (NVC)	July 2015	12.3
Breeding bird surveys	May to July 2015	12.4
Protected vertebrate and wood ant surveys	July - August 2015	12.5 and 12.6
Scarce breeding bird and woodland grouse surveys	May to July 2015 and March to May 2016	12.6
Fish habitat assessment	February – April 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

12.2.10 The Cairngorms National Park (CNP) is a stronghold for a variety of wildlife; and conservation action for 26 key species are described in the '*Cairngorms Nature Action Plan*' (CNAP) 2013 – 2018. Through environmental consultation, the 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 CNP. The broad habitat-based list was compiled using desktop information, species experts and local interest groups; and incorporates many of the 26 key species.

12.2.11 To inform the EcIA process, the 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

12.2.12 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.

12.2.13 The importance of a feature was defined using criteria set out in **Table 12-2** and **paragraphs 12.2.19** to **12.2.20**. Impact characterisation criteria are defined in **Table 12-3** and in **paragraphs 12.2.20** to **12.2.29**.

Importance

12.2.14 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*' (The Highways Agency et al., 2010).

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

12.2.16 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.

12.2.17 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.

12.2.18 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 regarding 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

Importance	Criteria
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

12.2.19 For the purposes of this assessment, the impact descriptors in **Table 12-3** are taken to summarise the overall characterisation of positive or negative 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)

12.2.20 The character of impacts is defined using the criteria set out in **Table 12-3**. Impact character was 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 negative, this type of effect would reduce the integrity of the feature and its conservation status. If positive, it would result in an improvement to the conservation status of the feature
Medium	An impact resulting in a long-term but reversible effect on the distribution and/ or abundance of a habitat, species assemblage/ community or population If negative this type of effect would have neutral long-term implications for the integrity of the feature or its conservation status. If positive, it would not alter the long-term conservation status of the feature
Low	An impact resulting in a short-term reversible effect on the distribution and/ or abundance of a habitat, species assemblage/ community or population
Negligible	No discernible impact on the distribution and/ or abundance of a habitat, species assemblage/ community or population

Impact Significance

12.2.21 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 effects on important ecological features. For example, an area of amenity grassland would be evaluated as being of less than 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.

12.2.22 CIEEM (2016) notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (negative or positive) on important ecological features. Significant effects are those that 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 ecological knowledge of CFJV ecologists with experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the Proposed Scheme on ecological features.

12.2.23 Following the above approach the assessment aims to characterise ecological impacts rather than placing a reliance only on magnitude. The character of an impact is used to inform the determination of whether or not the impact in the feature in question is significant.

12.2.24 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.

12.2.25 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.

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

12.2.27 Embedded mitigation measures described within the EcIA 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.

[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.

12.2.28 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) and 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 also mitigation targeted to specific locations as described in this assessment.

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

Assigning Mitigation

12.2.30 Potential 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 12.2.21** to **12.2.25**.

Limitations to Assessment

12.2.31 Baseline information from key stakeholders generally provides a catalogue of likely species accounts. 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 also been reviewed against potential habitat features to determine their likely presence using professional judgement.

12.2.32 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.

12.2.33 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 Proposed Scheme, this is not considered to be a constraint to the EcIA baseline due to the likely timescale required, particularly for habitats, to change significantly from baseline conditions.

12.3 Baseline Conditions

12.3.1 The assessment baseline for the Proposed Scheme is presented below, which includes the determination of important ecology features. Baseline tables have been prepared separately to record the determination of importance (see **Appendix 12.1** (**Volume 2**)).

Statutory Designated Sites

12.3.2 Four statutory designated sites have been identified within the study area (see **Table 12-4**), and shown in relation to the study area on **Drawings 12.1 – 12.5**, contained in **Volume 3**.

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

Designation	Name	Importance	Qualifying Features
Special Protection Area	Drumochter Hills	International	Dotterel *Charadrius morinellus*, breeding Merlin *Falco columbarius*, breeding
Special Area of Conservation	Drumochter Hills	International	Blanket bog Species-rich grassland with mat-grass in upland areas Wet heathland with cross-leaved heath *Erica tetralix* 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	International	Sea lamprey *Petromyzon marinus* Atlantic salmon *Salmo salar* Otter *Lutra lutra* Freshwater pearl mussel *Margaritifera margaritifera*
Site of Special Scientific Interest	Drumochter Hills	National	Breeding bird assemblage Fluvial geomorphology of Scotland Montane assemblage Vascular plant assemblage

12.3.3 The Drumochter Hills Special Protection Area (SPA) and Special Area of Conservation (SAC) share a similar site boundary, which is bisected by the Pass of Drumochter between Dalnaspidal and Balsporran Cottages. Both sites are located within 50m east of the existing A9 road at their closest point (Dalnaspidal), with the western extents of each site located over 100m to the west beyond the Highland Main Line (HML) railway. To the north of Balsporran Cottage, both sites occur only to the east of the existing A9 road, and some 200m from the road at the closest point.

12.3.4 At this location, the River Spey SAC includes almost the full extent of the River Truim from the Pass of Drumochter to the confluence with the River Spey at Crubenmore. The River Truim is located to the west of the existing A9 road, occurring within 10m of the carriageway at several locations. The River Spey SAC does not pass under the existing A9 road; however, most of the existing watercourse crossings from the Pass of Drumochter to Dalwhinnie are upstream of the River Truim.

12.3.5 Special Protection Areas and Special Areas of Conservation are included within the Natura2000 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 listed within the Birds Directive (2009/147/EEC) and Habitats Directive (92/43/EEC) respectively; therefore, both are of **international importance**.

12.3.6 The Drumochter Hills Site of Special Scientific Interest (SSSI) shares a similar site boundary with the Drumochter Hills SPA and SAC; however, the site includes the existing A9 road between Dalnaspidal and Balsporran Cottage. To the north of Balsporran Cottage, the site is located directly east of the existing A9 road. The fluvial geomorphology feature of the SSSI (i.e. Allt Dubhaig), is situated to the west of the existing A9 road at Dalnaspidal. Montane and vascular plant assemblages are characterised by arctic-zone habitats and flora associated with late-lying snow including *Phyllodoce caerulea* (Menzies heath), *Cerasticum alpinum* (alpine mouse-ear) and *Saxifraga nivalis* (alpine saxifrage). These particular habitats, and typical species, are not present within 250m of the existing A9 road (see **Appendix 12.3** (**Volume 2**)). The extensive heathland and montane habitats support important assemblage of upland and arctic bird species; although, evidence of breeding for these species within 500m of the existing A9 road is limited (see **Appendix 12.4** (**Volume 2**)). SSSIs are designated through the Nature Conservation (Scotland) Act 2004, and of **national importance**.

12.3.7 Between Dalnaspidal and Dalwhinnie, the existing A9 road pass through the upper catchments of the River Tay (i.e. Dalnaspidal to Pass of Drumochter) and River Spey (Pass of Drumochter to Dalwhinnie). Through the Allt Dubhaig and the River Truim, existing watercourse crossings are connected to other important statutory designated sites. However, given the distance and dilution potential to these sites, a significant effect is unlikely; and these additional sites are not considered any further in this assessment. Therefore, no other statutory or non-statutory designated sites have been identified within the study area.

Notable Habitats

12.3.8 Notable habitats are identified as a conservation priority though relevant legislation or planning policy, including:

- 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 CNAP

12.3.9 Notable habitats are identified using the above classification, regardless of whether they form part of a designated site.

12.3.10 A review of the AWI revealed that there is no ancient woodland within the study area, and as such, a significant effect on ancient woodland is unlikely. Therefore, ancient woodland is not considered any further in this the assessment.

Phase 1 Habitat Survey

12.3.11 Broad habitat types identified during the Phase 1 habitat survey are detailed in the accompanying Preliminary Ecological Appraisal (see **Appendix 12.2** (**Volume 2**)), and shown in **Drawings 12.6** to **12.10** (**Volume 3**).

12.3.12 In summary, existing roadside verge habitats are characterised by a mosaic of dry dwarf shrub heath and acid grassland. An extensive strip of coniferous plantation woodland is present to the east of the existing A9 road, beyond which wet dwarf shrub heath is relatively widespread over gently sloping ground. Marshy grassland and valley mire dominate low-lying ground to the west of the existing A9 road, where the Allt Dubhaig and River Truim floodplains are located.

12.3.13 Existing watercourse crossings are typically characterised as hillside drains or the lower reaches of watercourses emerging from adjacent ravines. They generally contain little or no aquatic or emergent vegetation, with riparian areas typically characterised by the adjoining habitats.

12.3.14 For the purpose of this assessment, watercourses are classified as either major (e.g. as shown on the 1:50,000 scale ordnance survey mapping) or minor (e.g. as shown on the 1:10,000 scale ordnance survey mapping). The existing A9 road crosses the following major watercourses, including relevant Hydro ID to correlate with **Chapter 11** in **Volume 1**:

- Allt Chaorach Beag (Hydro ID -2)
- Allt Coire Mhic-sith (Hydro ID 2)
- Allt Ruidh nan Sgoilearan (Hydro ID 8)
- Unnamed watercourse (Hydro ID 12)
- Allt Fuar Bheann (Hydro ID 13)
- Allt a' Chaorainn (Hydro ID 23)
- Allt an Creagach (Hydro ID 31)
- Allt Coire Chaorainn (Hydro ID 52)
- Unnamed watercourse (Hydro ID 57)
- Allt Coire Chuirn (Hydro ID 59)
- Allt Coire Bhotie (Hydro ID 64).

Phase 2 Habitat Survey

12.3.15 NVC communities identified during the Phase 2 habitat survey are detailed in the accompanying NVC Survey Report (see **Appendix 12.3** (**Volume 2**)); and shown in **Drawings 12.11** to **12.17** (**Volume 3**). NVC communities recorded within the study area that correlate with notable habitats are presented in **Table 12-5**.

12.3.16 Over 50% of the study area contains vegetation communities that correspond with Annex I habitats. European dry heath is the most widespread and generally occurs on steep slopes to the east of the existing A9, particularly through the Pass of Drumochter. In these areas, H12a *Calluna vulgaris* sub-community was the most commonly identified NVC community.

12.3.17 Northern Atlantic wet heathlands are also relatively common within the study area, occurring on more gentle slopes to the east of the existing A9, around Dalnaspidal and to the north of Drumochter Lodge. It is typically characterised by extensive M15b Typical sub-community where cross-leaved heather *Erica tetralix* is generally subordinate to ling heather *Calluna vulgaris*, which indicates possible desiccation of the underlying peatlands.

12.3.18 Blanket bogs are present to the west of the existing A9, where valley mire is extensive over the Allt Dubhaig and River Truim floodplains. In these areas, M17a *Drosera rotundifolia-Sphagnum spp.* sub-community is the most commonly identified NVC community, and was found to contain bog pool communities M1, M2 and M3. M19a *Erica tetralix* sub-community is also present with

varying levels of ling heather *Calluna vulgaris* and decreasing levels of Sphagnum mosses indicating some desiccation of the underlying peatlands.

12.3.19 Blanket bogs are also present to the east of the existing A9 road, notably around Dalnaspidal. In these areas, blanket bogs are small in scale and indicative of locally deep peat deposits within a wet heath mosaic. In these areas, M17 and M19 mosaics contain degraded blanket bog communities such as M20 *Eriophorum vaginatum* blanket mire and M25a *Erica tetralix* sub-community.

12.3.20 Discrete stands of species-rich *Nardus* grassland are relatively frequent throughout the study area, generally occurring on steeper slopes to the east of the existing A9 in more extensive mosaics of dry heath and U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland. There is a greater frequency of calcareous influence through the Pass of Drumochter, as a result of groundwater flushing, where CG10 *Festuca ovina – Agrostis capillaris – Thymus polytrichus* grassland is the most commonly identified NVC community. Two small areas of U4c *Lathyrus montanus – Stachys betonica* sub-community are also present on lower slopes to the east of the existing A9 near the Allt a' Chaorainn. The field layer in these areas typically contain few forb species and dominated by closely-cropped gramminoids due to grazing.

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

Notable Habitat	Conservation Status	Area (ha)	% cover	Importance
European dry heaths *(NVC: H10, H12, H18, H21)*	Annex 1	226.89	29.38	International
Northern Atlantic wet heathlands *(NVC: M15, M16)*	Annex 1	167.40	21.67	International
Non-priority grasslands *(NVC: all other U, MG, OV)*	None	134.42	17.40	Less than Local
Non-NVC – woodland *(e.g. coniferous plantation)*	None	31.92	4.13	Less than Local
Non-NVC – other *(e.g. bare ground)*	None	77.57	10.04	Less than Local
Blanket bogs *(M1, M2, M3, M17, M19, M20, M25)*	Annex 1	102.53	13.27	International
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M29, M32, S9)*	SBL	21.45	2.78	Authority Area
Non-priority woodlands *(W18, W23, W24)*	None	4.48	0.58	Local
Wet grasslands *(NVC: MG9, MG10,M23b)*	CNAP	2.87	0.37	Local
Transition mires and quaking bogs *(NVC: M4, M5)*	Annex 1	1.80	0.23	Authority Area
Upland birchwoods *(NVC: W11, W17)*	SBL	0.58	0.07	Local
Species-rich *Nardus* grasslands (NVC: CG10, U4c)	Annex 1	0.50	0.07	International

12.3.21 Whilst European dry heaths, Northern Atlantic wet heathlands, blanket bogs and species-rich Nardus grasslands are relatively common habitats within the Scottish uplands, these habitats occur partially within and directly adjacent to the Drumochter Hills SPA, SAC and SSSI. Whilst the condition of these habitats are under pressure from ongoing land management pressures, they are qualifying habitat for the Drumochter Hills SAC and of **international importance**.

12.3.22 Other Annex I habitats are present within the study area, including alkaline fens and transition mires and quaking bogs. Whilst these area important, they occur as discrete stands within wider habitat mosaics. These features are not qualifying habitat for the Drumochter Hills SPA, SAC or SSSI; and given the small extent of these habitats they are **authority area importance**.

12.3.23 Upland flushes, fens and swamps is a broad and variable habitat classification that occur where there is groundwater flushing or standing water within floodplains. M6 *Carex echinata - Sphagnum fallax/denticulatum* mire and M11 *Carex demissa – Saxifraga aizoides* mire are relatively commonly; although, they are typically discrete and scattered throughout other habitats including mires, grasslands, heaths and swamps. On this basis, they are **authority area importance**.

12.3.24 Wet grasslands are not a common within the study area with only an extremely small area of MG9 *Holcus lanatus – Deschampsia cespitosa* grassland located between the existing A9 road and the National Cycleway Network (NCN) 7, close to where the crossing of the Allt Coire nan Cisteachan. MG10 *Holcus lanatus – Juncus effusus* rush-pasture is present in very small amounts within other broad habitat types. Given that both MG9 and MG10 are small in scale and relatively species-poor, they are of **local importance**.

12.3.25 Upland birchwoods are not a common within the study area with only an extremely small area of W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland along the edge of the Allt Coire Mhic-sith. A further small area of W11 *Quercus petraea – Betula pubescens – Oxalis acetosella* woodland was also noted beyond the HML railway through the Pass of Drumochter. Whilst, W11 and W17 can correspond with Annex I habitat 91AO (Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles), they are generally too small in scale and isolated from other woodlands; therefore, they are of **local importance**.

12.3.26 Non-priority grasslands (*i.e.* vegetation communities that do not correspond with any Annex I, SBL or CNPA priority habitats) account for almost 20% of the study area and are common in areas adjoining the existing A9, side-roads and access tracks. In these areas, flora is indicative of nutrient enrichment and/ or infrequent management, which contain MG1 *Arrhenatherum elatius* grassland, MG6 *Lolium perenne – Cynosurus cristatus* grassland, OV24 *Urtica dioica – Galium aparine* community, *OV25 Urtica dioica – Cirsium arvense* community and OV27 *Chamerion angustifolium* community. Calcifugous grasslands are also common throughout the study area, with U5 *Nardus stricta – Galium saxatile* grassland present in riparian zones to the River Truim. U6 *Juncus squarrosus – Festuca ovina* grassland and U20 *Pteridium aquilinum – Galium saxatile* community typically occupy marginal areas to other habitat types (e.g. wet heath). On this basis, non-priority grasslands are of **local importance**.

12.3.27 Non-priority woodlands and understorey vegetation are not common within the study area with only extremely small areas of W18 *Pinus sylvestris – Hylocomium splendens* woodland present in shelter-belt planting around properties at Dalnaspidal and Drumochter Lodge. Whilst, W18 can correspond with Annex I habitat 91CO (Caledonian forest), they are generally too small in scale and isolated from other woodlands; therefore, they are of **local importance**.

12.3.28 Features that do not correspond with an NVC community are extremely limited or of no botanical interest and are of **less than local importance**.

