A9 DUALLING
PERTH TO INVERNESS

Appendix A12.9

Ecological Impact Assessment and Mitigation

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

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1. Introduction

1.1.1 This appendix firstly details the methods used for evaluation of ecological features and the impact assessment adopted and then goes on to detail the potential impacts and the effects of the Proposed Scheme on the ecological features identified and describes the associated mitigation measures.

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

1.2. Impact assessment methodology

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

Nature Conservation Evaluation

1.2.2 The general approach to defining the importance of ecological features follows that of CIEEM (2016)[i]. The approach is also in line with advice given in DMRB Interim Advice Note 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment' (The Highways Agency et al., 2010)[ii].

1.2.3 Ecosystems, habitats and species within the Ecological Zone of Influence (EZoI[1]) are assigned levels of importance for nature conservation based on the criteria set out in Table A1.1.

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

Table A1.1: Importance Criteria

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**

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

Importance	Criteria
	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)[iii].
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 Highland 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 Highland 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 Inverness and Nairn Local BAP.
Local	**Ecosystems and Habitats** Ecosystems or habitats essential for the maintenance of: • populations of species of conservation concern within the local area (for example a Local Nature Reserve (LNR)). **Species** Species whose presence contributes to: • the maintenance and restoration of biodiversity and ecosystems at a local level.
Less than Local	**Ecosystems and Habitats** • Ecosystems or habitats that do not meet the above criteria, i.e., supporting at least populations of species of conservation concern within the local area **Species** • Features that are considered to be absent or do not meet any of the above criteria.

Impact Assessment

1.2.5 For the purposes of this assessment, the impact descriptors in Table A1.2 are taken to summarise the overall characterisation of positive or negative impacts in accordance with CIEEM (2016)[i], 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)

1.2.6 The character of impacts was defined using the criteria set out in Table A1.2 as high, medium, low or negligible, following the above impact characterisation approach.

Table A1.2: 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.

1.2.7 Each feature's importance and the potential impacts upon it have been determined through surveys and consultation, to provide a robust basis for making a professional decision on the appropriate focus of the impact assessment. The assessment is then focused on those impacts that result in potentially significant effects on important ecological features. For example, an area of amenity grassland would not meet the criteria for local ecological importance and would not progress through the assessment process, as the assessment only includes features of local importance or above. However, any impact on a SSSI would progress through the assessment process as these sites are designated as nationally important. Habitats, species and species groups that are considered to have a nature conservation value of less than local are not considered important ecological features[2] in the context of this assessment. Any impact on such a feature as a result of the Proposed Scheme is considered unlikely to have a

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

significant effect on the conservation status of such habitats or species on a local, regional, national or international scale. Therefore, features assessed to be of less than local nature conservation value have been scoped out of the ecological impact assessment.

1.2.8 CIEEM (2016)[i] notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (negative or positive) on important ecological features. Significant effects are those that undermine the conservation status[3] of important ecological features. Knowledge and assessment of construction methods and operational activities, together with the ecological knowledge of ecologists with experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the project on ecological features.

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

1.2.10 Where impacts on internationally, nationally or regionally important ecological features are characterised as 'medium' or 'high', they are considered to be potentially significant under the terms of the Environmental Impact Assessment (EIA) Regulations (2011)[iv].

1.2.11 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.

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

1.2.13 The mitigation measures described within this assessment have been incorporated into the design and operational phasing programme and taken into in the assessment of residual effects. The mitigation aims to avoid or negate impacts on ecological features in accordance with best practice guidance and UK, Scottish and local government environmental impact, planning and sustainability policies.

1.2.14 Impacts that are not significant (including those where compliance with regulation is required) would be expected to be avoided or reduced through the application of a Construction Environmental Management Plan (CEMP) and best working practice (e.g. mitigation of potential pollution impacts through adherence to standard best practice and guidelines). Significant ecological impacts are expected to be mitigated through a combination of best practice and typical, proven mitigation methods along with mitigation targeted to specific locations as described in the assessment.

2. Mitigation

2.1.1 The principles of the mitigation hierarchy[v] have been applied when considering potential impacts and subsequent effects on ecological receptors within the EZoI. The principles of the mitigation hierarchy are that impacts on biodiversity should be subject to the following sequential mitigation actions:

3 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.

- avoidance
- mitigation
- compensation
- enhancement

2.1.2 For the purpose of this assessment, mitigation refers to measures that are considered essential to avoid and reduce negative impacts of the Proposed Scheme. Compensation refers to measures taken to make up for the loss of, or permanent damage to, biological resources through the provision of replacement areas. Unless otherwise stated, all compensatory measures are considered to be part of the essential mitigation package.

2.1.3 The mitigation measures described within the EcIA have been taken into account for the assessment of residual impacts. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any negative impacts of the Scheme. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.

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

2.1.5 Mitigation measures set out in this ES will be specified as environmental commitments in the contract documents to ensure implementation by the appointed Contractor.

2.1.6 A list of standard mitigation measures has been developed for all projects within the A9 Dualling Programme; those related to ecology are detailed below in Table A2.1. In addition to these, scheme specific mitigation measures have also been developed as detailed in Table A2.2. Specific mitigation measures are presented on the Landscape and Ecological Mitigation Plans, Figure 13.8a-t.

2.1.7 The assessment considers aspects embedded in the design, of relevance to ecology, this includes mammal ledges on culverts (as identified in section 3.6.58), the design of culverts to maintain natural beds and the design of underpasses which are of a suitable size for bat passage.

Table A2.1: A9 Standard Mitigation Commitments

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
SMC-E1	Throughout proposed scheme	Pre-Construction	Pre-construction surveys will be undertaken to verify and, where required, update the baseline ecological conditions set out in the ES. The scope of the pre-construction surveys will be confirmed with SNH prior to them being undertaken.	To update the baseline ecological conditions set out in the ES.	SNH
SMC-E2	Throughout proposed scheme	Pre-Construction	Prior to construction a suitably qualified (or team of suitably qualified) Ecological Clerk of Works (ECoW) will be appointed and will be responsible for implementation of the Ecological Management Plan. The ECoW will: • provide ecological advice over the entire construction programme, at all times as required; • undertake or oversee pre-construction surveys for protected species in the areas affected by the proposed scheme; and ensure mitigation measures are implemented to avoid and reduce impacts on ecological features; and • monitor the implementation of the mitigation measures during the construction phase to ensure compliance with protected species legislation and commitments within the ES. 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. 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.	None required
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 behavioural changes e.g. avoidance of areas or physical damage e.g. to hearing such as avoidance of areas and hearing damage. In addition, soft-	To protect fish species from noise, vibration and light spill.	None required.

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			start techniques will be applied to piling work procedures to enable sensitive species to evacuate the area.		
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.	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 Atlantic salmon, brook lamprey and brown/sea trout past areas of dewatering and/or significant alteration of water movement during any construction works within the watercourses. Suitable temporary channels may be implemented so that movement between areas of habitat can be maintained.	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 that have the potential to breach applicable conservation legislation necessary to construct the project. Licensing may be for the UK and/or protected species.	To comply with conservation legislation.	SNH
SMC-E7	Throughout proposed scheme	Pre-Construction & Construction	Tree felling and vegetation clearance to be minimised as far as practicable and undertaken outside the core bird nesting season (01 March to 31 August) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection of vegetation to be cleared for nesting birds by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they will be left in situ for their entire nesting period until the young birds have fledged. Alternative approaches to the work will need to be proposed e.g. leaving an exclusion zone around the nest to avoid disturbance.	To protect habitat and fauna during bird nesting season.	None required

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			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.		
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	The use of construction lighting will be in accordance with BS5489 Code of Practice for the Design of Road Lighting[vi] and follow guidance on lighting (e.g. Bat Conservation Trust (2009)[vii] and Institute of Lighting Engineers (2007)[viii]). The construction lighting design will take into account the need to avoid illuminating sensitive mammal habitats (e.g. for bats and badgers) 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[ix].This includes the following: • establishment of Root Protection Areas (RPA); • protective fencing will be erected around the RPA to reduce risks associated with vehicles trafficking over roots system or beneath canopies; • selective removal of lower branches of trees to reduce risk of damage by construction plant and vehicles; • prevent soil compaction measures; and	To comply with guidelines provided in 'BS 5837 Trees in relation to Construction' (British Standards Institute, 2012).	None required

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			• maintain vegetation buffer strips (where practicable).		
SMC-E12	Throughout proposed scheme	Construction & Post-Construction	Planting will be undertaken to replace any trees that were intended to be retained which are felled or die as a result of construction works. The size, species and location of replacement trees will be approved by Transport Scotland and other relevant stakeholders.	Replacement of trees lost that are to be retained.	Transport Scotland and other relevant stakeholders
SMC-E13	Throughout proposed scheme	Construction	Trenches, holes and pits will be kept covered at night or provide a means of escape for mammals that may become entrapped. Gates to compound areas will be designed sensitively to prevent mammals from gaining access and will be closed at night.	To avoid mammals becoming entrapped in and around compound areas during construction.	None required
SMC-E14	Throughout proposed scheme	Construction	Temporary mammal-resistant fencing will be provided around construction compounds following a specification agreed through consultation with Transport Scotland.	To avoid mammals becoming entrapped in and around compound areas during construction.	Transport Scotland
SMC-E15	Throughout proposed scheme	Construction	The Contractor will describe within the CEMP (Mitigation Item SMC-S1) the 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 21 (Table 21.5 (Road Drainage and the Water Environment), Table 21.7 (Landscape and Visual), Table 21.9 (Air Quality) and Table 21.10 (Noise and Vibration)) will be implemented to protect aquatic and terrestrial habitats and species.	To protect aquatic and terrestrial habitats and species.	n/a

Table A2.2: Project Mitigation Commitments

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P12-E16	Throughout proposed scheme	Pre-Construction & Construction	A Habitat Protection Plan will be produced pre-construction and agreed with SNH. The working area will be kept to the minimum necessary for construction of the project to reduce habitat loss.	To protect habitats	SNH
P12-E17	Throughout proposed scheme	Pre-Construction & Construction	Prior to construction necessary consents for tree felling will be obtained as provided for under the Forestry Act 1967.	To comply with legislation	Forestry Commission
P12-E18	Throughout proposed scheme	Pre-Construction & Construction	The removal of any trees identified for retention with the ES should be avoided. Where any trees that were intended to be retained are identified as requiring felling or die as a result of construction works will be replaced, assessment of the trees at such location should be undertaken. Any changes to the extent of tree removal from that assessed within the ES, should be subject to assessment using the same methods as detailed within the ES to determine the appropriate mitigation requirements. Where required any additional impacts identified will be appropriately mitigated for using the same methods as detailed within the ES. The size and species of replacement trees will be agreed in consultation with SNH and the Forestry Commission, and will take account of management plans to immediately adjacent woodland.	To protect trees	SNH and Forestry Commission
P12-E19	Throughout proposed scheme	Construction	Best practicable means will be employed to avoid the disturbance of sensitive species and habitats with noise, dust and air pollution. Please refer to Standard Mitigation Measures as detailed in Chapter 16: Air Quality and Standard Mitigation Measures as detailed in Chapter 17: Noise and Vibration for further details.	To protect fauna and habitats	None
P12-E20	Throughout proposed scheme	Construction	Ponds lost to construction will be replaced as near to their original location as practically possible, or within the nearest suitable habitat, whichever is more ecologically advantageous. This will be undertaken at a ratio of 1 pond	To maintain biodiversity	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			loss: 1 pond replacement, ponds replaced will be of a similar size to that lost. SuDS and drainage features shall not act to offset the loss of any pond; however SuDS shall be designed to maximise their biodiversity value, in line with the CIRIA SuDS Manual[x].		
P12-E21	Throughout proposed scheme	Construction	Construction works (for example, temporary watercourse diversions and in-channel working) to be undertaken taking into account sensitive ecological seasons (e.g. breeding, hibernation or migration seasons) and the potential impact that the type of construction work could have on protected species within that season. Prior to construction consultation will be undertaken with SNH to confirm the programme of construction works. The key sensitive period for salmonids is mid-October to June, inclusive. However the most acceptable timing will depend on which sensitive species are present and will be agreed with SEPA, Scottish Natural Heritage (SNH) and Findhorn Nairn and Lossie Fisheries Trust. During any river dewatering and/or in-channel working, an ecological watching brief and fish rescue plan will be instigated in consultation with SNH and SEPA.	To protect fish species	SNH and SEPA
P12-E22	Throughout proposed scheme	Construction	Mitigation measures to avoid or reduce potential impacts on surface waters will be employed, including adherence to Pollution Prevention Guidelines (PPGs)[xi] during construction, and appropriate road drainage and runoff treatment.	To protect fauna and habitats	None
P12-E23	Throughout proposed scheme	Construction	Any permanent watercourse diversion works (including realignments at crossings) will incorporate design measures that enhance both in-channel and riparian habitat quality e.g. provision of resting pools/spawning habitats for salmonids. Refer to Chapter 11 Road Drainage and Water Environment for key watercourse construction and design mitigation commitments.	To maintain biodiversity	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P12-E24	Throughout proposed scheme	Pre-Construction & Construction	Species Protection Plans to be produced pre construction and agreed with SNH. Plans will be produced for the following species: bats, otter, red squirrel, reptiles and water vole and any other species as deemed necessary from the pre-construction surveys.	To protect fauna	SNH
P12-E25	Throughout proposed scheme	Construction	Appropriate exclusion zones in line with best practice and as agreed with SNH should be maintained. Where exclusion zones of the required size are not possible and if a licence is not needed the amended buffer zone should be agreed with the relevant statutory body.	To protect fauna	SNH
P12-E26	Throughout proposed scheme	Construction	No working within 50m of watercourses during the hours of darkness, taken to be 30 minutes before sunset to 30 minutes after sunrise. In the event that works must be undertaken within this time period, the nature of the works should be discussed with the ECoW to establish what mitigation measures are required. Works may only take place with the agreement of the ECoW.	To protect fauna (primarily otters)	None
P12-E27	Throughout proposed scheme	Pre-Construction & Construction	Tree felling in areas with red squirrel dreys will be timed outside of the red squirrel breeding season (February to September). Where these timescales cannot be achieved the ECoW will determine an appropriate course of action. All tree felling in locations where dreys are present (active or inactive) will be supervised by the ECoW. A SNH derogation licence must be in place for the removal of all active dreys (and dreys where activity levels cannot be confirmed).	To protected red squirrels	If licence required - SNH
P12-E28	Throughout proposed scheme	Pre-Construction & Construction	European Protected Species licences will in place for all bat roosts to be removed or disturbed. Any bat roosts to be lost will be replaced with bat boxes (or other suitable roosting feature), to be erected prior to the loss of the roost. The requirement for the replacement roosts will be determined following pre-construction surveys. Six new bat boxes to be located within retained woodland within the land made	To protect bat species	SNH

