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Appendix 12.9

Red Squirrel, Pine Marten, Wildcat and Notable Species

Transport Scotland

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Table of contents

Tables

1. Introduction

1.1.1. This technical appendix presents desk study information and field survey data for legally protected species red squirrel (*Sciurus vulgaris*), pine marten (*Martes martes*) and wildcat (*Felis sylvestris*). It also presents information on three notable species; European hedgehog (*Erinaceus europaeus*), brown hare (*Lepus europaeus*), and mountain hare (*Lepus timidus*). Notable species are taken to be those listed on the Scottish Biodiversity List (SBL)[1] and priority species listed within the Cairngorm Nature Action Plan (CNAP; 2013 - 2018)[i].

1.1.2. Red squirrel, pine marten, wildcat, hedgehog, brown hare, and mountain hare are SBL species. Red squirrel, wildcat and mountain hare are listed on the CNAP. Red squirrel and wildcat are priority species on the Highlands Biodiversity Action Plan.

1.1.3. Red squirrel and pine marten have legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland). Wildcat has higher legal protection as a European Protected Species under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). This appendix does not consider the Scottish wildcat to be a sub-species of the European species *Felis sylvestris* in line with the International Union for Conservation of Nature[ii].

1.1.4. Polecat is a SBL species. However, a recent study of the distribution of the polecat suggests it is absent from the Study Area (Croose, 2016)[iii] and no records for this species were received from the desk study. Polecat have been scoped out of this assessment.

1.1.5. The information within this appendix has been collated to inform the Design Manual for Roads and Bridges (DMRB) Stage 3 Assessment of the Proposed Dalraddy to Slochd Scheme (hereafter referred to as the Proposed Scheme).

1.1.6. This appendix provides a nature conservation evaluation and impact assessment for those species that have been recorded in the Study Areas (as defined below).

2. Methodology

2.1. Introduction

2.1.1. This section describes the methods used to undertake desk studies and field surveys for red squirrel, pine marten, wildcat, European hedgehog, brown hare and mountain hare. This section also provides the methods used to determine the nature conservation value of the species and to undertake the impact assessment. This has included an assessment of the existing and potential permeability (ease of crossing) post-construction of the Proposed Scheme.

2.1.2. The Proposed Scheme has undergone several (increasingly minor) design iterations alongside the development of the Ecological Impact Assessment (EcIA). The latest design iteration resulted in an extension of the original Study Area (see below) for some features, typically in the order of a few metres.

[1] The SBL is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The SBL was published in 2005 and revised in 2013 to satisfy the requirement under Section 2(4) of The Nature Conservation (Scotland) Act 2004.

2.1.3. Existing survey information has been extrapolated based on desk study information to inform the valuation and assessment of impacts, as follows.

2.1.4. A number of areas within the 100m red squirrel and pine marten Study Area have not been subject to survey, due to design iterations occurring after survey completion. These remaining areas are primarily limited to the peripheries of the 100m Study Areas, where the majority of the Proposed Scheme has been surveyed within the minimum 50m standard survey area. This is therefore not considered to affect the outcome of this EcIA. The majority of these areas have National Vegetation Classification (NVC) field survey data available (Environmental Statement (ES) Appendix 12.4); as well as detailed information from adjoining woodland blocks which were subject to field survey. Using this information, together with aerial imagery, an understanding of the Study Area, and professional judgement, a desk-based assessment, taking a precautionary approach, was undertaken to determine the likely suitability of the un-surveyed areas. The results of this assessment are provided within the results section for red squirrel and pine marten.

2.2. Red Squirrel

Desk Study

2.2.1. The following organisations were contacted for historical records of red squirrel within 1km of the existing A9 carriageway:

- Highlands Biological Recording Group (HBRG);
- North East Scotland Biological Records Centre (NESBReC);
- National Biodiversity Network (NBN) Gateway;
- Scottish Wildlife Trust (SWT);
- Scottish Natural Heritage (SNH);
- National Trust for Scotland;
- Forestry Commission Scotland; and
- Scotland TranServ.

2.2.2. Records prior to 2007 have not been included as they are no longer considered to be relevant due to their age.

Field Survey

2.2.3. The red squirrel Study Area comprised a minimum 50m standard survey area, as agreed with SNH through the Environmental Stakeholder Group meetings, plus an additional 50m (this additional area was covered to account for design changes following the surveys), resulting in a survey area incorporating the Proposed Scheme and land extending to 100m from its boundary (as shown on Figure 12.18). The additional area was incorporated as a precautionary approach, to account for potential design changes during the Stage 3 process.

2.2.4. To inform the DMRB Stage 3 Assessment, potential red squirrel habitat within the red squirrel Study Area was identified through a review of the Phase 1 habitat survey data (ES Appendix 12.2, Designated Sites, Ancient Woodland and Habitats), to identify woodland blocks. All woodland blocks within the red squirrel Study Area were numbered and subject to survey. At the beginning of the survey, 237 woodland blocks were identified and each was assigned a unique identification number.

2.2.5. The approach to the survey was adapted from the Chartered Institute of Ecology and Environmental Management (CIEEM) technical guidance series for red squirrel, including:

- Gurnell *et al.* (2009)[iv]. Forestry Commission Research Information Note 255: Practical Techniques for Surveying and Monitoring Squirrels;
- information on red squirrel in: BAP Mammals; Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation[v]; and
- Gurnell *et al.* (2004)[vi] 'A critical look at methods for monitoring red and grey squirrels'.

2.2.6. This adaptation consisted of a single walk through of woodland blocks. The method deviates from Forestry Commission guidance which recommends four visits. However, following completion of four visits during surveys undertaken for the Proposed Scheme at Tomatin to Moy, three subsequent survey visits were not considered to provide any additional information to the first visit. Therefore, for the purpose of informing this assessment, it was agreed with CNPA and SNH (in spring 2017 prior to surveys commencing) that one visit would be sufficient.

2.2.7. Each woodland block was systematically walked by suitably experienced ecologists, who recorded features of the woodland to enable assessment of its relative quality for red squirrels, as outlined in further detail below. In addition, any indications of red squirrel activity, such as the presence of individuals, dreys, feeding signs, or ring barking were noted and their Geographical Positioning System (GPS) locations recorded. Surveys were undertaken at an optimal time of year in May and June 2017.

2.2.8. Features of value to red squirrel associated with each woodland block were assessed in line with Gurnell *et al.* (2009)[iv], and are listed below:

- woodland type (e.g. coniferous plantation, semi-natural broad-leaved woodland);
- woodland use (e.g. commercial forestry, parkland);
- connectivity (whether or not connecting features such as canopy, or thicket-stage plantations were present);
- tree species present (e.g. Scots pine (*Pinus sylvestris*), Sitka spruce (*Picea sitchensis*), birch (*Betula spp.*));
- dominant species;
- canopy species;
- age of woodland (over or under 25 years);
- understorey (presence of scrub layer providing cover); and
- ground flora (whether developed or poor, or presence of other foraging opportunities).

2.2.9. Following field survey, woodland blocks were assigned as either poor, moderate or high suitability based on the criteria developed based on professional experience in-combination with Gurnell *et. al.* 2009[iv], as detailed in Table 2.1 below.

Table 2.1: System Used to Score the Relative Quality of Survey Areas for Red Squirrel

Description of Typical Conditions	Suitability
Some disturbance; single species plantation of around 25 years or younger; ground flora and understory undeveloped.	Poor
Some disturbance; approximately 80% Scots pine 20% other species plantation over 25 years; ground flora developed; presence of understorey.	Moderate

Description of Typical Conditions	Suitability
Mature trees (50-100+ years) with cavities; approximately 80% Scots pine 20% other species; mature ground flora with understorey; minimal human disturbance. Well connected to other woodland areas or large woodland block.	High

Red Squirrel Activity

2.2.10. Observations of red squirrel activity during the field surveys were evaluated using a four-point scoring system (scores of 0-3 indicating low-high activity)[iv]. Criteria used to assign these scores are detailed in Table 2.2 below.

Table 2.2: Scoring System Used to Evaluate Red Squirrel Activity

Score	Description
0	No signs (no signs of activity, no dreys present)
1	Few signs (no dreys, very few feeding signs)
2	Moderate signs (<4 dreys present, some scattered feeding signs)
3	Many signs (>4 dreys present, abundant feeding signs)

Relative Habitat Suitability

2.2.11. The habitat suitability assessment (Table 2.1) has been taken together with the level (score) of red squirrel activity (Table 2.2) in order to identify and differentiate habitats of value to red squirrel across the red squirrel Study Area.

2.3. Pine Marten

Desk Study

2.3.1. The following organisations were contacted for pine marten records within 1km of the existing A9:

- HBRG;
- NESBReC;
- SWT;
- Forestry Commission Scotland;
- SNH;
- National Trust for Scotland
- Scotland TranServ; and
- RPS.

Study Area Selection

2.3.2. This pine marten Study Area comprised a minimum 50m standard survey area, as agreed with SNH through the Environmental Stakeholder Group meetings, plus an additional 50m, resulting in a survey area incorporating the Proposed Scheme and land extending to 100m from its boundary (as shown on Figure 12.19). This additional area was incorporated as a precautionary approach, to account for potential design changes during the Stage 3 process.

2.3.3. To inform the DMRB Stage 3 Assessment, potential pine marten habitat within the pine marten Study Area was identified through a review of the Phase 1 habitat survey data (detailed in ES Appendix 12.2); this focused on the identification of woodland blocks. All woodland blocks within the pine marten Study Area were numbered and subject to survey. At the beginning of the survey 237 woodland blocks were identified and each assigned a unique identification number.

2.3.4. Field surveys were undertaken by suitably experienced ecologists in May and June 2017 to assess habitat suitability for pine marten within the pine marten Study Area. Surveys followed methodology set out in Cresswell *et al*. (2012)[vii]. A scoring system was taken from Cresswell *et al*. (2012)[vii] and used to quantify key habitat features on a scale of 1 to 3. Combining the scores from each category enabled a final assessment to be made of each woodland block as being 'high', 'moderate' or 'poor' quality for pine marten. This method is described in Table 2.3 below.

Table 2.3: Habitat Suitability Assessment Scoring for Pine Marten

Category	Feature	Subjective Score Based Upon Presence/ Abundance of Each Feature in a Survey Area
Foraging resource	Abundance of fruit-bearing trees and shrubs	1 to 3, where 1= poor, 2= moderate, 3= rich (foraging resource)
	Extent of rough grassland/pre-thicket plantations (vole populations)	
	Extent of mature conifers with well-developed field layer	
	Area of broadleaf woodland and scrub	
	Extent of tree-lined stream valleys and wetlands	
	Rabbit abundance	
Habitat extent and connectivity	Extent (area) of 3-dimensional habitat (e.g. woodland) in woodland block	1 to 3, where 1= poor, 2= moderate, 3= high (habitat extent and connectivity)
	Habitat connectivity by hedgerows or tree lines beyond woodland edge	
Den availability	Abundance of potential elevated den sites (e.g. over-mature trees with cavities, windthrow, squirrel dreys, raptor or corvid nests, owl boxes, rock outcrops).	1 to 3, where 1= poor, 2= moderate, 3= high (den availability)
Mortality risk factors	Evidence of predator control (e.g. tunnel traps around pheasant pens)	1 to -3, where -1= low, 2= moderate, -3= high (mortality risk)
	Fox abundance	
	Density of main roads in target habitat Survey Area	
Total	Sum scores for each woodland block will range between 0 and 8, where score 0-2= poor, 3-5= moderate, and 6-8= high habitat suitability	

Field Survey

2.3.5. A survey for potential den sites (hereafter referred to as suitable den sites) and scats was undertaken in suitable habitat, alongside red squirrel surveys. The same woodland blocks identified for red squirrel were assessed for pine marten. Each woodland block was walked once.

2.3.6. Surveyors looked for scats, footprints, suitable den sites and direct sightings of pine marten. Surveys included searches along rides and paths for scats. Where evidence

was found, a detailed description was given and the GPS position recorded. All suspected pine marten scats were collected and sent for DNA analysis to EcoWarwicker Ecological Forensics, University of Warwick.

2.4. Scottish Wildcat

2.4.1. During consultation with the Environmental Steering Group for the Proposed Scheme, it was agreed that specific surveys for wildcat would not be undertaken at the design stage, given the mobility of the species and the general acceptance that wildcat habitat is extensive throughout much of the CNPA. However, during the course of the Stage 3 NVC surveys, undertaken in 2016 and 2017, which extended 250m from the Proposed Scheme, surveyors recorded any incidental records relating to wildcat. The Phase 1 habitat survey and NVC survey (ES Appendix 12.2) data has been reviewed to assess habitat suitability along the A9 corridor for wildcat.

2.4.2. The wildcat Study Area has been defined as the Proposed Scheme plus land up to 200m from its boundary. This area, recommended in SNH guidance[viii], accounts for indirect effects, such as project-related disturbance which may occur should any dens or resting sites be present in habitats close to the proposed works.