Invasive non-native species

12.3.29 No invasive non-native species (INNS) of plant are present in the study area; and these are not considered any further in this assessment.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

12.3.30 SEPA (2014) has classified a number of NVC communities as being dependent on groundwater (see **Table 12-6**). 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 A separate assessment of potential groundwater dependent terrestrial ecosystems (GWDTE) has been carried out to further assess their 'likely' groundwater dependence based on their topographical, geological and hyrdo-ecological context (see **Appendix 10.2** (**Volume 2**)). Therefore, GWDTE are not considered any further in this assessment.

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:	
M5	*Carex rostrata – Sphagnum squarrosum mire*
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
M29	*Hypericum elodes – Potamogeton polygonifolius soakway*
M32	*Philonotis fontana – Saxifraga stellaris* spring
CG10	Festuca ovina – Agrostis capillaris – Thymus polytrichus grassland

Ornithology

12.3.32 This assessment is focussed on identifying potential impacts on notable species of breeding and non-breeding birds identified as a conservation priority through relevant legislation or planning policy. This thereby excludes common species of low conservation concern, in order to more efficiently record and determine the location of higher sensitivity areas (i.e. containing populations of species of higher conservation concern). For the purpose of the assessment, this includes:

- internationally (or nationally) important interest features associated with SPAs (or SSSIs)
- internationally important resident or regularly occurring migratory species identified on Annex I of the Birds Directive
- nationally important species identified on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)
- regionally important species identified on the CNAP
- regionally important red and amber listed in the Birds of Conservation Concern (BoCC)

- any other locally important species identified as an integral part of the local bird assemblages which is of wider conservation importance (e.g. amber-listed wader species)

12.3.33 It is noted that while the BoCC Red and Amber list species are recognised as being important at a national scale, unless certain particularly scarce species included on the list are present, it is appropriate given the geographic scale of the study to assign a value of regional, or other appropriate lower level of importance, to these groups taking into account national and regional population data where it is available.

12.3.34 An overview of the abundance and distribution of breeding birds is presented below. Further detailed accounts of baseline ornithological conditions are set out in **Appendix 12.4** (**Volume 2**).

Breeding Birds

12.3.35 British Trust for Ornithology (BTO) Bird Atlas Data 2007-11 provides a summary of breeding birds recorded within the study area; those of conservation importance are presented in **Table 12-7**.

12.3.36 Consultation with Tayside Raptor Study Group highlighted records of breeding raptors within at least 500m of the existing A9 between 2011-2015, including historic nesting sites for merlin and hen harrier near Dalnacardoch; as well as peregrine falcon near Dalnaspidal.

12.3.37 Consultation with RSPB Scotland highlighted that no woodland grouse leks are known to occur within the study area; although, discrete areas of potential lekking habitat is limited to moorland areas marginal to woodland around Drumochter Lodge.

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

Breeding species recorded within tetrads overlapping with the study area			
International	**National**	**Regional**	
Golden plover *Pluvialis apricaria*	Dunlin *Calidris alpina*	Greylag Goose *Anser anser*	Redshank *Tringa totanus*
Short Eared Owl *Asio flammeus*	Peregrine falcon *Falco peregrinus*	Teal *Anas crecca*	Black-Headed Gull *Chroicocephalus ridibundus*
Golden eagle *Aquila chrysaetos*	Greenshank *Tringa nebularia*	Red Grouse *Lagopus lagopus*	Skylark *Alauda arvensis*
Hen harrier *Circus cyaneus*	Crossbill sp. *Loxia* sp.	Kestrel *Falco tinnunculus*	Ring Ouzel *Turdus torquatus*
Merlin *Falco columbarius*		Oystercatcher *Haemotopus ostralegus*	Lesser Redpoll *Carduelis cabaret*
Dotterel *Charadrius morinellus*		Lapwing *Vanellus vanellus*	
Black throated diver *Gavia arctica*		Curlew *Numenius arquata*	

12.3.38 Breeding bird surveys were carried out during 2015 and 2016; and survey findings are detailed in the accompanying Breeding Bird Survey Report (see **Appendix 12.4**, **Volume 2**), and shown in **Drawings 12.25** to **12.28** in **Volume 3**.

12.3.39 The Drumochter Hills SPA, which is present within the study area, is designated for breeding populations of dotterel and merlin. No dotterel was recorded within the study area, all of which lies at 450m altitude or below; this is considerably lower than the breeding range of dotterel in Scotland (Forrester and Andrews, 2007). Therefore, dotterel are considered to be absent from the study area and not considered further within this assessment.

12.3.40 A single female merlin flight was recorded within the southern extent of the study area in June 2015; although, no visible signs of breeding merlin was observed in 2015 or 2016. The most

recent site condition monitoring (SCM) indicates that three pairs of merlin are breeding within the SPA, while the citation notes that the site is selected based on a breeding population of seven breeding pairs of merlin. Given the scarce nature of merlin within the designated site, as merlin activity was reported within and immediately adjacent to the SPA boundary, merlin is of **international importance**.

12.3.41 Other notable raptors recorded during surveys include golden eagle and hen harrier; however, no evidence of breeding within the study area was reported for either species. Golden eagle is specifically noted within the Drumochter Hills SSSI citation. Flight records were noted in July 2015 towards Dalnaspidal. Current population estimates show a Scottish population of 443 occupied breeding territories, while 40 pairs of golden eagle are present within the central highlands and Cairngorms massif areas (combined) which overlap with the study area (Wilson *et al*. 2015). Where it is considered a single pair of golden eagle are present utilising (though not breeding within) the study area, they are considered to be of **regional importance**.

12.3.42 Three hen harrier flights were reported in 2015 in the southern half of the study area and it is possible that some habitat within the study area forms part of a breeding territory. Wilson *et al*. (2015) estimate 501 breeding hen harrier pairs in Scotland with a combined total of 36 of those pairs within the Central highlands and Cairngorms Massif. Hen harrier are therefore assessed as being of **regional importance** within the study area.

12.3.43 An assemblage of upland and arctic-zone breeding birds is a notified feature within the Drumochter Hills SSSI citation; of the species specifically noted in the SSSI citation, wigeon *Anas Penelope* were confirmed breeding within the study area within wetland habitats around the Allt Dubhaig near Dalnaspidal. Dunlin *Calidris alpina* (up to two pairs) were also reported breeding around the wetland at Allt Dubhaig. Ring ouzel *Turdus torquatus* were reported at two locations within the 500m study area where they were likely to be breeding. Wigeon, dunlin and ring ouzel are of **national importance** where they occur, owing to the contribution they make to a nationally designated site which specifically notes these species. Populations within the study area are however low in relation to national and populations based on populations presented by Forrester and Andrews (2007).

12.3.44 Black-tailed godwit *Limos limosa* (1 pair) was observed breeding within wetland at Allt Dubhaig, given the low numbers in which this species breeds in Scotland (5-11 pairs, Forrester and Andrews (2007)) and their protection, black-tailed godwit are of **national importance**.

12.3.45 Crossbill was recorded at a number of locations within the study area, including the plantation at Drumochter lodge, and the snowbelt plantation to the east of the existing A9 in low numbers. Given that they were located within suitable nesting habitat during the breeding season, it is assumed they were probably breeding within the study area. Crossbill species have a highly variable breeding population and Forrester and Andrews (2007) cite a Scottish population of between 5,000 and 50,000 pairs but note that the population can increase well in excess of that in some years. Taking into account the national breeding population, the limited extent of coniferous woodland within the surrounding area and owing to their protection, crossbill species are of **local importance**.

12.3.46 Species associated with CNAP and BoCC are present in the study area with their estimated population, based on peak counts, summarised in **Table 12-8**.

Table 12-8: Proportion of Strathspey wader population within the study area

Species	Strathspey Population (breeding pairs in 2005)	Estimated Population (breeding pairs in study area)	Proportion of Strathspey population (%)
Lapwing	761	40	5%
Oystercatcher	571	31	5.5%
Curlew	332	17	5%
Redshank	223	2	0.9%
Snipe	542	9	1.7%

12.3.47 To provide some further context on the importance of the wading bird population present within the study area, the populations of wading birds are contrasted with population estimates from Strathspey reported by RSPB (2006), as shown in **Table 12-8**. Given the importance of the high concentrations of waders breeding within Badenoch and Strathspey, the numbers presented by RSPB data for Strathspey are used as a regional baseline for the purposes of this assessment.

12.3.48 Of particular note are aggregations of breeding waders and wildfowl on the Allt Dubhaig floodplain near Dalnaspidal. The distribution of territories is primarily to the west of the existing A9 road on the River Truim floodplain and the Allt Dubhaig floodplain, where curlew *Numenius arquata*, oystercatcher *Haemotopus ostralegus* and snipe *Gallinago gallinago* were also observed. Lapwing *Vanellus vanellus*, curlew, snipe and redshank *Tringa totanus* are also noted as components of the wider Strathspey breeding wader assemblage, which occur in suitable habitat throughout the River Truim floodplain and as far downstream as Insh Marshes. Passerines are also present, including ground-nesting species such as Skylark *Alauda arvensis*, although generally in small numbers. On this basis, components of the Strathspey breeding wader assemblage are of **authority area importance** within the study area; and other species (including passerines) are considered to be of **local importance**. Most potential nesting habitat within the study area is limited to features likely to support other widespread species of **less than local importance**.

12.3.49 Visual checks of potential woodland grouse lekking habitat was carried out in 2016, though no evidence of black grouse *Tetrao tetrix* or capercaillie *Tetrao urogallus* breeding was reported.

12.3.50 **Table 12-9** presents an overview of those species targeted for assessment, not mentioned above due to association with designated sites or protected status, which were recorded breeding within the study area. Regional and national population data are presented where available to enable an assessment of the value of the species within the study area. Regional wader population data is taken from RSPB Strathspey Breeding Wader Census data from 2005; national population data is in line with estimates presented by Forrester and Andrews (2007).

Table 12-9: Conservation status for breeding bird within the study area (denoted species also on SBL)*

Species	Scientific name	Highest policy Importance	Numbers present	Scottish population	Regional population	Value
Lapwing*	*Vanellus vanellus*	CNAP	40	71,500 – 105,600	761	Regional
Redshank	*Tringa totanus*	CNAP	2	11,700 – 17,500	223	Regional
Curlew	*Numenius arquata*	BoCC (Red List)	17	58,800	332	Regional
Oystercatcher	*Haematopus ostralegus*	BoCC (Amber List)	31	84,500 – 116,500	571	Local
Snipe	*Gallinago gallinago*	BoCC (Amber List)	9	34,000 – 40,000	542	Regional
Ringed plover	*Charadrius hiaticula*	BoCC (Red List)	2	4,900 – 6,700	Not available	Regional
Lesser redpoll*	*Carduelis cabaret*	BoCC (Red List)	7	7,500 – 15,000	Not available	Local
Linnet*	*Carduelis cannabina*	BoCC (Red List)	1	70,000 – 90,000	Not available	Local
Song thrush*	*Turdus philomelos*	BoCC (Red List)	3	250,000 – 260,000	Not available	Local
Mistle thrush	*Turdus viscivorus*	BoCC (Red List)	1	40,000 – 50,000	Not available	Local

Species	Scientific name	Highest policy Importance	Numbers present	Scottish population	Regional population	Value
Spotted flycatcher*	*Muscicapa striata*	BoCC (Red List)	1	10,000 – 20,000	Not available	Local
Tree pipit*	*Anthus trivialis*	BoCC (Red List)	2	43,000	Not available	Local
Kestrel	*Falco tinnunculus*	BoCC (Amber List)	1	3,850	Not available	Local
Greylag goose	*Anser anser*	BoCC (Amber List)	15	20,000 (birds post breeding)	Not available	Local
Teal	*Anas crecca*	BoCC (Amber List)	3	1,950 – 3,400	Not available	Local
Mallard	*Anas platyrhynchos*	BoCC (Amber List)	12	17,000 – 43,000	Not available	Local
Red grouse	*Lagopus lagopus*	BoCC (Amber List)	6	100,000 – 150,000	Not available	Local
Black-headed gull	*Chroicocephalus ridibundus*	BoCC (Amber List)	8	43,200	Not available	Local
Common gull	*Larus canus*	BoCC (Amber List)	84	48,100	Not available	Local
Common sandpiper	*Actitis hypoleucos*	BoCC (Amber List)	18	17,000 – 24,000	Not available	Local

Non-Breeding Birds

12.3.51 British Trust for Ornithology (BTO) Bird Atlas Data 2007-11 provides a summary of non-breeding birds recorded within the study area; and those of conservation importance are presented in **Table 12-10**.

12.3.52 In summary, records highlight low numbers of non-breeding birds in the study area. Hen harrier, golden eagle, snow bunting, golden plover and ptarmigan are known to be present in the wider landscape. The low number of records is likely to be a result of the high altitude and prevailing climate during the winter months, which will limit the availability of prey species (e.g. small mammals or passerines). Data indicates that both kestrel and red grouse are likely to be resident throughout most of the year.

Table 12-10: Summary of BTO Bird Atlas Data – wintering (non-breeding) birds

Non breeding species recorded within tetrads overlapping with the study area			
International	**National**	**Regional**	
Whooper swan *Cygnus cygnus*	Ptarmigan *Lagopus muta*	Black grouse *Tetrao tetrix*	Greylag goose *Anser anser*
Golden eagle *Aquila chrysaetos*	Snow bunting *Plectrophenax nivalis*	Red grouse *Lagopus lagopus*	Field fare *Turdus pilaris*
Hen harrier Circus cyaneus	Crossbill sp. *Loxia sp.*	Goldeneye *Bucephala clangula*	Tawny owl *Strix aluco*
Merlin *Falco columbarius*	Peregrine falcon *Falco peregrinus*	Mallard *Anas platyrynchos*	Great grey shrike *Lanius excubitor*
		Teal *Anas crecca*	Redwing *Turdus iliacus*
		Kestrel *Falco tinnunculus*	Reed bunting *Emberiza scheoniclus*
		Woodcock *Scolopax rusticola*	Lesser redpoll *Carduelis cabaret*
		Lapwing *Vanellus vanellus*	

Herptiles (Amphibians and Reptiles)

Reptiles: adder (Vipera berus), common lizard (Zootoca vivipara), 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 over west-facing slopes, beyond which heather moorland is widespread. Potential hibernacula is locally present, particularly around fence-line boundaries; as well as tree root plates within plantation woodland.

12.3.54 Steep sloping ground associated with the Pass of Drumochter will limit exposure of potential habitats to direct sunlight around dawn and dusk throughout much of the study area, particularly within the existing A9 road corridor. This will limit basking opportunities, notably for adder as they are diurnal. Heathland areas are largely managed as grouse moorland and muirburn will further limit the extent and scale of suitable habitat; as well as the abundance of reptiles.

12.3.55 Incidental sightings from protected species walkover surveys have confirmed adder, common lizard and slow-worm are present in the study area (see **Appendix 12.1** (**Volume 2**)). Common lizard was observed in heathland areas found close to plantation woodlands near Dalnaspidal, Pass of Drumochter and Drumochter Lodge. Sightings of adder and slow-worm were made in heathland areas located south of the Allt Coire Mhic-sith at Dalnaspidal. On this basis, it is assumed that small populations of adder, common lizard and slow-worm could be locally present throughout the study area; and are determined to be of **authority area importance**.

Great Crested Newt (Triturus cristatus)

12.3.56 Great crested newts (GCN) are a European Protected Species (EPS) listed on Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994, and are a SBL species.

12.3.57 A Habitat Suitability Index (HSI) assessment (Oldham et al., 2000) was carried out for eight ponds identified within 250m from the existing A9. Due to the prevailing upland habitat and significant barriers (e.g. River Truim), the waterbodies were considered to offer 'poor' or 'below average' potential for breeding GCN (see **Appendix 12.5** (**Volume 2**)). Therefore, GCN are considered to be absent from the study area and not considered any further in this assessment.

Common toad (Bufo bufo)

12.3.58 Common toad are listed under the SBL. No records of this species are present in the study area however; therefore, no specific survey effort has been undertaken for this species.

12.3.59 An anecdotal record of common frog was noted within the study area during survey work. This species requires similar habitat conditions to common toad and it is therefore considered they are likely to be present. Common toad is of **authority area** importance.

Protected Vertebrates

Bats

12.3.60 The desktop study found no records of known bat roosts or incidental sightings of bats within the study area. A review of aerial photography highlighted that roosting potential, as well as foraging and commuting habitats, within the study area is extremely limited; potential habitats are

characterised by roadside verge containing low-lying vegetation and narrow bands of conifer thicket, within a predominantly upland and heather moorland environment.

12.3.61 A survey was carried out to record the presence of bat roost potential (BRP) features within the study area (see **Appendix 12.5** and **Appendix 12.6** (**Volume 2**)). Trees and man-made features supporting BRP features are detailed in **Table 12-11**. During the survey, possible droppings (guano) were noted at Dalnaspidal culvert in 2015; although, guano was degraded/ desiccated to the extent that no DNA sequencing could be carried out.