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			available for the works as shown on the Landscape and Ecological Mitigation Plans (Figure 13.8a-t) (precise number and location to be determined following pre-construction surveys).		
P12-E29	Throughout proposed scheme	Pre-Construction & Construction	A precautionary method of working (PMW) will be produced prior to construction to detail methodology to follow for habitat clearance in areas of suitable reptile habitat. Pre-construction hand searches of any areas containing suitable reptile habitat, will be undertaken by the ECoW. Any reptiles encountered will be moved to alternative suitable habitat. All vegetation clearance in areas of high suitability for reptiles will be cleared outside of the hibernation period (November to February, subject to seasonal variations). Where these timescales cannot be achieved the ECoW will determine an appropriate course of action.	To protect reptiles	None
P12-E30	Throughout proposed scheme	Pre-Construction & Construction	Permanent otter fencing to be installed 100m either side of watercourse crossings, where indicated on the Landscape and Ecological Mitigation Plan (Figure 13.8a-t), to be installed prior to scheme completion. Design should follow SNH guidance.[xii] The recommended specification is as follows: at least 1.2m high galvanised welded mesh (of at least 2.5mm gauge) above ground level, with a maximum mesh size of 100 x 50mm attached to fence posts and topped with barbed wire. Below ground, the mesh should be dug in to a depth of 300mm, or 100mm with a horizontal lap on the otters' side of 300-450mm. Temporary otter fencing must be installed prior commencement of the construction phase, 100m either side of all watercourse crossings where indicated on the Landscape and Ecological Mitigation Plan (Figure 13.8a-t). Specification should follow that of the permanent fencing, where deviations to this are required for constructability purposes, these should be agreed with the ECoW and SNH.	To protect otters	Deviations to be agreed with SNH

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P12-E31	Pond 5 - Lynebeg	Construction	The pond south of Lynebeg (Pond 5) will be lost as a result of the Scheme. A new pond will be constructed in an area to the east of the existing pond. The new pond will be designed to occupy a surface area similar in extent to the existing pond being lost, but will include sloping marginal shelves of gradient no greater than 1:8, ensuring the establishment of an extensive marginal wetland plant assemblage. The new pond may be lined to ensure water retention, subject to ground and soil conditions. In the event pond lining is required, a natural bentonite clay product will be used to ensure the sustained hydrological viability of the replacement pond. Where possible, the new pond will be 'seeded' with translocated material from the existing pond (seed bank, sediment, and/or vegetation where practical) to encourage rapid establishment of similar successional characteristics as the pond being lost. The pond will otherwise be designed following good practice principles as described by SEPA Guidance on good practice in the management and creation of small waterbodies in Scotland[xiii]. An ecological watching brief and fish rescue plan will be instigated in consultation with SNH and SEPA during pond dewatering activities.	To maintain biodiversity	SNH and SEPA
P12-E32	Throughout proposed scheme	Construction	Offsetting the loss of ecologically important habitats will occur through habitat creation including roadside planting, where appropriate, and has been integrated with landscape planting as shown on Figure 13.8a-t. Landscape planting and newly created habitat will be native species of local provenance, and will comprise a mixture of species. Sowing/planting should be undertaken in the appropriate planting season but as soon as possible following	To maintain biodiversity	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			completion of the works to reduce the likelihood of the areas being colonised by invasive, non-native species which are of lower value to wildlife. Replacement habitats will be monitored and managed during the aftercare and operation phase of the proposed scheme. Where practicable habitat creation will to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas.		
P12-E33	Throughout proposed scheme	Construction	Planting of new woodland will be undertaken at a variety of locations to mitigate for the loss of non-ancient woodland (see Landscape and Habitat Mitigation Plans, Figure 13.8a-t). Soil will be retained from locations of ancient woodland as identified on the Landscape and Ecological Mitigation Plans, Figure 13.8a-t and reused in areas of woodland planting. Locations for reuse are shown on Figure 13.8a-t.	To maintain biodiversity	None
P12-E34	Throughout proposed scheme	Pre-Construction & Construction	If an active water vole burrow is identified during pre-construction surveys then it is likely that an SNH derogation licence will be required for any works proposed within 10m of the burrow. Where a licence is required, translocation of water vole from the works area to a receptor site may be required to ensure that water vole are not harmed during construction. The need for and details of the translocation programme will determined by the ECoW, informed by the update pre-construction surveys, and developed in consultation with SNH.	To protect water vole	SNH
P12-E35	Throughout proposed scheme	Construction	Aspen woodland will be avoided where possible. If felling is required, deadwood over 75cm circumference will be retained where practicable.	To protect aspen and species associated with it.	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
P12-E36	Throughout proposed scheme	Construction	Where retained, deadwood will be placed in a variety of locations and conditions to benefit a number of species. Deadwood should be stored in a location away from the working area to prevent risk of damage and then placed within areas of retained woodland or woodland planting at an appropriate time. The ECoW will provide guidance on suitable locations. Tree stumps will be retained in situ where felled on the edge of working areas where this does not pose a constraint to the works. Edges of woodland will be scalloped where practicable, increasing the variety of habitat conditions, and where an increase in windthrow risk can be avoided.	To maintain biodiversity	None
P12-E37	Throughout proposed scheme	Construction	Where practicable top soil from cleared woodland will be stored appropriately for re-use where priority habitats and species are identified and in areas where similar habitat is to be created, see Figure 13.8a-t Landscape and Ecological Mitigation Plan.	To maintain biodiversity	None
P12-E38	Throughout proposed scheme	Construction	Where practicable top soil from species rich grassland affected will be stored appropriately for re-use in areas where similar habitat is to be created, see Figure 13.8a-t Landscape and Ecological Mitigation Plan.	To maintain biodiversity	None
P12-E39	Throughout proposed scheme	Construction	Where practicable top soil from heath lost will be stored appropriately for re-use in areas where similar habitat is to be created, see Figure 13.8a-t Landscape and Ecological Mitigation Plan.	To maintain biodiversity	None
P12-E40	Throughout proposed scheme	Construction	Culverts placed on watercourses Allt na Frithe. Allt Dubhag, Dalmagarry Burn, Allt na Loinne Mòire, Allt na Slànaich; and Allt Creag Bheithin) will be designed as open-arch structures that act to: • retain natural bed substrate within the culvert;	To ensure passage for fisheries through culverts	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			• ensure no deterioration (and aim to improve) existing water depth and flow provision within the culvert for migratory fish; and • improve river continuity by replacing existing A9 structures with artificial inverts. The watercourse outlet will be designed to provide appropriate resting pools immediately downstream of the culvert entrance. Marginal/riparian planting will also be implemented to provide cover and mitigate the transition from light to dark at the culvert inlet and outlet. This will ensure fish are not discouraged or prevented from entering or exiting the culvert. All culverts, including channel inlet and outlets, will be constructed with reference to SEPA's Good Practice Guides, namely: • Engineering in the Water Environment Good Practice Guide: Bank Protection Rivers and Lochs[xiv]; • Engineering in the Water Environment: Good Practice Guide - River Crossingxv; and • Position Statement WAT-PS-06-02 - Culverting of Watercourses – Position Statement and Supporting Guidance[xvi].		
P12-E41	Around pond 18	Construction	All vegetation clearance within 250m of pond 18 will be undertaken following a Precautionary Method of Working (PMW) for great crested newts. This PMW will be produced by a suitability qualify ecologist and will include details on approaches and timings for vegetation clearance and methods for hand searches of vegetation by an ecologist.	To prevent harm to great crested newts	None
P12-E42	SuDs pond (reference PYA)	Construction	SuDs ponds and drainage channels at Tomatin Junction and SuDs pond adjacent to the Allt Creag Bheithin where water vole have been recorded and will be designed sensitively to provide habitat for water vole, see locations	To provide enhancement to habitats in locations where water vole are present	None

Mitigation Item	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/Objective	Specific Consultation or Approval Required
			shown on Figure 13.8e and Figure 18.8p Landscape and Ecological Mitigation Plans.		
P12-E43	Throughout Proposed Scheme	Construction	Where any existing wood ant nests cannot be retained in-situ, they shall be translocated to suitable receptor sites. Prior to translocation, areas of suitable habitat shall be identified and agreed with TS and SNH. Where these exist within the construction site boundaries, they shall be clearly marked as an area to be retained and protected during construction. Wood ant nests shall be translocated during the spring in accordance with a methodology agreed with SNH.	To avoid detrimental impact on wood ant populations present within the site boundary.	SNH

3. General Impacts and Effects

3.1.1 This impact assessment assumes the adoption of the mitigation measures detailed above and as such detailed assessment is only provided on residual impacts. Pre-mitigation impact characterisation is provided for these impacts for clarity.

3.1.2 Effects are discussed in terms of locations which fall within the infrastructure footprint (defined as the Infrastructure footprint) and the land made available for the construction of the infrastructure (defined as the Construction footprint). The combined area of the Infrastructure footprint and Construction footprint is referred to as the Proposed Scheme.

3.2. Designated Sites

3.2.1 No construction or operational impacts will occur within the boundaries of any statutory designated sites.

3.2.2 There are four designated sites located within 10km of the Proposed Scheme which are designated for ecological reasons: Slochd SAC, Carn nan Tri-tighearnan SAC and SSSI as shown on Figure 12.1 and Loch Ashie SPA (not shown due to distance from the Scheme, but within 10km). A Habitat Regulations Assessment (HRA) screening has been undertaken to assess the likely impacts of the Proposed Scheme on the qualifying features of the international sites. The details of this assessment can be found in Appendix A11.5. The HRA assessment concluded that the Proposed Scheme would have no likely significant effects on the conservation objectives of either SAC or the SPA.

3.2.3 Carn nan Tritighearnan SAC and SSSI, is located 3.8km to the north east of the Proposed Scheme and Slochd SAC is located 1.6km to the south. Due to the distance between the sites and the Scheme there will be no direct impacts and as neither site is hydrologically connected to the Scheme no indirect impacts are predicted. Therefore, these sites are not considered further within this appendix and there are no specific mitigation requirements with respect to these sites.

3.2.4 Loch Ashie SPA is located 9.5km from the Proposed Scheme. Due to the distance between this site and the proposed Scheme, there will be no loss of land from the SPA and there are no areas of functional land located within the Scheme. Studies indicate that works within 150-300m could result in disturbance to the species. However, due to the distance between the SPA and the Scheme, disturbance effects have been discounted.

3.2.5 There are no non-statutory designated sites within the Ecological Zone of Influence (EZoI)[4].

3.3. Ancient Woodland

Construction

3.3.1 Sixteen areas listed on the ancient woodland inventory (AWI) are present within the EZoI, as shown on Figure 12.1. During the scheme development, design options have

[4] The Ecological Zone of Influence (EZoI) is an area defined by the assessment in which there may be ecological receptors subject to changes and subsequent effects as a result of the Proposed Scheme.

been selected to reduce the extent of ancient woodland habitat loss where practicable. Eight areas on the AWI fall within the Proposed Scheme and will be subject to permanent habitat loss. It is acknowledged that ancient woodland cannot be replaced so all areas of ancient woodland that are affected, either within the Scheme footprint or within the areas required to accommodate the Scheme construction, are considered to be permanent losses.

3.3.2 Areas of ancient woodland that will be lost form part of larger woodland habitats. By removing a part of the woodland, this may also result in edge effects on the remaining woodland, which may reduce the suitability of the habitat for woodland species.

3.3.3 Table A3.1 assesses the impacts on the eight areas of ancient woodland that fall within the Proposed Scheme.

3.3.4 Indirect effects during construction may occur as a result of pollution to watercourses which flow through ancient woodland from oil and chemical spills which could in turn result in the loss of plants through the uptake of contaminants. Pollution could also arise from silt, which could smoother plants. This effect will be mitigated through the construction drainage, which will include temporary SuDs ponds and silt management. It is considered that these measures will reduce any effects from pollution and silt during the construction phase to a non-significant level.

Table A3.1: Ancient Woodland - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Area of habitat loss (ha) Woodland habitat loss (Ha) Other habitat loss (Ha)	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
AW ID Area 2 Ch-900 Value: Authority Area	Habitat loss	Total habitat loss: 0.18 Woodland loss: 0.16 Other habitat loss: 0.2	Extent: Construction of signal gantries at this location will result in the loss of 0.18ha of habitat which is listed on the AWI. Approximately 0.16ha of plantation birch woodland will be permanently lost, and areas of semi-improved grassland. The woodland within the Proposed Scheme does not support mature trees or a well-developed ground-flora. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E1 P12-E2 P12-E3 P12-E4 P12-E17 P12-E18 P12-E21 P12-E22	Not significant
AW ID Area 3 Ch-400 Value: Authority Area	Habitat loss	Total habitat loss: 0.015 Woodland loss: 0.01 Other habitat loss: 0.005	Extent: Construction of a signal gantry at this location will result in the loss of 0.015ha of habitat which listed on the AWI. This includes approximately 0.12 ha of broadleaved birch plantation woodland which does not support mature trees or a well-developed ground-flora. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E1 P12-E2 P12-E3 P12-E4 P12-E17 P12-E18 P12-E21	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha) Woodland habitat loss (Ha) Other habitat loss (Ha)	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
			Impact Descriptor: High	P12-E22	
AW ID Area 5 Ch600 Value: Authority area	Habitat loss	Total habitat loss: 0.27 Woodland loss: 0.18 Other habitat loss: 0.2	Extent: Construction of the Tomatin Grade Separated Junction will result in the loss of 0.27ha of habitat which is listed on the AWI. This includes 0.18ha of coniferous plantation woodland which does not support very mature trees or a well-developed and diverse ground-flora. The remainder of the habitat lost is either improved grassland or hard standing. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: Low	None required as no woodland or ancient woodland seedbank will be affected at this location.	Not significant
AW ID Area 7 Ch1500 – Ch1650 Value: Authority area	Habitat loss	Total habitat loss: 0.75 Woodland loss: 0.60 Other habitat loss: 0.15	Extent: Widening at this location will result in the loss of 0.75 ha of habitat listed on the AWI. This stand is a predominantly dense coniferous plantation woodland with a species poor ground flora. A small area of broadleaved woodland is also present with a more diverse ground flora, which includes ancient woodland indicator species including bilberry, greater wood-rush and primrose. The area of broadleaved woodland subject to loss is 0.11ha, with loss occurring to the edge of this woodland block. The remainder of the habitat within the Proposed Scheme includes dry heath / acid grassland mosaic, hard standing, and marsh / marshy grassland. Effect: Direct negative Duration: Permanent	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. The soil within the area of broadleaved woodland (0.11ha) will be stripped and reused retained and used within a woodland planting area. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha) Woodland habitat loss (Ha) Other habitat loss (Ha)	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
			Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High	P12-E16 P12-E17 P12-E18 P12-E19 P12-E32 P12-E33 P12-E36 P12-E37	
Area 11 Ch6300 – Ch6700 Value: Authority area	Habitat loss	Total habitat loss: 3.05 Woodland loss: 2.19 Other habitat loss: 0.86	Extent: Habitats which will be lost include coniferous plantation woodland, broadleaved woodland, acid grassland, and dry heath. The woodland at this location is generally mature and has a relatively floristically diverse ground-flora. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. The soil within the area with a well-developed ground flora (approximately 2ha) will be stripped and re-used within a woodland planting area. These areas of shown on the Habitat and Landscape Mitigation Plans – Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E16 P12-E17 P12-E18 P12-E19 P12-E32 P12-E33 P12-E36	Significant