Desk Study

2.4.3. The following organisations were contacted for wildcat records extending to a minimum of 5km from the existing A9:

- Scottish Wildcat Action (SWA);
- HBRG;
- NESBReC;
- Scotland TranServ;
- SNH provided details of their Wildcat Habitat Suitability Model, which maps wildcat cover, movement and prey habitats; and
- CNPA provided records of wildcat sightings from within the Cairngorms National Park.

2.4.4. A SNH paper on survey and scoping of wildcat priority areas[ix] has been reviewed to identify if any priority areas are located within the wildcat Study Area.

Habitat Suitability Assessment

2.4.5. In order to define ‘suitable wildcat habitat’, a literature review on the habitat preferences of wildcat was undertaken[x]. Table 2.4 below summarises the findings of this review and sets out positive and negative indicators for habitat suitability for wildcat.

Table 2.4: List of Positive/Negative Indicators for Suitability of Habitat for Wildcat

Positive Indicators
Heterogeneous, high diversity habitats
Margins of habitats, particularly moorland and woodland
Close to woodland, preferably mixed broad-leaved and small in size. Outer 50m zone of woodland is considered optimal
Close to grassland

Close to arable fields
Close to watercourses
Negative Indicators
Homogenous habitats e.g. large, dense conifer plantations, large expanses of extensive agriculture
Dwarf shrub
High mountain areas
Open/exposed habitats e.g. open rock face, sparsely vegetated areas
Proximity to man-made structures

2.4.6. The information presented in Table 2.4 has been developed by AMJV to provide definitions of habitat suitability for wildcat set out in Table 2.5. These definitions have been used in the assessment of habitat suitability for wildcat across the Proposed Scheme.

Table 2.5: Definition of High, Moderate and Low Suitability of Habitat for Wildcat

Habitat Suitability	Definition
High	Heterogeneous habitats with opportunities for both shelter e.g. woodland and foraging e.g. grassland, moorland, riparian habitats. Good connectivity to other suitable habitats with limited effects from habitat fragmentation or proximity to man-made structures.
Moderate	Some suitable habitats present, but either lacking in opportunities for both shelter and foraging, or habitat suitability reduced through habitat fragmentation or proximity to man-made structures.
Low	Open expanses of homogeneous habitat e.g. large dense conifer plantations, expanses of dwarf shrub, extensive agriculture, with little or very few opportunities for shelter and foraging. Habitats may be highly fragmented, in close proximity to man-made structures or in high mountain areas.

2.4.7. Habitats within the wildcat Study Area were identified using Phase 1 habitat survey data along with aerial photography. The dominant habitats were mapped (ES Appendix 12.2) using the Joint Nature Conservation Committee (JNCC) Phase 1 habitat classifications. These habitats were assessed for their type in respect of positive and negative indicators (Table 2.4) and degree of connectivity, to assign a value of 'high', 'medium' or 'low' habitat suitability for wildcat. Information on the condition and structure of woodland habitat, collected during red squirrel and pine marten surveys, was used to augment the assessment.

2.5. Notable Species

2.5.1. Notable species included in this appendix[2] are: European hedgehog, brown hare and mountain hare. Justification for inclusion of these species is provided below. In agreement with the CNPA, no specific surveys were undertaken for these notable species.

2.5.2. The following organisations were contacted for records of notable species within 1km of the existing A9:

- HBRG; and

[2] The remaining notable species are discussed in other Appendices, as outlined in the Introduction,

- NESBReC.

2.5.3. Notable species considered within this section, were derived from those listed on the SBL and listed as priority species by the CNPA.

2.5.4. The CNPA provided a list of priority species for consideration within the DMRB Stage 3 Assessment. This list was created using the priority species list within the Cairngorm Local Biodiversity Action Plan (LBAP)[xi]. The list contained 1200 species, and was filtered down by the CNPA to 360 species based on rarity. The list is divided into the following:

- Priority Species: which details three mammal species; of which red squirrel and wildcat are discussed above, and water vole are considered in ES Appendix 12.10;
- Research Data Priorities: which details two mammal species; pine marten as discussed above and mountain hare, which is included within this section;
- other High Importance Species: No mammals listed in this group; and
- Low Importance Species: which details four mammal species; pipistrelle bat as discussed in ES Appendix 12.5, deer as discussed within ES Chapter 12 Ecology and Nature Conservation, otter as discussed in ES Appendix 12.10 and brown hare, which is included within this section.

2.5.5. The CNPA provided records for these species, alongside details of areas with potential to support such species based on their review of the 2014 Phase 1 habitat survey results[xii].

2.6. Limitations

2.6.1. Ecological surveys are limited by factors which affect the presence of animals such as the time of year and behaviour. The ecological surveys undertaken to support this EIA have not therefore produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the results of these surveys have been reviewed and are considered to be sufficient to undertake this EIA. Surveys undertaken for red squirrel and pine marten in 2017 were undertaken between May and June, in the breeding season, and thus an optimal time of year for identifying dreys or breeding dens.

2.6.2. The following limitations were encountered during the red squirrel and pine marten surveys (Table 2.6 below). This consisted of limited access at three locations. Where large enough to map, these locations are shown on Figure 12.18 and 12.19.

Table 2.6: Limitations Encountered During the Red Squirrel and Pine Marten Survey

X Ref.	Y Ref.	Location	Limitation
289265	811923	Area of woodland roughly 100m east of A9 and 50m north west of Aviemore Youth Hostel.	Access to woodland restricted due to physical barrier between woodland and caravan park from private gardens and high fencing.
289147	812831	Within an area of woodland to the east of A9 and north of Scandinavian Village.	Top of steep craggy areas not accessed due to health and safety concerns.
290915	819217	Area of boulders within woodland north of Kinveachy near watercourse roughly 150m west of the A9.	Area of boulders extends approximately 8m across. Various crevices; not able to inspect in full.

2.6.3. A small area of woodland located east of Aviemore Youth Hostel could not be accessed. The surrounding area was fully surveyed and determined to be of low habitat suitability for red squirrel and pine marten. Due to the high survey coverage of the surrounding habitat and due to the small area that could not be accessed, overall this is not considered to be a significant limitation to the survey. It can be confidently predicted that this area is of low habitat suitability for red squirrel and pine marten as the surrounding habitat is of low suitability and has poor habitat connectivity. Thus, this is not considered to have affected the results of this impact assessment.

2.6.4. An area to the north of the Scandinavian Village was not accessed for health and safety reasons (as above Table 2.6). However, the remaining area was fully surveyed and thus this is not considered to affect the results of the impact assessment.

2.6.5. In woodland north of Kinveachy, a location with boulders with deep cracks was identified which would be accessible for small to medium sized mammals, but the full depth and internal structure of the crevices could not be viewed. This does not limit the survey which fulfilled its purpose for identifying the location as a suitable den site (as per Table 2.6 above). A precautionary approach is undertaken in respect of all features identified as suitable den sites in this assessment.

2.6.6. Wildcat is one of the UK's rarest species; sightings which can be confirmed as wildcat are exceptional. Therefore, the absence of evidence of the species discussed in this section should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

3. Impact Assessment Methodology

3.1. Introduction

3.1.1. Ecological features have been subject to a 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.

3.2. Nature Conservation Evaluation

3.2.1. The general approach to defining the importance of ecological features follows that of CIEEM (2016)[xiv]. The approach is also in line with advice given in DMRB Interim Advice Note 130/10 ‘Ecology and Nature Conservation: Criteria for Impact Assessment’[xiii].

3.2.2. Ecosystems, habitats and species within the Ecological Zone of Influence (EZoI[3]) are assigned levels of importance for nature conservation based on the criteria set out in Table 3.1 below.

3.2.3. 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.

[3] 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

Table 3.1: 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** 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)[i].
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 (LNR)) 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 Aviemore in the CNAP.
Local	**Ecosystems and Habitats** Ecosystems or habitats essential for the maintenance of: • populations of species of conservation concern within the local area (for example a Local Nature Reserve). **Species** Species whose presence contributes to:

Importance	Criteria
	• 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.

3.3. Impact Assessment

3.3.1. For the purposes of this assessment, the impact descriptors in Table 3.2 are taken to summarise the overall characterisation of positive or negative impacts in accordance with CIEEM (2016)[xiv], 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); and
- likelihood of occurrence (certain/near certain, probable, unlikely or extremely unlikely).

3.3.2. The character of impacts was defined using the criteria set out in Table 3.2 below as High, Medium, Low or Negligible, following the above impact characterisation approach.

Table 3.2: 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.

Impact Significance

3.3.3. 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 has 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 Site of Special Scientific Interest (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[4] 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 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 EcIA.

3.3.4. CIEEM (2016)[xiv] 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[5] of important ecological features. Knowledge and assessment of construction methods and operational activities, together with the knowledge of ecologists with experience of similar large-scale infrastructure projects, has been used to identify the potential impacts of the project on ecological features.

3.3.5. 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.

3.3.6. 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[xv].

3.3.7. Impacts characterised as 'Low' on internationally important features, can be determined as potentially significant as can impacts characterised as 'High' on features of Authority Area importance. 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.

3.3.8. Where significant impacts are identified, mitigation will be developed to reduce impacts where feasible and are taken into account in the assessment of residual effects.

3.4. Operational Impacts and Assessment of Permeability

3.4.1. As part of the assessment of anticipated operational impacts on ecological features, a review of the current and future permeability of the Proposed Scheme was undertaken. The assessment consisted of a review of existing and proposed bridges, underpasses

[4] 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).
[5] 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.

and culverts which cross the Proposed Scheme, in relation to their permeability for red squirrel, pine marten, wildcat and notable species.

3.4.2. Suitability for crossing the A9 was determined based on locations of the proposed or existing structures and dimensions of these structures (i.e. culverts, underpasses and bridges).

3.4.3. Locations were considered suitable where field survey and desk-based work had determined the habitat to be of high or moderate suitability for any given species. Poor habitat was considered suitable for passage only where habitats of high or moderate suitability were located on the opposing side of the carriageway. Where habitat on both sides of the A9 were either poor, or had not been scoped into the field surveys, then these areas were considered 'unsuitable' locations, as species were considered less likely to be present in these areas relative to high or moderate suitability areas.

3.4.4. Dimensions of structures were considered suitable for red squirrel, pine marten and hares, where they were more than 0.5m diameter and thus physically large enough for these species, taking into account extra space for visibility through the passage. For hedgehog, 0.2m was considered to be sufficient[xvi]. For wildcat, structures larger than 1.2m diameter were considered to be suitable. This dimension was based on information which has found carnivore crossings in Europe to be twice as high in passages 1.5m wide or larger (Grilo *et. al.,* 2008)[xvii]. Taking into account the fact that wildcat is smaller than other European carnivores a 1.2m diameter was considered to be appropriate for passage.

3.4.5. Hedgehog and hares (both brown and mountain) which are medium sized mammals are considered likely to use structures of varying dimensions, which have been designed for species red squirrel, pine marten, wildcat, bat, badger, otter and deer.

3.4.6. As part of embedded mitigation, a number of bridges, underpasses and culverts which cross the Proposed Scheme will have mammal ledges or soft verges (vegetated verges) installed (where a new structure is proposed) or retrospectively installed (where the existing structure is to be retained). All culverts are to be of standard 1.2m x 1.2m dimensions. This will be an increase in size to the existing structures. Details of the embedded mitigation proposed for these structures are provided in the results (section 4) and Annex B below.

3.5. Mitigation

3.5.1. The principles of the mitigation hierarchy[xviii] 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:

- avoidance;
- mitigation;
- compensation; and
- enhancement.

3.5.2. 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.

3.5.3. The mitigation measures described within this EcIA have been incorporated into the design and construction programme and taken into account 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. 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.

3.5.4. Mitigation is also designed to produce a net gain for biodiversity where practicable, in line with policy and guidelines[xiv].

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

3.5.6. 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.

4. Results

4.1. Introduction

4.1.1. This section details the results of the desk studies and field surveys for red squirrel, pine marten, wildcat and the notable species. The section concludes with the nature conservation value of each of these ecological features.

4.2. Red Squirrel

Desk Study

4.2.1. Three hundred and fifty-five records of red squirrel dating from 2007 to 2017 were received from the following sources:

- SWT via the NBN gateway - 292 records, of those, 11 of the most recent were from 2011 (specific details were not provided);
- NESBReC - 51 records of red squirrel sightings with the most recent being a road casualty by Dalraddy Holiday Park, approximately 830m from the Proposed Scheme;
- HBRG – nine records of red squirrel sightings including two of road casualties, one a voucher specimen and five records for which specific details were not provided. The most recent record was from 2014, south-west of Allt Chriochaidh; approximately 350m (northwest) from the Proposed Scheme; and
- Scotland TranServ - three records of red squirrel, all road casualties. Records are between 2009 and 2011. The two latest records are located one mile south of Lynwilg junction, A9 southbound carriageway.