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

Feature Name	Bat Roost Potential
Dalnaspidal plantation	Low
Derelict Dalnaspidal house	High
Dalnaspidal culvert	Moderate/ High
Allt Ruidh nan Sgoilearan cycle path culvert	Moderate/ High
Allt Fuar Bheann cycle path culvert	Low/ negligible
Allt a' Chaorainn culvert	Moderate/ High
Drumochter Lodge plantation	Low
Drumochter Lodge	High

12.3.62 Emergence/ re-entry surveys of BRP features were carried out during 2015 and 2016 (see **Appendix 12.6** (**Volume 2**)), with surveys of the buildings at Dalnaspidal completed in 2017. No roosting bats were observed using BRP features during any of these surveys.

12.3.63 Bat activity is very low with individual common and soprano pipistrelle bats observed foraging in areas adjoining BRP features. Low levels of bat activity and species diversity is likely to be a result of limited suitable foraging and commuting habitats as woodland areas are generally small in scale, isolated and of limited structure; particularly in proximity to BRP features. In addition, the cool, wet and windy prevailing climate further limits opportunities for foraging and commuting bats. Therefore, it is considered that habitat features within the study area do not support important populations of foraging or commuting bats.

12.3.64 On this basis, common pipistrelle and soprano pipistrelle are of **local importance**; and other species of bat are assumed to be absent and of **less than local importance** (see **Appendix 12.1** (**Volume 2**)).

European Badger (*Meles meles*)

12.3.65 Badger are protected under the Protection of Badgers Act 1992. No signs of badger were recorded within the study area during the 2015 surveys. A single record of a badger road mortality is present at the northern tie-in.

12.3.66 Suitable habitat for badger is limited within the study area and it is therefore considered that badger are unlikely to be present on site, though they may enter the northern tie-in. As no setts have been identified they are of **local importance**.

European Otter (*Lutra lutra*)

12.3.67 Otter are an EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 as amended. Baseline information on otter within the study area is summarised in **Table 12-12**.

Table 12-12: Summary of otter records within the study area

Location	Catchment	Observation	Year	Source
Dalnaspidal	River Tay	Spraint	2014	Preliminary Ecological Appraisal
Dalnaspidal	River Tay	Spraint	2014	Preliminary Ecological Appraisal
Allt a' Chaorainn	River Tay	Couch	2016	Protected Vertebrate Update Survey
Allt a' Chaorainn	River Tay	Spraint	2014	Preliminary Ecological Appraisal
Allt a' Chaorainn	River Tay	Spraint	2015	Protected Vertebrate Survey
Allt a' Chaorainn	River Tay	Couch / Hover	2015	Protected Vertebrate Survey
Allt a' Chaorainn	River Tay	Couch / Hover	2016	Protected Vertebrate Update Survey
Allt a' Chaorainn	River Tay	Couch / Hover	2016	Protected Vertebrate Update Survey
River Truim	River Spey	Spraint	2015	Protected Vertebrate Survey
River Truim	River Spey	Spraint	2015	Protected Vertebrate Survey
Allt Coire Chaorainn	River Spey	Spraint	2014	Preliminary Ecological Appraisal
Allt Coire Chaorainn	River Spey	Spraint	2016	Protected Vertebrate Update Survey
Allt Coire Chaorainn	River Spey	Spraint	2015	Protected Vertebrate Survey
Allt Coire Chuirn	River Spey	Spraint	2014	Preliminary Ecological Appraisal
Layby 85	River Spey	Dead Otter	2017	Incidental – Fish Habitat Assessment
Allt Coire Bhotie	River Spey	Spraint	2014	Preliminary Ecological Appraisal

12.3.68 Surveys concluded that otter activity within the study area is low overall and no holts were encountered. As a qualifying species of the River Spey SAC, an EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 as amended, otter are of **international importance**.

Pine Marten (*Martes martes*)

12.3.69 Pine marten are protected under the Wildlife and Countryside Act (1981). No signs of pine marten were recorded in the study area during the 2015/ 2016 surveys. Mustelid prints were recorded to the west of the existing A9 road near Balsporran Cottages in 2016; however, this could not be confirmed as pine marten. The lack of suitable sheltering habitat and cover make the survey area unattractive to pine marten. It is therefore considered that pine marten are absent from the study area and are not considered any further in this assessment.

Red Squirrel (*Sciurus vulgaris*)

12.3.70 Red squirrel are protected under the Wildlife and Countryside Act 1981 (as amended). There is limited woodland cover within the study area, other than an isolated belt of coniferous plantation woodland to the east of the existing A9 and around Drumochter Lodge. Protected vertebrate surveys recorded no evidence of red squirrel within the study area. Potential cone feeding remains at Drumochter Lodge are extremely unlikely to belong to red squirrel due to no dreys being recorded and isolation of this area from more extensive woodland cover, which is located to the west of the existing A9 road towards Dalwhinnie. Therefore, red squirrel is assumed to be absent and of **less than local importance**.

European Wildcat (*Felis silvestris silvestris*)

12.3.71 Wildcat are an EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 as amended. CNPA has provided one verified record of European wildcat where an animal road mortality was observed in 2012 at the northern extent of the study area.

12.3.72 Coniferous plantation woodland, which may provide potential cover habitat for wildcat, is present to the east of the existing A9 road through the Pass of Drumochter, and from Drumochter Lodge to the Allt Coire Bhaitaich located beyond the study area. Two areas of coniferous plantation woodland are present to the west of the existing A9 road at Dalnaspidal and Drumochter Lodge. Around these areas, the woodland edge and scrub may offer potential commuting habitats. Heathland and grassland are widespread through all sections and may provide potential foraging habitats.

12.3.73 No incidental sightings of European wildcat were recorded during the Phase 1 Habitat Survey. During 2015/ 2016 protected vertebrate surveys, no signs of wildcat were recorded. It is considered that wildcat is absent from the study area; 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. On this basis, they are assigned a **national importance**.

Water Vole (*Arvicola amphibius*)

12.3.74 Water vole are protected under the Wildlife and Countryside Act 1981 (as amended) and are listed under the SBL and CNAP. Protected vertebrate surveys found evidence of water vole within the study area, notably to the west of the A9 road through the Pass of Drumochter (see **Appendix 12.6** (**Volume 2**)). In these areas, riparian habitats (e.g. wet grasslands and mires) are widespread, although their extent is limited by the existing A9 and HML railway. On this basis, water vole are of **authority area importance**.

Hare Species (*Lepus Spp.*)

12.3.75 Mountain hare (*Lepus timidus*) and brown hare (*Lepus europeas*) are listed under the SBL and also receive limited protection under the Wildlife and Countryside Act 1981 (as amended).

12.3.76 Indicative sightings of mountain hare have been recorded, and the species is assumed to be present in suitable moorland habitat; therefore, they are considered to be of **authority area importance**.

Atlantic Salmon (*Salmo salar*)

12.3.77 Through consultation with SNH, SEPA and SFB, Atlantic salmon are known to occur throughout the River Truim. In-channel features on the main-stem of the River Truim incorporate fish passage, and Atlantic salmon are known to spawn regularly as far upstream as the railway crossing of the Allt Coire Fhar at Balsporran Cottages. Atlantic salmon are not present in the upper catchment of the River Garry as an impassable weir is present at Struan, downstream of the Allt Dubhaig.

12.3.78 A fish habitat assessment was completed where the existing A9 road crosses major watercourses (see **Appendix 12.7** (**Volume 2**)). In these areas, potential spawning habitat features for Atlantic salmon was found to be extremely limited due to low water levels, low water velocity, large sediment size and active river morphology. None-the-less, potential spawning habitat is more likely to be present at the confluence between these tributaries and the River Truim.

12.3.79 Atlantic salmon are a qualifying feature of the River Spey SAC and act as a host species to freshwater pearl mussel 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*)

12.3.80 Through consultation with SNH, SEPA and 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 sub-optimal upstream of Newtonmore.

12.3.81 A fish habitat assessment was completed where the existing A9 road crosses major watercourses (see **Appendix 12.7** (**Volume 2**)). In these areas, potential spawning habitat features for sea lamprey was found to be extremely limited due to low water levels, low water velocity, large sediment size and active river morphology. None-the-less, potential spawning habitat is more likely to be present at the confluence between these tributaries and the River Truim.

12.3.82 Sea lamprey are a qualifying feature of the River Spey SAC and assumed to be present in the River Truim; therefore, this species is of **international importance**.

Freshwater Pearl Mussel (*Margaritifera margaritifera*) (FWPM)

12.3.83 There are no records of FWPM on the Allt Dubhaig and no recent records of FWPM on the River Garry (Cosgrove 1997), which is located immediately downstream of the Allt Dubhaig. Consultation with Tay District Salmon Fisheries Board has highlighted that a weir within the River Garry near Struan is impassable to freshwater fish and that no Atlantic salmon are present in the upper catchment of the River Garry. On this basis, re-colonisation of FWPM in the upper catchment of the River Garry is extremely unlikely and the species is absent.

12.3.84 FWPM are known to be historically present on the River Spey, which is located downstream of the River Truim, a shallow-water survey found no evidence of FWPM in the upper reaches of the River Truim. In addition, tributaries to the River Truim were determined to be wholly unsuitable for FWPM due to low water flows, sediment size and active river morphology (see **Appendix 12.18** (**Volume 2**)). Given that FWPM are known to be present towards the confluence with the River Spey, this species is of **international importance**.

Wood Ant

12.3.85 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 SBL and International Union for Conservation of Nature (IUCN) Red List as endangered. Therefore, this assessment will focus on the three Formica species.

12.3.86 Whilst the three Formica species are broadly associated with woodland habitats, there are differences in habitat preference. As described by 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.

12.3.87 The Phase 1 habitat survey notes woodland within the study area in a number of locations, generally along the eastern extent. Details of these affected areas and survey findings are provided in **Appendix 12.2** (**Volume 2**). The coniferous woodland present within the study area mainly comprises of a monoculture of Sitka spruce thicket (*Picea sitchensis*), however, areas such as Dalnaspidal and Drumochter Lodge contain occasional mature stands of Scot's pine (*Pinus sylvestris*) plantation. The limited species and structural diversity offers limited wood ant nest building habitat. These categories are less frequent and present in small isolated patches or thin strips within the study area.

12.3.88 Subsequent walkover surveys carried out in 2017 did not record any wood ant nests within the study area; therefore, wood ant is considered to be absent and not considered further in this assessment.

Invasive non-native species (Faunal)

12.3.89 Invasive non-native species (INNS) that predate, outcompete or spread disease can have negative impacts on native species populations. Within the study area, potential INNS include American mink *Neovison vison* (hereon referred to as mink) (a significant predator of water vole).

12.3.90 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. They are therefore **not applicable** and scoped out of this assessment.

Features scoped out of the assessment

12.3.91 The following features have been determined to be of less than local importance or absent from the study area; and are not considered any further in this assessment:

- Ramsar sites
- National Nature Reserves
- Local Nature Reserves
- ancient woodland
- NVC communities which do not correlate with notable habitats (excluding non-NVC woodland communities)
- invasive non-native species
- dotterel
- great crested newt
- Nathusius' pipistrelle, Natterer's, Daubenton's, brown long-eared, Leisler's and noctule bats
- pine marten
- red squirrel
- wood ant.

Additional Baseline Information

Ecological Permeability

12.3.92 Road widening schemes can create barrier effects to mobile species, which can result in death and injury to wildlife from associated collisions with vehicles. It is likely that the current A9 presents a barrier to protected species and wider biodiversity. Therefore, the design process has considered potential opportunities to utilise road drainage features, pedestrian subways and bridges to improve ecological permeability.

12.3.93 A visual assessment of existing assets was carried out using a traffic light scoring system to highlight current or potential permeability:

- Green: structures that require no, or minor, improvements to increase their suitability as a wildlife crossing
- Amber: structures that may require moderate improvements to increase their suitability as a wildlife crossing
- Red: structures that are unsuitable as wildlife crossings

12.3.94 The assessment classified 36 structures as green, 50 structures as amber and 19 structures as red (see **Table 12-13**). This data has been used in conjunction with wider baseline information to identify locations where safe crossing points could be incorporated into the Proposed Scheme.

Table 12-13: Summary of existing ecological permeability

Structures Assessment	Potential Faunal Corridors
36 **green** 50 **amber** 19 **red** 3 were unable to be located or could not be accessed safely.	• Hydro ID 5 provides good links between river and marshland • Good habitat links across the Drumochter Hills SPA at Hydro ID 13 • Main watercourse crossing at Hydro ID 23 • Hydro ID 31 is likely to be important for the movement of protected species • Hydro ID 43 provides a link from Truim River and upland habitat • Hydro ID 52 is likely to be a commuting route for otters • Hydro ID 64 is a potentially important corridor to the River Spey SAC

Deer Vehicle Collision (DVC) Desk Study

12.3.95 Within the study area, the hotspots of DVCs are in three locations, shown in **Appendix 12.9** (**Volume 2**) in **Drawing 12.40** (**Volume 3**). Hotspot locations are:

- Near Dalnaspidal Lodge just north of where the existing split level dual carriageway ends and leads into a 1km section where woodland abuts close to the east of the road
- A section of approximately 2km, through the Pass of Drumochter (also including some woodland close to the southbound verge)
- In addition, a less prominent cluster of incidents stretches from Drumochter Lodge to 1km south of this location

CNPA draft priority non-protected species

12.3.96 The CNPA desktop review of priority non-protected species highlighted nine red (highest priority) areas and 15 amber (high priority) areas within the study area, 15 of which are 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) are provided in **Table 12-14**.

Table 12-14: Potential habitat features – CNPA priority non-protected species

Habitat feature	Interest Group	Red/ Amber
Unimproved acid grassland	Fungi - Waxcaps	Red
Unimproved acid grassland	Fungi and botanical interest	Red
Dry dwarf shrub heath – acid and Marshy Grassland mosaic	Fungi and botanical interest	Red
Unimproved calcareous grassland	Fungi and botanical interest	Red
Unimproved calcareous grassland	Fungi (waxcap) and botanical interest	Red
Dry modified bog	Exposed areas of peat for restoration	N/A
Dry dwarf shrub heath – acid	Lepidoptera (if bearberry present)	Amber
Raised Bog	Potential botanical and *Diptera* interest	Amber
Crags and Scree	Potential bryophyte interest	Amber
Crags and Scree	Potential bryophyte interest	Amber
Dry dwarf shrub heath – acid	Lepidoptera (if bearberry present)	Amber
Fen – valley mire	Potential botanical and *Diptera* interest	Amber
Raised *Sphagnum* bog	Potential botanical and *Diptera* interest	Red
Fen – valley mire	Potential botanical and *Diptera* interest	Amber
Dry dwarf shrub heath – acid	Lepidoptera (if bearberry present)	Amber
Fen – valley mire	Potential botanical and *Diptera* interest	Amber
Coniferous woodland - plantation	Tooth fungi recorded nearby	Amber
Coniferous woodland - plantation	Tooth fungi recorded nearby	Amber
Coniferous woodland - plantation	Fungi potential	Amber
Unimproved acid grassland	Fungi - Waxcaps	Red
River shingle	Lichen potential	Amber
River shingle	*Brachyptera putata* and *Spiriverpa lunulata* present	Red
Coniferous woodland - plantation	Tooth fungi recorded nearby	Amber
Dry heath - basic	Potential fungi and botanical interest	Amber
Raised *Sphagnum* bog	Potential botanical and *Diptera* interest	Red

Non-NVC Woodland Communities

12.3.97 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. As noted in **paragraph 12.3.91**, 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.

12.4 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 effects may be associated with the removal of existing barriers to species' movement, as well as the provision of Sustainable Drainage System (SuDS) features to protect and improve the aquatic environment. Adverse effects would generally be related to:

- Direct loss of habitat
- Fragmentation and isolation of habitats through severance
- Disturbance of habitats and the water environment
- Pollution events and sedimentation of the water environment
- 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.

12.4.3 An air quality assessment of the Proposed Scheme has been undertaken on ecologically designated sites, the associated impacts for each individual site are detailed within the Permanent Operational Phase, as well as notable habitats. As faunal species are not sensitive to nitrogen deposition, no adverse impacts are anticipated and are not discussed further.

12.4.4 An air quality assessment on temporary construction activities in relation to dust was assessed within 20m and 50m of the Proposed Scheme works boundary. The River Spey and Drumochter Hills SAC, SPA and SSSIs are all within 20m and 50m of the works boundary and contain habitats with unknown sensitivities to dust impacts. Related effects on these designated sites are discussed in **Chapter 16, Air Quality**, and are not considered further in this assessment.

Embedded Mitigation

12.4.5 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 – a net gain for biodiversity. The impact assessment therefore assesses the Proposed Scheme design, which includes the embedded mitigation.

12.4.6 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 natural bed material in some culverts and inclusion of mammal ledges above the 1 in 50 year flood level (see **Table 12-15**). These

crossings are designed for medium sized mammals such as otter, badger, wildcat and pine marten

- Review of national DVC data, identification of safe deer crossing opportunities and inclusion of deer provision into crossing designs, as noted in **Table 12-15**
- Permeability provisions including existing and embedded mitigation have been identified and can be found in **Table 12-15**
- 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 reduced as far as possible and therefore encroachment into designated sites has been minimised
- The Proposed Scheme design will re-use the BDL access track for the Drumochter Estate access, thereby only affecting habitats that are already degraded.