Location and Value	Potential Impact	Area of habitat loss (ha) Woodland habitat loss (Ha) Other habitat loss (Ha)	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
				P12-E37	
Area 12 Ch6300 – Ch6700 Value: Regional	Habitat loss	Total habitat loss: 1.04 Woodland loss: 0.60 Other habitat loss: 0.44	Extent: This woodland supports Scots pine plantation woodland. The Scots pine woodland within this area has taken on characteristics of a mature woodland, including well developed and diverse ground flora. A strip of dense Sitka spruce dominated plantation woodland is situated to the centre of the area; this stand is species-poor and does not support a well-developed or diverse ground flora. The Proposed Scheme lies within an area of Scots pine plantation woodland directly adjacent to the existing A9. The trees within this area are not as mature and the ground-flora less developed than areas towards the centre of the woodland. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. The soil within the area with a well-developed ground flora (0.35ha) will be retained and used within a woodland planting area. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E16 P12-E17 P12-E18 P12-E19 P12-E32 P12-E33 P12-E36 P12-E37	Significant
Area 14 Ch6800 Value: Authority Area	Habitat loss	Total habitat loss: 0.3 Woodland loss: 0.1	Extent: Widening at this location will result in the loss of 0.1ha of coniferous woodland. All trees are less than 20m height, relatively young with a very sparse ground flora of acid grassland and bryophytes including *Hylocomium splendens, Pleurozium schreberi, Rhytidiadelphus triquetrus*. This stand does not exhibit features which are characteristic of an ancient woodland.	Woodland planting will be undertaken as detailed in the Landscape and Ecological Mitigation Plans Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12	Not significant

Location and Value	Potential Impact	Area of habitat loss (ha) Woodland habitat loss (Ha) Other habitat loss (Ha)	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
		Other habitat loss: 0.20	 Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Probability: Certain Impact Descriptor: High	P12-E16 P12-E17 P12-E18 P12-E19 P12-E32 P12-E33 P12-E36 P12-E37	

3.3.5 The total loss of area that is listed on the AWI is 5.61ha, of which 3.84ha is woodland. It is recognised that it is not possible to mitigate for the loss of ancient woodland, however in summary no areas considered to be ancient woodland will be lost as a result of the Scheme as the areas of woodland present do not contain mature trees and evidence of modification is present. Areas of modified woodland will be affected and in these locations there may still be a seed bank containing species that are associated with ancient woodland. In these locations, the soil will be stripped and used within areas of woodland creation. Areas of woodland planting are proposed as part of the Landscape and Ecological Mitigation Plans, Figure 13.8a-t. Across the Scheme approximately 53.9ha of woodland will be lost, in total 54ha of woodland and tree planting is proposed.

3.3.6 Indirect effects may also occur during construction as a result of sedimentation or pollution to watercourses which flow through ancient woodland, which could in turn result in smothering of habitats adjacent to the watercourse, or loss of plants through the uptake of contaminants. This effect will be mitigated through the adoption of standard mitigation measures detailed in Tables A2.1 and A2.2 above and as such are not considered further.

Operation

3.3.7 Indirect effects during operation may occur as a result of pollution to watercourses which flow through ancient woodland from oil and chemical spills, which could in turn result in the loss of plants through the uptake of contaminants. This effect will be mitigated through the built road drainage design and so is not considered further. It is considered that the road drainage design associated with the Scheme will reduce any effects from pollution to a non-significant level.

3.3.8 In line with DMRB IAN 174/13, where annual mean NOx concentrations are below the Air Quality Strategy (AQS) objective for the protection of vegetation (annual mean of 30µg/m3), significant effects on vegetation are not anticipated. The average annual mean background NOx concentrations across the EZoI is currently less than a tenth of the objective, and therefore the impact on vegetation, including ancient woodland, due to changes in annual mean NOx as a result of the Proposed Scheme, has been assessed as not significant, see details within Table 16.7 within Chapter 16 Air Quality.

3.4. Terrestrial Habitats

Construction

3.4.1 Terrestrial habitats may be affected during construction as a result of:

- Permanent habitat loss through land-take. The Proposed Scheme will result in permanent habitat loss due to widening of the A9 and land required for associated drainage (e.g. SuDs ponds) and access tracks.
- Temporary habitat loss. The works will result in temporary habitat loss due to the land required to accommodate site compounds, temporary access tracks, storage of construction materials and temporary SuDs ponds.
- Habitat fragmentation. Terrestrial habitats may be affected by habitat fragmentation as a result of the widened A9 and associated infrastructure. Where smaller areas of habitat are created these may be more vulnerable to loss, damage or change, which may result in reduced species diversity.
- Disruption to local hydrology. Disruption to drainage patterns such as changes in the flow and the volume of sub-surface water, as a result of construction may alter habitat types through drying or wetting of areas.

3.4.2 During the scheme development, design options have been selected to reduce the habitat loss where practicable. However, some habitat loss cannot be avoided and this is detailed below in Table A3.2. This details both the temporary habitat loss during the construction stage for temporary works areas, access roads and construction drainage and the permanent habitat loss as a result of the Scheme.

3.4.3 Project specific mitigation measures are proposed to mitigate for the loss of ecologically important habitats.

3.4.4 In summary, these measures will include the following:

- Habitat reinstatement. Temporary habitat loss will be mitigated for through reinstatement of habitats. This will generally be done on a like for like basis or will aim to provide an enhancement where degraded or ecologically poor habitats are present (e.g. improved grassland), where practicable.
- Habitat creation. Permanent loss of ecologically important habitats, including Annex I and SBL Priority Habitat, will be mitigated for through habitat creation. Habitats will either be replaced on a like for like basis, with habitats of a similar type and character to be created within the vicinity of the area where the loss has occurred. Where this is not possible, habitat creation will occur within other suitable areas within Land Made Available (LMA). Small areas of heath and bog habitats may be lost; areas of acid grassland are included in the landscape and habitat mitigation plan. Depending on local hydrology and adjacent habitats these areas in time may transition to bog habitat, although this habitat would take many years to develop. Taking a precautionary approach, it is assumed that these habitats will be permanently lost and there is no proposed mitigation to account for their loss due to the complexities in creating this habitat type.

3.4.5 The details of the proposed habitat reinstatement and creation are shown on Landscape and Ecological Mitigation Plans, Figure 13.8a-t.

Table A3.2: Summary of Habitat Loss

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
Semi-natural broad-leaved woodland (excluding areas identified within the AWI – these are considered in Table A3.1) Ch400–Ch1000 (NB but predominantly SB) Ch1300–Ch1500 (SB) Ch1700–Ch1900 (SB) Ch2000-Ch2300 (NB) Ch3000–Ch3600 (NB but predominantly SB) Ch4300–Ch5200 (NB but mainly SB) Ch5500–Ch6400 (NB and SB) Ch7300–Ch8400 (NB) Value: Authority	17.79	Extent: Construction of the Proposed Scheme will result in the loss of approximately 17.79ha of broadleaved woodland. Notable areas of loss include areas of wet woodland which will be lost due to the construction of Tomatin GSJ, an area of wet woodland within the widening footprint adjacent to Invereen farm, loss of wet woodland in the vicinity of road widening and access road construction at Dalmagarry Burn, and loss of mixed birch woodland due to widening near Moy Rail Bridge and the Lynebeg LILO. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	Approximately 18.6ha of broadleaved woodland planting. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E16 P12-E17 P12-E18 P12-E19 P12-E23 P12-E33 P12-E35 P12-E36 P12-E37	Not significant
Coniferous plantation woodland (includes a relatively	36.45	Extent: Construction of the Proposed Scheme will result in the loss of	35.4ha of native coniferous woodland planting (Scots pine woodland with	Not significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
small area (1.2 ha of mixed plantation woodland) (Excludes areas identified within the AWI – these are considered in Table A3.1). Ch300-Ch550 (NB and SB) Ch1200–Ch3500 (NB and SB) Ch4100–Ch4400 (NB and SB) Ch4700–Ch5900 (NB and SB) Ch5200–Ch6500 (Predominantly SB but also NB) Ch6500–Ch8300 (NB and SB) Ch8400–Ch9600 Value: Local		approximately 36.45ha of coniferous and mixed plantation woodland. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	associated native ground flora and shrubs). These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E2, SMC-E8, SMC-E9, SMC-E11, SMC-E12 P12-E16 P12-E17 P12-E18 P12-E19 P12-E32 P12-E33 P12-E36 P12-E37	
Unimproved acid grassland Ch300–Ch1000 (NB and SB) Ch1400–Ch3600 (NB and SB) Ch3800–Ch4300 (NB and SB) Ch6000–Ch6400 (NB and SB) Ch7800-Ch9600	15.88	Extent: Construction of the Proposed Scheme will result in the loss of 15.88 ha of unimproved acid grassland. Notable areas of loss include areas of unmanaged grassland which will be lost due to construction of Tomatin GSJ, access roads, and general road widening works.	86.7ha of acid grassland / species-rich neutral grassland planting is proposed across the Proposed Scheme. A species rich acid grassland mix typical of the Scottish Highlands will be used	Not significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
(SB) Value: Local		Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	within the majority of the areas. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E9 P12-E16 P12-E19 P12-E32 P12-E38	
Unimproved neutral grassland Ch800 (SB) Ch3300 (SB) Ch5000-Ch5200 (SB) Ch6500 (NB) Ch7900-Ch8000 (SB) Ch8300-Ch8400 (NB) Value: Local	1.54	Construction of the Proposed Scheme will result in the loss off 1.5 ha of unimproved neutral grassland. Areas of loss are scattered throughout the Proposed Scheme and are of a relatively limited extent. Effect: Direct negative Duration: Long-term Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	87.1ha of acid grassland / species-rich neutral grassland planting in proposed across the scheme. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E9 P12-E16 P12-E19 P12-E32 P12-E38	Not significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
Marshy grassland Ch700–Ch1200 (NB but predominantly SB) Ch1550 (SB) Ch2000–Ch2500 (SB) Ch3100–Ch3600 (NB but predominantly SB) Ch7700–Ch8000 (SB) Ch9000–Ch9100 (NB) Value: Local	4.25	Extent: Construction of the Proposed Scheme will result in the loss off 4.21ha of marshy grassland. Notable areas of loss include areas of marshy grassland within the vicinity of Tomatin GSJ, grassland within the vicinity of the access tracks at Dalmagarry Farm and Dalmagarry Quarry to Tomatin, and marshy grassland to the north of Moy (occurring within a mosaic of dry / wet heath) which will be lost due to road widening and construction of SUDS access roads. Effect: Direct negative Duration: Long-term Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	0.8ha of wet / marshy grassland planting is proposed across the scheme. These areas of shown on the Landscape and Habitat Mitigation Plans, Figure 13.8a-t. SMC-E9 P12-E16 P12-E19 P12-E32 P12-E38	Not significant
Dry dwarf shrub heath: acid (including areas of dry heath / acid grassland mosaic) Ch300–Ch1000 (NB and SB)	6.38	Extent: Construction of the Proposed Scheme will result in the permanent loss off 6.38ha of dry dwarf shrub heath. Notable areas of loss include the areas within the vicinity of the Moy Rail Bridge which will be lost due to road	Areas of acid grassland are included in the landscape and habitat mitigation plan. Depending on local hydrology and the presence of adjacent heathland	Significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
Ch2500–Ch3000 (NB) Ch3500–Ch3650 (SB) Ch4500–Ch5300 (NB and SB) Ch6600–Ch6900 (NB and SB) Value: Authority Area		widening, and the heath / bog / acid grassland mosaic which will be lost due to road widening and construction of SUDS access tracks to the north of Moy. Effect: Direct negative Duration: Long-term Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	habitat these areas in time may transition to dry heath. However, taking the precautionary approach it is assumed that these habitats will be permanently lost and there is no proposed mitigation to account for their loss due to the complexities in creating these habitat types. SMC-E9 P12-E16 P12-E19 P12-E32 P12-E39	
Wet dwarf shrub heath (including areas of wet heath / acid grassland mosaic) Ch2000–Ch2200 (NB and SB) Ch4900-Ch5300 (NB) Ch8600(SB) Value: Authority Area	1.34	Extent: Construction of the Proposed Scheme will result in the permanent loss off 1.34 ha of wet heath. Notable areas of loss include the mosaic of heath and bog that will be lost due to construction of Tomatin GSJ, areas within the vicinity of the Moy Rail Bridge which will be lost due to road widening, and the heath / bog / acid grassland mosaic which will be lost due to road	Areas of acid grassland are included in the landscape and habitat mitigation plan. Depending on local hydrology and adjacent habitats these areas in time may transition to wet heath or dry heath. However, taking the precautionary approach it is assumed that these habitats will be	Significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
		widening and construction of SUDS access tracks to the north of Moy. Effect: Direct negative Duration: Long-term Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	permanently lost and there is no proposed mitigation to account for their loss due to the complexities in creating these habitat types. SMC-E9 P12-E14 P12-E19 P12-E32 P12-E24	
Blanket bog and wet modified bog including areas of acid / neutral flush Ch600–Ch1000 (NB and SB) Ch2500–Ch3600 (NB and SB) Ch4800–Ch5200 (NB and SB) Ch6600–Ch9300 (NB and SB) Value: Authority Area	11.14	Extent: Construction of the Proposed Scheme will result in the permanent loss off 11.14 ha of bog and flush habitat. Notable areas of loss include the mosaic of heath and bog that will be lost due to construction of Tomatin GSJ, areas within the vicinity of the Moy Rail Bridge which will be lost due to road widening, and the heath / bog / acid grassland mosaic which will be lost due to road widening and construction of SUDS access tracks to the north of Moy. Effect: Direct negative Duration: Long-term	Areas of acid grassland are included in the landscape and habitat mitigation plan. Depending on local hydrology and adjacent habitats these areas in time may transition to bog habitat, although this habitat would take many years to develop. Taking a precautionary approach, it is assumed that this habitat will be permanently lost and there is no proposed mitigation to account for their loss due to the	Significant

Phase 1 Habitat Type Location NB – Northbound SB - Southbound Value	Total Habitat Loss (Ha) Proposed Scheme	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significance of (residual) Effect
		Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	complexities in creating this habitat type. SMC-E9 P12-E16 P12-E19 P12-E32	

3.4.6 The dualling of the road is unlikely to create fragmentation effects as habitat connectivity will still occur following the linear route of the road. Fragmentation of habitats will occur due to associated infrastructure, such as junctions and access roads which will cut through areas of habitat. With respect to access roads this is not likely to be significant given the relatively small width of these roads which are not likely to be a barrier to seed dispersal. With respect to junctions, at Lynebeg, woodland habitat will remain around the LILO and Moy to Lynebeg link road and underpass, thus providing connections between habitats and the habitats that will remain are considered large enough to remain viable. At the Moy LILO junction the area is grazed grassland, neutral improved and unimproved acid grassland. These habitats extend round the junction and whilst habitat will be removed, effects from fragmentation are not anticipated due to these habitats extending into the wider landscape and the habitats that will remain cover a large area so will remain viable. At Tomatin GSJ, the northbound side the Scheme is located within neutral unimproved grassland. This will be fragmented and the junction will split this habitat into two smaller parcels. However, as these habitats are assessed to be of less than local value this impact is not considered significant. On the southbound side of Tomatin GSJ broadleaved woodland and unimproved acid grassland is present; the junction does not fragment these habitats.