4.2.2. In addition, the following was recorded from previous surveys undertaken in relation to the scheme:

- Jacobs UK Ltd - one record of a road casualty and two other records (specific details were not provided); and
- Eight records of red squirrel were provided from the Preliminary Ecological Appraisal undertaken by CH2M in 2015[xii].

4.2.3. Two incidental records were made of red squirrel during ecological surveys undertaken for the scheme in the summer of 2017. These records included two dead juveniles identified near the edge of woodland to the east of the A9 and west of the B9153 (NH 90889 20786); and a live sighting of a red squirrel in woodland (woodland block 116) approximately 100m west of the existing A9 near the Feith Mhor burn (NH 90580 20800).

Habitat Suitability Assessment

Field Survey

4.2.4. The findings of the habitat suitability assessment for red squirrels are summarised in Table 4.1 below and should be read in conjunction with Figure 12.18.

Table 4.1: Red Squirrel Habitat Suitability Assessment Results

Habitat Suitability	No. of Woodland Blocks	Average Activity Score[6]
High	44	0.98
Moderate	47	0.40
Poor	156	0.03

4.2.5. High habitat suitability comprised 44 woodland blocks (157ha) within the red squirrel Study Area. Two woodland blocks had high suitability and a score of '3' for red squirrel activity (woodland block 67 south of Avielochan and woodland block 177 between Avielochan and An Slochd Beag). Thirteen woodland blocks were of both high habitat suitability scoring '2' in terms of red squirrel activity; and 11 woodland blocks were considered to be of high habitat suitability with a score of '1' for red squirrel activity. The remaining woodland blocks of high suitability received a score of '0' for activity.

4.2.6. High suitability areas consisted of a greater number of mature conifer woodlands (>25 years old), were well connected, with little disturbance and were dominated by Scots pine. Trees were mature enough to provide both feeding resources and suitable drey sites for red squirrels, with evidence of the species recorded frequently. High suitability areas were spread across the Study Area. Four large areas were located northbound between Granish and Avielochan; north of Kinveachy northbound and southbound; a continuous stretch northbound starting north of Carrbridge, then southbound to Blackmount; and at An Slochd Beag northbound and southbound.

4.2.7. Areas of moderate habitat suitability comprised 47 woodland blocks (78ha) within the red squirrel Study Area. Woodland blocks with moderate habitat suitability and high scores (2 or above) for red squirrel activity consisted of 46, 106, 162, 169 and 184.

4.2.8. Moderate suitability areas consisted of a greater number of immature conifer woodlands (<25 years old), largely well connected and largely dominated by Scots pine with little disturbance, with evidence recorded occasionally. Two large areas of moderate habitat

[6] The average activity score is the mean value for each of the activity scores for high, moderate and poor habitat suitability of each woodland block surveyed

suitability were located between Torr Mhulc northbound and then southbound to Feith Mhor stream; and southbound north of Allt nan Ceathnarnach river. These areas in particular are considered likely to facilitate movement through to high habitat suitability areas.

4.2.9. Poor habitat suitability areas comprised 156 woodland blocks (200ha) across the red squirrel Study Area. Woodland blocks with poor habitat suitability and high scores (2 or above) for red squirrel activity consisted of woodland blocks 39 and 146.

4.2.10. Poor suitability areas consisted of immature conifer woodlands (<25 years old), sometimes isolated and largely dominated by birch spp., with some disturbance. Poor suitability areas rarely had evidence of red squirrel activity. Large areas of poor suitability were located northbound and southbound at Aviemore and Kinveachy. These woodlands were dominated by birch and, therefore, preferred food sources were scarce or absent (i.e. pine cones). The sparser canopy offered by birch may also result in poorer cover from predators in this type of woodland, thus is suboptimal for red squirrel. Smaller, poor suitability areas may still provide connectivity to moderate and high suitability areas particularly where they have been identified above.

Desk-Based Assessment of Un-Surveyed Areas

4.2.11. Un-surveyed, desk assessed areas were assumed to have the same habitat suitability status as the nearest adjoining woodland block which was surveyed in the field where:

- the adjoining woodland block contained the same NVC communities as the desk-assessed area;
- the desk assessed area was contiguous with the adjoining woodland block; and
- aerial imagery suggested a similar vegetation type of the desk-assessed area to the adjoining woodland block.

4.2.12. Where the desk-assessed area was considered to be of the same status as the adjoining woodland block this is represented by the nearest adjoining woodland block number with the suffix ‘x’, and denoted as a solid purple line, as per Figure 12.18.

Field Signs

4.2.13. Results of the field surveys undertaken in 2017 are shown on Figure 12.18 and summarised in Table 4.2 and Table 4.3 below.

Table 4.2: Red Squirrel Field Signs

Description of Feature	Number of Records
Drey – unknown if active	32
Feeding signs	96
Feeding platforms	2
Sighting	14

4.2.14. Dreys were found throughout the red squirrel Study Area. However, particular concentrations were found in woodland blocks 67 (eight records of dreys) and 177 (four records of dreys). Woodland block 67 is located between Granish and Avielochan on the southbound side of the A9; while woodland block 177 is located at the northern end of the Proposed Scheme near Slochd.

4.2.15. Woodland block 67 was characterised by woodland of Scots pine and birch species of more than 25 years old, with a ground flora of heather (*Calluna vulgaris*) and bilberry (*Vaccinium myrtillis*), with both good connectivity via the canopy and the scrub layer. Woodland block 177 was very similar to woodland block 67, but with areas of windblown trees and fewer cavities noted within trees.

4.2.16. Woodland blocks where three or fewer dreys were recorded ranged from low to high habitat suitability. The majority of these woodlands were commercial, coniferous plantations, with canopies dominated by Scots pine. They included both immature and mature woodlands and varied in the quality of the understory (the majority had no understory) and ground flora. However, all were noted as being well connected and with little disturbance.

4.2.17. Two feeding platforms were located within Scots pine trees within woodland block 106 (north of Kinveachy).

4.2.18. Positive evidence of red squirrel was recorded through live sightings of the animals (Table 4.3 below). These were recorded in only four woodland blocks, 1, 69, 106 and 118; with sightings seen on more than one occasion in woodland block 69.

Table 4.3: Red Squirrel Sightings

Woodland Block	Date	Description
1	31/05 - 01/06/2017	Squirrel climbing tree at edge of woodland close to woodland block 4.
69	31/05 - 01/06/2017	Two red squirrels observed along the path and getting in to patch of woodland block 69.
		Six red squirrels sighted.
106	31/05/2017	Single red squirrel in Scots pine.
118	18/05/2017	Four red squirrels seen in Scots pine adjacent to the A9.

4.3. Pine Marten

Desk Study

4.3.1. Three biological records for pine marten were received from those organisations contacted:

- two records were from HBRG; one from 2006 of prints to the south of Lynphail Lodge (NH 90 21), approximately 600m west of the Proposed Scheme, and one record in 2008 identifies a sighting at Dalraddy (NH 854 082) adjacent to the B9152 around 860m from the Proposed Scheme; and
- RPS – one pine marten, noted as hit by traffic, located on the northbound carriageway near Kinveachy (NH 90986 18118).

Habitat Suitability Assessment

4.3.2. The results of the habitat suitability assessment for pine marten are summarised in Table 4.4 below.

4.3.3. The results of the habitat suitability assessment, detailed in Table 4.4 below show 22 woodland blocks were assessed as having high habitat suitability for pine marten; (124ha). Large areas of high habitat suitability were found generally in the south of the route, primarily on the northbound side between Lynwilg farm and Aviemore and north of

Aviemore to Kinveachy. Smaller pockets were located on both the northbound and southbound side between Torr Mhulc and Feith Mhor and near Dalraddy on the northbound side, at the far south of the Proposed Scheme. These woodlands were generally well connected, very mature conifer woodlands (>100 years old) dominated by Scots pine; containing trees of an age and size to provide suitable den sites, as well as rocky outcrops (frequent at Kinveachy) and with little disturbance.

Table 4.4: Pine Marten Habitat Suitability Assessment Results

Habitat Suitability	No. of Woodland Blocks	Average Score[7]
High	22	5.6
Moderate	41	4.9
Poor	183	3.6

4.3.4. Moderate habitat suitability areas comprised 41 woodland blocks (127ha) across the pine marten Study Area. Moderate suitability areas consisted of a greater number of immature conifer and broadleaved woodlands (<25 years old), largely well connected with little disturbance and some records for suitable den sites. Areas northbound between Lynwilg farm and Aviemore; northbound north of Aviemore; and north and southbound between Torr Mhulc and Feith Mhor, are likely to be important where they connect high habitat suitability areas described above. Elsewhere moderate habitat suitability areas were interspersed with poor suitability areas primarily in the north of the Proposed Scheme.

4.3.5. Poor habitat suitability areas included 183 woodland blocks (184ha) across the pine marten Study Area. Poor suitability areas consisted of a greater number of immature broadleaved woodlands (<25 years old), sometimes isolated and largely dominated by birch, with some disturbance. No records of suitable den sites were made within these areas. This may be due to birch trees being generally smaller than Scots pine, with less capacity to produce large cavities for making dens, compounded by being immature. Habitat of poor suitability dominated the north of the Proposed Scheme. These areas also included conifer plantation woodland but these tended to have poorer foraging resources, particularly for fruit-bearing shrubs and trees, as well as lacking suitable den sites.

Desk-Based Assessment of Un-Surveyed Areas

4.3.6. The approach to the desk-assessment of un-surveyed areas for pine marten was the same as for red squirrel, discussed above. Where the desk-assessed area was considered to be of the same status as the adjoining woodland block this is represented by the nearest adjoining woodland block number with the suffix ‘x’, and denoted as a solid purple line, as per Figure 12.19.

Field Signs

4.3.7. Results of the field survey in respect of suitable den sites and scats identified are detailed in Table 4.5 below and shown on Figure 12.19. There was no positive evidence of pine marten recorded at any of these suitable den sites.

[7] The average activity score is the mean value for each of the activity scores for high, moderate and poor habitat suitability of each woodland block surveyed

Table 4.5: Pine Marten Survey Results, 2017

Woodland Block	Distance from Proposed Scheme (m)	Feature
34	0	Scat
69	0	Scat
118	0	Scat
34	0	Suitable Den Site
43	14	Suitable Den Site
43	19	Suitable Den Site
56	28	Suitable Den Site
69	0	Suitable Den Site
102	14	Suitable Den Site
102	24	Suitable Den Site
104	19	Suitable Den Site
108	57	Suitable Den Site
108	70	Suitable Den Site
108	48	Suitable Den Site
112	108	Suitable Den Site
113	23	Suitable Den Site
113	0	Suitable Den Site
113	8	Suitable Den Site
113	21	Suitable Den Site
113	23	Suitable Den Site
115	44	Suitable Den Site
118	32	Suitable Den Site
118	84	Suitable Den Site
119	0	Suitable Den Site
119	0	Suitable Den Site
119	7	Suitable Den Site
119	21	Suitable Den Site
119	42	Suitable Den Site
119	42	Suitable Den Site
128	109	Suitable Den Site
128	117	Suitable Den Site
152	5	Suitable Den Site
246a	116	Suitable Den Site
246a	91	Suitable Den Site

4.3.8. Evidence of pine marten (scat) was recorded on three occasions within the pine marten Study Area. Of these, only one scat was confirmed via DNA analysis (Annex A). This record was located on a track between woodland block 117 and 118 (approximately 40m west of the Proposed Scheme, northbound, near Feith Mhor stream). Both

woodland blocks contain commercial forestry. Woodland block 117 was dominated by mature Scots pine, occasional birch and wind-blown trees, with a ground flora of dominant grasses, mosses, occasional bilberry and heather. It was heavily grazed by deer. Woodland block 118 adjacent to 117 by contrast was noted to be dominated by immature Scots pine, with a ground flora of dominant grasses, mosses and occasional heather. Both woodland blocks were considered to be well connected and provide a rich source of fruit bearing trees, thus providing a good foraging resource for pine marten.

4.3.9. The two scats that were not confirmed by DNA analysis (Annex A) to be pine marten were found in woodland of differing characteristics. One unconfirmed scat was located in woodland block 34 (north of Lynwilg Farm), a broadleaved semi-natural woodland including a canopy of Scots pine, silver birch, larch (*Larix* spp.) and a scrub layer of juniper (*Juniperus communis*) and broom (*Cytisus scoparius*). The ground flora here included bracken (*Pteridium aquilinum*), heather, mosses and grasses. Mature trees were present which had multiple suitable features for den making consisting of rocky outcrops. Evidence of rabbit recorded here also indicated a foraging resource. The second unconfirmed scat was located in woodland block 69 (northbound at Avielochan) in naturally re-generated Scots pine forest of over 25 years in age. This woodland block offered a rich supply of fruit bearing trees as well as rocky areas which offered suitable den sites.