12.4.7 The Proposed Scheme drainage incorporates at least two levels of SuDS treatment (a minimum requirement in line with planning policy and published SEPA guidance) designed to the following specification (see **Chapter 11** for more information):

- All un-kerbed roads are provided with 'over-edge' drainage via filter drains (or conveyance swales) providing source control and first treatment stage
- Basins or ponds have been sized to attenuate a 1 in 200 year flood event and restrict outflow for long-term storage
- Watercourse capacity assessed for pre-selection of outfall locations during SuDS design for avoidance of potential impact on smaller watercourses (i.e. watercourses with less dilution capacity)
- SuDS have been located outside flood extents (1 in 30 year for outfalls; 1 in 200 year for earthworks where possible) to minimise impacts on the water environment (limits risk of overtopping and wash out of contaminated material)
- Additional (enhanced) treatment is provided where required to satisfy the water quality assessment
- Where infiltration has been deemed inappropriate as a form of treatment, SuDS are lined to prevent adverse impacts to groundwater
- Inclusion of spillage containment features in SuDS facilities (emergency shut-off valve chambers on basin outlet) to minimise risks to receiving watercourses.

12.4.8 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
- 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
- Reduced upstream head cutting to improve stability of channels
- Considered positioning of access tracks to accommodate watercourse morphology

Table 12-15: Project-wide permeability

Chainage	Hydro ID	Watercourse/ Structure	Structure Height/ Clearance (m)	Culvert Dimensions (mm)	Distance from Previous Crossing Provision (m)
0,220	1	Ledge sized for medium sized mammal passage		1500 x 1250	N/A
0,400	2	Allt Coire Mhic-sith underbridge Ledge sized for large mammal passage	4.2		180
0,500	N/A	Dalnaspidal Underpass Underpass sized for large mammal passage	5.7		100
1,500	8	Ledge sized for medium sized mammal passage		2000 x 1250	1000
2,020	13	Ledge sized for medium sized mammal passage		2400 x 1500	520
3,000	23	Allt a Chaorruin underbridge Ledge sized for large mammal passage	4.2		980
3,775	31	Ledge sized for medium sized mammal passage		2400 x 1800	775
6,130	43	Ledge sized for medium sized mammal passage		2400 x 1500	2355
6,980	51	Ledge sized for medium sized mammal passage		1500 x 1000	850
7,200	52	Allt Dubhaig underpass Dry tunnel sized for medium sized mammal passage	1.2		220
7,550	N/A	Pass of Drumochter underpass Vehicle underpass sized for large mammal passage	4.2		350
7,900	57	Ledge sized for medium sized mammal passage		2400 x 1500	350
8,400	59	Allt Chuirn underbridge Sized for medium sized mammal passage	0.8		500
9,300	64	Allt Coire Bhotie underbridge Sized for medium sized mammal passage	0.7		900

Designated Sites

12.4.9 The Proposed Scheme results in unavoidable overlap with statutory designated sites (see **Table 12-16**), which will result in permanent and temporary impacts. Potential effects on each site are discussed below.

Table 12-16: Summary of encroachment into statutory designated sites

Designated Site Name (Total Area)	Permanent works boundary		Temporary works boundary	
	Area (Ha)	% of site affected	Area (Ha)	% of site affected
Drumochter Hills SPA (9431.89 ha)	2.17	0.02	2.81	0.03
Drumochter Hills SAC (9439.48 ha)	2.12	0.02	1.76	0.02
Drumochter Hill SSSI (9688.13 ha)	49.63	0.51	55.12	0.57
River Spey SAC (5759.72 ha)	<0.01	<0.01	0.03	<0.01

12.4.10 A Habitats Regulations Appraisal (HRA) has been completed to assess the likely significant effects of the Proposed Scheme for interest features associated with the Drumochter Hills SPA, Drumochter Hills SAC and the River Spey SAC. The HRA concluded that permanent and temporary effects will not result in an adverse effect on site integrity (AESI); and relevant mitigation has been incorporated into the Schedule of Environmental Commitments (see **Chapter 21**).

Drumochter Hills SPA

Temporary Impacts – Construction Phase

12.4.11 Temporary works encroach into this SPA as shown on **Drawings 12.1** to **12.5** (**Volume 3**) and detailed in **Table 12-17**. The total area of temporary works within the SPA is 2.81ha (i.e. approx. 0.03% of the total designated site area).

Table 12-17: Temporary works boundary within Drumochter Hills SPA

ch.	Summary of temporary works within the Drumochter Hills SPA
450 – 500	Temporary construction access, including temporary crossing of the Allt Coire Mhic-sith to connect with Dalnacardoch Estate access track on the line of the old General Wade's Military Road.
1,500 - 1,550	Temporary construction access around cut-off drain and watercourse diversion
2,000 - 2,250	Temporary construction access
2,500	Temporary construction access
3,000 - 3200	Temporary construction access
3,600 - 3,800	Temporary construction access around cut-off drain and watercourse diversion
4,100 - 4,300	Temporary construction access around cut-off drain and watercourse diversion
5,200	Temporary construction access around cut-off drain
6,100 – 6,300	Temporary construction access around earthworks cutting
6,400 – 6,950	Temporary construction access around earthworks, cut-off drain and watercourse diversions

12.4.12 Temporary construction works activities are predicted to involve excavation, soil movement and transport of materials, as well as vehicle access. However, disturbance to SPA qualifying species, for example through noise and/ or visual disturbance, as well as access onto the estate is considered unlikely as no breeding merlin have been identified within the study area and access into the estate is already present at ch. 500.

12.4.13 Temporary disturbance will be localised in scale, short-term and reversible; therefore, construction activities will have a **Low adverse impact**, which is not significant.

Permanent Impacts – Operational Phase

12.4.14 Permanent works will encroach into the SPA resulting in a loss of habitat as shown in **Drawings 12.1** to **12.5** (**Volume 3**). The total area of permanent works (including permanent earthworks, drainage and access tracks) within the SPA is 2.17ha (approx. 0.02% of the total SPA site area).

12.4.15 The Dalnaspidal Junction, including the southbound loop earthworks and associated telecoms mast and Dalnacardoch Estate access track connections and drainage infrastructure, will result in permanent loss of some supporting SPA habitat (i.e. that may support merlin prey species).

12.4.16 Given that dualling will bring the southbound carriageway, and therefore traffic, closer to the SPA on the east side, noise modelling predicts a maximum of 3.3 decibel (dB) increase 35m from the existing A9 (at ch. 3,500), at the Drumochter Hills SPA, in 2026; increasing to 3.5 decibels (dB) in 2041. This increase is to be expected at such distances as traffic is physically closer to the monitoring/ modelling point.

12.4.17 Modelled noise levels at greater distances reduce with dualling. For example, at ch. 6,225 modelling at 225m distant from the existing A9 (into the SPA) determined that noise levels reduce by 0.9 decibels (dB) by 2026; and by 0.6 decibels (dB) by 2041. This is a more representative distance to compare noise effects in the SPA. Within 35m the increase is mainly due to change in traffic proximity, at 225m the decrease demonstrates even with greater immediate proximity, low noise surfacing will reduce noise levels further into the SPA.

12.4.18 Further detail on the noise modelling assessment is contained within **Appendix 12.10** (**Volume 2**). Historic evidence of merlin breeding within 500m of the A9 was reported by Tayside Raptor Study Group (2011 record); however, this location was over 300m distant to the A9, at a distance where a reduction in noise levels is predicted. As there is no evidence of breeding merlin reported within 1km during 2015/ 2016 breeding bird surveys, no adverse effects due to operational road noise on the qualifying features of the SPA are predicted.

12.4.19 While the SPA is designated for its faunal species, these species rely on habitats associated with the corresponding Drumochter Hills SAC that are sensitive to poor air quality. However, an air quality assessment on the SAC found that oxides of nitrogen (NOx) concentrations attributed to the Proposed Scheme will not constitute a significant effect on the designated site, as the Proposed Scheme does not lead to any exceedances of the NOx objective (30µg m^{-3}). It can therefore be concluded that there will be no indirect habitat change (see **Chapter 16**).

12.4.20 It is not anticipated that the Proposed Scheme will cause increased recreational and operational disturbance pressure on SPA qualifying species as no breeding activity has been recorded in the study area (see **Appendix 12.4** (**Volume 2**)). Access to the SPA will remain similar throughout the Proposed Scheme, although access to parking will increase slightly through revised lay-by provisions, as discussed in **Table 12-18**.

Table 12-18: Proposed Scheme Lay-by Locations

ch.	Lay-by Type	Carriageway	Access to SPA	Recreational Impacts to SPA
900	New lay-by	Northbound	Located outwith SPA, formal path to NCN7 though does not lead to SPA	No recreational impacts anticipated with the SPA
2,140	Emergency lay-by	Southbound	Located outwith SPA	No recreational impacts anticipated with the SPA
3,575	New lay-by to replace existing lay-by	Northbound	Located outwith SPA in location where a lay-by is already present, formal path to NCN7 though does not lead to SPA	No recreational impacts anticipated with the SPA
3,975	New lay-by to replace existing lay-by	Southbound	Located outwith SPA in close proximity, however a lay-by is already present at this location, pedestrian access is available from lay-by to ch. 3,000 and NCN7 outwith the SPA boundary	Located in close proximity to the boundary of the SPA. A lay-by is already present in this location as part of the current carriageway. An access track is present east of the Proposed Scheme that runs parallel to the proposed mainline from the lay-by to the Allt a' Chaorainn underbridge, leading to the NCN7. The access track lies outside of the SPA boundary and is anticipated to be utilised by occasional cyclists and pedestrians. Given the proximity of this feature to the proposed mainline and absence of formal or informal pathways leading east into the SPA this is not expected to result in an increase in recreational disturbance to the SPA.
5,880	Emergency lay-by	Northbound	Located outwith SPA in location where a lay-by is already present	No recreational impacts anticipated with the SPA
6,640	Emergency lay-by	Southbound	Located outwith SPA	No recreational impacts anticipated with the SPA
6,800	Balsporran car park	Northbound	Located outwith SPA in a location where an unbound surface car park is already present, to the west of the Proposed Scheme. Walking route is already present at this location to the SPA west of the Proposed Scheme	Surface will be upgraded from unbound gravel with no formal drainage to include geocellular underground drainage to enable collection and treatment of surface water before discharge to the River Truim (River Spey SAC) Level of parking provision will be retained (i.e. no increase in area) The access track that leads from Balsporran to the SPA will remain unaffected and similar levels of use are anticipated No change anticipated with respect to the SPA
8,990	New lay-by	Northbound	Located outwith SPA	No recreational impacts anticipated with the SPA

12.4.21 National cycle network route 7 (NCN7), which lies to the west of the existing A9 and Proposed Scheme, will be locally rerouted in some locations. Any such works will all be outside of the SPA boundary. No significant changes in levels of use of the NCN7 are predicted as a result of the Proposed Scheme and no increase in recreational disturbance to the SPA is predicted.

12.4.22 These permanent impacts will be localised in scale, long-term and irreversible; therefore, the operational scheme will have a **Low adverse impact**, which is not significant.

Drumochter Hills SAC

Temporary Impacts – Construction Phase

12.4.23 Temporary works extend into the Drumochter Hills SAC at a number of locations, as shown in **Drawings 12.1** to **12.5** (**Volume 3**) and detailed in **Table 12-19**. A temporary access track from the A9 extends into the SAC when crossing the Allt Coire Mhic-sith at ch. 400. This track allows access into the wider Dalnacardoch Estate, within the designated site, and is likely to be used by construction traffic. This would potentially involve damage to surface habitat due to vehicle access, resulting in long term impacts but potentially reversible if restored at the end of the construction phase. Note also, that the temporary access track is primarily located on the route of the old General Wades Military Road and the majority of the affected area is therefore previously disturbed.

Table 12-19: Temporary works boundary within Drumochter Hills SAC

ch.	Summary of temporary works within the Drumochter Hills SAC
450 – 800	Temporary construction access, including temporary crossing of the Allt Coire Mhic-sith to connect with Dalnacardoch Estate access track on the line of the old General Wade's Military Road.
2,150 – 2,175	Temporary construction access
2,550 – 2,600	Temporary construction access
3,000 – 3,100	Temporary construction access

12.4.24 Temporary works are present at ch. 2,550 and ch. 3,000, which will be used as temporary access for the deposition of peat along the previously disturbed BDL access track. This will be a temporary impact, with the habitat restored during the construction phase. Other temporary encroachment into the SAC will be due to general construction works leading to temporary disturbance of habitats and associated construction stage pollution risks, which could affect habitats both within and outside the temporary works boundary.

Table 12-20: 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	0.15	0.06	<0.01 (0.001)
4030	European dry heaths (2,256.98 ha)	H12	0.92	0.04	<0.01 (0.004)
7130	Blanket bogs (2,166.36 ha)	M17	0.01	<0.01 (0.0005)	<0.01 (0.0001)

12.4.25 Temporary disturbance will affect 1.76ha of habitats within the SAC, which could result in the partial and irreversible loss of 1.08ha of qualifying habitat (see **Table 12-20**); therefore, construction activities result in a **Medium adverse impact**, which is significant.

Permanent Impacts – Operational Phase

12.4.26 The permanent works boundary extends into the Drumochter Hills SAC at a number of locations, as shown in **Drawings 12.1** to **12.5** (**Volume 3**) and detailed in **Table 12-21**.

Table 12-21: Permanent works boundary within Drumochter Hills SAC

ch.	Summary of permanent features within the Drumochter Hills SAC
450 – 950	Dalnaspidal Junction extends into the SAC at this location, consisting of junction side roads, associated earthworks, drainage and an access track to Dalnacardoch Estate and a telecommunications mast
1,000 - 1,175	Cut-off drain
1,550 – 1,650	Cut-off drain
2,300 – 2,450	Cut-off drain
2,825 – 3,100	Cut-off drain, watercourse diversion and compensatory storage
3,500 – 3,600	Cut-off drain and watercourse diversion
5,050 and 5,675	Cut-off drain
5,850 – 5,900	Watercourse diversion
6,300 – 6,400	Cut-off drain and watercourse diversion
BDL	Localised improvements to former BDL construction track

12.4.27 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 the designated 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**.

Table 12-22: 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	0.01	<0.01 (0.005)	<0.01 (0.001)
4030	European dry heaths (2,256.98 ha)	H12	0.92	0.04	0.01
7130	Blanket bogs (2,166.36 ha)	M17	0.14	<0.01 (0.006)	<0.01 (0.003)

12.4.28 These permanent impacts will result in the loss of 2.12 ha of habitats within the SAC, which could result in the partial and irreversible loss of 1.07 ha of qualifying habitat (see **Table 12-22**); therefore, the operational scheme results in a **Medium adverse impact**, which is significant.

River Spey SAC

Temporary Impacts – Construction Phase

12.4.29 Temporary works extend into the River Spey SAC at a number of locations, as shown in **Drawings 12.1** to **12.5** (**Volume 3**) and detailed in **Table 12-23**. The total area of temporary encroachment is approximately 0.03ha (<0.001% of the total area of the designated site).

Table 12-23: Temporary works assessment boundary within River Spey SAC

Chainage Location (ch.)	Summary of temporary works within the River Spey SAC
4,025	Temporary construction access to watercourse diversions and compensatory storage area
4,350 – 4,450	Temporary construction access to watercourse diversions

12.4.30 Encroachment into the River Spey SAC will be needed to install drainage outfalls and potentially for watercourse diversions and crossings. Such activities could affect riparian habitat and potentially affect water quality that could have adverse impacts on SAC interest features. Where areas have been identified as suitable spawning grounds for Atlantic salmon and sea lamprey on tributaries of the SAC (Allt an Creagach (ch. 3,750), Allt Coire Dubhaig (ch. 7,200), unnamed watercourse (ch. 7,900), Allt Coire Chuirn (ch. 8,400), Allt Coire Bhotie (ch. 9,300) and the Allt Coire nan Cisteachan (northern tie-in)), any temporary works within the watercourse have potential to cause direct temporary habitat impacts.

12.4.31 As many aquatic species are affected by noise and lighting, night-time 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 their habitats.

12.4.32 There is a risk of pollution events during construction that may have long-term effects on the designated site and its interest features, both in the Proposed Scheme and populations downstream of the construction areas due to hydrological linkages. Interest features that make up the designation require very good water quality, particularly Atlantic salmon. Increased sedimentation can choke fish, disrupt feeding behaviour and smother salmonid eggs thereby preventing or disrupting emergence (Hendry and Cragg-Hine, 2003). Through the use of appropriate construction stage sediment controls, as required by current regulations and best practice guidance, pollution events may be contained to these features.

12.4.33 Temporary disturbance will be localised in scale and irreversible in the short-term; therefore, construction activities will have a **Medium adverse impact**, which is significant.