3.4.7 In summary, no significant fragmentation impacts are predicted. To enhance the existing habitat features, habitat reinstatement and creation will aim to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas, see Landscape and Ecological Mitigation Plans, Figure 13.8a-t.

3.4.8 Habitat severance due to the widening of the existing A9 is not considered to be significant, given that habitats either side of the road are already severed due to the presence of the existing A9.

3.4.9 Disruption to local hydrology has been avoided or reduced as far as practicable through consideration of the location of sensitive habitats at the design stage. This has included avoiding areas which potentially support Groundwater Dependent Terrestrial Ecosystems (GWDTE) or reducing the Proposed Scheme footprint within the vicinity of these areas. The effect of the Proposed Scheme on GWDTEs is fully considered in Chapter 10 Geology Soils and Groundwater, and not discussed further here.

3.4.10 Habitats may be affected during the construction phase as a result of changes in water quality, air pollution from dust and silt. It is considered that the proposed mitigation measures will address these impacts such that the residual effects will not be significant.

Operation

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

3.4.12 As discussed above for ancient woodland, the average annual mean background NOx concentrations across the EZoI is currently less than a tenth of the AQS objective for vegetation. Impacts to vegetation as a result of changes in annual mean NOx is therefore assessed as not significant. See Table 16.7 within Chapter 16 Air Quality for further detail.

3.5. Aquatic Habitats

Construction

3.5.1 During construction, river habitats could be affected by:

- placement of new culverts and bridges and/or extension to existing structures resulting in direct habitat loss and reduced habitat availability for aquatic species at the point of construction
- loss of riparian habitat structure arising from vegetation clearance which may reduce valuable cover and refuge for notable fish populations
- pollution and sedimentation events (run-off during construction) which may result in habitat degradation, for example smothering of fish habitat (e.g. spawning sites)
- in channel works such as watercourse diversions and temporary crossings resulting in temporary loss of habitat and/or fragmentation of habitats that affect fish species reaching spawning habitats and/or undertaking daily feeding migrations

3.5.2 During construction, pond habitats could be affected by:

- direct habitat loss
- indirect habitat loss as a result of interrupted hydrological support to the pond (e.g. severance of groundwater flow paths or redirection of surface water drainage pathways due to earthworks)
- pollution and sedimentation events (run-off during construction) resulting in habitat degradation by affecting water quality and/or smothering marginal habitats

3.5.3 With the implementation of the mitigation commitments in Table A2.1 and Table A2.2 (and also in relation to water as detailed in Chapter 11 (Road Drainage and the Water Environment)), pollution, sedimentation and hydrological impacts will either not occur, or are likely to be short-term, temporary and not significant and so are not considered further. The exception to this is direct and indirect habitat loss, which may be permanent depending on the mechanism of loss, and for which (in terms of river and bankside habitat) there are limited practical mitigation options. These impacts are assessed in Table A3.3 below.

3.5.4 A key area of embedded design mitigation, is the realignment of Dalmagarry Burn. The realigned channel will reflect a natural length and size to accommodate the existing flow and sediment regime of the watercourse. This will promote natural functioning of the channel and floodplain and therefore morphological and habitat diversity.

3.5.5 The existing length of the burn to be realigned is approximately 640m, with the proposed realignment length being approximately 680m (6% longer). This is dictated to a certain degree by the A9 crossing point over the burn and the road embankment pushing the river c.40m north-eastwards, but the realignment also includes a natural sinuosity to encourage natural processes (erosion and deposition) which will ensure the sustained viability of gravel bed habitats for salmonids and other aquatic species. Further information is provided in the Hydromorphology Assessment (Appendix 11.1 of Chapter 11 Road Drainage and the Water Environment).

3.5.6 A SUDS pond will be located between the realigned burn and the A9 alignment towards the lower end which will be landscaped and planted to form a wetland area.

Table A3.3: Aquatic Habitats - Specific Impacts, Mitigation and Residual Impacts – Construction

Location	Potential Impact	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Significant (residual)
Watercourse Allt na Frithe Location: Ch900, north-west of Tomatin (Figure 12.12c) Value: Local	Loss of open channel and bankside habitat through culvert placement.	Extent: Approximate 41m loss of open channel to A9 1250 Allt na Frithe Culvert. Note; an existing footbridge will be replaced with a 1.5m wide footbridge over the Allt na Frithe (the A9 1245 F Tomatin Distillery Footbridge) which will not result in net loss of open channel. Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High	All practical measures have been included in embedded and standard mitigation to avoid impacts on watercourse habitats during construction, reducing the length of culverts required and retaining natural bed substrates through the use of open culverts. The use of open culverts will also serve to increase the extent of natural bed substrate in watercourses within the A9. SMC-E1, SMC-E2, SMC-E3, SMC-E4, SMC-E5, SMC-E9 P12-E16 P12-E19 P12-E21 P12-E22 P12-E23 P12-E25 P12-E26 P12-E40	Not significant
Watercourse Allt Dubhag Location: Ch1500, north-west of Tomatin (Figure 12.12d) Value: Local		Extent: Approximate 40m loss of open channel to A9 1250 C25 Allt Dubhag Culvert. Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High		Not significant
Watercourse Allt na Loinne Mòire Location: Ch6700, at Lynemore (Figure 12.12g)		Extent: Approximate 8m loss of open channel to A9 1273 C8 Allt Na Loinne Moire Culvert. Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain		Not significant

Location	Potential Impact	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Significant (residual)
Value: Local		Impact Descriptor: High		
Watercourse Allt na Slànaich Location: Ch8200, north-west of Lynemore (Figure 12.12h) Value: Local		Extent: Approximate 36m loss of open channel to A9 1273 C28 Culvert 8. Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High		Not significant
Watercourse Allt Creag Bheithin Location: Ch8300, north-west of Lynemore (Figure 12.12i) Value: Local		Extent: Approximate 18m loss of open channel to A9 1273 C31, MC90 C1, and MCY0 C1 Culverts. Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain Impact Descriptor: High		Not significant
Watercourse Dalmagarry Burn Location: Ch3600, at Dalmagarry (Figure 12.12e) Value: Local	Temporary loss of habitat during river realignment works	Extent: Approximate 640m of channel being permanently realigned to accommodate Proposed Scheme construction footprint. Effect: Direct negative Duration: Short term Frequency and timing: N/A Reversibility: Reversible Likelihood: Certain	The embedded design and standard mitigation measures ensure the sustainable design of the Dalmagarry Burn and avoid impacts to the watercourse during construction. However, there will be a short-term period of deterioration in river habitat quality during construction, and likely up to one year post-construction whilst habitats re-establish. Although the specific duration of this effect is difficult to predict with accuracy, Dalmagarry Burn is	Not significant

Location	Potential Impact	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Significant (residual)
		Impact Descriptor: Medium	a relatively active, upland river system. Periods of high flow will shape in-channel habitat structure in a relatively short timeframe, and there is no significant loss of riparian structure (e.g. tree-lined banks) during construction. SMC-E1, SMC-E2, SMC-E3, SMC-E4, SMC-E5, SMC-E9 P12-E16 P12-E19 P12-E21 P12-E22 P12-E23 P12-E25 P12-E26	
	Permanent gain of open channel and bankside habitat through road bridge placement, and river realignment.	Extent: Approximate 30m gain of open channel through a combination of: a) gain of 40m length of channel through realignment works; b) loss of 10m open channel associated with removal of existing structures and replacement with A9 1260 Dalmagarry Bridge (32m), A9 1260 ARB Dalmagarry Access Road Bridge and A9 1260 S Dalmagarry Side Road Bridge. Effect: Direct positive Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Likelihood: Certain	All practical measures have been included in embedded and standard mitigation to avoid impacts on watercourse habitats during construction, reducing the length of crossings required and retaining natural bed substrates through the use of clear span bridges. SMC-E1, SMC-E2, SMC-E3, SMC-E4, SMC-E5, SMC-E9 P12-E16 P12-E19 P12-E21 P12-E22 P12-E23 P12-E25	Not significant

Location	Potential Impact	Characterisation of Impact (Pre-mitigation)	Essential Mitigation	Significant (residual)
		Impact Descriptor: Medium	P12-E26 P12-E40 (culverts only)	
Pond Pond 5 Location: Ch6100, south of Lynebeg (Figure 12.13g) Value: Local	Permanent loss of pond habitat during construction.	Extent: Total loss of pond Effect: Direct negative Duration: Long term Frequency and timing: N/A Reversibility: Irreversible Impact Descriptor: High	Detailed specific mitigation has been developed to replace this pond. P12-E20 P12-E31	Not significant

Operation

3.5.7 During operation watercourse and pond habitats could all be affected by the following:

- changes to discharge volume and water quality (i.e. outfalls from new drainage infrastructure)
- where new and extended culverts are required, watercourse habitat may be affected through changes in hydro-morphological character both upstream and downstream of their location - associated alterations to sediment delivery rates and changes in flow character have the potential to reduce morphological diversity and reduce habitat complexity.

3.5.8 With the implementation of mitigation commitments in Table A2.1 and Table A2.2 (and also in relation to water as detailed in Chapter 11 (Road Drainage and the Water Environment)), the impacts described above will not be significant.

3.6. Protected and Notable Terrestrial Species

3.6.1 Badgers are not considered within the impact assessment as no evidence of these species was recorded during surveys and as such they are not considered to be present within the EZoI.

3.6.2 Although no great crested newts have been recorded in the Study Area, due to design changes there are two ponds which have not been subject to survey. Taking the precautionary approach the assessment considers potential impacts to great crested newts which could be present in these locations.

Construction

3.6.3 During construction terrestrial species (bats, otter, water vole, red squirrel, pine marten and reptiles) may be affected as a result of:

- direct loss of habitats (used for commuting, foraging and dwelling) through land-take
- severance of habitat and important commuting routes
- direct mortality due to various construction related activities
- disturbance to species due to elevated levels of construction related disturbance, such as increased noise, lighting, and human presence

3.6.4 Specific details relating to the species located within the EZoI are detailed in the species sections below.

3.6.5 With the adoption of the mitigation commitments degradation by pollution of habitats used by species is not anticipated.

Bats

3.6.6 During construction bats could be affected by the following:

- direct loss of roosts
- disturbance to roosts.
- habitat loss - permanent and temporary habitat loss may affect bat commuting routes and areas used for foraging

3.6.7 Two locations with bat roosts supporting low number of common species will be lost as a result of the scheme. In addition to this, four locations were identified with low numbers of common species recorded, that will be subject to disturbance during the construction period. In addition to this results from tree surveys in woodland areas also only recorded low numbers of common species and surveys of suitable roosting features potentially affected by the Scheme again only recorded low numbers of common bats (common pipistrelle, soprano pipistrelle and occasional *myotis* species). Seven roosts which were recorded only supported one or two bats. Effects on these roosts are assessed in Table A3.4 below.

3.6.8 Habitat will be lost following a corridor along the route of the existing A9. Suitable bat foraging habitat is present either side of the existing road but only low numbers of bats were recorded throughout the bat surveys. The crossing point surveys recorded bats crossing over or under the A9 and covered seven locations spread across the length of the Scheme. The surveys targeted areas with high quality bat habitat for both commuting and foraging, i.e. watercourses or woodland edges, and so although these surveys focused on recording bats crossing the road they also provide a record of bat activity within areas which are suitable for commuting and foraging.

3.6.9 Across the recording period (May to September 2016) levels of activity were generally low; two or less bats were recorded per survey at five out of the seven locations. Only at two crossing locations (Moy Rail bridge and Tomatin Underpass) were a total of more than 10 bats recorded across the entire survey period (between May and September 2016). These locations along with the Tomatin and Lynebeg junction locations, where larger areas of habitat loss will occur (and thus potential severance and loss of foraging areas) are assessed in Table A3.4. The habitat at the Moy LILO Junction is very open with neutral and acid grassland, which is sheep grazed. This habitat only offers limited suitability in terms of foraging and commuting habitat and as such its loss is not considered significant to bats.