4.3.10. Suitable den sites were found throughout the Study Area. Woodland blocks with over five records for suitable den sites included woodland blocks 113 and 119 (northbound and southbound respectively, near Feith Mhor stream). These woodlands were well connected, dominated by Scots pine and less than 25 years old. Both had a rich abundance of fruit bearing trees. Woodland block 113 had multiple opportunities for suitable den sites on the ground amongst boulders and rocky outcrops while woodland 119 had opportunities for suitable den sites within cavities and old nests of mature trees.

4.3.11. The remaining woodland blocks with records for suitable den sites and other shelters were characterised by good connectivity to other woodlands and were dominated by Scots pine. These largely had foraging opportunities from fruit bearing trees, with evidence of the presence of small mammals and little disturbance. As such, these areas provided both suitable shelters and foraging resources with good potential to support pine marten.

4.4. Wildcat

Desk Study

4.4.1. The following records for wildcats were received (dates were not provided for all records):

- Mammal Society via SWA – two records from 2016 and 2011. The former, at Boat of Garten, was approximately 500m east of the Proposed Scheme; and the latter, at Lochanhully, 2km east of the Proposed Scheme. The latter record was captured by a trail camera and validated by SWA;
- iRecord via SWA – four records provided between 2014 and 2016 and considered to be plausible or correctly identified upon validation by SWA. One record in 2015 was located approximately 4.5km south-west of the Proposed Scheme near Carrbridge. Another record in 2014 was located at the A95 near Loch Vaa, 100m east of the Proposed Scheme. The remaining locations are deemed sensitive by SWA and cannot be disclosed, however they are both recent 2016 and within approximately 10km of the Proposed Scheme;

- SNH via the NBN gateway – hold a total of three records within the past 10 years, from 2007 and 2008. The record from 2007 was from adjacent to a footpath near Feshiebridge (2.4km south east of the A9 at Kincraig); the two records from 2008 detail a sighting adjacent to Dalfaber Drive, 1.2km east of the A9 at Aviemore; and the most recent record details a sighting around 2.5km east of Granish on the A9;
- NESBReC – hold 12 records for this species, the most recent of which from 2011 is from around 700m east of the Proposed Scheme;
- HBRG – no records are held within the past 10 years;
- Scotland Transerv – 12 records are held for wildcats, 11 of which are from 2010 and one from 2009 and all recorded on camera traps. Two records are from within the Highland Wildlife Park, between 7.6 and 7.7km from the Proposed Scheme. The remaining 10 records are from the Kinveachy area and are between 800m and 1.5km west of the Proposed Scheme; and
- CNPA – three records within woodland south of Loch Alvie; 630m – 1.6km south of the Proposed Scheme at Dalraddy, between 2009 – 2011; all of unsubstantiated, but probable wildcat individuals, seen crossing the A9. An additional substantiated record of a probable wildcat in 2009 was returned for an undisclosed location near Alvie, described as 'found apparently abandoned'.

Field Survey

4.4.2. During the breeding bird walkover survey undertaken in 24th May 2018, an incidental sighting of a (probable) wildcat hybrid was made. The sighting of an individual with hybridised characteristics was made within heather just north of Aviemore near Granish Quarry NH 90550 15195. The habitat in which the record was made consisted of a mosaic of open birch woodland, pasture and patches of deep heather, and was considered to have a good rabbit population.

4.4.3. No field signs for wildcat were observed during field surveys in 2016 and 2017.

Wildcat Priority Areas

4.4.4. The SNH paper on survey and scoping of wildcat priority areas identified five sites of high priority for wildcat conservation[ix]. These areas comprise Angus Glens, Northern Strathspey, Morvern, Strathbogie and Strathpeffer.

4.4.5. Of the five areas, Angus Glens is located in Angus, Morvern on the west coast of Scotland, Strathbogie in Aberdeenshire and Strathpeffer north of Inverness. Due to the distance of these sites from the Proposed Scheme these sites are not considered further in this literature review.

4.4.6. The Northern Strathspey priority area (Figure 12.22) consists of the Cairngorms boundary to the west, and River Spey in the east. The priority area excludes Grantown-on-Spey and Aviemore, but runs up to the A9 south of Aviemore and then along the watershed up to the National Park boundary[ix]. It encompasses almost the entirety of the Proposed Scheme from Dalraddy to Slochd.

4.4.7. During the study by SNH, one wildcat was confirmed within the Northern Strathspey priority area via camera trapping (undertaken between 2013 and 2014), in accordance with the strict definition used to determine wildcat in the report[ix]: '…*Under the Strict ID, no individuals identified as Wildcats will display any domestic cat traits and no domestic cats will display any Wildcat traits.*'

4.4.8. The Northern Strathspey priority area encompasses 20,576ha with 7,520ha considered to consist of high quality habitat for wildcat. The priority area is the smallest of all priority areas identified and is considered to be isolated, as there is poor connectivity via high quality habitat corridors to the wider area. This is especially true in the north and west; with the River Spey to the east considered to pose a natural barrier to movement.

4.4.9. The study was not able to provide robust data of densities of wildcats in these locations[ix]. Previous studies have estimated the density at 68.17 (SE 9.47) for wildcats and wildcat hybrids per 100 km^2 (or 6.8 per $10km^2$) in north-east Scotland on the boundary of the Cairngorms National Park (Kilshaw *et al.* [in press])[xix]. In other studies, Northern Strathspey was reported to support more wildcats than this study suggests (four wildcat and nine hybrids in part of the Northern Strathspey priority area, as reported in study by Kilshaw and MacDonald (2011)[xx]).

4.4.10. As the average home range is up to 200ha for female wildcats and larger for male wildcats, it is possible that wildcats associated with the Northern Strathspey priority area will be present within the wildcat Study Area.

Habitat Suitability Assessment

4.4.11. Whilst it is known that the Northern Strathspey priority area is considered to be of high value for wildcats by SNH, in order to refine this in respect of the Proposed Scheme, a habitat suitability assessment was undertaken to identify areas of highest value, as per the methodology described in Section 2 above. The results of this assessment are summarised in Table 4.6 below and shown in Figure 12.25.

Table 4.6: Habitat Suitability Assessment for Wildcat

Habitat Suitability	No. of Habitat Units	Total Area (km^2) (approximate)
High	8	1.18
Moderate	23	3.06
Low	22	2.55

4.4.12. In summary, habitats to the west of the A9 are considered of high value to wildcat compared to the east, partly because the west offers connectivity to suitable habitats beyond the wildcat Study Area. Habitats to the east of the A9 are more fragmented through the presence of the Highland Main Railway Line, the A95 and B9152, the settlements of Aviemore and Carrbridge and the River Spey; a likely barrier to movement further east[ix].

4.4.13. The habitat suitability assessment identified high suitability habitat in the south half of the Proposed Scheme on the northbound side around Aviemore at Craigellachie National Nature Reserve and Granish; on the northbound side at Kinveachy and at Baddengorm on the southbound side north of Carrbridge. Large parts of the Proposed Scheme were considered to be of moderate habitat suitability. Low habitat suitability areas included a large expanse of heath and bog to the north of the Proposed Scheme at Slochd. Detailed assessment results are provided in Table 4.7 below and should be read in conjunction with Phase 1 mapping provided in Figure 12.3.

4.4.14. Areas of high habitat suitability tended to include a mix of habitats, including grassland, woodland, heath and riparian margins. These habitats also tended to provide large areas of woodland edge and were well connected to other woodlands. Woodlands often had established understory or ground flora offering cover for commuting wildcat but also required by their prey (small mammals). These woodlands also tended to have mature

trees and rocky outcrops/boulders as well as dense vegetation which may offer suitable opportunities for shelter.

4.4.15. Moderate habitat suitability areas tended not to be as diverse as high habitat suitability areas; lacking in woodland edge (i.e. no or small areas of woodland; or large areas of woodland with relatively less edge habitat) and with larger expanses of homogenous habitats. Moderate habitat suitability areas had a greater level of disturbance than habitats of high suitability including being located nearer to urban areas or to denser areas of road and rail.

4.4.16. Poor habitat suitability areas tended to include large expanses of homogenous habitat and included large areas of bog and heath. These habitats offer little cover to allow wildcat to shelter from the elements and reduce the ability for wildcat to conceal themselves from prey species. Wildcat may also compete for prey in these areas from raptors. Dense conifer plantations with poor ground flora as a result of a closed canopy may reduce resources for prey species and thus foraging for wildcat. Poor areas also included areas highly fragmented by roads, rail and urban centres.

Table 4.7: Habitat Suitability Assessment for Wildcat

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
Northbound						
1	Plantation conifer woodland	Large area of mature Scot's pine dominated woodland.	Mix of grassland and broadleaved habitats at western edge of plantation; areas of wind-blown trees may offer opportunities for shelter.	Poor ground flora and understory for cover; large area of homogenous conifer plantation.	Low	0.06
2	Acid dry dwarf shrub heath	Extensive; to western edge and northern and eastern edges a mix of habitats present.	Broadleaved woodland to west offers opportunities for shelter, mosaic of grassland, marshy grassland and heath offers foraging and commuting habitat.	Small areas of optimal habitat.	Low	0.12
3	Improved grassland	Large areas of pasture.	Pasture interspersed with semi and unimproved grasslands, broadleaved woodland and scattered trees thus good area of woodland edge for foraging, commuting and shelter.	Disturbance from agricultural operations at Ballinluig.	Moderate	0.12
4	Broadleaved semi-natural woodland	Extensive.	Broadleaved woodland bordered by semi and unimproved grassland; scattered trees and riparian habitat suitable for shelter foraging and commuting.	Disturbance from agricultural operations at Lynwilg Farm.	Moderate	0.08
5	Improved and semi-improved grassland	Fields adjacent to A9 and east of broadleaved woodland.	Pasture with borders of broadleaved and conifer plantation woodland offering edge habitat for foraging commuting and shelter.	Disturbance from agricultural operations at Lynwilg Farm. Allt-na-Criche river may present a barrier to movement.	Low	0.08
6	Mosaic of acid dry dwarf shrub heath, broadleaved semi-		Mosaic offers large edge habitats, a range of opportunities for foraging commuting and	Dwarf shrub areas more exposed.	High	0.12

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
	natural woodland, scrub, dense and scattered bracken, marshy grassland		shelter.			
7	Broadleaved semi-natural woodland	Primary habitat interspersed with bracken, grassland dry and wet shrub heath.	Bracken and woodland offer opportunities for shelter, foraging and commuting.	Some disturbance from residential properties near the A9.	High	0.16
8	Broadleaved semi-natural woodland	Primary habitat dominated by Birch which has open canopy allowing greater woodland edge from within small clearings.	Woodland with addition of good ground flora provides cover, shelter and foraging opportunities.	Parts open to public as part of Craigellachie National Nature Reserve.	High	0.20
9	Conifer plantation	Large area dominated by Scots pine. Birch and larch also present allowing a more open canopy and ground flora of bracken, heather and grass.	Woodland with addition of good ground flora provides cover, shelter and foraging opportunities. Well connected to wider woodland areas.	Locally dense areas of Scots pine may be less suitable.	Moderate	0.04
10	Broadleaved semi-natural woodland	Woodland interspersed grassland, heath flush and riparian habitat with the presence of Allt na Criche stream.	Woodland offers shelter, foraging and commuting opportunities.	Woodland relatively wet; with willow a dominant species, thus shelter opportunities limited to higher ground.	Moderate	0.16
11	Conifer plantation	Extensive. Woodland naturally regenerating from plantation and dominated by Scots pine, larch and silver birch.	Woodland with good ground flora of heather, mosses and grasses as well as windblown Scots pine offers shelter, foraging and commuting opportunities.	Relatively homogenous habitat.	Moderate	0.12
12	Broadleaved semi-	Woodland interspersed	Good mix of habitats providing	Several minor roads cross this	High	0.16

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
	natural woodland	with scrub, bracken, grassland and heath.	large area of woodland edge. Foraging, commuting and shelter opportunities.	area in addition to A9 to the east.		
13	Conifer semi-natural woodland	Semi-natural woodland surrounded by and connected to broadleaved semi-natural woodland.	Woodland offers shelter, foraging and commuting opportunities.	Intersected or bordered by minor roads.	High	0.08
14	Conifer plantation	Extensive. To north of this area woodland interspersed with grassland and heath.	Woodland offers shelter from rocky outcrops, foraging and commuting opportunities.	Intersected by minor roads.	Moderate	0.20
15	Bog and heath mosaic	Large area, with areas of conifer and broadleaved woodland interspersed.	Wetland offers foraging opportunities.	Wetland less suitable for shelter and bog and heath areas more exposed thus less suitable for commuting.	Low	0.04
16	Conifer plantation	Extensive. Dominated by Scots pine and birch.	Area of woodland with recent clear fell increasing woodland edge habitat. Shelter, foraging and commuting habitat.	Area of woodland disturbed by forestry operations during ecological surveys in 2017. Bare ground at Dalrachney Beag and River Dulnain likely to be a barrier to movement to the north.	Moderate	0.16
17	Improved grassland	Agricultural land for pasture and arable farming.	Narrow strip of grassland to the east may allow commuting to the riparian habitat of the River Dulnain.	Unsuitable for shelter or foraging.	Low	0.04
18	Broadleaved semi-natural woodland	Small area with patches of heath and grassland.	Woodland with open canopy and good ground flora offers shelter, foraging and commuting opportunities.	May be isolated by Allt nan Ceatharnach river to north and River Dulnain to south as well as disturbance from nearby agricultural operations.	Low	0.02
19	Woodland, heath and	Small area.	Mosaic offers good areas of	Areas of heath more exposed	Moderate	0.04