Permanent Impacts – Operational Phase

12.4.34 The alignment of the Proposed Scheme does not cross directly over the River Truim (River Spey SAC); however, permanent works will encroach into the SAC, resulting in a loss of habitat as shown in **Drawings 12.1** to **12.5** (**Volume 3**) and detailed in **Table 12-24**. This results in approximately 0.01ha of the SAC being permanently affected, with loss of riparian habitat, equating to <0.001% of the total area of the designated site. The installation of Compensatory Flood Storage Areas (CSAs) will not directly lead to habitat loss of the SAC.

Table 12-24: Permanent assessment boundary within the River Spey SAC

ch.	Summary of permanent features within the River Spey SAC
4,000 – 4,300	Watercourse diversions, compensatory storage, SuDS basin (042) outfall connecting to River Truim
4,550 – 4,650	Watercourse diversion and cut-off drain connecting to River Truim
4,775	Watercourse diversion connecting to River Truim
4,850	Watercourse diversion connecting to River Truim
4,950	Watercourse diversion connecting to River Truim
6,150	Watercourse diversion, incorporating SuDS basin (060) outfall connecting to River Truim
6,275	Watercourse diversion connecting to River Truim
6,400 – 6,450	SuDS basin (063) outfall and watercourse diversion connecting to River Truim
6,550 – 6,600	SuDS basin (065) outfall and watercourse diversion connecting to River Truim
9,300	SuDS basin (092) outfall connecting to River Truim, re-aligned crossing of NCN7

12.4.35 An unnamed watercourse that connects to the Allt Coire Bhotie (ch. 9,300) downstream of the Proposed Scheme, will have a culvert, extending into the SAC by 8.4m to account for the crossing of the NCN7. A fish habitat assessment found that the area adjacent to the current crossing location is dominated by larger cobbles and boulders with no notable pool features, limiting spawning potential for fish species, and an absence of sand particles limits the value to sea

lamprey spawning (see **Appendix 12.7** (**Volume 2**)). Localised re-alignment of the NCN7 crossing is unlikely to have a lasting discernible impact on freshwater fish habitat.

12.4.36 Operational SuDS features would not result in exceedance of EQS threshold values on water quality. In addition, SuDS outfalls have been designed to avoid causing in-channel scour with open grassed channels (swales) and low velocity outfalls to avoid indirect habitat loss. Therefore, there will be no long-term deterioration in water quality from routine surface water run-off (see **Chapter 11**). Qualifying features of the River Spey SAC are not known to be sensitive to nitrogen; therefore, no impacts from operational nitrogen NOx concentrations will occur (see **Chapter 16**).

12.4.37 Non-aquatic noise modelling predicts a minimum noise reduction of 1.2 dB at the River Spey SAC in 2026 and a 0dB reduction in 2041. Therefore, there is no noise impact predicted on the River Spey SAC. Further detail on noise is contained within **Appendix 12.10** (**Volume 2**).

12.4.38 These permanent impacts will be localised in scale, long-term and irreversible; therefore, the operational scheme will have a **Negligible impact** on the SAC, which is not significant.

Drumochter Hills SSSI

Temporary Impacts – Construction Phase

12.4.39 There is temporary encroachment into the SSSI from ch. 400 to ch. 9,100. The total area of temporary encroachment is 55.12ha (approximately 0.57% of the whole SSSI area), which is largely confined to areas within or adjoining the existing A9 road corridor. Due to the high-altitude nature of montane assemblages, vascular plant assemblages and arctic birds, these aspects of the SSSI will not be affected by the Proposed Scheme.

12.4.40 There is potential for upland birds and their supporting habitats to be affected by construction works. This will result in temporary disturbance through increases in noise, vibration, lighting and human presence. There is potential for temporary disturbance to breeding sites from vegetation clearance, compaction of soils, disruption to groundwater regimes and increased deposition of construction dust and particulates. In addition, there is potential for disturbance to aquatic habitats (e.g. foraging habitat and roosting sites) and fluvial geomorphology features from accidental spillages and sedimentation.

12.4.41 Temporary disturbance will be localised in scale, short-term and reversible; therefore, construction activities will have a **Low adverse impact**, which is not significant.

Permanent Impacts – Operational Phase

12.4.42 Road infrastructure, embankments, SuDS and access tracks will result in the permanent loss of 49.63ha of habitat within the SSSI (approximately 0.51% of the whole SSSI). The total area of loss is confined to areas within or adjoining the existing A9 road corridor.

12.4.43 Noise modelling predicts that the majority of ecological receptors will have reduced noise levels in 2026 and 2041 (see **Appendix 12.10** (**Volume 2**)). A maximum increase of 3.3 decibel (dB) in 2026; increasing to 3.5 decibels (dB) in 2041 at ch. 3,500; however, no species associated with SSSI upland birds will be affected by this localised increase. An air quality assessment for the SSSI found that operational nitrogen oxide (NOx) concentrations will not exceed 30µg m^{-3} threshold values for important habitats within the SSSI (see **Chapter 16**). Operational SuDS will not exceed EQS threshold values; therefore, no long-term deterioration in aquatic habitats or fluvial geomorphology will occur (see **Chapter 11**).

12.4.44 These permanent impacts will be localised in scale, long-term and irreversible; therefore, the operational scheme will have a **Low adverse impact** on the SSSI, which is not significant.

Notable Habitats

12.4.45 Notable habitats within the temporary and permanent works boundaries are presented in **Table 12-25** and **Table 12-26** 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 tree-planting has the potential to increase shading, which could affect the composition and structure of vegetation communities within adjoining notable habitats.

12.4.46 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.

12.4.47 As well as direct loss, new and extended cuttings may intercept groundwater and affect local hydrogeological regimes, which will be most extensive around ch. 500 (Dalnaspidal) and ch. 7,500 (Drumochter Lodge/ Balsporran) to facilitate junction improvements. 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 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** (**Volume 2**)).

12.4.48 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; as well as long-term increases in nitrogen oxide (NOx) deposition (see **Chapter 16** in **ES Volume 1**). Critical loads for notable habitats have been assessed using pre-determined threshold values for habitats associated with Natura2000 sites and Sites of Special Scientific Interest (e.g. NOx threshold of 30 µg/m³). 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 impacts will be extremely localised and small in scale.

12.4.49 Permanent and temporary impacts on notable habitats identified within the study area are described below in more detail.

Temporary Impacts – Construction Phase

12.4.50 The majority of construction activities will affect non-priority grassland, which will be reduced by approximately 22.73 hectares for the duration of works. This accounts for over 16% of the total non-priority grassland resource in the study area. Potential impacts include loss of surface vegetation, compaction of soils, disruption to groundwater regimes and increased deposition of construction dust and particulates. Non-priority grasslands are ubiquitous, of limited botanical interest and easily re-creatable. On this basis, temporary effects are reversible and construction activities will have a **Negligible impact** in the short-term, which is not significant.

Table 12-25: Summary of notable habitats affected by temporary works

Notable Habitat	Total resource within study area (ha)	Temporary works		Significance
		Area (ha)	Proportion of total resource (%)	
European dry heaths *(NVC: H10, H12, H18, H21)*	226.89	15.36	6.77	Medium
Northern Atlantic wet heathlands *(NVC: M15, M16)*	167.40	10.22	6.10	Medium
Non-priority grasslands *(NVC: all other U, MG, OV)*	134.42	22.73	16.91	Negligible
Blanket bogs *(M1, M2, M3, M17, M19, M20, M25)*	102.53	9.95	9.71	Medium
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M29, M32, S9)*	21.45	2.35	10.96	Low
Non-priority woodlands *(W18, W23, W24)*	4.48	0.34	7.59	Negligible
Transition mires and quaking bogs *(NVC: M4, M5)*	1.80	0.72	40.00	Low
Species-rich *Nardus* grasslands (NVC: CG10, U4c)	0.50	0.36	72.00	Low

12.4.51 The extent of European dry heaths will be reduced by 15.36 hectares as a result of construction activities, which account for less than 7% of the total dry heath resource identified in the study area. Affected areas largely consist of H12 *Calluna vulgaris – Vaccinium myrtillus* heath and are mostly to the east of the existing A9 road and along the edge of more extensive dry heath mosaics, notably around ch.500 (Dalnaspidal) and ch.4,800 (Pass of Drumochter). Dry heaths are sensitive to temporary disturbance, particularly where surface vegetation or the acrotelm (active growing layer) is damaged or removed. Given the localised scale of temporary encroachment and probable reversibility of potential effects, construction activities will have a **Medium adverse impact**, which is significant.

12.4.52 Construction activities will reduce the extent of wet heaths by 10.22 hectares, which account for over 6% of the total wet heath resource identified in the study area. Affected areas largely consist of M15b Typical sub-community and are mostly to the east of the existing A9 road and along the edge of more extensive wet heath mosaics, notably between ch. 500 and ch. 2,000 (Dalnaspidal to Pass of Drumochter) and the former Beauly-Denny construction track. Wet heaths are sensitive to temporary disturbance, particularly where surface vegetation or the acrotelm (active growing layer) is damaged or removed, as typical species that characterise wet heath communities can be slow to recover. Given the localised scale of temporary encroachment and likely reversibility of potential effects, construction activities will have a **Medium adverse impact**, which is significant.

12.4.53 The extent of blanket bogs will be reduced by 9.95 hectares as a result of construction activities, which account for less than 10% of the total blanket bog resource identified in the study area. Affected areas are mostly to the west of the existing A9 road and along the edge of the adjoining River Truim floodplain where M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire is present between ch. 3,000 and ch. 4,200 (Pass of Drumochter); as well as locally within affected wet heath mosaics near ch. 500 (Dalnaspidal) and the former Beauly-Denny construction track. Blanket bogs are an irreplaceable resource and very sensitive to temporary disturbance, particularly where surface vegetation, or the acrotelm (active growing layer), is damaged or removed, as typical species that characterise blanket bogs communities may not recover. Given

the localised scale of temporary encroachment, construction activities will have a **Medium adverse impact**, which is significant.

12.4.54 Construction activities will reduce the extent of upland flushes, fens and swamps mires by 2.35 hectares, which accounts for over 10% of the total resource identified in the study area. Affected areas largely consist of M6 *Carex echinata - Sphagnum fallax/denticulatum* mire and are mostly to the east of the existing A9 road around ch. -500 (southern tie-in) and ch. 500 (Dalnaspidal). In these areas, potential impacts include loss of surface vegetation, compaction of soils, disruption to groundwater regimes and increased deposition of construction dust and particulates. Given the localised scale of temporary encroachment and probable reversibility of potential effects, construction activities will have a **Low adverse impact**, which is not significant.

12.4.55 Construction activities will reduce the extent of non-priority woodlands by 0.34 hectares, which accounts for less than 10% of the total non-priority woodland resource identified in the study area. One small stand of W23a *Anthoxanthum odoratum* sub-community to the west of the existing A9 road at ch. 2,400 (Pass of Drumochter). In this area, potential impacts include loss of surface vegetation, compaction of soils and increased deposition of construction dust and particulates. Given the localised scale of temporary encroachment and probable reversibility of potential effects, construction activities will have a **Negligible impact**, which is not significant.

12.4.56 Construction activities will reduce the extent of transition mires by 0.72 hectares, which accounts for 40% of the total transition mire resource identified in the study area. Affected areas largely consist of M4 *Carex rostrata - Sphagnum fallax* mire and are mostly to the west of the existing A9 road between ch.3,400 and ch.4,000 (Pass of Drumochter); as well as a single areas at ch.7,600 (Balsporran Cottages) and the former Beauly-Denny construction track. In these areas, potential impacts include loss of surface vegetation, compaction of soils, disruption to groundwater regimes and increased deposition of construction dust and particulates. Given the small scale of affected areas and possible reversibility of potential effects, construction activities will have a **Low adverse effect**, which is not significant.

12.4.57 The extent of species-rich *Nardus* grassland will be reduced by 0.36 hectares, which account for almost 75% of the total species-rich *Nardus* grassland resource identified in the study area. Affected areas largely consist of small stands of CG10a *Trifolium repens – Luzula campestris* sub-community and U4c *Lathyrus montanus – Stachys betonica* sub-community, which are mostly to the east of the existing A9 road around ch. -500 (southern tie-in) and ch. 2,800 (Pass of Drumochter). In these areas, potential impacts include loss of surface vegetation, compaction of soils and increased deposition of construction dust and particulates. Given the small scale of affected areas and probable reversibility of potential effects, construction activities will have a **Low adverse effect**, which is not significant.

12.4.58 No construction activities will be carried out in areas of wet grassland or upland birchwoods. **Negligible impacts** are anticipated, which is not significant.

Permanent Impacts - Operational Phase

12.4.59 The Proposed Scheme will permanently reduce the extent of non-priority grassland by approximately 24.80 hectares, which accounts for almost 20% of the total resource in the study area. Affected areas are mostly to the east of, and directly adjacent to, the existing A9 road. Non-priority grasslands are ubiquitous and of limited botanical interest. On this basis, the Proposed Scheme will have a **Negligible impact**, which is not significant.

Table 12-26:Summary of notable habitats affected by permanent loss

Notable Habitat	Total resource within study area (ha)	Permanent loss		Significance
		Area (ha)	Proportion of total resource (%)	
European dry heaths *(NVC: H10, H12, H18, H21)*	226.89	20.04	8.83	Medium
Northern Atlantic wet heathlands *(NVC: M15, M16)*	167.40	4.76	2.84	Medium
Non-priority grasslands *(NVC: all other U, MG, OV)*	134.42	24.80	18.45	Negligible
Blanket bogs *(M1, M2, M3, M17, M19, M20, M25)*	102.53	2.97	2.90	Medium
Upland flushes, fens and swamps *(NVC: M6, M11, M23a, M29, M32, S9)*	21.45	0.94	4.38	Low
Non-priority woodlands *(W18, W23, W24)*	4.48	0.23	5.13	Negligible
Transition mires and quaking bogs *(NVC: M4, M5)*	1.80	0.14	7.78	Low
Species-rich *Nardus* grasslands (NVC: CG10, U4c)	0.50	0.02	4.00	Low
Non-NVC woodlands	31.92	13.79	43.20	N/A

12.4.60 The Proposed Scheme will reduce the extent of European dry heath by 20.04 hectares, which accounts for less than 10% of the total dry heath resource identified in the study area. Affected areas are characterised by relatively common and species-poor sub-communities of H12 *Calluna vulgaris – Vaccinium myrtillus* heath, which are mostly to the east of the existing A9 road. None-the-less, loss of this important 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 areas of dry heath; therefore, no additional indirect habitat loss is anticipated. Losses at the predicted scale will result in a **Medium adverse impact**, which is significant.

12.4.61 The Proposed Scheme will reduce the extent of Northern Atlantic wet heath by 4.76 hectares, which accounts for less than 5% of the total wet heath resource identified in the study area. Affected areas are characterised by relatively extensive areas of M15b Typical sub-community, which are mostly to the east of the existing A9 road. None-the-less, loss of this important habitat to infrastructure will be irreversible and permanent. Wet heaths are sensitive to changes in groundwater; however, localised alterations are limited to the permanent and temporary works boundaries and no discernible upslope change in groundwater beyond affected areas is anticipated. No exceedance in NOx threshold values are predicted in areas of wet heath; therefore, no additional indirect habitat loss is anticipated. Losses at the predicted scale will result in a **Medium adverse impact**, which is significant.

12.4.62 The Proposed Scheme will reduce the extent of blanket bogs by 2.97 hectares, which accounts for less than 5% of the total blanket bog resource identified in the study area. Affected areas are characterised by relatively extensive areas of M17 *Trichophorum germanicum – Eriophorum vaginatum* blanket mire, which are mostly to the west of the existing A9 road. Isolated stands of M17 and degraded bog communities are present to the east of the existing A9 road near ch.500 (Dalnaspidal). None-the-less, loss of this important habitat to infrastructure will be irreversible and permanent. In these areas, degraded bogs (e.g. M25) are sensitive to changes in groundwater; however, localised alterations are limited to the permanent and temporary works boundaries and no discernible upslope change in groundwater beyond affected areas is

anticipated. No exceedance in NOx threshold values are predicted in areas of blanket bogs; therefore, no additional indirect habitat loss is anticipated. Losses at the predicted scale will result in a **Medium adverse impact**, which is significant.

12.4.63 The Proposed Scheme will reduce the extent of upland flushes, fens and swamps by 0.94 hectares, which accounts for less than 5% of the total resource identified in the study area. Affected areas are characterised by M6 *Carex echinata - Sphagnum fallax/denticulatum* mire and M11 *Carex demissa – Saxifraga aizoides* mire, which are small in scale and relatively common throughout other habitats including mires, grasslands, heaths and swamps. These habitats are sensitive to changes in groundwater; however, localised alterations are limited to the permanent and temporary works boundaries and no discernible upslope change in groundwater beyond affected areas is anticipated. No exceedance in NOx threshold values are predicted in areas of upland flushes, fens and swamps; therefore, no additional indirect habitat loss is anticipated. Losses at the predicted scale will result in a **Low adverse impact**, which is not significant.