Table A3.4: Bats – Specific Impacts, Mitigation and Residual Impacts – Construction

Location (Grid reference) and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
Building 149 at Dalmagarry Farm (278720, 832323) Figure 11.9e Value: Local Bridge 146, railway bridge (278723, 832134) Figure 11.9e Bridge 123, railway bridge (278633, 832206) Figure 11.9e Rock face (273567, 234713) Figure 11.9j Value: Authority	Disturbance	Extent: Roosts 149 and 146 are day roosts and each was recorded as being used by a single soprano pipistrelle. Roost 123 is a transitional roost and was recorded as being used by a single bat, probably a common pipistrelle. Two roosting locations used by single bats were recorded at the rock face. Bridges 146 and 123 and the rock face have been valued at the Authority level as these features have potential to support hibernating roosts. Night works, lighting and construction activities may have a negative effect on bats commuting from the roosts and foraging in the local area. Piling and earthworks may disturb bats while in the roost through vibration effects. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E6, SMC-E9,SMC-E10 P12-E19 P12-E24 P12-E25 P12-E28	Not significant
Building 151 at existing B9154 junction with the A9 (278426, 832323) Figure 11.9e Culvert 281	Loss of roost	Extent: Roost 151 is a transitional/ day roost; a single Myotis and single common pipistrelle were recorded roosting. Culvert 281 has low bat roost potential but an endoscope inspection could not rule out the use of the structure by bats. Taking the precautionary approach it is assumed a small bat roost could be present. Based on the findings of bat surveys within the wider area if	SMC-E1, SMC-E2, SMC-E6. SMC-E9, SMC-E10 P12-E19 P12-E24 P12-E25	Not significant

Location (Grid reference) and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
(277963,833176) Figure 11.9f Value: Local		any bats were using this structure it is likely to be used by common species. Roost 135 is a day roost with a single soprano pipistrelle recorded roosting. Roost 151 and 135 will be destroyed to accommodate the Scheme. Bridge 135 has been assessed to be of Authority value as has potential to support a hibernation roost. Effect: Direct negative Duration: Permanent Frequency and timing: One time event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	P12-E28 Bat boxes will be installed to account for the loss of all roosts, detailed mitigation measures will be developed as part of SNH licence applications.	
Bridge 135, railway bridge (276980, 834109) Figure 11.9g Value: Authority				
Moy Railway Bridge (Bridge 381) Figure 11.9f Value: Local	Disturbance to commuting route Potential roost loss	Extent: Common and soprano pipistrelle were recorded commuting through this structure. The highest activity count was recorded in July with 25 bats recording passing through and over the structure and other bats observed foraging along the railway corridor. A new structure will be created at this location, which will be 120m in length. Passage for bats may be disturbed during the construction period. It was not possible (due to access constraints) to fully view all areas of this structure for survey so there is also potential that it contains a bat roost. Taking the precautionary principle, it is therefore assumed that a small bat roost may be present, supporting either common or soprano pipistrelle. This assumption is based on the species and number of bats recorded at this location. Effect: Direct negative (roost loss), Indirect negative (disturbance) Duration: Permanent (roost loss), Temporary (disturbance) Frequency and timing: Single event (roost loss), Reoccurring (disturbance) Reversibility: Irreversible (roost loss), Reversible (disturbance) Likelihood: Certain	SMC-E1, SMC-E2, SMC-E6, SMC-E9, SMC-E10 P12-E19 P12-E24 P12-E25 P12-E28 The works to this structure should be undertaken between October and March to avoid the main bat activity period when bats will be using the structure. If this period if not achievable within the construction	Not significant

Location (Grid reference) and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
		Impact Descriptor: Medium (roost loss), Low (disturbance) Not significant	programme additional mitigation measures will be required and should be determined following pre-construction surveys.	
Suitable foraging habitat - Tomatin GSJ Figure 12,9c Value: Local	Loss of foraging habitat	Extent: An area of wet woodland will be lost on the southbound side of the A9 at the proposed Tomatin GSJ (approximately 2ha will be lost). This offers bat foraging habitat, although the area of loss only represents a small area of the total wet woodland habitat at this location (approximately 15ha). Suitable bat foraging habitat is also present in the wider area, along the River Findhorn and woodland areas to the south. Common species of bats were recorded forging at this location, common and soprano pipistrelles and also occasional Myotis, with activity levels suggesting a roost in the wider area. Effect: Direct negative Duration: Permanent Frequency and timing: One time event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium Not significant	Abundant bat foraging habitat is present in the wider area, so specific mitigation is not considered necessary. The two SuDs ponds to be created on the southside of Tomatin GSJ will provide foraging habitat.	Not significant
Suitable foraging habitat - Lynebeg LILO and link road Figure 12,9g Value: Local	Loss of foraging habitat	Extent: Approximately 4ha of habitat will be lost in this area which is a mosaic of plantation coniferous woodland, broadleaved woodland and grassland. This offers bat foraging habitat, although the area of loss only represents a small area of the total habitat at this location, with abundant habitat present in the surrounding area. Detailed activity surveys were not undertaken at this location but an evaluation of local is given based on the findings of the surveys across the Scheme and the overall levels of bat activity recorded in areas with good quality foraging and commuting habitat. Effect: Direct negative	Abundant bat foraging habitat is present in the wider area, so specific mitigation is not considered necessary. The two SuDs ponds to be created on the southside of Lynebeg	Not significant

Location (Grid reference) and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Essential Mitigation	Significant (residual)
		Duration: Permanent Frequency and timing: One time event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium Not significant	LILO will provide also foraging habitat.	
Suitable foraging habitat - Tomatin House Underpass (Crossing point survey location 1) Figure 12.9c Value: Local	Disturbance to commuting route	Extent: Common and soprano pipistrelle were recording commuting through this underpass. The highest activity count was recorded in August 2016, with 16 common pipistrelle and one soprano pipistrelle recorded. This underpass is to be extended on the southbound side and as such bat usage of this structure may be temporarily affected during the construction period. Habitat removal around the structure on the northbound side will be limited as the widening is proposed to the southbound side only. There will be vegetation clearance around the southbound side extending out to approximately 20m from the underpass, beyond this the habitat either side of the track will be retained and as such it is considered that once constructed the commuting route through the underpass and along the access track will be suitable for bats to use. Effect: Indirect negative Duration: Temporary Frequency and timing: Reoccurring Reversibility: Reversible Impact Descriptor: Low Not significant	The works to this structure should be undertaken between October and March to avoid the main bat activity period when bats will be using the structure. If this period if not achievable within the construction programme additional mitigation measures will be required and should be determined following pre-construction surveys.	Not significant

Otter

3.6.10 During construction, otters could be affected by the following:

- habitat loss
- severance
- direct mortality
- disturbance

3.6.11 Signs of otter have been recorded on thirteen watercourses within the EZol, with resting sites on four of these. However, otter evidence was sporadic and it is considered that the area is used periodically by otters for foraging and commuting but does not form a key part of their territory.

3.6.12 Effects as a result of riparian habitat loss, which includes loss of foraging resource and areas of suitability for resting sites is unlikely to be significant, as the extent of habitat which will be lost (both temporarily for construction and permanently within the Proposed Scheme) is negligible in comparison to the resource available within the local area.

3.6.13 Table A3.5 below provides details of the resting sites recorded within the Study Area, along with details of their distance from the construction footprint. Resting sites over 100m from the construction footprint are unlikely to be disturbed as a result of the Scheme as they are all low status sites with no evidence to suggest use as natal or breeding sites. No direct effects will occur on these sites, although it is acknowledged that during the construction period movement along watercourses to reach these sites may be affected. This effect is considered under habitat severance below.

3.6.14 None of the resting sites recorded were considered suitable as breeding or natal holts. As such any resting site recorded that is over 100m from construction activities will not be affected the proposals. On this basis no impacts are anticipated on resting sites located at TN 8 (hover on Allt na Slanaich), TN 5 (holt on tributary of River Findhorn), TN 6 (hover on Allt Dubhag), TN 7 (hover on Allt na Loinne Moire) and TN9 (holt on Funtack burn) and these are not considered further within this assessment.

Table A3.5: Otter - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and distance to Proposed Scheme	Potential Impact	Characterisation of Impact(Pre mitigation)	Mitigation	Significant (residual)
Low status hovers recorded on the Allt na Frithe TN 1 NH7949629789 – 42m TN 2 NH7958629852 – 60m TN 3 NH7948629797 – 40m TN 4 NH7973930096 – 24m (Figure 12.16c) Value: Local	Disturbance to resting sites and fragmentation.	Extent: Any otters using these resting sites may be subject to disturbance during the construction period, through noise, vibration and increased human activity. Access will not be directly restricted although otter movements in the local area during the construction period may be affected due to the levels of disturbance and as such the resting sites may not be frequented during the construction period. Effect: Indirect negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E26 P12-E30 P12-E40	Not significant
Otter activity has been recorded on the following watercourses: River Findhorn (and tributaries) Dalmagarry Burn Funtack Burn Caochan na h-Eaglais Unnamed Burn (Ch6500) Unnamed Tributary of Allt Creag Bheithin (Ch7700) Allt na Slanaich Allt Creag Bheithin Midlairg's Burn	Direct mortality, disturbance, habitat fragmentation and severance	Extent: Construction works within the near vicinity of these watercourses may cause changes to existing otter activity levels and alter how they use watercourses and terrestrial habitat in the area, this may result in an increased risk of mortality caused by road traffic accidents. Any otters using the watercourses during the construction period may be disturbed due to an increase in light, noise, vibration, and human activity associated with construction activities. This disturbance may alter how otters use these watercourses and may result in temporary fragmentation of habitats if otters avoid areas due to the disturbance. During construction of culverts and other water crossings, passage along watercourses may be temporarily severed whilst construction takes place. Effect: Direct negative (mortality); Indirect negative (disturbance, habitat fragmentation and severance) Duration: Temporary	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E26 P12-E30 P12-E40	Not significant

Location and distance to Proposed Scheme	Potential Impact	Characterisation of Impact(Pre mitigation)	Mitigation	Significant (residual)
Allt na Slanaich Allt Dubagh Allt na Loinne Moire Value: Local		Frequency and timing: Permanent (mortality) Recurring (disturbance, habitat fragmentation and severance) Reversibility: Irreversible (mortality) Reversible (disturbance, habitat fragmentation and severance) Likelihood: Likely Impact Descriptor: Medium (mortality), Low (disturbance, habitat fragmentation and severance)		

Water vole

3.6.15 During construction, water vole could be affected by the following:

- habitat loss
- severance
- direct mortality
- disturbance

3.6.16 Signs of water vole have been recorded on eight watercourses within the Study Area. Details of the evidence recorded and the proximity to the construction footprint is detailed in Table A3.6. Impacts on water vole on four of the watercourses where they have been recorded have been discounted due to the distance from the Scheme; these are as follows: River Findhorn, closest burrow 230m, Allt na Frithe, no burrows recorded only droppings recorded 60m from Scheme, Allt na Loinne Moire, closest burrow 180m and Midlairg's Burn, closest burrow 130m.

3.6.17 Three watercourses have been identified where the water vole populations present could be affected: a tributary of the River Findhorn, the Allt Creag Bheithin and a tributary of the Allt Creag Bheithin. On these watercourses water vole may be affected through habitat loss, direct mortality, and disturbance during the construction phase as detailed in Table A3.6. As water vole were recorded on both sides of the existing A9 on the Allt Creah Bheithin and its tributary, severance effects are also considered here. The works will only affect one side of the River Findhorn tributary and as such severance impacts on this watercourse have been discounted.

Table A3.6: Water vole - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
Allt Creag Bheithin (Ch8400 and Ch9300) (Figure 12.16i) Value: Authority area	Habitat loss (including burrows)	Extent: Where the A9 crosses the Allt Creag Bhethin on the southbound side six burrows have been recorded, although no evidence to confirm use was recorded at this location. Three of these burrows fall within the Proposed Scheme and will be lost. On the northbound side the closest burrow to the Proposed Scheme is 126m, although positive evidence of water vole was recorded within 1m. Suitable water vole habitat will be lost from either side of the road where a new culvert will be installed. Approximately 35m will be effected on the northbound side and 70m will be effected on the southbound side. Suitable habitat is present up and downstream of this and the highest concentration of water vole activity was recorded upstream of this on the northbound side of the A9. An access track to SuDs pond (reference PYA) crosses the Allt Creag Bheithin, the closest burrow to the point where the track crosses the burn is 24m. None of the burrows recorded will be lost as a result of the track crossing, however it is possible that new burrows may be built in this area prior to construction. The temporary construction area around the SuDs pond also comes in close proximity to the burn and the closest recorded burrow to this area is 2m away. Abundant water vole evidence was recorded along this watercourse on the northbound side of the A9. Effect: Direct negative Duration: Permanent Frequency and timing: Single event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E34 P12-E40 P12-E42	Not significant
	Direct mortality and disturbance	Extent: Where the A9 crosses the Allt Creag Bhethin on the southbound side six burrows have been recorded, although no evidence to confirm use was recorded at this location on the southbound side of the A9, this area may be used in the	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
		future by water vole. Three of these burrows fall within the Proposed Scheme and will be lost. On the northbound side the closest burrow to the Scheme is 126m, although positive evidence of water vole was recorded 1m from the construction footprint. Any water vole using the habitat along the watercourse that falls within the Proposed Scheme will be at risk of disturbance. These effects are likely to affect water voles using a 150m reach of the watercourse. An access track to SuDs pond (reference PYA) crosses the Allt Creag Bheithin. The closest burrow to the point where the track crosses the burn is 24m. No burrows will not be lost as a result of the track crossing but water voles using this stretch of watercourse may be disturbed. The temporary construction area around the SuDs pond also comes in close proximity to the burn. The pond has been positioned to allow a 10m buffer around the burn from the Proposed Scheme. The closest burrow recorded is 10m from these works. Abundant water vole evidence was recorded along this watercourse on the northbound side of the A9. Effect: Direct negative (mortality), Indirect negative (disturbance) Duration: Permanent (mortality), Temporary (disturbance) Frequency and timing: Recurring Reversibility: Irreversible (mortality), Reversible (disturbance) Likelihood: Likely Impact Descriptor: Medium (mortality) Low (disturbance)	P12-E19 P12-E24 P12-E25 P12-E34 P12-E40	
Allt Creag Bheithin (Ch8400 and Ch9300) (Figure 12.16i)	Severance	Extent: As described above water vole are present on these watercourses on both sides of the A9. During the construction period new culverts will be installed where these watercourses flow under the A9. During this construction passage along the watercourse under the A9 is likely to be affected. Effect: Direct negative Duration: Temporary	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
Value: Authority area Tributary of Allt Creag Bhethin (Figure 12.16h) Value: Local		Frequency and timing: Recurring Reversibility: Reversible Likelihood: Certain Impact Descriptor: Low	P12-E34 P12-E40	
Tributary of Allt Creag Bhethin (Ch 7750) (Figure 12.16h) Value: Local	Disturbance	Extent: Water vole have been recorded on this watercourse on both sides of the A9. On the southbound side latrines and burrows were recorded in 2015 and 2016, with the closest confirmed evidence (burrow with latrine) at 100m from the Proposed Scheme, other burrows were recorded closer to the A9, with the nearest at 30m. On the northbound side burrows were recorded in 2016, although no other positive evidence was found, the closest burrow was 26m from the Proposed Scheme. No burrows will be destroyed, but any water voles using the habitat in this area, will be at risk of disturbance. Effect: Direct negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible Likelihood: Certain **Impact Descriptor: Low**	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E34 P12-E40	Not significant
	Habitat loss	Extent: As described above water vole have been recorded on this watercourse. No burrows are present within the Proposed Scheme but approximately 20m of channel is and the habitat within this area will be affected during the construction period. Effect: Direct negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E34 P12-E40	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
		Likelihood: Certain Impact Descriptor: Low		
Tributary of River Findhorn (Southbound side of A9) (Ch 700) (Figure 12.16c) Value: Local	Disturbance	Extent: Two burrows and droppings were recorded in 2016 on this watercourse. These are located 3m from the Proposed Scheme and so burrows will not be directly affected. The habitat along the watercourse will be retained but any water voles using these burrows and the habitat along the burn are at risk of direct mortality and disturbance due to the close proximity of the construction works. Although the burn will not be directly affected water voles may use habitat directly adjacent to the burn, so are at risk. Effect: Indirect negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible Likelihood: Certain Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E3, SMC-E13, SMC-E14 P12-E19 P12-E24 P12-E25 P12-E34 P12-E40 P12-E42	Not significant