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
	grassland mosaic		woodland edge. Shelter, foraging and commuting opportunities.	and less suitable to commuting.		
20	Conifer plantation	Extensive. Woodland patches separated by strips of acid dry dwarf shrub heath.	Patches of woodland offers increased woodland edge habitat.	Woodland immature, generally with a poor ground flora.	Low	0.28
21	Acid dry and wet dwarf shrub heath	Large area with patches of blanket bog.	Denser, taller areas of heath may offer cover, foraging opportunities.	Vegetation more exposed, less suitable for shelter and commuting.	Low	0.12
22	Blanket bog	Large homogenous area.	Little disturbance. Mixed habitat to north may offer some opportunities for shelter, foraging and commuting.	Exposed and largely unsuitable for foraging commuting or shelter.	Low	0.12
23	Conifer plantation	Extensive. Heathland and grassland patches in places.	Woodland with good ground flora offers shelter, foraging and commuting. Good area of woodland edge due to patches of heath and grassland.	Disturbance from number of forestry tracks as well as railway line to north.	Moderate	0.16
24	Broadleaved semi-natural woodland	Patchy woodland interspersed with grassland, heath, bog and scattered trees.	Woodland with good ground flora and rocky outcrops offers shelter, foraging and commuting. Good area of woodland edge due to patches of other habitats.	Minor roads and railway fragment the area.	Moderate	0.16
25	Acid dry dwarf shrub heath	Extensive with patches of blanket bog.	Heath may offer foraging and commuting opportunities in denser, taller areas.	Relatively exposed, shelter, foraging and commuting limited.	Low	0.16
26	Blanket bog	Large area interspersed with grassland, heath, flush and bare peat.	Limited prey in drier patches of heath and grassland.	Exposed and largely unsuitable for foraging commuting or shelter.	Low	0.12

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
Southbound						
27	Woodland, bracken, grassland, loch	Mixed habitats surrounding western banks of Loch Alvie.	Mix of broadleaved woodland and bracken offers continuous cover and edge habitat. Loch edge may offer additional variation in prey species.	Less cover from large areas of pasture at Druim Mhor and continuous cover from bracken may be broken in winter when it dies back.	Moderate	0.16
28	Semi-improved acid grassland	Grassland stretch with small patches of broadleaved woodland.	Taller grass may offer good commuting and foraging habitat – woodland patches may offer additional shelter.	May be less suitable for commuting in winter when vegetation dies back.	Moderate	0.08
29	Broadleaved semi-natural, mixed semi-natural, broadleaved and conifer plantation woodland	Interspersed with heath, grassland and flush.	Mosaic of habitats offers greater area of woodland edge habitat. Shelter, foraging and commuting opportunities.	Fragmented by roads and railway. Allt na Criche river may pose a barrier to movement to the north.	Moderate	0.12
30	Improved grassland	Pasture with woodland strip borders.	Woodland and semi-and unimproved grassland to the margins of the fields may provide commuting routes and limited foraging and shelter.	Fragmented by roads and railway.	Low	0.04
31	Poor semi-improved grassland	Interspersed with higher quality grassland, bracken and woodland patches.	Taller grass may offer good commuting and foraging habitat – woodland and bracken patches may offer additional shelter.	Fragmented by roads and railway. River Spey to east a barrier to movement.	Moderate	0.08
32	Broadleaved semi-natural and plantation woodland	Woodland bordered by grassland.	Woodland offers shelter, foraging and commuting habitat.	Immature Birch woodland, poor ground flora limits opportunities. Fragmented: intersected by B-roads and railway. River Spey to east a barrier to movement.	Moderate	0.08
33	Urban mosaic	Aviemore settlement interspersed with	Patchwork of woodland and grassland in between	Disturbance from human activity, fragmented by roads	Low	0.28

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
		woodland, grassland and bare ground.	hardstanding and buildings may offer some connectivity.	and railway and barrier Aviemore Burn may pose barrier to north and River Spey a barrier further east.		
34	Broadleaved semi-natural woodland	Woodland bordered by Aviemore settlement.	Woodland offers shelter, foraging and commuting opportunities.	Isolated with A9 a barrier to west, Aviemore to south an east and potentially Aviemore Burn to north.	Low	0.06
35	Semi-improved acid grassland	Mosaic habitat with heath, woodland, bracken and mire fen.	Pasture with patchwork of habitats offers areas of edge habitat.	Land cattle-grazed so cover from grassland poor; connectivity likely limited to margins.	Low	0.08
36	Broadleaved semi-natural woodland	Woodland interspersed with grassland, bracken heath and bare ground.	Mosaic of woodland patches offers a diversity of habitats and large areas of edge habitat for shelter, foraging and commuting.	Recent construction activity of residential buildings will reduce suitable habitat in south of area and increase disturbance. Bounded by B9152, A95 and A9.	Moderate	0.16
37	Conifer plantation	Large area with small patches of heath grassland and mire fen.	Woodland with good ground flora. Offers shelter, foraging and commuting habitat.	Minor road intersects woodland.	Moderate	0.08
38	Improved grassland	Agricultural land with pockets of higher quality grassland, scrub and woodland.	Connectivity, shelter and foraging confined to margins of habitat parallel to A9.	Largely exposed. Disturbance from farmhouse buildings and agricultural operations .	Low	0.20
39	Poor semi and semi improved acid grassland	Grassland tapers to point to north of area .	Connectivity, shelter and foraging confined to margins of habitat parallel to A9.	Largely exposed. Disturbance from farmhouse buildings and operations.	Low	0.08
40	Broadleaved and conifer semi-natural woodland	Woodland interspersed with grassland, swamp pond and loch edge.	Woodland habitat offers shelter, foraging and commuting and loch and pond edge habitats may offer additional prey species.	Denser areas of woodland less suitable. A95 and railway intersect.	Moderate	0.16

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
			Good wider connectivity further east.			
41	Improved and semi-improved acid grassland	Pasture in between patches of plantation and semi-natural woodland.	Connectivity, shelter and foraging confined to margins of habitat.	Disturbance from farmhouse buildings and agricultural operations.	Low	0.12
42	Broadleaved semi-natural woodland	Woodland with patches of blanket bog and bracken.	Woodland habitat offers shelter, foraging and commuting opportunities.	Relative small extent offers less opportunities than other woodland areas.	Moderate	0.08
43	Conifer plantation	Extensive. Woodland is interspersed with mixed and broadleaved semi-natural woodland, grassland, clear fell, bog, flush and mire fen.	Woodland with good scrub layer. Good shelter, foraging and commuting opportunities.	Denser areas of woodland less suitable. B9153 and railway fragment the habitat.	Moderate	0.40
44	Broadleaved and conifer semi-natural woodland	Small area of woodland to south east of Ellan with patches of grassland, scrub, and bare ground.	Woodland offers shelter, foraging and commuting habitat.	Fragmented by addition of railway. Disturbance and barrier of Carrbridge settlement and River Dulnain to the north-west.	Low	0.04
45	Semi-improved acid grassland, unimproved grassland and marshy grassland	Pasture interspersed with scrub, and broadleaved semi-natural woodland.	Mosaic of woodland with good shrub layer of Broom and grassland offers shelter, foraging and commuting habitat. River Dulnain offers commuting route and riparian habitat.	Disturbance from agricultural operations. Fragmented by addition of railway. Barrier of River Dulnain to the south-east.	Moderate	0.05
46	Conifer plantation	Extensive; with strips of broadleaved and conifer semi-natural woodland bordering Allt nan Ceatharnach river.	Woodland offers good shrub and ground flora layers for shelter, foraging and commuting habitat; Allt nan Ceatharnach river offers riparian habitat and commuting route; good wider connectivity.	Fragmented by addition of railway. Allt nan Ceatharnach river may pose barrier to crossings in places.	High	0.16
47	Broadleaved and conifer	Interspersed with	Woodland offers good ground	Fragmented by addition of	High	0.12

Habitat Unit No (Figure 12.25).	Primary Habitat	Notes	Positive Indicators	Negative Indicators	Outcome	Approximate Area (km^2)
	semi-natural, and conifer plantation woodland	grassland, heath, bog and riparian habitat with the Allt nan Ceatharnach river running through this area.	flora layers for shelter, foraging and commuting habitat; Allt nan Ceatharnach river offers riparian habitat and commuting route; good wider connectivity.	railway. Allt nan Ceatharnach river may pose barrier to crossings in places. Blanket bog to north of area exposed and would limit commuting.		
48	Mosaic of mixed semi-natural and conifer plantation woodland, blanket bog, heath, swamp		Heterogeneous habitat and woodland with good shrub and ground flora layers offers range of opportunities for shelter, foraging and commuting. Good wider connectivity.	Fragmented by addition of railway and B-road.	High	0.18
49	Conifer plantation	Extensive, with narrow strips of heath and grassland.	Woodland with poor shrub and ground flora layers. Woodland rides offer edge habitat. Good wider connectivity.	Shelter, foraging and commuting limited.	Moderate	0.28
50	Blanket bog and mire fen	Stretch between B-road and A9.	Some connectivity at margins which include grassland, scrub and pockets of woodland.	Shelter, foraging and commuting very limited.	Low	0.04
51	Conifer plantation	Heath, conifer semi-natural, mixed plantation, grassland, bog and mire also in small patches.	Woodland offers good shrub and ground flora layers for shelter, foraging and commuting habitat; good wider connectivity.	Railway and large expanse of heathland to the north barriers to movement.	Moderate	0.12
52	Acid dry dwarf shrub heath	With large patches of scrub bog, flush, grassland and woodland.	Scrub, grassland and woodland patches offer better opportunities for shelter, foraging and commuting.	Large expanses of heathland limit commuting and isolate preferable habitats.	Low	0.40

4.5. Notable Species

4.5.1. This section provides the results of the desk study records search for European hedgehog, brown hare, mountain hare and polecat as well as incidental sightings.

Desk Study

European Hedgehog

4.5.2. No records for European hedgehog were received from those organisations contacted.

4.5.3. Hedgehogs can be found in farmland, parks, gardens, and urban areas. To a lesser extent the species can be found in deciduous woodland, woodland edge and grasslands (Lapini, 1999, as cited by Amori, 2016)[xxi]. Conifer woodland may be less preferred, especially as the vegetation offers less suitable hibernation sites[vii].

4.5.4. Farmland, limited deciduous woodland and abundant woodland edge habitat was found throughout the route, with urban areas being limited. Therefore, these habitats within the Study Area are considered likely to support a population of hedgehog.

Brown Hare

4.5.5. The following records were received for brown hare:

- HBRG – two records are held within the last 10 years: A single record from 2012 at An Camas Mor (NH 90 12) and is a RTA; the remaining record is from Dalraddy Caravan Park (NH 85 08) [2008] on the B9152.

4.5.6. Brown hare will use a varied habitat resource, but it has been noted that there is a positive association with hare abundance and habitat density and diversity (Smith *et al.* 2005 as cited by Smith and Johnston 2008[xxii]). Preferred food sources consist of grasses and herbs. Crop species are also taken where preferred options are not available (Reichlin *et al.* 2006, as cited by Smith and Johnston, 2008)[xxii].

4.5.7. Using Phase 1 habitat data (Appendix 12.2), the Study Area is primarily comprised of woodland, heath and pasture with occasional arable fields. Key areas for brown hare have therefore been identified as areas of most diversity of habitat. These are found northbound and southbound near Lynwilg Farm, Granish; Kinveachy, Carrbridge; southbound near Baddengorm; and northbound at An Slochd Beag. These areas are considered to provide optimal habitat for brown hare within the Study Area; which is thus considered likely to support a population of the species.

Mountain Hare

4.5.8. Two records were received for mountain hare:

- NESBReC – hold one record for this species within the last 10 years at NH 83 25; and
- HBRG – one record is held for this species, from East Foregin, around 600m to the north east of the Proposed Scheme at NH 880 247.

4.5.9. Habitat requirements for the mountain hare consist of a preferred habitat of moor and bog in Scotland 2008, after which pine, birch, and juniper are utilized. The species has also been known to use agricultural land in Ireland. Its diet mainly consists of heather in Scotland but it is also known to take birch, juniper, poplar (*Populus* spp.), willow (*Salix*

spp.), and bilberry sp. in Europe. Agricultural species in the diet have been noted to include grasses and clovers[xxiii].