12.4.64 The Proposed Scheme will permanently reduce the extent of non-priority woodland by 0.23 hectares, which accounts for approximately 5% of the total resource identified in the study area. Affected areas are characterised by a small stand of W23a *Anthoxanthum odoratum* sub-community to the west of the existing A9 road, which is extremely small in scale and contains relatively common species. Loss of this habitat to infrastructure will be irreversible and permanent. Losses at the predicted scale will result in a **Negligible impact**, which is not significant.

12.4.65 The Proposed Scheme will reduce the extent of transition mire by 0.14 hectares, which accounts for less than 10% of the total resource identified in the study area. Affected areas are characterised by small stands of M4 *Carex rostrata - Sphagnum fallax* mire and one area of M5 *Carex rostrata – Sphagnum squarrosum* mire that are relatively common throughout other mire habitats. Loss of this important habitat to infrastructure will be irreversible and permanent. Losses at the predicted scale will result in a **Low adverse impact**, which is not significant.

12.4.66 The Proposed Scheme will reduce the extent of species-rich *Nardus* grassland by 0.02 hectares, which accounts for less than 5% of the total resource identified in the study area. Affected areas are characterised by small stands of CG10a and U4c that are relatively common throughout other mire and grassland habitats. Loss of this important habitat to infrastructure will be irreversible and permanent. CG10 is sensitive to changes in groundwater; however, localised alterations are limited to the permanent and temporary works boundaries and no discernible upslope change in groundwater beyond affected areas is anticipated. No exceedance in NOx threshold values are predicted in areas of species-rich *Nardus* grassland; therefore, no additional indirect habitat loss is anticipated. Losses at the predicted scale will result in a **Low adverse impact**, which is not significant.

12.4.67 The Proposed Scheme will reduce the extent of non-NVC woodlands by 13.79ha, which accounts for 43.20% of the total resource identified in the study area.

Breeding Birds

Temporary Impacts – Construction Phase

12.4.68 Temporary impacts during construction and subsequent habitat restoration include temporary construction disturbance and temporary habitat loss, which could affect birds over three consecutive breeding seasons.

12.4.69 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).

12.4.70 The extent to which noise, vibration and disturbance impact breeding birds will be variable throughout the Proposed Scheme and it is likely that the most sensitive area will be between ch. 400 to ch. 1,400 in the Allt Dubhaig floodplain where notable populations of breeding waders and wildfowl have been identified. It is noted, however, that the majority of breeding territories and the more optimal breeding habitats are separated from the proposed scheme by the HML railway which will limit the magnitude of effects reaching key areas for breeding birds. 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 distribution in the floodplain, construction activities will have **Negligible to Medium adverse impacts**, which is significant (see **Table 12-27**).

Permanent Impacts - Operational Phase

12.4.71 Permanent effects during the operational phase on breeding birds comprise of permanent habitat loss. Potential disturbance due to operational noise and habitat fragmentation. Potential for increases in bird collisions with vehicles are also considered, though given the presence of the existing road no significant increases are anticipated.

12.4.72 There is potential for permanent habitat loss for some of the species listed. A review of the permanent land take within the Proposed Scheme against breeding bird territories identified in 2015 indicates that up to two lapwing territories may be lost in addition to three oystercatcher territories, and a single ringed plover territory, losses of this scale are considered to be a low adverse effect. Where the Proposed Scheme encroaches into woodland and scrub habitat, potential loss of one linnet territory, four lesser redpoll territories and one song thrush territory are predicted losses of this scale are similarly considered to represent a low adverse effect. 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.

12.4.73 A wider road and altered location of carriageways may lead to some potential for increased operational road noise reaching breeding birds within the study area. Reijenen *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 the Allt Dubhaig west of the HML railway at ch. 800 and ch. 2,500, which is likely to be the most sensitive area for breeding birds, indicates predicted noise levels of up to 51.4dB in areas selected for assessment; however, the predicted noise levels are lower than those predicted for a 'do minimum' (retain the existing A9 unchanged) scenario and therefore no adverse effects are predicted as a result of road noise. At ch. 2,550 (east), noise modelling predicted an increase of 3dB and at ch. 5,700 (east) an increase of 2.2dB is predicted. However, given the presence of the existing road noise and the intermittent rail noise, the likelihood of significant effects is low. Hockin *et al*. (1992) highlights that in situations where disturbance is passive and low level that waders and wildfowl become habituated to it over time.

12.4.74 Operational road noise is likely to be passive and increase gradually as road traffic approaches rather than comprising sudden noise which can alert a startle response in birds. Some habituation to operational noise while foraging is possible for notable species potentially utilising moorland habitats east of the Proposed Scheme such as hen harrier (Ruddock and Whitfield

2007). Flight records collected within baseline studies of both merlin and hen harrier indicate that current noise levels which will remain broadly unchanged or reduced in most areas are not prohibitive to foraging merlin and hen harrier. Potential impacts for notable breeding bird species identified in the study area are presented in **Table 12-27**.

Table 12-27: Summary of potential impacts on breeding birds

Feature	Importance	Temporary Impacts	Permanent Impacts
Merlin	International	Disturbance to 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** impact.	Permanent effects include permanent habitat loss through infrastructure or modification of areas affected by temporary works or planting within 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. Noise modelling indicates only localised increases with decreases in wider environment most likely to be used by breeding and foraging Merlin. 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. **Negligible** impact in long-term.
Hen Harrier	Regional	Disturbance to active hen harrier in the locality from increased noise, vibration and visual disturbance. Displacement of potential commuting and foraging hen harrier within affected habitats during works. As activity within the study area is limited an hen harrier occupy large ranges a potential short-term **Low adverse** impact, which is not significant.	Due to the large territories used by breeding hen harrier (SNH 2013), foraging and commuting habitat will be maintained in the wider landscape. Noise modelling indicates only localised increases with decreases in wider environment most likely to be used by breeding and foraging hen harrier. 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. **Negligible** impact in long-term, which is not significant.
Golden eagle	Regional	There are no golden eagle nests within 1km of the Proposed Scheme. Short-term **Negligible impact** to individual active birds in the locality during works, which is not significant.	Due to the large territories used by breeding golden eagle (SNH 2013), foraging and commuting habitat will be maintained in the wider landscape. Noise modelling indicates only localised increases with decreases in wider environment most likely to be used by breeding and foraging hen harrier. 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. **Negligible** impact in long-term, which is not significant.
Black-tailed godwit	National	Potential impacts during construction relate to temporary disturbance while breeding. The breeding territory identified to date is located approximately 450m from the extent of works and separated by the existing HML and is considered unlikely to be affected by disturbance at that range. Short term **Negligible** adverse impact, which is not significant.	No breeding habitat will be affected by the Proposed Scheme. Increases in road noise as a result of dualling are not predicted to be of a magnitude where any detectible effects on breeding black tailed godwit are predicted. No increase in visual disturbance during operation is predicted based on the location of nesting behaviour. As suitable habitat is located only to the west of the Proposed Scheme no increase in collision risk is predicted. Overall **Negligible** impact is predicted in the long term, which is not significant

Feature	Importance	Temporary Impacts	Permanent Impacts
Ring ouzel	National	Baseline surveys identified a single Ring ouzel territory >300m east of the Proposed Scheme. Some temporary disturbance is possible during louder/ percussive works during construction. Short term **Low adverse** impact is predicted, which is not significant.	No permanent habitat loss impacting existing breeding territories is predicted. **Negligible** impact is predicted, which is not significant.
Dunlin	National	The distribution of breeding dunlin reported are located around wetlands at the Allt Dubhaig. The nearest breeding dunlin are approximately 120m from the Proposed Scheme and the extent of temporary effects are restricted to construction disturbance. As most dunlin are reported breeding >200m distant to the Proposed Scheme, temporary disturbance is predicted to be a **Low adverse** effect, which is not significant.	No breeding habitat will be affected by the Proposed Scheme. Increases in road noise as a result of dualling are not predicted to be of a magnitude where any detectible effects on breeding dunlin are predicted. All dunlin breeding is a minimum of 200m from the mainline. Negligible increase in visual disturbance during operation is predicted based on the location of nesting behaviour. As suitable habitat is located to the west of the Proposed Scheme no increase in collision risk is predicted. Overall **Negligible** impact is predicted in the long-term, which is not significant.
Wigeon	National	The distribution of breeding and feeding wigeon reported are located around wetlands at the Allt Dubhaig the nearest breeding wigeon are approximately 200m from the Proposed Scheme. Disturbance and displacement of breeding wigeon is possible at this range though disturbance will be limited by the presence of the existing HML railway. Short term **Low adverse** impact is predicted, which is not significant.	No breeding habitat will be lost as a result of the Proposed Scheme. Increases in road noise as a result of dualling are not predicted to be of a magnitude where any detectible effects on breeding wigeon are predicted. No increase in visual disturbance during operation is predicted based on the location of nesting behaviour. As suitable habitat is located to the west of the Proposed Scheme no increase in collision risk is predicted. Overall **Negligible** impact is predicted in the long term, which is not significant.
Breeding birds (Strathspey waders)	Regional	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** impact, which is significant.	Nesting habitat loss would result in displacement of breeding waders. Given that majority of breeding waders are located on the Allt Dubhaig and River Truim floodplains, and beyond the Proposed Scheme, minimal habitat loss and displacement is expected. The linear nature of the road will be maintained, and therefore no increased fragmentation is expected to occur. No significant change to road level; therefore, no discernible increase in collision risk. **Low adverse** impact in long-term, which is not significant.
Woodland Grouse	Authority	**Negligible impact**, which is not significant.	**Negligible impact**, which is not significant.

Feature	Importance	Temporary Impacts	Permanent Impacts
Crossbill species	Local	Loss of nesting and foraging habitat leading to increased risk of killing, injuring, disturbance and displacement to small population of crossbill species; as well as damage or destruction of active nests and mortality of dependant young. Disturbance to breeding crossbill species adjacent to the Proposed Scheme. Short-term **Low adverse** impact, which is not significant.	Affected nesting habitat would result in displacement of breeding crossbill species. 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. **Low adverse** impact in long-term, which is not significant.
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** impact, which is 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. **Low adverse** impact in long-term, which is not significant.

Non-breeding birds

Temporary Impacts – Construction Phase

12.4.75 Non-breeding birds may be affected by temporary disturbance during construction, and could also be subject to temporary habitat loss/ fragmentation. Disturbance could include noise and vibration from machinery, light from night-time working or general disturbance resulting from human activity. While it is likely that overwintering birds will be present within the study area, the altitude is such that, as soon as winter weather sets in, these birds will seek lowland areas; therefore, it is unlikely that notable aggregations of non-breeding birds will be present within the study area. Areas of habitat affected directly by construction activity are not considered to be of notable value to overwintering species while areas outside the Proposed Scheme within the floodplain are more likely to support some overwintering bird interest. Construction effects are limited to disturbance which is predicted to be a **Low adverse** impact, which is not significant.

12.4.76 Other notable species included within the desk study results during the overwintering period include ptarmigan, golden plover and dunlin. These are all features of the Drumochter Hills SSSI and are regarded as national importance (though the designation refers to the breeding assemblage only). The numbers of these birds recorded, their high mobility and abundance of suitable available habitat mean that any disturbance to these species will be of **Negligible** impact, which is not significant.

Permanent Effects – Operational Phase

12.4.77 Given that the majority of non-breeding birds, if present, will aggregate on the River Truim and Allt Dubhaig floodplain, and beyond the Proposed Scheme, no loss of habitat or displacement is expected. The linear nature of the road will be maintained, along a similar alignment throughout the scheme. This alignment avoids the floodplain where non-breeding birds are more likely to congregate and therefore habitat fragmentation is likely to be negligible. Similarly, the vertical

profile of the road is not predicted to change sufficiently to increase risk of collision to non-breeding birds. **Negligible** impact on non-breeding birds are expected in the long-term, which is not significant.

Common toad

Temporary Impacts – Construction Phase

12.4.78 Common toad could be affected by temporary disturbance during construction, with the potential for temporary habitat loss and displacement. Disturbance could include noise and vibration from machinery, light from night-time working (as common toad are 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. Any small bodies of water which might be disturbed during the spring and early summer months could have the potential to affect toad spawn which may be present. Waterbodies likely to be affected are present at ch. 2,700, ch. 6,900 and ch. 7,450.

12.4.79 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 terrestrial 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, which is not significant.

Permanent Impacts – Operational Phase

12.4.80 Given that 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.

12.4.81 The Proposed Scheme will incorporate filter drainage for the majority of the carriageway, reducing the risk of common toad entrapment and mortality throughout.

12.4.82 The loss of ponds that could be used by breeding common toad at ch. 6,950 and ch. 7,450 may result in minimal, localised impacts to the breeding population. However, it is anticipated that population numbers would not be significantly affected in the long term and therefore the Proposed Scheme has a **Negligible impact**, which is not significant.

Reptiles – Adder, common lizard and slow-worm

Temporary Impacts – Construction Phase

12.4.83 Reptiles 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 reptiles may use machinery or equipment for basking purposes, as well as earthworks movements, particularly during hibernation. Therefore, a short term **Medium adverse** impact is predicted, which is significant.

Permanent Impacts – Operational Phase

12.4.84 Given that suitable foraging, commuting and hibernating habitat in the wider landscape will be retained, a **Negligible impact** on reptiles is predicted, which is not significant.

Bats – common pipistrelle and soprano pipistrelle

Temporary Impacts – Construction Phase

12.4.85 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 subject to habitat fragmentation associated with vegetation clearance. Removal of low suitability bat roost trees reduces roosting availability on site. Temporary impacts will be extremely localised, short term and reversible; therefore construction works present a **Low adverse** impact, which is not significant.

Permanent Impacts – Operational Phase

12.4.86 As there are limited features for bats to utilise for foraging and commuting within the Proposed Scheme, any tree clearance, would result in habitat fragmentation and loss of commuting routes and foraging areas. New winter resilience snow belt trees will be planted between ch. 100 and ch. 400, and existing shelter belts will be replanted with native mix trees, shrubs and scrub to reduce risk of windthrow to remaining trees. No bat roosts are within the Proposed Scheme and commuting/ foraging bats will adapt to changed conditions once the road is operational. However, the linear nature of the A9 road will be retained; therefore, a **Negligible** impact would occur from the Proposed Scheme, which is not significant.

Badger

Temporary Impacts – Construction Phase

12.4.87 The species could be affected by temporary disturbance during construction through habitat loss/ displacement in the northern tie-in. 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. Construction works could also introduce barrier effects through construction activities and site compounds, and may lead to an increased risk of vehicle collision if appropriate controls for badger are not implemented.

12.4.88 No disturbance or loss of badger setts is anticipated. Therefore, **Low adverse** impact is predicted due to short term but reversible impacts, which is not significant.

Permanent Impacts – Operational Phase

12.4.89 Habitat loss and fragmentation will 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 road will be retained, and while the road will be widened, mammal crossing provision is included within the Proposed Scheme design (and is above 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

12.4.90 Otter are at risk of 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.

12.4.91 There is likely disturbance on three otter resting places present at ch. 3,000 as a result of construction activities in close proximity to these locations, such as culvert demolition, earthworks and human activity.

12.4.92 During construction, habitat loss will occur due to temporary works present within identified otter habitat. Fragmentation may also occur, especially if temporary fencing is erected 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 active carriageway.

12.4.93 Accidental pollution of watercourses during temporary construction works could lead to long term impacts on the species themselves and their food supply.

12.4.94 Otter are considered to be of international importance and short term **High adverse** impacts are anticipated from construction activities through increased risk of disturbance, risk of pollution events, mortality and habitat loss.

Permanent Impacts – Operational Phase

12.4.95 There is potential for otter to move throughout their range using habitats on both sides of the Proposed Scheme; therefore, otter will have to cross either under the culverts, bridges or over the road carriageway into oncoming traffic. The linear nature of the A9 road will be retained, with no new barrier effects. However, the road will be widened for the inclusion of the new carriageway, increasing the risk of collision should otter cross the road. The widened road may also discourage otter from crossing the road entirely, fragmenting habitat suitable for otter.

12.4.96 Mammal crossings, in the form of dry ledges, are included in the scheme design to allow safe egress through the Proposed Scheme, reducing the need to cross over the road and preventing habitat fragmentation. The height of the crossings above the 1 in 50 flood level will allow otter to pass under culverts and structures while in flood (1 in 50 year event), reducing the risk of otter being forced over the road on these occurrences where risk of mortality is high. This embedded mitigation will therefore mitigate for the increase in road width, allowing for negligible effects to commuting otter and reducing the risk of mortality through road traffic collision.

12.4.97 Noise modelling (see **Appendix 12.10** (**Volume 2**)) has been carried out at the recorded otter resting locations, around ch. 3,000, where a reduction of 0.9dB is predicted for 2026; and 0.7dB for 2041, therefore this reduction in noise levels will not cause long term disturbance to otter.