Red squirrel

3.6.18 During construction, red squirrel could be affected by the following:

- habitat loss (loss of dreys during vegetation clearance)
- severance
- direct mortality
- disturbance

3.6.19 Signs of red squirrel activity have been recorded within the majority of woodland habitat adjacent to and within the Proposed Scheme. Seventeen notable areas, based on levels of red squirrel activity and suitability of the woodland for red squirrel, are present at the following locations (as shown on Figure 12.13):

- Survey Areas 5, 6, and 7 - coniferous woodland within the vicinity of Tomatin Junction on both sides of the existing A9 (Ch300-Ch800).
- Survey Areas 8, 9, 10, and 12 - coniferous woodland north of Tomatin Junction and south of Dalmagarry on both sides of the existing A9 (Ch1100-Ch2200).
- Survey Areas 17, 18, 19, 20, 21, 22, 23, and 24 - coniferous woodland and mixed woodland extending from Moy Rail Bridge to Lynebeg and the Allt na Loinne Moire Burn on both sides of the existing A9 (Ch5000-Ch6800).
- Survey Areas 26 and 27 - coniferous woodland north of the Allt Creag Bheithin on the southbound side of the A9 (Ch8400-Ch9600).

3.6.20 It is considered most likely that red squirrels will be affected by works occurring within the above-identified areas. In particular, dreys have been recorded within the Proposed Scheme within ten Survey Areas: 17, 18, 19, 20, 21, 22, 23, 24, 26, and 27. Table A3.7 details the impact assessment in relation to these areas.

3.6.21 Red squirrel habitat (suitable for both dreys and foraging) will be lost (approximately 40 ha of woodland) as it falls within the Proposed Scheme. The loss of this habitat is unlikely to affect the ability of red squirrel to forage and seek shelter within the local environment, given the extent of suitable habitat within the wider area. The project specific mitigation measures described above for terrestrial habitat loss will create woodland habitat in the long-term and as such any temporary impacts on distribution are likely to be reversed once trees reach coning age (15 to 20 years). This will include habitat creation which endeavors to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas (see Landscape and Ecological Mitigation Figure 13.8).

Table A3.7: Red Squirrel - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
Areas 17, 18, 19, 20, 21, 22, 23, and 24 (Ch5000 - Ch6800 – both sides of A9). (Figure 12.14f and 12,14g) Areas 26 and 27 (Ch8400-Ch9600 -southbound). (Figure 12.14h)) Local	Habitat loss and direct mortality	Extent: Red squirrel dreys were recorded within the Proposed Scheme at these locations. Tree removal in these locations is likely to result in the loss of dreys and foraging habitat. Effect: Direct negative Duration: Long term Frequency and timing: Single event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E6, SMC-E8, SMC-E9, SMC-E13 P12-E19 P12-E24 P12-E25 P12-E27	Not significant
Areas 4, 5, and 7 (Ch300 - Ch800 – both sides of A9). (Figure 12.14c) Areas 8, 9, 10, and 12 (Ch1100 -Ch2200 – both sides of A9). (Figure 12.14d) Areas 17, 18, 20, 23, 19, 21, 22, and 24 (Ch5000 -Ch6800 – both sides of A9). (Figure 12.14f and 12.14g) Areas 26 and 27 (Ch8400 - Ch9600 - southbound). (Figure 12.14h) Local	Disturbance	Extent: Proposed construction activities adjacent to these locations are likely to increase disturbance levels from noise, vibration and increased human activity. This may disturb red squirrel present in these locations. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E6, SMC-E8, SMC-E9, SMC-E13 P12-E19 P12-E24 P12-E25 P12-E27	Not significant
Areas 19, 21, 22 and 24 (Ch6100 – CH6500)	Severance	Extent: Red squirrel dreys and foraging signs were recorded within the Proposed Scheme at this location. The construction	SMC-E1, SMC-E2, SMC-E6, SMC-E8,	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
(Figure 12.14g) Local		of the Lynebeg LILO junction is likely to sever connectivity between woodland to the north and south of the junction on the northbound side of the A9. Effect: Direct negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E9, SMC-E13 P12-E19 P12-E24 P12-E25 P12-E27	

Pine marten

3.6.22 During construction, pine marten could be affected by the following:

- habitat loss (loss of dreys during vegetation clearance)
- severance
- direct mortality
- disturbance

3.6.23 Two pine marten scats were recorded within Study Area, located 33m and 87m from the Proposed Scheme. However, no pine marten dens were recorded. The overall suitability of the woodland habitat within the vicinity of the construction footprint is low. However, it is likely that pine marten occur at low densities in the area. Woodland at the following locations (as shown on Figure 12.16) were considered to be suitable for supporting pine marten:

- Survey Area 4 - semi-natural broad-leaved woodland and coniferous woodland within the vicinity of Tomatin Junction on both sides of the existing A9 (Ch300-Ch800).
- Survey Areas 5, and 6 - coniferous woodland north of Tomatin Junction and south of Dalmagarry on both sides of the existing A9 (Ch1100-Ch2200).
- Survey Areas 11, 12, and 13 - coniferous woodland and mixed woodland extending from Moy Rail Bridge to Lynebeg and the Allt na Loinne Moire Burn on both sides of the A9 (Ch5000-Ch6800).
- Survey Area 16 - coniferous woodland north of the Allt Creag Bheithin on the southbound side of the existing A9 (Ch8400-Ch9600).

3.6.24 Construction will result in the loss of habitat that may be used by pine marten for foraging and shelter. However, signs of pine marten within the Study Area were very limited and no dens were recorded. Therefore, it is considered unlikely that a den will be destroyed as a result of the Proposed Scheme. Furthermore, there is an abundance of suitable foraging and sheltering habitat within the wider area that the species will be able to disperse into during construction. It is likely that any species present within the Proposed Scheme will be disturbed as a result of noise and the presence of people. This disturbance is likely to result in individual pine martens moving into alternative suitable habitat within the wider area. Disturbance is likely to be temporary during the construction phase and is unlikely to affect the size of the local pine marten population give the suitability of habitat in the wider area. As it is likely that any pine martens present will move out of the construction area, the risk of direct mortality is considered to be very low.

3.6.25 The implementation of mitigation commitments in Table A2.1 and Table A2.2 reduce the risk of effects on pine marten from loss of dens, direct mortality and disturbance to pine marten to a non-significant level, particularly as no dens were recorded during the pine marten surveys for the Proposed Scheme. Pre-construction surveys, which are a condition of the A9 Standard Mitigation Commitments, will ensure that pine marten are given appropriate consideration at the construction phase.

Wildcat

3.6.26 Construction will result in the loss of habitat that may be used by wildcat for foraging and shelter. However, no signs of wildcat have been recorded within the Study Area. Therefore, it is considered unlikely that a den will be destroyed as a result of the Proposed Scheme. Furthermore, there is an abundance of suitable foraging and

sheltering habitat within the wider area that the species will be able to disperse into during construction. It is likely that any species present within the Proposed Scheme will be disturbed as a result of noise and the presence of people. If any wildcats are present in the area, this disturbance is likely to result in individuals moving into alternative suitable habitat within the wider area. Disturbance is likely to be temporary during the construction phase and is unlikely to affect wildcat populations give the suitability of habitat in the wider area. As it is likely that any wildcats present will move out of the construction area, the risk of direct mortality is considered to be very low.

3.6.27 The implementation of mitigation commitments in Table A2.1 and Table A2.2 reduce the risk of effects on wildcat from loss of dens, direct mortality and disturbance to pine marten to a non-significant level, particularly as no dens or signs of wildcat have been recorded. Pre-construction surveys, which are a condition of the A9 Standard Mitigation Commitments, will ensure that wildcat are given appropriate consideration at the construction phase.

Reptiles

3.6.28 During construction, reptiles could be affected by the following:

- habitat loss
- severance
- direct mortality
- disturbance

3.6.29 Suitable reptile habitat will be lost during construction of the Proposed Scheme, including approximately 46ha of heath, bog, grassland, and woodland. The loss of this habitat will be mitigated for through project specific mitigation, namely habitat creation (see Landscape and Ecological Mitigation Plans, Figure 13.8a-t). This will include creation of hibernacula and log piles to provide sheltering opportunities for reptiles.

3.6.30 Reptiles may be subject to direct mortality or disturbance during the construction phase. A relatively large proportion of the Study Area (approximately 55% of the Study Area or 445ha) supports habitats which are suitable for common reptiles (particularly common lizard) to bask, forage and shelter, particularly in areas of grassland, heath, and bog. Impacts to reptiles are assessed in Table A3.8.

Table A3.8: Reptiles - Specific Impacts, Mitigation and Residual Impacts - Construction

Location	Potential Impact	Characterisation of Impact	Mitigation	Significant (residual)
Areas of high and moderate suitability habitat for reptiles within the footprint of the Proposed Scheme (at various locations throughout the Proposed Scheme's extent – see Figure 12.15) Value: Local	Habitat loss	Extent: Direct loss of habitat suitable for reptiles Effect: Direct negative Duration: Long term Frequency and timing: Single event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1 SMC-E2 SMC-E6 SMC-E8 SMC-E9 SMC-E13 P12-E19 P12-E24 P12-E25	Not significant

Location	Potential Impact	Characterisation of Impact	Mitigation	Significant (residual)
Areas of high and moderate suitability habitat for reptiles within the footprint of the Proposed Scheme (at various locations throughout the Proposed Scheme's extent – see Figure 12.15) Value: Local	Direct mortality and disturbance	Extent: Mortality of common reptiles due to construction related activities, including earthworks and vehicle movements. Noise, vibration and increased human activities associated with construction activities may result in disturbance. Effect: Direct negative (mortality), indirect negative (disturbance) Duration: Temporary Frequency and timing: Single event (mortality), Recurring (disturbance) Reversibility: Irreversible (mortality), Reversible (disturbance) Likelihood: Likely Impact Descriptor: Medium (mortality); Low (disturbance)	SMC-E1 SMC-E2 SMC-E6 SMC-E8 SMC-E9 SMC-E13 P12-E19 P12-E24 P12-E25	Not significant

Great crested newts

3.6.31 During construction, great crested newts could be affected by the following:

- habitat loss
- direct mortality
- disturbance

3.6.32 There are two ponds which have not been subject to detail survey which fall within 250m of the Scheme. It is considered unlikely that these ponds support great crested newts based on the findings of surveys of other ponds within 250m of the Scheme which did not record any great crested newts. However, following the precautionary principle, potential impacts on these two ponds are assessed. Assessment is limited to these three locations as great crested newts were not recorded in any of the other ponds subject to survey within the Study Area.

3.6.33 Pond 18, was subject to habitat suitability assessment (HSI), but not an eDNA survey. The HSI survey recorded very low habitat suitability with a score of 0.38. This pond is 230m from the Scheme and is separated from the Scheme by the Highland Mainline railway. Considering the distance to the Scheme and the low risk of encountering great crested newts based on the HSI score and the findings of other pond surveys in the wider area it is considered unlikely that the Scheme will effect great crested newts using this pond or terrestrial habitat in the vicinity of this pond. There will be no habitat loss from the pond due to the distance from the Scheme and although suitable terrestrial habitat is present within the Scheme it is unlikely to be used by great crested newts due to the distance. Given this, the risk of direct mortality and disturbance of great crested newt are very low. The project specific mitigation measures include the use of a

Precautionary Method of Working (P12-E41) for great crested newts and with the adoption of this measure there will be no significant impacts on great crested newt should they be present.

Birds

3.6.34 Wintering bird surveys identified Loch Moy as a relatively important migratory stopover point for waterfowl. Generally, however, in winter much of the habitat in the study area is vacated as cold temperatures reduce foraging opportunities for wintering species. Gardens and farmland are of greater importance during the winter, whereas woodlands and moorland are vacated as the former present foraging opportunities the latter do not through winter.

3.6.35 Construction of the Proposed Scheme will not affect wintering birds supported within Loch Moy, given the intervening distance between the Proposed Scheme and Loch Moy. There will be some loss of other habitat used by birds in the winter (see areas of loss of woodland, grassland, heath and bog habitat in the Terrestrial Habitat Section above) although this will not be significant, as there is an abundance of similar or better quality habitat within the local area. Habitat creation will be undertaken as part of the proposed Ecology and Landscaping mitigation strategy which will create replacement areas of suitable habitat (see Landscape and Ecological Mitigation Figure 13.8a-t).

3.6.36 Breeding bird surveys identified habitats that are important for breeding birds, including areas of woodland, heathland and rough grassland. The following areas contain habitats that are of importance to breeding birds and which may be used by notable species of bird:

- North and south of the A9 in the vicinity of Tomatin Junction (Ch100-Ch1000) – This area supports woodland, rough grassland, heath, and bog mosaic. Species recorded in this location included song thrush, common crossbill, dunnock, and lesser redpoll.
- Ch1000-Ch3700 northbound side of existing A9 – This area supports a large area of intact wet heath, bog, acid grassland mosaic. The area is of particular importance to red grouse, although other species including lapwing, curlew, skylark, grasshopper's warbler, and dunnock have also been recorded here.
- Area by Moy Rail Bridge adjacent to the existing A9 on the north and southbound side (Ch4100-Ch5800) – This area supports continuous heath, bog, and acid grassland on the northbound side of the existing A9, and an area of mixed broad-leaved and coniferous woodland. The heathland habitats are important for red grouse, while the woodland habitat support notable numbers of song thrush, siskin, curlew, common crossbill, and bullfinch.
- Ch6700 – Ch8200 both sides of the existing A9 north of Moy - This area supports extensive heath, bog, acid grassland mosaic. These areas support an assemblage of predominantly red grouse, lapwing, curlew, greylag goose, and skylark.
- Ch8400-Ch9600 both sides of the existing A9 north of Moy Area 5 – This area supports extensive woodland, heath, bog, acid grassland mosaic This area was not accessible at the time of survey, although based on the habitats present, it is likely to support a similar assemblage to that described above between Ch6700 and Ch8200.