4.5.10. The Study Area consists of semi-natural and plantation woodland, heath, bog and pasture, with woodland dominating. Therefore, optimal habitat preferences are limited within the Study Area. As the name suggests, the species tends to occupy upland areas, which is believed to be because this limits competition with brown hare (Thulin 2003, as cited by Smith and Johnston, 2008)[xxiii].

4.5.11. Using Phase 1 habitat data (Appendix 12.2) and topographical data (Ordnance Survey 1:25000) areas of upland heath habitat within the Study Area is limited to Slochd Mor and Slochd Summit. Therefore, it is considered likely that a small population of mountain hare occurs within the Study Area.

5. Nature Conservation Evaluation

Red Squirrel

5.1.1. The Study Area has been valued with respect to red squirrel based on the suitability of the habitat (see Figure 12.18) and the red squirrel evidence recorded, as well as the conservation status of the species. The rationale for this is set out in Table 5.1 below.

Table 5.1: Red Squirrel Valuation

Habitat Suitability	Valuation	Rational for Valuation
High	Regional	37 woodland blocks covering an area of 26ha (approximately 26% of red squirrel Study Area) were assessed to be of high habitat suitability for red squirrel within the Study Area. High suitability areas consisted of woodlands with a high number of mature conifer trees (>25 years old), that were well connected and dominated by Scots pine, and containing trees of an age and size to provide abundant feeding resources and suitable drey sites for red squirrels, with little disturbance. High suitability areas on average had the greatest number of records of evidence of the presence of red squirrel. As red squirrel is both a priority species for the Highlands Biodiversity Action Plan and CNPA as well as an SBL species. As the Cairngorms are an important strong hold for red squirrel in a UK context, high suitability areas are considered to be of Regional value.
Moderate	Authority Area	30 woodland blocks covering an area of 17ha (approximately 18% of Study Area) were assessed to be of moderate suitability for red squirrel in the Study Area. Moderate suitability areas consisted of a greater number of immature conifer woodlands (<25 years old) than poor habitat suitability areas, largely well connected and largely dominated by Scots pine with little disturbance. Moderate suitability areas included a high number of records of evidence of the presence of red squirrel. As moderate areas allow connectivity to higher quality areas, moderate suitability areas are considered to be of Authority Area value.
Poor	Local	143 woodland blocks covering an area of 56ha (57% of Study Area) across the red squirrel Study Area were assessed to be of poor habitat suitability for red squirrel. Poor suitability areas consisted of immature conifer woodlands (<25 years old), sometimes isolated and largely dominated by silver birch,

Habitat Suitability	Valuation	Rational for Valuation
		with some disturbance. Poor suitability areas had no records of evidence of the presence of red squirrel. As poor areas may allow connectivity to higher quality areas, poor suitability areas are considered to be of Local value.

Pine Marten

5.1.2. The pine marten Study Area has been valued based on the suitability of the habitat and the pine marten evidence recorded, as well as the conservation status of the species. The rationale for this is set out in Table 5.2 below.

Table 5.2: Pine Marten Valuation

Habitat Suitability	Valuation	Rational for Valuation
High	Authority Area	21 woodland blocks covering an area of 23ha (approximately 23% of pine marten Study Area) were assessed to be of high suitability for pine marten. High suitability areas tended to consist of a high number of very mature conifer trees (>100 years old), well connected and dominated by Scots pine; containing trees of an age and size to provide suitable den sites, with little disturbance. High suitability areas included the greatest number of suitable den sites. Pine marten is a UK BAP SBL species, and is legally protected therefore high suitability areas are considered to be of Authority Area value.
Moderate	Local	41 woodland blocks covering an area of 26ha (approximately 26% of pine marten Study Area) across the Study Area. Moderate suitability areas tended to consist of a greater number of immature conifer and broadleaved woodlands (<25 years old), largely well connected with little disturbance. Moderate suitability areas included suitable den sites. As moderate areas allow connectivity to higher quality areas, moderate suitability areas are considered to be of Local value.
Poor	Less than local	148 woodland blocks covering an area of 51ha (approximately 51% of pine marten Study Area) were assessed to be of poor suitability. Poor suitability areas tended to consist of a greater number of immature broadleaved woodlands (<25 years old), sometimes isolated and largely dominated by silver birch, with some disturbance. No locations were identified as suitable den sites within these areas. Poor suitability areas are considered to be of less than local value as they are unlikely to support pine marten or assist in their dispersal.

Wildcat

5.1.3. The wildcat Study Area has been valued based on the literature review and habitat suitability assessment, as well as the conservation status of the species. The valuation is based on the habitats assessed as detailed in Table 4.7 above, and classed as high, moderate and low wildcat habitat suitability, adopting the precautionary principle. The rationale is set out in Table 5.3 below.

Table 5.3: Wildcat Valuation

Habitat Suitability	Valuation	Rational for Valuation
High	National	Habitat of high suitability covers an area of 34ha (15% of wildcat Study Area) spread across the wildcat Study Area. Wildcat is nationally rare and this habitat is located within an area designated for targeted conservation action by SNH. Therefore, high suitability areas are considered to be of National value.
Moderate	National	Habitat of moderate suitability includes an area of 90ha (40% of wildcat Study Area) across the wildcat Study Area. As moderate suitability areas are likely to allow connectivity to higher quality areas, and as this habitat is located within an area designated for targeted conservation action by SNH, moderate habitat suitability areas are considered to be of National value.
Poor	Regional	Habitat suitability of poor suitability includes an area of 98ha (44% of wildcat Study Area) 304ha across the wildcat Study Area. As poor areas may allow connectivity to higher quality areas, poor suitability areas are considered to be of Regional value.

Notable Species

Hedgehog

5.1.4. Suitable habitat for hedgehogs across the Study Area is limited to habitat in urban, farmland and woodland fringes and this species is not a key species for targeted conservation action in this region; therefore, habitat is considered to be of Local value to hedgehogs.

Brown Hare

5.1.5. Suitable habitat for within the Study Area has been identified for brown hare. As a species of principal importance for biodiversity conservation in Scotland this habitat is therefore considered to be of Local value to brown hare.

Mountain Hare

5.1.6. Large areas of the Study Area are considered to be unsuitable for mountain hare and more suitable for its competitor brown hare. Limited upland heath habitat at Slochd Mor and Slochd Summit is considered to be of Local value; with the remaining habitat within the Study Area considered to be less than local value.

6. Potential Impacts

6.1. Construction

6.1.1. The potential construction impacts identified as a result of the Proposed Scheme were common to the species considered within this appendix. These are:

- damage of or disturbance to resting sites;
- loss of commuting or foraging habitat;
- severance;
- direct mortality; and

- disturbance from noise and vibration during piling and blasting.

6.2. Operation

6.2.1. Operational impacts identified as a result of the Proposed Scheme were common to all species considered within this appendix. These are:

- direct mortality from collision with traffic; and
- severance.

7. Mitigation

7.1.1. 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 7.1**.** In addition to these, scheme specific mitigation measures have been developed as detailed in Table 7.2. Specific mitigation measures are presented in Figure 13.4 - Landscape and Ecological Mitigation plan. The Proposed Scheme includes embedded mitigation as part of the design such as mammal ledges through culverts and design of culverts to maintain permeability of the carriageway.

7.1.2. A full list of ecological mitigation measures is provided in ES Chapter 12: Ecology and Nature Conservation. Those measures of relevance to red squirrel, pine marten, wildcat and notable species have been extracted and are detailed in Table 7.2.

7.1.3. Some of these mitigation measures are relevant to a number of species; all species are referred to in the tables below for consistency between ES Chapter 12 and the other ES Appendices.

Table 7.1: A9 Standard Mitigation Commitments

Mitigation Item[8]	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
SMC-E3	At watercourses throughout Proposed	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	To protect fish species from noise, vibration and light spill.	None

[8] Only items relevant to red squirrel, pine marten, wildcat and notable species are listed

Mitigation Item[8]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
	Scheme		physical damage e.g. to hearing such as avoidance of areas and hearing damage. In addition, soft-start techniques will be applied to piling work procedures to enable sensitive species to evacuate the area.		
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 all 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-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
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
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[xxiv] and follow best available guidance on lighting with regards to protected species (e.g. Bat Conservation Trust (2009)[xxv] and Institute of Lighting Engineers (2007)[xxvi]). 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

Mitigation Item[8]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
SMC-E13	Throughout Proposed Scheme	Construction	Trenches, holes and pits will be kept covered at night or provide a means of escape for mammals, reptiles and amphibians 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, reptiles and amphibians becoming entrapped in and around compound areas during construction.	None
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
n/a (note)	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. The Standard Mitigation Measures as detailed in ES Chapter 11 (Road Drainage and the Water Environment), ES Chapter 13 (Landscape and Visual), ES Chapter 16 (Air Quality) and ES Chapter 17 (Noise and Vibration) will be implemented to protect aquatic and terrestrial habitats and species.	To protect aquatic and terrestrial habitats and species.	n/a

Table 7.2: Project Mitigation Commitments

Mitigation Item[9]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
P11-E16	Throughout Proposed Scheme	Pre-Construction & Construction	The working area will be kept to the minimum necessary for construction of the project to reduce habitat loss. A Habitat Management Plan will be produced pre-construction and agreed with SNH. This will include specific plans and measures for working on the border of the Craigellachie SSSI/NNR and Alvie SSSI, as well as other sensitive habitats (such as aspen woodland), detailing avoidance, mitigation and rehabilitation measures to further reduce residual	To protect all habitats, including those located on the boundary of Craigellachie SSSI/NNR and	SNH

[9] Only items relevant to red squirrel, pine marten, wildcat and notable species are listed

Mitigation Item[9]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
			impacts.	Alvie SSSI.	
P11-E20	Throughout Proposed Scheme	Construction	Mitigation and compensation for the loss of ecologically important habitats will occur through habitat creation. This will include roadside planting, where appropriate, as shown on Landscape and Ecological Mitigation plan (Figure 13.4). Where feasible important habitats will 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 identified within the Proposed Scheme. In respect of red squirrel, 43ha or greater of created woodland habitat should comprise a mixed species composition favourable to the species as detailed in guidance within Table 3 of *Managing forests as red squirrel strongholds*[xxvii]. Landscape planting and newly created habitat will comprise locally obtained 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 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 fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas.	To compensate for the loss of ecologically important habitats (including woodland, dry heath, and blanket bog).	None
P11-E22	Throughout Proposed Scheme	Construction	Where practicable, top soil from cleared woodland not on the ancient woodland inventory but still considered important (e.g. aspen woodland or SBL birchwoods) will be stored appropriately for re-use in areas where similar habitat is to be created. See Landscape and Ecological Mitigation plan, Figure 13.4.	To retain the seedbank of cleared woodland (including aspen and SBL birchwoods).	None
P11-E23	Throughout Proposed Scheme	Construction	Where practicable top soils or substrates from areas of Annex I or SBL priority habitat loss, including heath and species rich grassland, will be stored appropriately for re-use in areas where similar habitat is to be created. See	To retain the seedbank of lost Annex I/SBL	None

Mitigation Item[9]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
			Landscape and Ecological Mitigation plan, Figure 13.4. This includes species rich grasslands and areas of fungi habitat (such as grasslands that have been highlighted as potential waxcap habitat: CNPA priority locations 12, 15, 16, 34 and 55 shown on Figure 12.9) where turves will re-used to retain seed sources and botanical value.	priority habitats.	
P11-E25	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. Similarly, where possible, selected, blasted rock material will be incorporated into retained woodland and woodland planting for the benefit of a range of species including pine marten under the direction of an ECoW. 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 variety of conditions to reduce the risk of windthrow. Existing stone dykes shall be retained where possible.	To maintain/enhance habitat for species including reptiles, invertebrates, and pine marten.	None
P11-E32	Throughout Proposed Scheme	Construction	Mitigation measures to avoid or reduce potential impacts on surface waters will be employed, including adherence to Guidance for Pollution Prevention (GPP)[xxviii] during construction, and appropriate road drainage and runoff treatment.	To protect fauna and habitats from pollution of surface waters during construction.	None
P11-E34	Throughout Proposed Scheme	Pre-Construction & Construction	Species Protection Plans to be produced pre-construction and agreed with SNH. Plans will be produced for pine marten, red squirrel and wildcat. Where appropriate, the Species Protection Plans will include monitoring plans.	To comply with conservation legislation and to protect fauna.	SNH
P11-E35	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	To comply with conservation legislation and to protect fauna.	SNH