12.4.98 There is potential for occasional disturbance to established otter resting places from Non-Motorised User (NMU) presence, i.e. walkers and cyclists, due to the presence of a new access track proposed on the east side of the carriageway at ch. 3,000, where the track extends from an established lay-by at ch. 3,950, at the Allt a' Chaorainn to the NCN7.

12.4.99 There will be eight lay-bys incorporated into the design which includes a parking area off the carriageway at Balsporran (ch. 6,800), see **Table 12-17**. This parking area will be retained with some upgrading works to drainage, but the result will remain as an unbound surface of

approximately the same area. Usage is not expected to change when compared to current levels; therefore, recreational disturbance to commuting and foraging otter at this location, due to the proximity to the River Spey SAC, is also unchanged.

12.4.100 Lighting may be required at the new Dalnaspidal Junction underbridge (ch. 500) and Drumochter Estate/ Balsporran link road underpass (ch. 7,570), as underpasses may be illuminated. This is not predicted to impact otter due to these being new structures not currently used by otter. The Allt A' Chaorainn Underbridge (ch. 3,000) is at the most sensitive location within the Proposed Scheme due to abundant signs of resting and commuting otter, as well as resting areas to the east of the carriageway. Lighting within this underpass may prevent commuting otter using this area which may lead to loss of resting areas as well as increased risk of otter using the active carriageway to cross the road, leading to vehicle collision and mortality.

12.4.101 Permanent impacts, including provision of embedded mitigation, will be localised in scale, long-term and irreversible; therefore, the operational scheme will have a **Low beneficial impact**, which is not significant.

European wildcat

Temporary Impacts – Construction Phase

12.4.102 Site clearance will affect habitat that provides potential cover for wildcat. Nonetheless, the presence of extensive moorland, particularly within the eastern extent, provides habitat for prey items 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.

12.4.103 In addition, temporary works could increase habitat fragmentation through the presence of construction equipment and personnel near existing culverts and structures potentially used by wildcat to cross the existing A9 road to access habitats within their territory. A **Low adverse** impact is expected due to the elusive nature of the species, which is not significant.

Permanent Impacts – Operational Phase

12.4.104 Moorland prey habitat will be retained in areas adjacent to the Proposed Scheme. Therefore, wildcat are not expected to be affected by loss of/ displacement from denning habitat as there is a lack of suitable habitat within the Proposed Scheme. Commuting/ foraging will be improved by the inclusion of mammal ledges in culverts, and other underpass and watercourse crossing structures within the scheme. 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. Therefore, permanent impacts, including provision of embedded mitigation, will be localised in scale, long-term and irreversible; therefore, the operational scheme will have a **Low beneficial impact**, which is not significant.

Water vole

Temporary Impacts – Construction Phase

12.4.105 Water vole will be affected by site clearance operations, earthworks movement and watercourse diversions that could result in the destruction of burrows, loss of foraging and commuting habitat, and increased mortality.

12.4.106 In addition, increased noise, vibration and visual disturbance could lead to disturbance of water vole from retained burrows that are adjacent to the Proposed Scheme. Construction works also

present a risk of a pollution event from fuel spills and increased sedimentation, particularly during high rainfall events. Therefore, a short term **High adverse** impact is expected, which is significant.

Permanent Impact – Operational Phase

12.4.107 Small areas of water vole habitat and their associated burrows will be permanently lost as a result of the Proposed Scheme.

12.4.108 Noise modelling carried out for the Proposed Scheme (water vole habitat around ch. 4,275) predicted a decrease of 0.6dB in 2026, decreasing to 0.3dB in 2041, therefore this reduction in noise levels will not cause long-term disturbance to water vole.

12.4.109 The Proposed Scheme will include the permanent loss of water vole habitat; however, a **Low adverse** impact is expected as it is small areas from within a wider water vole habitat range.

Hare Species

Temporary Impacts – Construction Phase

12.4.110 As both hare species are elusive animals, 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 hares during works, which is not significant.

Permanent Impacts – Operational Phase

12.4.111 Hares are not expected to be affected by loss of/ displacement of habitat as there is a lack of suitable habitat within the Proposed Scheme. Commuting/ foraging will be improved by the inclusion of mammal ledges in culverts, and other underpass and watercourse crossing structures within the scheme. 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. Therefore, a **Low beneficial** impact is expected in the long-term.

Freshwater fish - Atlantic salmon and sea lamprey

Temporary Impacts – Construction Phase

12.4.112 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.

12.4.113 Night-time works have the potential to create barrier effects to migratory fish that may delay or prevent fish from spawning. In addition, construction works present the risk of a pollution event from fuel spills and increased sedimentation, particularly during rainfall events, the use of construction stage SuDS across the Proposed Scheme will reduce risk of pollution to some extent.

12.4.114 Temporary in-channel works may also be required during construction that could create barriers for freshwater fish dispersal in the short term. Therefore, a short term **High adverse** impact could occur, which is significant.

Permanent Impacts – Operational Phase

12.4.115 The provision of SuDS features, with incorporate spillage containment, will work to remove any long-term adverse effects on water quality.

12.4.116 No permanent in-channel structures are proposed and culverts have been appropriately sized to avoid creating any new barriers to fish passage. Culverts within 13 watercourses will incorporate natural-bed materials to facilitate permeability.

12.4.117 Noise modelling (see **Appendix 12.10** (**Volume 2**)) where Atlantic salmon may be present on the River Truim predicts a decrease of -3.7 decibel (dB) in 2026 and -3.4dB in 2041 at ch. 7,125; and a decrease of -3.4dB decrease in 2016 and -3.1dB in 2041 at ch. 8,950. No increase in vibration is expected in the long-term; therefore, a **Low beneficial** impact is expected, which is not significant.

Freshwater pearl mussel (FWPM)

Temporary Impacts – Construction Phase

12.4.118 Construction works present a risk of a pollution event from fuel spills and increased sedimentation, particularly during rainfall events, to FWPM located downstream of the Proposed Scheme. Therefore, a **High adverse** impact could occur from a pollution event, which is significant.

Permanent Impacts – Operational Phase

12.4.119 The provision of SuDS features, with incorporated spillage containment, will avoid any long-term adverse effects on water quality. Therefore, a **Low beneficial** impact is expected in the long-term for FWPM, which is not significant.

Overview of Potential Impacts

12.4.120 The findings of this evaluation are summarised in **Table 12-28** that shows an overview of the ecological evaluation of features in terms of importance, and overall impact significance recorded within the Proposed Scheme, during construction (temporary impacts) and post-construction (permanent impacts) before any mitigation is applied.

Table 12-28: Overview of potential impacts

Feature	Temporary Impact	Significance	Permanent Impact	Significance
Drumochter Hills SPA	Low Adverse	Not significant	Low Adverse	Not significant
Drumochter Hills SAC	Medium Adverse	Significant	Medium Adverse	Significant
River Spey SAC	Medium Adverse	Significant	Low Adverse	Not significant
Drumochter Hills SSSI	Low Adverse	Not significant	Low Adverse	Not significant
European dry heaths	Medium Adverse	Significant	Medium Adverse	Significant
Northern Atlantic wet heathlands	Medium Adverse	Significant	Medium Adverse	Significant
Non-priority grasslands	Negligible	Not significant	Negligible	Not significant
Blanket bogs	Medium Adverse	Significant	Medium Adverse	Significant
Upland flushes, fens and swamps	Low Adverse	Not significant	Low Adverse	Not significant
Non-priority woodlands	Negligible	Not significant	Negligible	Not significant
Transition mires	Low Adverse	Not significant	Low Adverse	Not significant
Species-rich *Nardus* grassland	Low Adverse	Not significant	Low Adverse	Not significant
Merlin (active)	Low Adverse	Not significant	Negligible Adverse	Not significant
Black-tailed godwit (breeding)	Negligible Adverse	Not significant	Negligible Adverse	Not significant
Ring ouzel (breeding)	Low Adverse	Not significant	Negligible Adverse	Not significant
Dunlin (breeding)	Low Adverse	Not significant	Negligible	Not significant
Wigeon (breeding)	Low Adverse	Not significant	Negligible	Not significant
Crossbill species (breeding)	Low Adverse	Not significant	Low Adverse	Not significant
Breeding birds (Strathspey waders)	Medium Adverse	Significant	Low Adverse	Not significant
Woodland grouse (Black grouse)	Negligible	Not significant	Negligible	Not significant
Breeding birds (General)	Low Adverse	Not significant	Low Adverse	Not significant
Non-breeding birds	Low Adverse	Not significant	Negligible	Not significant
Reptiles	Medium Adverse	Significant	Negligible	Not significant
Common toad	Low Adverse	Not significant	Negligible	Not significant
Bats (all species)	Low Adverse	Not significant	Negligible	Not significant
Badger	Low Adverse	Not significant	Negligible	Not significant
Otter	High Adverse	Significant	Negligible	Not significant
European wildcat	Low Adverse	Not significant	Negligible	Not significant
Water vole	High Adverse	Significant	Low Adverse	Not significant
Hare species	Low Adverse	Not significant	Low beneficial	Not significant
Freshwater fish	High Adverse	Significant	Low beneficial	Not significant
Freshwater pearl mussel	High Adverse	Significant	Low beneficial	Not significant

12.5 Mitigation

Standard A9 Mitigation

12.5.1 Standard A9 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 12-29**.

Embedded Mitigation

12.5.2 Embedded mitigation has been incorporated into Proposed Scheme and was considered when identifying potential impacts for relevant ecological features. **Table 12-29** 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 12-29** also details watercourses where natural bed material is incorporated into the crossings.

Project Specific Mitigation

12.5.3 Following the impact assessment for the Proposed Scheme, project specific mitigation has been identified to further minimise or compensate for potentially significant impacts. These measures are presented **Table 12-29**.

Summary of Mitigation Requirements

12.5.4 **Table 12-29** collates and numbers the mitigation requirements, which have been incorporated into the Schedule of Environmental Commitments presented in **Chapter 21**.

Table 12-29: 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; and • 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 the 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) and Institution of Lighting Professionals (2011)). 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 SMC-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 Institution, 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 • 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
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

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
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 designated 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 SMC-S1 in Chapter 21**) 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 **Chapter 11** (Road Drainage and the Water Environment), **Chapter 16** (Air Quality) and **Chapter 17** (Noise and Vibration) will be implemented to protect aquatic and terrestrial habitats and species.*	*To protect aquatic and terrestrial habitats and species*	*n/a*
Embedded Mitigation					
P07 – E1	ch. 0,200/ Hydro ID 1 ch. 0,400/ Hydro ID 2 ch. 0,500 ch. 1,500/ Hydro ID 8 ch. 2,020/ Hydro ID 13 ch. 3,000/ Hydro ID 23 ch. 3,775/ Hydro ID 31 ch. 6,145/ Hydro ID 43 ch. 6,980/ Hydro ID 51 ch. 7,200/ Hydro ID 52 ch. 7,900/ Hydro ID 57 ch. 8,400/ Hydro ID 59 ch. 9,300/ Hydro ID 64	Design Construction	Mammal crossings to be provided in the form of a dry ledge or dry pipe culvert (where no watercourse is present) above the 1 in 50 year flood level, for medium sized mammals such as otter, badger, wildcat, red squirrel and pine marten.	To reduce the risk of mortality, allow safe passage of mammals and prevent habitat severance.	None required
P07 – E2	ch. 0,400/ Hydro ID 2 ch. 0,500 ch. 3,000/ Hydro ID 23 ch. 7,550	Design Construction	Mammal crossings to be provided in the form of a dry crossing above the 1 in 50 flood level, large enough for deer crossing provision.	To reduce the risk of deer vehicle collisions, 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
P07 – E3	ch. 0,220/ Hydro ID 1 ch. 0,400/ Hydro ID 2 ch. 1,145/ Hydro ID 6 ch. 1,500/ Hydro ID 8 ch. 1,875/ Hydro ID 12 ch. 2,020/ Hydro ID 13 ch. 2,775/ Hydro ID 21 ch. 3,000/ Hydro ID 23 ch. 3,340/ Hydro ID 27 ch. 3,775/ Hydro ID 31 ch. 6,145/ Hydro ID 43 ch. 7,900/ Hydro ID 57 ch. 8,700/ Hydro ID 61	Design Construction	Watercourse/ culvert crossings where natural bed material will be incorporated.	To create suitable hydro-morphological habitat for aquatic species.	None required
Project Specific Mitigation					
P07-E4	ch. 3,900 to ch. 3,950 ch. 4,150 to ch. 4,300 ch. 4,450 to ch. 4,950 ch. 6,100 to ch. 7,000 ch. 7,500 to ch. 7,550 ch. 7,750 to ch. 7,850 ch. 8,650 to ch. 8,750 ch. 9,150 to ch. 9,450 ch. 3,750 ch. 7,200 ch. 7,900 ch. 8,400 ch. 9,300	Construction Works avoided: October to February for Atlantic salmon June to July for sea lamprey	Where temporary in-channel works are required in the Spey catchment, sensitive Atlantic salmon spawning season should be avoided (October to February). Percussive construction works should be avoided in proximity to suitable watercourses during sensitive salmon and sea lamprey spawning periods (October to February 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. Riparian vegetation should be retained where practicable. The Contractor will produce a fish rescue plan to detail working methods and control measures for temporary 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 SFB

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E5	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. **Chapter 11** provides further details on SuDS and sediment control measures, specifically **Mitigation Items SMC-W3**, **SMC-W12** and **SMC-W17**.	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
P07-E6	ch. 3,800 to the northern tie-in	Design Construction Works avoided: October to June for Atlantic salmon June to July for sea lamprey	To minimise permanent habitat loss, temporary works within the River Spey SAC will be minimised, and any SuDS which outfall directly into the SAC should be designed/ constructed to ensure that fluvial morphology is not altered.	To prevent adverse effects on site integrity on the River Spey SAC	Consultation with SNH and SFB
P07-E7	Throughout Proposed Scheme	Pre-construction	Minimise disturbance of habitats through careful siting of construction compounds and storage of construction materials, particularly avoiding blanket mire and wet heath. The siting of compounds, storage areas and working areas within the land made available (LMA) will be reviewed by the ECoW at the planning stage of the construction works to ensure minimal disturbance on sensitive habitats.	To reduce impact on notable habitats within the temporary works boundary	Consultation with SNH
P07-E8	Throughout Proposed Scheme	Pre-construction Construction	As required, the Contractor will install temporary fencing to demarcate temporary works areas, as well as any sensitive habitats identified by the ECoW.	To minimise loss of notable habitats	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E9	Throughout Proposed Scheme	Pre-construction Construction	The Contractor will minimise disruption to the water environmental 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. Refuelling and machinery maintenance will only be permitted in designated areas in site compounds with containment facilities to manage leaks and spills. Refer to **Chapter 11**, **mitigation item SMC-W3** for more information.	To reduce impact on notable habitats within the temporary works boundary and prevent adverse effects on site integrity of Drumochter Hills SAC and River Spey SAC	N/A
P07-E10	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 the Tay Catchment, and in the Spey Catchment to prevent adverse effects on site integrity to the River Spey SAC	N/A
P07-E11	Throughout Proposed Scheme	Construction	Maintain hydrological connectivity through retention of natural water channels, flushes and wet habitats. Where watercourses require in channel works that requires 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. Refer to **Chapter 11**, **mitigation item SMC-W5** for more information.	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	N/A
P07–E12	Throughout Proposed Scheme	Construction	Water quality inspection and monitoring will be in place to allow control of construction site runoff and sedimentation. A visual water quality assessment will be made on all tributaries where in-channel 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. **Chapter 11** should be referenced for further details, specifically **mitigation item SMC-W3**.	To implement appropriate controls for site runoff	N/A
P07-E13	Throughout Proposed Scheme	Construction	The Contractor will develop information presented in the Outline Peat Management Plan (see **Appendix 10.6** (**Volume 2**)), including an update from pre-construction surveys/ activities, to detail the process and control measures for peat excavation, storage and re-use.	To allow the successful reinstatement of peat habitats such as blanket bog and heath habitats	Consultation with SNH and SEPA