3.6.37 Construction of the Proposed Scheme will result in the loss of suitable bird breeding habitat (particularly within the areas identified above). Loss of suitable breeding habitat will not be significant (see areas of loss of woodland, grassland, heath and bog habitat in the Terrestrial Habitat Section above), as there is an abundance of similar or better quality habitat within the local area. Habitat creation will be undertaken as part of the proposed Ecology and Landscaping mitigation strategy which will create replacement

areas of suitable bird nesting habitat (see Landscape and Ecological Mitigation Figure 13.8a-t).

3.6.38 There is also the risk of direct mortality, damage to nests, and disturbance to birds during the breeding season. The implementation mitigation commitments in Table A2.1 and Table A2.2 above are considered to reduce the risk of effects on birds from construction to a non-significant level.

Aquatic Species

3.6.39 All watercourses considered in this Stage 3 Assessment fall within the River Findhorn catchment (see Appendix A12.3 for full details). Migratory salmonids, lamprey and eel are characteristic of the catchment and are likely to be present within the construction footprint.

3.6.40 During construction, fish, aquatic macrophyte and aquatic macroinvertebrate communities could be affected by:

- placement of new culverts and bridges and/or extension to existing structures which may result in direct habitat loss and reduced habitat availability for aquatic species at the point of construction
- loss of riparian habitat structure arising from construction related vegetation clearance which may reduce valuable cover and refuge for notable fish populations
- acoustic disturbance (e.g. vibration from percussion piling) which may cause physiological damage to fish, deter passage through areas affected and reduce foraging and breeding success
- visual disturbance (e.g. movement of construction plant and lighting) which may deter passage of fish through areas affected
- pollution events which may result in species mortality and habitat degradation - heavy metals that may be mobilised during construction activities (e.g. breakup of existing carriageway) can have detrimental effects on fish such as decreased production, increased susceptibility to disease and increased mortality
- sedimentation events (run-off during construction) which may smother habitats resulting in the loss/reduction in quality of fisheries spawning sites and in acute cases may result in species mortality (e.g. smothering of eggs/loss of sediment sensitive aquatic macroinvertebrate species
- in channel works such as watercourse diversions and temporary crossings which may result in temporary loss of habitat of resource value to notable species and/or fragmentation of habitats that affect fish species reaching spawning habitats and/or undertaking daily feeding migrations.
- de-watering activities (temporary discharges to watercourses during construction) that affect water quality and hydro-morphology which could cause harm to notable populations and induce behavioural changes in fisheries populations e.g. disruption to seasonal migration of salmon populations

3.6.41 During construction, pond habitats could be affected by the following:

- direct habitat loss to the construction footprint, or indirect habitat loss as a result of interrupted hydrological support to the pond (e.g. severance of groundwater flow paths or redirection of surface water drainage pathways)
- pollution events which may result in species mortality and habitat degradation -heavy metals that may be mobilised during construction activities (e.g. breakup of existing

carriageway) can have detrimental effects on fish such as decreased production, increased susceptibility to disease and increased mortality

- sedimentation events (run-off during construction) which may smother habitats resulting in the loss/reduction in quality of fisheries spawning sites and in acute cases may result in species mortality (e.g. smothering of eggs/loss of sediment sensitive aquatic macroinvertebrate species)

3.6.42 With the implementation of A9 Standard Mitigation Commitments for Water (see Chapter 11) and Ecology as outlined in Table A2.1 and Table A2.2, the impacts described above will either not occur, or are likely to be short-term, temporary and not significant. In the case of notable species mortality, incidental individual mortality would be negligible at the population level.

Invertebrates

3.6.43 During construction, invertebrates could be effected by the following:

- habitat loss
- severance
- direct mortality
- disturbance

3.6.44 A habitat assessment for invertebrates identified six locations which maybe support red and amber CNPA priority species and/ or SBL species, five of which fall within the construction footprint. In addition to these, sunny and grassy verges with common bird's-foot trefoil and heathers along the existing A9 offer suitability for solitary and social bees. Impacts on invertebrates are considered in Table A3.9.

Table A3.9: Invertebrates: Specific Impacts, Mitigation and Residual Impacts - Construction

Feature, Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
Conifer woodland with potential for rare saproxylic hoverflies, spiders. CNPA Amber Locations 357, 378, 382 (Figure 12.6d, 12.6f and 12.6g accordingly) Value: Authority	Habitat loss	Extent: Widening of the A9 and construction of the junction at Lynebeg and access roads will result in the partial loss of conifer woodland suitable for invertebrates. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19 P12-E32	Not significant
Exposed riverine habitat with potential for CNPA Red and Amber list species NH 78813 32162 (Figure 12.7f) Value: Authority	Habitat loss	Extent: The realignment of the Dalmagarry Burn will result in the loss of exposed riverine habitat suitable for invertebrate species. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19	Not significant
Wet heath with potential for Scottish Biodiversity List Species and CNPA Red and Amber species NH75715 34565 (Figure 12.7e) NH76003 34489 (Figure 12.7h) NH75810 34566 (Figure 12.7h) NH74235 34725 (Figure 12.7i) NH74220 34751 (Figure 12.7i)	Habitat loss	Extent: Widening of the A9 will result in the partial loss of wet heath suitable for invertebrates. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely	SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19 P12-E32 P12-E39	Not significant

Feature, Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
Value: Authority		Impact Descriptor: Medium		
Flowery verges with potential for solitary and social bees 22 sections of the route. (Figure 12.7) Value: Local	Habitat loss	Extent: Widening of the A9 and construction of access roads and junctions will result in the partial loss of flowery verges suitable for invertebrates. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19 P12-E32 P12-E38	Not significant
Sunny wood fridge banks with potential for wood ants 12 sections of the route (Figure 12.7) Value: Authority	Habitat loss	Extent: Widening of the A9 and construction of access roads and junctions will result in the partial loss of sunny wood fringe banks suitable for invertebrates. Three wood ant nests have been recorded within the Scheme. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Medium	Any wood ants nests located within the Scheme will be translocated. Prior to translocation, areas of suitable habitat within the land made available will be identified and clearly marked as an area to be retained and protected. Wood ant nests will be translocated during the spring following methods adopted during the A9 Kincraig to Dalraddy widening[xvii]. SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19 P12-E32	Not significant

Fungi

3.6.45 During construction, fungi could be affected by habitat loss. As per assessment of effects on habitats, effects from changes in air quality have been ruled out.

3.6.46 A habitat assessment for fungi identified eleven areas of interest for fungal species, six of which fall within the construction footprint. As habitat loss will occur at these locations, impacts on fungi as a result of the construction are assessed in Table A3.10.

Table A3.10: Fungi - Specific Impacts, Mitigation and Residual Impacts – Construction

Feature Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
CNPA Records amber records – locations with potential fungal interest: 365 NH7929431778 366 NH7890232190 368 NH7857532311 (Figure 12.6e) 373 NH7814033019 377 NH7774433337 376 NH7776733428 (Figure 12.6f) 379 NH7747733727 (Figure 12.6g) Target notes with fungal interests: TN2 NH787322 TN3 NH78403265 (Figure 12.6e) TN4 NH75663482 TN5 NH79982959 TN6 NH797300 (Figure 12.6c)	Direct and partial habitat loss	Extent: Widening of the A9 and construction of access roads and junctions at these locations will result in the direct loss of suitable habitat for waxcap fungi and CNPA amber priority species. Effect: Direct negative Duration: Permanent Frequency and timing: Single-event Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9 P12-E16 P12-E19 P12-E32 P12-E36	Not significant

Feature Location and Value	Potential Impact	Characterisation of Impact (Pre mitigation)	Mitigation	Significant (residual)
TN8 NH780331 (Figure 12,6f) TN9 NH769339 and NH770338 TN10 NH767341 (Figure 12.6g) Value: Authority				

Operation

3.6.47 Given the presence of the existing A9, terrestrial species recorded within the EZoI will be already habituated to disturbance through ambient road noise levels. Therefore, impacts on species as a result of noise disturbance have been discounted. As such operational impacts on species are considered to be limited to direct mortality and effects from increased severance as a result of the road widening and additional access tracks and junctions.

3.6.48 Effects on habitats and fungi as a result of changes to air quality and pollution risks are as those assessed above for construction and have been discounted following the same rationale.

Bats

3.6.49 Bats may be affected during operation by the increase in road width affecting their passage across the landscape, by creating a wider, more open area to fly across and increasing mortality risk associated with crossing the A9. This increase in road width could therefore affect commuting routes and access to foraging habitat and thus ultimately affect the size of the local bat population.

3.6.50 The bat surveys which targeted the areas with the most suitable habitat for bats to cross the existing A9, either over or under the road, only recorded low numbers of common species crossing the road. During operation, the two locations where the highest levels of bat activity were recorded will remain suitable for bat usage. In these locations bats were recorded passing under the existing A9. The new structures at these locations will remain at a size suitable for bat passage:

- The Tomatin House underpass (A9 1240) was used by bats foraging within it and commuting through it. The proposed underpass here will be large in size (6.3m high x 9.9m wide), so will remain suitable for bats to use once the road is operational. The underpass will not be lit.
- Where the A9 crosses the railway line at NH 77932 33226 is a large bridge structure, Moy Rail Bridge (A9 1270). Bats were recorded here foraging along the railway line and passing under the structure. When operational, the passage along the railway line will be maintained for bats for foraging and commute along, the new proposed structure will be 14m wide, by 120m long and 5m high.

3.6.51 At all other locations survey, either no bats were recorded, or only 1 or 2 bats were observed crossing either over or under the road. Whilst the widening of the road could result in greater severance than the existing road due to its extra width, in general it was found that bats generally do not currently cross over the road (with a maximum of 2 bats at any location) and as such it is considered that the widening will not affect the local bat population.

3.6.52 Overall the provision of passage under the A9 for bats commuting will be improved by the Scheme as a number of culverts will be increased in size. For example, no bats were recorded using the Allt na Frith culvert (A9 1250) (existing size 4m high x 2m wide). The new proposed culvert is larger in size being 4.5m high x 2.5m wide. Only 1 bat was recorded within a culvert on the Allt Dubhag (A9 1250 C25) burn. The existing culvert is 2m x 2m; this will be increased in size to 2.5m to 2.5m. The increased length of the culvert, however, may also affect future use.

3.6.53 The following culverts, which were not subject to survey as they are not currently suitable for bat passage, will be improved for bats as all will be increased in size. Whilst

it still remains uncertain that bats will use these new structures, by having an increase in size the structures will be more suitable for passage than the existing structures:

- The Strathdearn culvert, through which a tributary of the Funtack Burn flows is currently a 1.65m diameter culvert, this will be increased to a 2.5m x 2.5m culvert.
- The Caochan na h-Eaglais burn culvert will be increased in size from 1.7m diameter to 2.5m x 2.5m.
- The Allt na Loinne Moire culvert will be increased in size from 2.2m diameter to 2.2m high x 5m wide.
- The Allt Creag Bheithin culvert will be increased in size from 1.8m diameter to 2.5m x 2.5m.
- The Badachream culvert will be increased in size from 1.4m diameter to 2m x 2m.

3.6.54 A new crossing under the A9 will be created at the Lynebeg LILO junction. This structure increases the permeability of the A9 at this location and will be suitable for bats to pass under the A9. The structure will be 16.4m wide by 5.3m wide. The underpass here will not be lit and is only likely to be subject to low volumes of traffic at night. This underpass creates a connection between the properties at Lynebeg which offer suitability for bat roosting with the habitats on the southbound side of the A9 including the Lynebeg north pond and Loch Moy and its surrounding woodland.

3.6.55 The locations where bats were observed to cross the A9 will remain suitable for use, and the permeability of other locations will be improved through larger sized culverts and a new underpass. Therefore, based on these embedded design measures, impacts on bats as a result of the increase in A9 width are not considered significant.

Otter

3.6.56 Evidence of otter was recorded on thirteen of the watercourses within the EZoI. Of these, eleven will be crossed by the Proposed Scheme. The potential risk of increased severance and mortality as a result of the widening of the A9 has been mitigated through embedded design measures to maintain permeability.

3.6.57 Where otter evidence has been recorded on watercourses crossed by the dualled A9 mammal ledges built into the culvert or bridge and in general the size of culverts has been increased. This will be as detailed:

- Allt na Frithe (Ch900) (A9 1250) – 4.5m wide x 2.5m wide culvert with integrated mammal ledge (approximately 70m of this watercourse will be culverted). Existing structure is an open arch / pipe with a 4m diameter. The proposed structure will maintain connectivity at this location.
- Unnamed Tributary of the River Findhorn (Ch1200 and Ch1300) – These are relatively small drains crossed by the existing A9. These drains currently support piped culverts which are of a size that is unlikely to allow for otter passage. Culverts with mammal ledges are not proposed at this location and culvert sizes will be in line with what is currently present. These drains do not connect up with any watercourses on the northbound side of the A9 so are not considered to be important commuting corridors.
- The Allt Dubhag (Ch1500) (A9 1250 C25) will be 2.5m x 2.5m culvert with an integrated mammal ledge, compared to an existing size being a 2m diameter piped culvert. The proposed culvert is larger with a mammal ledge incorporated, although it is noted that the culvert will span both the widened A9 and the adjacent side road and will be 84m in length. This increase in length may deter otters from using it, but it is considered that the mammal ledge is an overall improvement to the existing passage.