Mitigation Item[9]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
			statutory body.		
P11-E52	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 comply with conservation legislation and protect red squirrels and their dreys.	If licence required - SNH
P11-E53	At wildcat crossing points	Pre-Construction & Construction	Permanent wildcat fencing to be installed at identified crossings, the scope and design of which is to be agreed with SNH. Where fencing ties into structures, culverts and mammal underpasses gaps will not exceed 5cm. Mammal proof fencing will be taken around the top of the structure where the height of the headwall/wingwalls do not exceed the required height of fencing, where access could be gained up a sloping wall or where an overhang on the fencing is required. Where fencing crosses access tracks mammal proof gates will be provided to prevent access onto the carriageway. The installed fencing will be subject to checking and approval by the ECoW prior to works commencing. Where deviations to this are required for constructability purposes, these will be agreed with the ECoW and SNH. Temporary wildcat fencing will be installed prior to commencement of the construction phase, terminating at the edge of construction works. The specification of the temporary fencing will follow that of the permanent fencing.	To protect wildcats from road traffic accidents.	SNH
P11-E54	Throughout Proposed Scheme	Construction	Pre-construction surveys will include the identification of hedgehog nesting and hibernation sites. Prior to construction and outwith the hedgehog hibernation period (October to March inclusive) identified nesting and hibernation sites will be dismantled by hand and re-located outwith the construction area and within suitable, retained habitat for hedgehog, within the Proposed Scheme, under the supervision of the ECoW. This will allow nesting and hibernation sites to be used during construction.	To protect hedgehog nesting and hibernation habitat.	None
P11-E55	Throughout Proposed Scheme	Construction	Habitat manipulation will be undertaken for key areas for brown hare (Lynwilg Farm, Granish; Kinveachy, Carrbridge; southbound at Baddengorm; and northbound at An Slochd Beag). Habitat manipulation should consist of	To protect brown hare, mountain hare and	None

Mitigation Item[9]	Approximate Chainage/ Location	Timing of Measure	Description	Mitigation Purpose/ Objective	Specific Consultation or Approval Required
			strimming vegetation early in the year (February) prior to works commencing and should include a buffer of 5m from working areas. Prior to strimming, a check should be made by the ECoW to ensure no hares or breeding birds are present. Where vegetation is more than 15cm high, a phased cut is recommended. The first cut should reduce the vegetation to 15cm. The second cut should then be taken to ground level. Habitat manipulation may be required to be maintained for the duration of works within the brown hare breeding period as directed by the ECoW. Where this is not possible, then 24 hours prior to works, the working area will be checked by the ECoW. Should a leveret be found an exclusion buffer of 30m will be applied by the ECoW and maintained for the duration of weaning period (30 days)[xxix]. Adult hares will be allowed to move out of the construction area of their own accord. Once moved, the ECoW will provide authorisation to proceed with works in that area.	breeding birds during construction.	

8. Residual Impacts

8.1. Introduction

8.1.1. 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.

8.1.2. Impacts are discussed in terms of locations which fall within the Proposed Scheme (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.

8.1.3. The construction impacts identified as a result of the Proposed Scheme were common to the species considered within this section and which are discussed for each further below. These are:

- habitat loss (e.g. loss of resting sites/shelter during vegetation clearance, loss of commuting or foraging habitat);
- severance;
- direct mortality; and
- disturbance; including noise and vibration from piling and blasting.

8.1.4. Similarly, operational impacts identified as a result of the Proposed Scheme were common to all species in this section and this has consisted of:

- direct mortality from collision with traffic; and
- severance.

8.1.5. Whilst severance impacts will affect species from the point of construction, and thus have been identified within the construction section, they have been discussed in detail in the following operation section.

8.1.6. As per the impact assessment methodology, all features assessed to be of Less than Local nature conservation value have been scoped out of the EIA.

8.2. Construction

Red Squirrel

8.2.1. Signs of red squirrel activity have been recorded within the majority of woodland habitat adjacent to and within the Proposed Scheme. Six notable areas, based on levels of red squirrel activity, which intersect the Proposed Scheme, are present at the following locations (as shown on Figure 12.18):

- mixed semi-natural woodland (woodland block 46) southbound; located between MacDonald Hotels Aviemore and Aviemore Burn/A9 crossing (Ch6100 – 7100), which includes a drey and has high levels of foraging activity;
- coniferous plantation (woodland block 67) southbound, south of Avielochan (Ch9150 – 9850); has high habitat suitability and 10 records of dreys and foraging activity;

- coniferous plantation (woodland block 106) northbound (Ch13800 – 14450) has high habitat suitability with two records for dreys, two records for feeding platforms and some foraging activity;
- coniferous plantation (woodland block 147) southbound north of Ellan (Ch17300 – 17400); has moderate habitat suitability and a record for one drey;
- coniferous plantation (woodland block 177) southbound near Slochd (Ch21000 – 21700); has high habitat suitability and eight records of dreys and foraging activity; and
- coniferous plantation (woodland blocks 173, 182, 191, 192, 186 northbound and 190, 197, 198, 202, 203 southbound) of high, moderate and poor habitat suitability near Baddengorm/A938-A9 junction (Ch18200 – 19300).

8.2.2. It is considered most likely that red squirrels will be affected by works occurring within the above identified areas. Table 8.1 details the impact assessment in relation to all areas considered to be of regional and authority value for red squirrel. This includes habitat of high and moderate suitability.

8.2.3. The Landscape and Ecological Mitigation plan (Figure 13.4) includes 88.97ha of woodland planting. 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 endeavours to fill in existing gaps in linear vegetation features, adjoin or connect existing blocks of woodland or act as stepping stones between habitat areas.

8.2.4. Red squirrel is considered likely to be disturbed by construction activities within 50m of dreys (Table 8.1). This disturbance may result in individual red squirrels moving into alternative suitable habitat within the wider area. As this disturbance is temporary, for the duration of works, the nature conservation status of the population is considered unlikely to be altered.

8.2.5. Blasting works at Slochd will affect woodland block 224 (Table 8.1), with a drey recorded here during field surveys. The works are considered likely to result in temporary displacement of red squirrel at this location. However, the area of suitable habitat affected is small. Additionally, the woodland block is connected to woodland further north, and so it is considered likely that the species will be able to move into the wider area for the duration of works.

8.2.6. Piling works will affect suitable habitat (Table 8.1), some of which have dreys recorded during field surveys. The works are considered likely to result in temporary displacement of red squirrels within 100m of piling activities. These woodlands are generally well connected to the wider area and thus it is considered likely that red squirrel will be able to use alternative habitat for the duration of works. Furthermore, the duration of works is considered to be short and thus the effects short-lived.

8.2.7. The widening of the A9 may raise the risk of mortality from crossing of the road and raise the effect of severance, in particular at the proposed locations of the junctions where there is suitable habitat (Table 5.1). The impacts of severance and proposed and embedded mitigation are discussed further in Section 8.3.

Table 8.1: Red Squirrel - Specific Impacts, Mitigation and Residual Impacts – Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Woodland blocks of Regional value: Northbound 1*, 56, 63*, 62, 65, 69*, 71*, 113, 117, 118, 150, 153, 158, 159, 161*, 160, 163, 165, 167, 173, 182, 186*, 234, 246a, 246b Southbound 6*, 7, 42a, 67*, 119, 154, 177*, 183, 185, 187, 194, 195, 199, 201*, 202, 204, 224*, 242, 247 Woodland blocks of Authority Area value: Northbound 10, 20, 24, 42, 104, 106* 107, 111, 122, 124, 128, 139, 147*, 155, 156, 162*, 169*, 180, 200, 214, 216, 223, and 131a. Southbound 3, 11, 36, 46*, 60, 80, 110, 112, 114, 115, 116, 131, 135, 151, 152, 157, 170, 171, 178, 179, 184*, 190, 203, 244 *drey present	Loss of habitat including loss of dreys 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-E3 SMC-E6 SMC-E8 SMC-E9 SMC-E10 SMC-E13 SMC-E14 P11-E16 P11-E20 P11-E22 P11-E25 P11-E32 P11-E34 P11-E35 P11-E52	Not significant
Woodland blocks with dreys of Regional value: Northbound	Disturbance – general construction	Extent: Proposed construction activities are within 50m of these locations noted with dreys present. Construction activities are likely to increase disturbance levels from noise, vibration and increased human activity. This may disturb red squirrel present in	SMC-E1 SMC-E2 SMC-E3	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
69, 71, 186 Southbound 67, 177, 224 Woodland blocks of Authority Area value: Northbound 106, 147 Southbound 46	activities	these locations. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Medium	SMC-E6 SMC-E9 SMC-E10 SMC-E13 SMC-E14 P11-E16 P11-E34 P11-E35 P11-E52	
Woodland blocks of Regional value: Southbound 224	Disturbance – blasting	Extent: Blasting at Slochd summit will affect habitat of regional value for red squirrels at 224, as well as a drey located approximately 50m north-east of the Proposed Scheme. This may displace red squirrel from nesting, foraging and commuting within this area for the duration of works. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1 SMC-E2 SMC-E3 SMC-E6 SMC-E9 SMC-E10 SMC-E13 SMC-E14 P11-E16 P11-E34 P11-E35	Not significant
Woodland blocks of Regional value: Northbound 150, 165, 186* Southbound 177, 183, 185, 187, 195, 202 Woodland blocks of Authority Area value:	Disturbance – piling	Extent: Proposed construction activities are within 100m of these locations, noted with dreys or habitat of Regional or Authority Area value present. Construction activities are likely to increase disturbance levels from high levels of noise, vibration and human activity. This may displace red squirrel from nesting, foraging and commuting within these areas for the duration of works. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring	SMC-E1 SMC-E2 SMC-E3 SMC-E6 SMC-E9 SMC-E10 SMC-E13 SMC-E14 P11-E16 P11-E34	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Northbound 147*, 180 Southbound 135, 139, 151, 152, 157, 171, 178 *drey present		Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	P11-E35	
Woodland blocks of Regional value: (Granish Junction): 62 northbound (Blackmount Junction): Northbound 173, 182, 186 Southbound 190 and 202 Woodland blocks of Authority Area value: (Blackmount Junction): Southbound 190 and 203	Severance	Extent: The junction at Granish has a section on the northbound side where it is located within habitat of Regional value red squirrels. This junction is likely to reduce connectivity between the south and north of the junction of the northbound side as woodland is located within the junction and remaining woodland requires greater distance to circumvent. However, the habitat is not completely severed – and a corridor for movement across the woodland will remain. No foraging records or dreys were located within this woodland block, but presence was detected in neighbouring blocks. The Blackmount Junction at the B938 crosses habitat of high suitability for red squirrel on both the north and southbound sides. This may have a severance effect, between woodland blocks 182 and 202. These blocks are opposite each other along the A9, and are both of Regional value, with a drey located approximately 50m east of 182 and a feeding sign within 202. However, it is unlikely that red squirrel currently cross the road as high quality habitat exists on both sides of the carriageway. Effect: Direct negative Duration: Short term Frequency and timing: Constant Reversibility: Irreversible Likelihood: Likely Impact Descriptor: Low	SMC-E1 SMC-E2 SMC-E3 SMC-E6 SMC-E8 SMC-E9 SMC-E10 SMC-E13 SMC-E14 P11-E16 P11-E20 P11-E21 P11-E25 P11-E32 P11-E34 P11-E35 P11-E52	Not significant

Pine Marten

8.2.8. There was little confirmed evidence of pine marten presence within the Proposed Scheme. No pine marten dens were confirmed; and only suitable structures were recorded. Only one scat could be confirmed, located 0m from the Proposed Scheme. A further two, unconfirmed scats were located within the Proposed Scheme. The north of the Proposed Scheme was largely of poor habitat suitability. Large sections of habitat of Authority Area value were located to the south of the Proposed Scheme, primarily on the northbound side. This suggests pine martens are likely to be present in low densities within the pine marten Study Area, and more likely to be found in the south of the Proposed Scheme on the northbound side.

8.2.9. Of 238ha hectares of Authority Area and Local value habitat for pine marten, 37ha will be lost. Habitat will be lost from the following areas (woodland blocks are shown on Figure 12.19):

- semi-natural broadleaved woodland (woodland block 34 northbound), north of Lynwilg Farm; of Authority Area value and includes a suitable den site immediately adjacent to the Proposed Scheme. An unconfirmed scat was also located within this block; and
- coniferous plantation (woodland block 119 southbound), north of Torr Mhuic; of Authority Area value for pine marten and with six suitable den sites including one which will be directly lost as a result of the Proposed Scheme. A confirmed scat was located near this block on the track between coniferous woodland (woodland blocks 117/118) northbound.

8.2.10. Construction will result in the loss of habitat that may be used by pine marten for foraging and shelter (Table 8.2 below). However, signs of pine marten within the Study Area were limited and no dens were confirmed as active. In the worst case scenario, suitable den sites identified at woodland blocks 34 and 119, which will be directly lost as a result of the Proposed Scheme, are likely only to have a minor effect to one or two individuals. As there is suitable habitat for shelter and foraging within the wider area the species will be able to disperse during construction. Within the proposed woodland planting areas, den sites will be created using recovered, blasted, rock materials.

8.2.11. It is likely that any species present within the Proposed Scheme will be disturbed as a result of lighting, noise and the presence of people (Table 8.2). This disturbance may result in 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 given the suitability of habitat in the wider area. Pine martens are highly mobile and as such it is likely that any pine martens present will move out of the construction area, therefore the risk of direct mortality is considered to be very low.