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E14	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	Consultation with SNH and SEPA
P07-E15	ch. 100 to ch. 400	Post-construction	Proposed tree-planting will avoid sensitive peatland habitats, notably blanket bog. Locations and indicative species mixes are as shown on **Environmental Mitigation Drawings 6.1 to 6.7** (**Volume 3**).	To prevent loss of important peatland habitats.	Consultation with CNPA and SNH
P07-E16	Ch. 400 ch. 3,000 ch. 6,100 to ch. 6,800 ch. 9,300	Post-construction	Proposed shrub-planting as cover for otter and any freshwater fish will be undertaken at ch. 400, ch. 3,000, ch. 6,100 to ch. 6,800 and ch. 9,300 upon completion of construction works at these locations (see **Environmental Mitigation Drawings 6.1 to 6.7** (**Volume 3**)).	To mitigate for the loss of otter habitat at ch. 3,000 as well as ch. 6,100 to ch. 6,800, along with providing cover for continued dispersal throughout these watercourses. ch. 6,100 to ch. 6,800 also provides fish sheltering habitats as mitigation for loss of riparian cover from construction works and permanent outfalls	Consultation with SNH and SFB
P07-E17	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
P07-E18	Throughout Proposed Scheme	Pre-construction Construction	The Contractor will have regard to the potential for nesting crossbill to be present in coniferous plantation woodlands near Dalnaspidal and Drumochter Lodge. As required, the Contractor will liaise with the ECoW to programme works to avoid impacts on nesting crossbill. Relevant working methods and control measures will be incorporated into the Contractor's Species Protection Plan.	To avoid damage or destruction of active nests and disturbance to breeding birds.	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E19	Throughout Proposed Scheme	Pre-construction Construction	The Contractor will have regard to the potential for nesting merlin to be present within and adjacent to the Proposed Scheme, notably in proximity to historic nest sites. As required, the Contractor will liaise with the ECoW to programme works to avoid impacts on nesting merlin. Relevant working methods and control measures for any merlin that could be affected by any construction activities will be incorporated into the Contractor's Species Protection Plan (e.g. timings of works, temporary exclusion zone, etc).	To prevent disturbance to breeding merlin and to ensure no adverse effects on site integrity of Drumochter Hills SPA	Consultation with SNH
P07-E20	ch. 600 to ch. 3,000	Pre-construction Construction Between March and August	The Contractor will have regard to the potential for ground-nesting waders in floodplain areas through the Pass of Drumochter. As required, the Contractor will liaise with the ECoW to programme works to avoid impacts on nesting birds. Relevant working methods and control measures will be incorporated into the Contractor's Species Protection Plan (e.g. timings of works, temporary exclusion zone, etc).	To prevent disturbance to protected and notable waders that are part of the Drumochter Hills SSSI breeding bird assemblage	Consultation with SNH
P07-E21	Throughout Proposed Scheme	Pre-construction Construction	The Contractor will have regard to the potential presence of reptiles within the Proposed Scheme. As required, the Contractor will liaise with the ECoW to programme works to avoid impacts on active reptiles (April to October inclusive) including phased vegetation clearance (to displace animals in adjoining habitats unaffected by construction activities) and avoid storing material/ equipment directly on the ground. Should reptiles 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. Dismantling of potential hibernacula shall not be carried out during the hibernation season (e.g. November to March inclusive).	To ensure no reptile mortality during construction	N/A
P07-E22	Throughout Proposed Scheme	Pre-Construction Construction	As far as practicable, the Contractor shall phase works over major watercourse crossings to maintain otter permeability through the road network and minimise potential increase in animal road mortality.	To reduce risk of otter road mortality as a result of working on watercourse crossings where otter would otherwise cross	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E23	ch. 200 ch. 400 ch. 500 ch. 1,500 ch. 2,020 ch. 3,000 ch. 3,775 ch. 6,145 ch. 6,980 ch. 7,00 ch. 7,900 ch. 8,400 ch. 9,300	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 for the crossing of the Allt Coire Mhic-sith, Dalnaspidal Junction underpass, and Allt a' Chaorainn, designed to allow for permeability of small mammals via access culverts and underpasses.	To reduce risk of otter road mortality and DVC	N/A
P07-E24	Throughout Proposed Scheme	Pre-construction Construction	Water vole are present along the western extent of the Proposed Scheme. The Contractor shall acquire an SNH licence in advance of any construction activity, including site clearance, that could affect water vole and their burrows. The SNH licence will detail pre-construction survey findings, relevant working methods and control measures; as well as capture/ release strategies and the locations of any pre-determined receptor sites/ temporary captivity. In addition, the SNH licence will consider exclusion measure relating to predatory species including American mink. The Contractor will have regard to recent studies and current professional guidance (Dean *et al*. 2016) that highlights water vole translocations are generally more successful when carried out in early spring (e.g. March to April inclusive).	To prevent unlawful destruction of water vole burrows and risk of mortality to water vole	Consultation and licence obtained from SNH
P07-E25	Throughout Proposed Scheme	Construction Post-construction	The Contractor will develop information presented in the Outline Habitat Management Plan (see **Appendix 12.11** (**Volume 2**)), including an update from pre-construction surveys/ activities, to detail the works methods, control measures and monitoring requirements for habitat restoration works.	To prevent the loss of notable habitat throughout the Proposed Scheme	Consultation with SNH
P07-E26	Throughout Proposed Scheme	Post-construction	In line with the Control of Woodland Removal Policy and in-conjunction with landscape plans (see Chapter 13), tree planting will take place, in the locations identified within **Environmental Mitigation Drawings 6.1-6.7** (**Volume 3**).	To prevent loss of woodland habitats and encourage woodland regeneration	Consultation with SNH
Project Monitoring Requirements					
P07-E27	Throughout Proposed Scheme	Post-construction	Inspections of mammal ledges and tunnels will be undertaken during operational years. 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 determine if structures are being used by target species	N/A

Item Ref.	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P07-E28	Throughout Proposed Scheme	Post-Construction	The Contractor will specify relevant specific monitoring requirements for habitat and species mitigation in the relevant Habitat Management Plan, Species Protection Plan and/ or SNH licence. Long-term monitoring requirements will be agreed between Transport Scotland and the relevant statutory consultees.	To determine if mitigation and/ or habitat restoration is successful	SNH Transport Scotland/ Operating Company

12.6 Residual Impacts

Drumochter Hills SPA

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.2 With the implementation of construction stage mitigation, including applying visual screening during construction, SPA qualifying species are not considered to be impacted; therefore, no significant residual impacts are predicted. .

Drumochter Hills SAC

Temporary Impacts – Construction Phase

12.6.3 Construction activities will result in unavoidable temporary impacts to qualifying habitat through loss of surface vegetation, compaction of soils, disruption to groundwater regimes and elevations in construction dust. Mitigation measures identified in **Table 12-29** 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 will be reinstated/ restored upon completion of works; therefore, no significant residual impacts are predicted.

Permanent Impacts – Operational Phase

12.6.4 Embedded mitigation for the Proposed Scheme has minimised encroachment into the site. Given that affected qualifying habitats are generally degraded by existing land management (e.g. drainage, muirburn and grazing), extremely localised habitat loss will have neutral implications for the site and will not be not sufficient in scale to affect the integrity of qualifying habitats in the long-term. Therefore, no significant residual impacts are predicted.

Drumochter Hills SSSI

Temporary Impacts – Construction Phase

12.6.5 Construction activities will result in unavoidable temporary impacts through disturbance to habitats and species within the SSSI. Mitigation measures identified in **Table 12-29** seek to minimise the extent and duration of disturbance during works; and improve the restoration potential of habitats in the long-term. It is anticipated that temporary disturbance will be made good upon completion of works; therefore, construction activities will not result in significant residual impacts.

Permanent Impacts – Operational Phase

12.6.6 Embedded mitigation for the Proposed Scheme has minimised encroachment into the site, and avoided encroachment into fluvial geomorphology, montane and vascular plant assemblages. Given that affected habitats are degraded by existing land management (e.g. drainage, muirburn and grazing), extremely localised habitat loss is not sufficient in scale to damage the SSSI. Therefore, the Proposed Scheme does not result in a significant residual impact on the Drumochter Hills SSSI.

River Spey SAC

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.7 As discussed in **section 12.4**, there is potential to increase the risk of sedimentation during excavation and construction; however, the use of pollution prevention measures detailed in **Table 12-29** will ensure the risk is managed for the construction of the Proposed Scheme. The loss of marginal and bankside vegetation along the SAC in the short term (2-5 years) whilst vegetation becomes established, this is expected to recover and therefore no significant residual impacts are predicted.

Notable Habitats

Temporary Impacts – Construction Phase

12.6.8 Construction activities will result in unavoidable temporary impacts 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 heathlands 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 12-29** 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 as per the OHMP; therefore, construction activities will not result in a significant residual impact

Permanent Impacts – Operational Phase

12.6.9 Embedded mitigation for the Proposed Scheme has minimised encroachment into notable habitats however, infrastructure will result in permanent and irreversible habitat loss (see **Table 12-30**). The majority of encroachment occurs along the edge of more extensive mosaics within or adjacent to the existing A9 corridor. In these areas, vegetation composition and structure of notable habitats has been reduced by existing land management (e.g. drainage, muirburn and grazing); and not considered to be the best examples of these habitats.

Table 12-30: Residual effects for notable habitats

Notable Habitat	Target restoration (ha)	Residual impact	
		Area (ha)	Proportion of total resource (%)
European dry heaths	27.48	7.44 (habitat gain)	3.28 (habitat gain)
Northern Atlantic wet heathlands	24.25	19.49 (habitat gain)	11.64 (habitat gain)
Blanket bogs	2.40	0.57 (habitat loss)	0.56 (habitat loss)

12.6.10 Dry heaths are common within the study area, and widespread within the adjoining Drumochter Hills SAC. These habitats are ubiquitous throughout Scotland and have a widespread European distribution; therefore, the permanent loss of 20.04 hectares is not sufficient in scale to affect the integrity or conservation status of European dry heaths; therefore, this is not considered to be significant.

12.6.11 Whilst wet heaths and blanket bogs are also common within the study, they are associated with shallow and deep peat deposits respectively that are not easily re-created (e.g. specific hydrological requirement). Therefore, habitat and peat restoration areas have been identified to

maintain the extent of sensitive peatland habitats, and associated vegetation communities, in the locality. Therefore, no significant residual impacts will occur in the long term.

Breeding birds

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.12 Potential nesting habitat will be affected by construction activities, which could result in destruction of an active nest and disturbance to breeding birds. With the implementation of construction-stage mitigation, and no significant increase in operational noise/ vibration is expected at a scale that could displace breeding birds from reinstated habitats; the residual impact on breeding birds is not significant.

Non-breeding birds

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.13 Potential wintering bird habitat will be affected by construction activities, which could result in destruction of potential habitat and disturbance to non-breeding birds. With the implementation of construction-stage mitigation, and with no significant increase in operational noise/ vibration expected at a scale that could displace non-breeding birds from reinstated habitats, no significant residual impacts are expected.

Herptiles (Amphibians and Reptiles)

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.14 Reptile habitat will be affected by construction activities, which could result in destruction of hibernacula and incidental risk of animal mortality. With the implementation of construction-stage mitigation (see **P07-E21**), and the reinstatement of temporarily affected habitats, no significant residual impacts are predicted.

Bats

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.15 With the implementation of construction-stage mitigation, extremely low levels of bat activity in the study area, no significant residual impact will occur in the short and long-term.

Badger

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.16 With the implementation of construction-stage mitigation, and extremely low levels of badger activity in the study area, no significant residual impacts are predicted.

Otter

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.17 Otter habitat will be affected by construction activities, which could result in destruction of structure used for temporary shelter or protection; as well as disturbance to otter in the locality and otter prey species. With the implementation of construction-stage mitigation numbers **P07-**

E5, **P07-E16**, **P07-E22** and **P07-E23**, and the reinstatement of bankside vegetation, provision of mammal crossings at regular intervals to maintain ecological permeability, and provision of SuDS; there are no significant residual impacts expected.

European wildcat

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.18 With the implementation of construction-stage mitigation ensuring that the Outline Species Protection Plan will be developed and adhered to (see **P07-E17**), and the provision of mammal crossings at regular intervals to maintain ecological permeability, no significant residual impacts are predicted.

Water vole

Temporary Impacts – Construction Phase

12.6.19 Water vole habitat will be affected by construction activities, which could result in destruction of burrows and disturbance to water vole. With the implementation of the proposed mitigation, including acquisition of an SNH licence, no significant residual impacts are predicted.

Permanent Impacts – Operational Phase

12.6.20 Banksides to affected watercourses, including watercourse diversions, will be re-vegetated upon completion of works using species that can be utilised by water vole. No significant increase in operational noise/ vibration is expected at a scale that could displace water vole from reinstated habitats. Therefore, no significant residual impacts are predicted.

Hare Species

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.21 With the implementation of construction-stage mitigation; and the provision of mammal crossings at regular intervals to maintain ecological permeability, no significant residual impacts are predicted.

Freshwater fish – Atlantic salmon and sea lamprey

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.22 With the implementation of construction-stage mitigation, no significant adverse residual effects are expected. Natural bed material in replaced culverts will improve habitat for freshwater fish. The loss of marginal and bankside vegetation as well as establishment of natural bed material along watercourses supporting freshwater fish in the short term (2-5 years), this is expected to recover resulting in no significant residual impacts.

Freshwater pearl mussel

Temporary Impacts – Construction Phase/ Permanent Impacts – Operational Phase

12.6.23 With the implementation of construction-stage mitigation, and the provision of SuDS features to reduce potential pollution incidences, no significant residual impacts are predicted.

Summary

12.6.24 The findings of this evaluation are summarised in **Table 12-31** and **Table 12-32**, which show an overview of the residual impacts on ecological features recorded within the Proposed Scheme.

Table 12-31: Overview of temporary residual impacts of the Proposed Scheme

Feature	Importance	Impact	Mitigation	Significance
Drumochter Hills SPA	International	Low adverse	Habitat restoration	Not significant
Drumochter Hills SAC	International	Low adverse	Monitoring and habitat restoration	Not significant
River Spey SAC	International	Medium adverse	Compensatory flood storage areas Sediment controls	Not significant
Drumochter Hills SSSI	National	Low adverse	Monitoring and habitat restoration	Not significant
European dry heaths	International	Medium adverse	Minimise works area, temporary protection measures, temporary storage of soils/ peat, habitat reinstatement	Not significant
Northern Atlantic wet heathlands	International	Medium adverse		Not significant
Blanket bogs	International	Medium adverse		Not significant
Breeding birds (general)	Local	Low adverse	Phasing construction activities Pre-works checks Applying screening	Not significant
Non-breeding birds	Local	Low adverse	Applying screening	Not significant
Amphibians and Reptiles (Herptiles)	Authority area	Medium adverse	Watching brief	Not significant
Bats	Local	Low adverse	Pre-works checks	Not significant
Badger	Local	Low adverse	Pre-works checks	Not significant
Otter	International	High adverse	Licence required and phasing construction activities	Not significant
European wildcat	National	Low adverse	Pre-works checks	Not significant
Water vole	Authority area	High adverse	Licence needed Pre-works checks	Not significant
Hare species	Authority area	Low adverse	Pre-works checks	Not significant
Freshwater fish	International	High adverse	Avoid sensitive seasons Avoid percussive construction in proximity Exclusion zones	Not significant
Freshwater pearl mussel	International	High adverse	Pre-works checks	Not significant

Table 12-32: Overview of operational residual impacts of the Proposed Scheme

Feature	Importance	Impact	Mitigation	Significance
Drumochter Hills SPA	International	Low adverse	Habitat restoration	Not significant
Drumochter Hills SAC	International	Medium adverse	Habitat restoration	Not significant
River Spey SAC	International	Low adverse	Habitat restoration	Not significant
Drumochter Hills SSSI	National	Low adverse	Habitat restoration	Not significant
European dry heaths	International	Medium adverse	Monitoring and adaptive management	Not significant
Northern Atlantic wet heathlands	International	Medium adverse		Not significant
Blanket bogs	International	Medium adverse		Not significant
Breeding birds	Local	Low adverse	Low tree planting	Not significant
Non-breeding birds	Local	Negligible	Low tree planting	Not significant
Amphibians and Reptiles (Herptiles)	Authority area	Negligible	None proposed	Not significant
Bats	Local	Negligible	Winter resilience planting foraging routes	Not significant
Badger	Local	Negligible	Underpasses and water crossings Mammal ledges	Not significant
Otter	International	Negligible	Underpasses and water crossings Mammal ledges Inclusion of SuDs	Not significant
European wildcat	National	Negligible	Underpasses and water crossings Mammal ledges	Not significant
Water vole	Authority area	Low adverse	None proposed	Not significant
Hare species	Authority area	Low beneficial	Underpasses and water crossings Mammal ledges	Not significant
Freshwater fish	International	Low beneficial	Inclusion of SuDs Bed material in culverts	Not significant
Freshwater pearl mussel	International	Low beneficial	Inclusion of SuDs with spillage containment	Not significant

12.7 Summary of Combined Impacts

12.7.1 Mitigation for the Proposed Scheme has minimised unavoidable overlap with notable habitats, for example by refining the road alignment and provision of retaining walls to minimise the earthworks extent. Dry heaths, wet heaths and blanket bogs are widespread throughout the Proposed Scheme and approximately 15.36ha will be affected during construction. A further 20.04 ha will be permanently lost to earthworks, road infrastructure and SuDS; although this accounts for less than 10% of the total resource identified in the study area. The accompanying Outline Habitat Management Plan (see **Appendix 12.11**, (**Volume 3**)) details measures to reinstate temporarily disturbed habitats. Therefore, residual adverse effects will be localised and significant only at the local scale and would not result in a significant combined impact.

12.8 References

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