- Dalmagarry Burn (Ch2800-Ch3700) (A9 1260) – 23m wide x 3.5m (minimum height) open span bridge with an integrated mammal ledge.
- Caochan na h-Eaglais (Ch6000) (A9 1270 C80) – 2.5m x 2.5m culvert with integrated mammal ledge. Existing culvert is a 1.7m diameter piped culvert and is poor for mammal passage. The proposed culvert is therefore likely to improve connectivity for otter at this location.
- Unnamed Burn (Ch6500) (A9 1273 C5) – 2.5m wide x 1.2m high culvert with integrated mammal ledge. Existing culvert is a 1.2m diameter piped culvert and is poor for mammal passage.
- Allt na Loinne Moirre (tributary of Moy Burn) (Ch6800) (A9 1273 C8) – 5m wide x 2.5m high culvert with integrated mammal ledge. Existing culvert comprises two 2.1m diameter piped culverts. The single 5m wide open bottomed culvert is likely to improve connectivity for otter.
- Unnamed Tributary of Allt Creag Bleithin (Ch7800) (A9 1273 C22) – 2.5m x 2m culvert proposed with integrated mammal ledge. Existing culvert comprises one 1.7m diameter piped culvert and is poor for mammal passage. Proposed culvert is larger and will improve connectivity for otter.
- Allt na Slanaich (Ch8200) (A9 1273 C28) – 6m wide x 1.2m high culvert proposed with integrated mammal ledge. Existing culvert comprises two 2m diameter piped culverts. The single 6m wide open bottomed culvert is likely to improve connectivity for otter.
- Allt Creag Bheithin (Ch8400) (A9 1273 C31) – 4m wide x 2m high with integrated mammal ledge. Existing culvert comprises one 1.8m diameter piped culvert. The proposed open bottomed culvert is likely to improve connectivity for otter.
- Midlairg's Burn (Ch9200) (A9 1273 C43) – 1.2m x 1.2m culvert proposed. Existing culvert is piped culvert with a 1m diameter. The proposed culvert will therefore be larger than the existing piped culvert and is unlikely to significantly reduce connectivity for otter.

3.6.58 The Dalmagarry Quarry – Tomatin Access Road, which runs adjacent to the existing A9 on the soundbound side between CH800 and CH3000, crosses the following watercourses:

- Unnamed Tributaries of the River Findhorn – There are three small drains that pass under the access road and the A9, these do not connect up to larger watercourses and no otter evidence was recorded on them, culverts on these drains are not likely to have an effect on otters.

3.6.59 Six SuDs access roads cross watercourses which are likely to support otter (namely, MCA5 SuDs Access, MC80 SuDs Access, MC90 SuDs Access, MCX0 SuDs Access, MCY0 SuDs Access, MCR0 Forestry Access). These access roads are narrow in width (on average 4m) and will be used infrequently by maintenance vehicles. Considering the width of the roads and very low frequency and volume of traffic, it is unlikely that these access roads will present a barrier to otter movement or elevate the likelihood of mortality.

3.6.60 In addition to the embedded design measures described above, specific mitigation measures to reduce otter mortality include provision of permanent otter fencing at watercourses crossed by the A9 where otter activity has been recorded and suitable habitat exists. Vegetation will also be planted to provide sufficient cover for otter using these crossing points (see Landscape and Ecological Mitigation Figure 13.8a-t). Given this it is considered that permeability of the A9 to otter will be improved and as such their

connections to habitats in the wider area will be improved and the mortality risk from the A9 will be reduced as a result of the Scheme.

Water vole

3.6.61 Signs of water vole have been recorded on seven watercourses crossed by the Proposed Scheme. Water vole was also recorded on the River Findhorn, which is not crossed. The potential risk of increased severance and mortality as a result of the widening of the A9 has been mitigated through embedded design measures to maintain permeability.

3.6.62 The existing A9 fragments watercourses where small culverts are present that are likely to be acting as a barrier to the movement of water vole. (Although it is noted that it is not currently known what type of culverts are habitually used or avoided by water vole). The Proposed Scheme design will improve the current situation with the provision of larger culverts with mammal ledges. Water vole may also use culverts without ledges but the provision of a ledge further increases the suitability. Culverts with mammal ledges will be installed at the following watercourse crossing points where water vole are known to occur:

- Allt na Frithe (Ch900) (A9 1250) – 4.5m wide x 2.5m wide culvert with integrated mammal ledge (approximately 70m of this watercourse will be culverted). Existing structure is an open arch / pipe with a 4m diameter. The proposed structure will maintain connectivity at this location.
- Allt Dubhag (Ch1500) (A9 1250 C25) – 2.5m x 2.5m culvert with integrated mammal ledge. Existing structure is a 2m diameter piped culvert. Proposed culvert is larger with a mammal ledge and is likely to improve connectivity for water vole.
- Allt na Loinne Moirre (tributary of Moy Burn) (Ch6800) (A9 1273 C8) – 5m wide x 2.2m high culvert with integrated mammal ledge. Existing culvert comprises two 2.1m diameter piped culverts. The single 5m wide open bottomed culvert is likely to improve connectivity for water vole.
- Unnamed Tributary of Allt Creag Bleithin (Ch7800) (A9 1273 C22) – 2.5m x 2m culvert proposed with integrated mammal ledge. Existing culvert comprises one 1.7m diameter piped culvert. Proposed culvert is larger and will improve connectivity for water vole.
- Allt Creag Bheithin (Ch8400) (A9 1273 C31) – 2.5m x 2.5m with integrated mammal ledge. Existing culvert comprises one 1.8m diameter piped culvert. The single 2.5m x 2.5m open bottomed culvert is likely to improve connectivity for water vole.
- Midlairg's Burn (Ch9200) (A9 1273 C43) – 1.2m x 1.2m culvert proposed. Existing culvert is piped culvert with a 1m diameter. The proposed culvert will therefore be larger than the existing piped culvert and is unlikely to significantly reduce connectivity for water vole.

3.6.63 SuDs ponds are to be created as part of the Scheme. These will designed to include suitable forage plants for water vole.

3.6.64 The embedded mitigation measures described above will increase the permeability of the A9 for water vole and thus operational impacts are considered not significant.

Red squirrel

3.6.65 Red squirrels are currently present on both sides of the existing A9, with evidence of both dreys and feeding signs. The levels of evidence on either side are similar, suggesting that each side of the A9 is of equal value for red squirrels. During the

surveys, no locations were noted where red squirrels currently cross the road, although it is possible that the underpass at Tomatin House is used, given the size of this structure. The existing Moy railway bridge over the A9 is also currently passable by red squirrel. Here the railway track runs under the A9 with suitable habitat along the track side for squirrel to pass along. No other underpasses are currently present, and the culverts present are unlikely to be used due to their size.

3.6.66 The Proposed Scheme will increase severance of the habitats caused by the existing A9 as the road will be wider. It is considered that an increase in severance will not have a significant impact on the local red squirrel population due to the abundance of suitable habitat either side of the A9 and given that their current usage of the area indicates that habitat on both sides is suitable for the species.

3.6.67 Permeability across the road may increase as a number of structures will be increased in size, with mammal ledges included. Although it is not currently known if red squirrel would utilise these, they will provide potential crossing locations that do not currently exist. The following areas have been identified where passage across the A9 may be improved:

- Survey Areas 4, 5, and 7 (Ch300-Ch800) – Tomatin House Underpass and an additional underpass beneath the new Tomatin GSJ is likely to maintain connectivity between woodland to the east and west of the existing A9 at this location.
- Survey Area 17, 18, 19, 20, 21, 22, 23, and 24 (Ch5000-Ch6800) – Permeability will be maintained within this area through the Moy Rail Underpass (which will still be in place) and improved with the new Lynebeg Underpass, and provision of larger culverts and mammal ledges at the crossings of the Caochan na h-Eaglais (A9 1270 C80 at Ch6000), unnamed burn (Ch6500), and Allt na Loinne (A9 1273 C8, Ch6800).
- Survey Areas 26 and 27 (Ch8400-Ch9600) – Fragmentation is unlikely to be significant at this location as there is no woodland south of the A9 where widening is proposed (the woodland has been felled here).

3.6.68 The effects of severance of habitats on either side of the A9, for example as a result of junctions and access tracks, will be mitigated through habitat creation which will aim to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas (see Landscape and Ecological Mitigation Plans, Figure 13.8a-t).

3.6.69 Given the above, operational impacts on red squirrel are considered not significant.

Pine marten and wildcat

3.6.70 Pine marten and wildcat may be affected by severance and the increased risk of mortality from crossing the widened road. The embedded mitigation measures described above for red squirrel are likely to reduce the effects of severance and direct mortality on this species. Habitat creation, including planting of habitats to promote connectivity across woodland blocks, will maintain existing levels of permeability across the A9 and improve habitat connectivity, where practicable.

3.6.71 Given the above operational impacts on pine marten and wildcat are not considered not significant.

Reptiles

3.6.72 During operation of the Proposed Scheme, reptile habitat will be more fragmented, particularly within the vicinity of Tomatin Junction and associated access roads. This is unlikely to significantly affect reptile populations within the local area due to the

abundance of similar and high quality habitat in the area around Scheme. Direct mortality of reptiles is unlikely to be any greater than the existing baseline.

3.6.73 Given the above operational impacts on reptile are not considered not significant.

Birds

3.6.74 Widening of the A9 will lead to greater fragmentation of bird habitat either side of the widened road. During field surveys, it was noted that birds periodically cross the existing A9, although species appear to have become habituated to the presence of the road as they fly above the traffic. The widened road will however present a greater distance for birds to cross and there may therefore be an elevated risk of collision with vehicles.

3.6.75 In terms of notable species, the SBL listed red grouse may be at greater risk of collision as the species generally flies close to the ground and is abundant within heath and bog habitat either side of the A9 to the north of Moy. It is considered unlikely that the widened road will lead to a significant increase in the number of bird casualties, as birds are likely to habituate to the presence of the widened road, as they have done with the existing road. Given this, the impact is considered to be not significant.

Invertebrates

3.6.76 During operation of the Proposed Scheme, invertebrate habitat will be more fragmented, particularly within the vicinity of Tomatin GSJ and associated access roads. This is unlikely to significantly affect invertebrate populations within the local area due to the abundance of similar and high quality habitat in the area around Scheme. Direct mortality of invertebrates is unlikely to be any greater than the existing baseline.

3.6.77 Given the above operational impacts on invertebrates are not considered not significant.

Aquatic Species

3.6.78 All watercourses considered under this Stage 3 Assessment fall within the River Findhorn catchment (see Appendix A12.3 for full details). Migratory salmonids, lamprey and eel are characteristic of the catchment and are likely to be present within the Study Area.

3.6.79 During operation, fish, aquatic macrophyte and aquatic macroinvertebrate communities could all be affected by the following:

- There may be harm to populations/loss of sensitive species reliant on aquatic habitats negatively affected by changes to discharge volume and water quality (i.e. outfalls from new drainage infrastructure). Including the potential for reduction in spawning habitat quality and effects on fish recruitment and loss of sensitive aquatic macroinvertebrate species.
- The presence of new and extended structures (culverts and bridges) may create a barrier to species movement and isolate/fragment existing populations and prevent migratory fish from undertaking spawning and/or feeding migrations affecting recruitment potential.
- If a barrier to fish species is created then recruitment and distribution of freshwater pearl mussel may be constrained as a result of exclusion of larval host (salmonid fish) from key habitats in the catchment. Although no freshwater pearl mussel are present within the site, the potential effects of barriers to migration could elicit impacts within the wider EZoI, i.e. freshwater pearl mussel populations beyond the site extent. Movement of lamprey and eel populations may also be affected as a result of any new barrier.

- Conversely, where watercourse severance is reduced (e.g. through the replacement of existing culverts/structures that are acting as barriers) improved connectivity and fish passage may benefit the fish community and freshwater pearl mussel populations within the EZoI.

3.6.80 With the implementation of A9 Standard Mitigation Commitments for Water (see Chapter 11) and Ecology as outlined in Table A2.1 and Table A2.2, the majority of impacts described above will not occur. Specifically, as described in project mitigation P12-E35 (Table 2.2), existing A9 culverts (all of which include artificial inverts) will be replaced with new open structures which act to:

- retain natural bed substrate within the culvert
- ensure no deterioration (and aim to improve) existing water depth and flow provision within the culvert for migratory fish
- improve river continuity through the replacement of existing A9 culvert structures which have artificial inverts

3.6.81 Aside from ensuring hydraulic conditions are passable (based on swim capability), culverts may form a barrier to fish movement by eliciting a behavioural response. Fish may be reluctant to swim through culverts, particularly non-migratory species which lack strong behavioural migration cues. It has been suggested that fish find the interior of a culvert less discouraging if natural light is present, but there is little evidence to support this in the United Kingdom (CIRIA, 2010)[xviii]. Some evidence suggests that fish may be reluctant to move between discrete light/dark interfaces, i.e. at culvert inlets and outlets. Project mitigation therefore includes riparian and marginal planting at culvert inlets and outlets (P12-E35) to mitigate for this potential through provision of dappled light and shade.

3.7. Conclusions

3.7.1 In summary residual impacts have been identified in relation to ancient woodland and notable habitats. These impacts will occur at the construction phase.

3.7.2 With respect to ancient woodland 5.61 ha of land listed on the ancient woodland inventory will be lost, of this 3.84ha of this land currently supports woodland. This is identified as a significant impact at two locations:

- Area 11: Here the habitats which will be lost include coniferous plantation woodland, broadleaved woodland, acid grassland, and dry heath. The woodland at this location is generally mature and has a relatively floristically diverse ground-flora.
- Area 12: This woodland supports Scots pine plantation woodland. The Scots pine woodland within this area has taken on characteristics of a mature woodland, including well developed and diverse ground flora. The Proposed Scheme lies within an area of Scots pine plantation woodland directly adjacent to the existing A9. The trees within this area are not as mature and the ground-flora less developed than areas towards the centre of the woodland.

3.7.3 In these locations the woodlands form part of larger woodland parcels assessed to be of Authority Area importance. However, where the woodland is to be lost no trees are considered to be ancient or relict trees and the majority of areas are Scots pine plantation. It is however possible that the ancient woodland seedbank is still be present and the relatively floristically diverse ground flora suggests this. In these locations, the soil will be stripped and re-used within areas of woodland planting within the Scheme. It is knowledge that the loss of ancient woodland cannot be mitigated and as such the loss of these areas has been identified as a significant effect. Overall in terms of woodland

loss it is noted that with the proposed planting (as shown on the Landscape and Ecology Mitigation Plan) there will be no overall net loss of woodland - 53.9.ha of woodland will be lost, while 54ha is proposed.

3.7.4 With respect to notable habitat loss, areas of dry dwarf shrub, wet heath and flushes and blanket bog and wet modified bog habitats will be lost, this is identified as a significant impact at an Authority level. Whilst habitat creation will be undertaken as part of the Scheme mitigation and depending on the local hydrology areas may transition to these habitats, taking the precautionary approach it is assumed that these habitats will be permanently lost and there is no proposed mitigation to account for their loss due to the complexities in creating these habitat types. In terms of scale the following areas will be lost from each habitat type:

- Acid dry dwarf shrub heath (including areas of dry heath / acid grassland mosaic) – 6.38ha;
- Wet dwarf shrub heath – 1.34ha; and
- Blanket bog and wet modified bog including areas of acid / neutral flush – 11.14ha.

4. References

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[x] CIRIA (2015) SUDS Manual C753
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[xii] SNH (undated) Otters and Development http://www.snh.org.uk/publications/on-line/wildlife/otters/mitigation.asp
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