8.2.12. Blasting works at Slochd are considered unlikely to affect pine marten since habitat affected at woodland blocks 218-224 is Less than Local value or unsuitable for the species. Piling works will affect Authority Area and Local value habitat (Table 5.2). The works are considered likely to result in temporary displacement of pine marten. Pine marten are anticipated to use available, alternative habitat present within the wider area for the duration of works. The duration of works is considered to be short and thus the effects short-lived.

8.2.13. Fragmentation of habitat is unlikely to present a significant impact due to the majority of Authority Area value habitat being located on the northbound side. Passage may currently be enabled from culverts of the Feith Mhor burn in the occasional instance of

Authority Area value habitat being present on both sides of the A9 (Table 8.2). However, the review of the existing structure considered the lack of a mammal ledge to be a deterrent to pine marten. Here suitable den sites have been identified on the northbound and southbound sides. Pine marten should benefit from an improved structure which will be installed here for the Proposed Scheme. The improved structure will be a box culvert design with height and width of 1.8m, inclusive of a 600m mammal ledge. Pine marten are likely to benefit from culverts and underpasses installed for other mammal species; e.g. wildcat (see below).

8.2.14. The impacts of severance and proposed and embedded mitigation are discussed further in Section 8.3. The implementation of mitigation commitments in Table 7.1 and Table 7.2 reduce the risk of effects on pine marten from loss of dens, direct mortality and disturbance to pine marten to a non-significant level. Pre-construction surveys, which are a condition of the A9 Standard Mitigation Commitments, will ensure that pine martens are given appropriate consideration at the construction phase.

Table 8.2: Pine Marten - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Woodland blocks of Authority Area value: Northbound 1, 34*, 40, 43*, 47, 62, 63, 65, 69*, 71, 73, 90, 96, 113*, 243, 246a* Southbound 119* Woodland blocks of Local value: Northbound 4, 10, 45, 55, 58, 102*, 117**, 118**, 150, 153, 156, 165, 182, 207, 210, 246 Southbound 2, 3, 6, 64, 67, 104, 114, 154, 177, 190, 194, 202 *with suitable den site **with suitable den site and scat	Loss of quality habitat including loss of suitable den sites and direct mortality	Extent: Suitable den sites were recorded within the Proposed Scheme at these locations. Works in these locations could result in the loss of suitable den sites and foraging habitat. The cumulative effect has been considered with regards to habitat of local value. Effect: Direct negative Duration: Long term Frequency and timing: Single event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E8, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E17 P11-E21 P11-E23 P11-E26 P11-E32 P11-E33 P11-E35 P11-E36 P11-E53	Not significant
Woodland blocks of Authority Area value: Northbound 34*, 43*, 56*, 69*, 113* Southbound 119* Woodland blocks of Local value: Northbound 102*, 104*, 117**, 118**	Disturbance – general construction activities	Extent: Proposed construction activities are within the vicinity of these locations noted with suitable den sites present. Construction activities are likely to increase disturbance levels from noise, vibration and increased human activity. Taking a precautionary approach, and prior to undertaking pre-construction surveys as per mitigation measure P11-E34 to confirm use by pine marten, activities here could disturb the individuals in these locations. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E17 P11-E32 P11-E35 P11-E36	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Southbound 108*, 115*		Likelihood: Likely Impact Descriptor: Medium		
Woodland blocks of Local value: Northbound 150, 165, 207 Southbound 177, 187, 202	Disturbance – piling	Extent: Proposed construction activities are within 100m of these locations which are noted with Authority Area or Local value habitat present. Construction activities are likely to increase disturbance levels from high levels of noise, vibration and human activity. This may displace pine marten from denning, foraging and commuting within these areas. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E17 P11-E32 P11-E35 P11-E36	Not significant
Feith Mhor Woodland blocks of Authority Area value: Northbound 113 Southbound 119	Severance	Extent: The section of the A9 at Feith Mhor includes habitat determined as Authority Area, Local and Less than Local value habitat for pine marten. Authority Area value habitat is present at blocks 113 northbound and 119 southbound. Widening at this junction may decrease connectivity to these two highly suitable areas. Whilst a culvert exists at this location, which could be used by pine marten, it is considered a sub-optimal structure to cross the road as it is located in a damp and more open area; and thus considered likely only to be used occasionally. Effect: Direct negative Duration: Short term Frequency and timing: Constant Reversibility: Reversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E8, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E17 P11-E21 P11-E23 P11-E26 P11-E32 P11-E33 P11-E35 P11-E36 P11-E53	Not significant

Wildcat

8.2.15. Construction will result in the loss of habitat that may be used by wildcat for foraging and shelter (Table 8.3). No signs of wildcat have been recorded within the Study Area, however they are likely to be present in low densities across the Study Area. It is considered unlikely that a den will be destroyed as a result of the Proposed Scheme as it is unlikely that den sites will be present in the area around the current A9 given their avoidance and sensitivity to anthropogenic disturbance. 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. As it is likely that any wildcats present will move out of the construction area, the risk of direct mortality is considered to be low. Compensatory planting of woodland lost as a result of the Proposed Scheme will provide woodland edge habitat for the species in the long-term.

8.2.16. It is likely that individuals present within the vicinity of the Proposed Scheme will be disturbed as a result of noise, dust and the presence of people (Table 8.3). If wildcats are present in the area, this disturbance is likely to result in individuals moving into alternative suitable habitat within the wider area; this may have an energy cost to the species (i.e. requiring to travel to other foraging areas). Disturbance is likely to be temporary during the construction phase, thus any effect on energy requirements is likely to be low and unlikely to impair the ability of the species to survive.

8.2.17. In respect of disturbance from blasting at Slochd (Table 8.3), the species is considered unlikely to be affected by this activity here due to it being located habitat of Regional value. In respect of disturbance from piling, the species may temporarily be displaced from habitat of National value within 100m of works for the duration. This would include habitat units 16, 19, 23, and 24 northbound and 45, 46, 48, 49, and 51 southbound. Being very mobile wildcats are not expected to be at risk of direct mortality, but they may be deterred from using these areas to den, forage or commute, and thus be required to travel further for these resources. However, these effects are anticipated to be short-lived, as these works will be of a short duration.

8.2.18. The implementation of mitigation commitments in Table 7.1 and Table 7.2 will reduce the risk of effects on wildcat from loss of dens, direct mortality and disturbance to wildcat to a non-significant level.

8.2.19. With respect to severance (Table 8.3) impacts from the widening of the A9, passage will be created every 1.5km to 2.5km (this takes into account the size of a female home range being typically between 1.75km and 2km). This will be of a suitable size for wildcat use (being a minimum of 1.2m wide) and planting will be undertaken to provide cover and connectivity to suitable habitats on either side of the underpass. Fencing will also be used to guide wildcat to the underpass, as these have been shown to have a positive effect on channelling movement of cats[xxx] and have been recommended from studies in Germany[xxxi].

Table 8.3: Wildcat - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Habitat units of National value: Northbound 3, 4, 6, 7, 8, 10, 11, 12, 13, 14, 16, 18, 19, 23, 24 Southbound 27, 28, 29, 31, 32, 36, 37, 40, 42, 43, 45, 46, 47, 48, 49, 51	Loss of quality habitat including direct mortality	Extent: Works in these locations will result in the loss of habitat for foraging and shelter for wildcat prior to mitigation. Effect: Direct negative Duration: Long term Frequency and timing: Single event Reversibility: Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E8, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E20 P11-E22 P11-E23 P11-E25 P11-E34	Not significant
All National value habitat units	Disturbance – general construction activities	Extent: Proposed construction activities across the Proposed Scheme are likely to increase disturbance levels from noise, vibration and increased human activity. Activities here could disturb the species 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-E3, SMC-E6, SMC-E8, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E32 P11-E34 P11-E35	Not significant
Habitat units of Regional value: Northbound 25 Southbound 52	Disturbance – blasting	Extent: Blasting at Slochd is within habitat unsuitable or poor suitability habitat for wildcat and thus the species is considered unlikely to be affected by this activity in this location. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E34 P11-E35	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
		Reversibility: Reversible Likelihood: Unlikely Impact Descriptor: Negligible		
Habitat units of National value: Northbound 16, 19, 23, 24 Southbound 43, 45, 46, 47, 48 49, 51	Disturbance – piling	Extent: Proposed construction activities are within 100m of these locations which are noted with high or moderate habitat suitability present. Construction activities are likely to increase disturbance levels from high levels of noise, vibration and human activity. This may displace wildcat from denning, foraging and commuting within these areas. Effect: Indirect negative Duration: Short term Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E34 P11-E35	Not significant
Habitat units of National value: Northbound 4 Southbound 28, 29 Habitat units of Regional value: Northbound 5 Southbound 30	Severance	Extent: Widening across the Proposed Scheme may decrease connectivity to suitable areas of habitat, this effect is considered to be greatest across habitat units determined as high or moderate suitability for wildcat and which are intersected by the proposed junctions of Aviemore South, Granish and Black Mount. Effect: Direct negative Duration: Short term Frequency and timing: Constant Reversibility: Reversible Likelihood: Likely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E3, SMC-E6, SMC-E8, SMC-E9, SMC-E10, SMC-E13, SMC-E14 P11-E16 P11-E17 P11-E21 P11-E23 P11-E26 P11-E32 P11-E33 P11-E35 P11-E36 P11-E53	Not significant

Notable Species

Hedgehog

8.2.20. Hedgehogs may be affected by habitat loss as a result of the Proposed Scheme. The effect of this loss will be temporary and reversible, following the establishment of new habitat through mitigation measures P11-E20 (in respect of general habitat creation and connectivity), P11-E25 (in respect of re-use of deadwood), P11-E24 (in respect of woodland creation) P11-E23 (in respect of grassland creation). These measures will provide nesting, hibernation, foraging and commuting habitat for hedgehog and as such this impact is not considered significant

8.2.21. Direct mortality from construction activities could arise as a result of vegetation clearance which destroys nesting or hibernation sites and from entrapment. Construction related dust, noise and lighting (required for night time working) could also result in disturbance. These impacts are considered in Table 8.4 below.

8.2.22. Junctions at Granish and the A938 will fragment habitat suitable for hedgehog. The location at Granish is primarily broadleaved woodland and unlikely to be optimal habitat for hedgehog. The junction at the A938 has more varied habitat types which are likely to be more suitable for hedgehog, this impact is considered in Table 8.4 below.

Table 8.4: Hedgehog - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Farmland, deciduous woodland, woodland edge, urban areas of Local value	Loss of quality habitat including direct mortality	Extent: Works in these locations will result in the loss of habitat for foraging and shelter for hedgehog prior to mitigation. Effect: Direct negative Duration: Long term Frequency and timing: Single event Reversibility**:** Irreversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E13, SMC-E14 P11-E16 P11-E23 P11-E33 P11-E32 P11-E54	Not significant
	Disturbance	Extent: Works in these locations will result in disturbance to from construction related noise, dust and night-time working. Effect: Direct negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely Impact Descriptor: Low	SMC-E1, SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E13, SMC-E14 P11-E16 P11-E54	Not significant
	Severance	Extent: Widening across the	SMC-E1,	Not

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
		Proposed Scheme may decrease connectivity to Local value habitat, this effect is considered to be greatest across habitat intersected by the proposed junctions of Aviemore South and Granish. Effect: Direct negative Duration: Short term Frequency and timing: Constant Reversibility: Reversible Likelihood: Likely Impact Descriptor: Medium	SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E12, SMC-E13, SMC-E14 P11-E23 P11-E32 P11-E33 P11-E54	significant

Mountain Hare

8.2.23. Mountain hare is unlikely to be affected by habitat loss of Local value at Slochd Mor and Slochd Summit, which is elevated above footprint of the Proposed Scheme, which will be located within the lowest part of the natural valley occurring between Slochd Mor and Slochd Summit.

8.2.24. Mountain hares tend to shelter in 'forms' (depressions within vegetation such as heather/long grass), using woodland edges close to heather moorland[xxxii]. There is a lack of woodland in the Slochd Mor/Slochd Summit area; with the nearest extensive area of woodland being broadleaved woodland located south of Slochd on the northbound side. It is considered more likely that mountain hare would use this woodland on the side facing into the area of moorland preferentially (west side of the woodland) i.e. away from the existing A9 where existing disturbance is higher. Therefore, the risk of destroying forms is considered to be low.

8.2.25. It is unlikely there will be direct mortality or disturbance of mountain hares from construction activities as habitat of Local value at Slochd is within upland areas.

8.2.26. Following the adoption of the mitigation measures in Table 7.1, no significant impacts on mountain hare are anticipated as a result of the Proposed Scheme.

Brown Hare

8.2.27. Local value habitat for brown hare will be lost from areas with greatest habitat diversity along the Proposed Scheme; this is likely to include the loss of areas used as forms. However, the impact is not considered significant as within the wider area of the river basin of the River Spey and River Dulnain similarly diverse habitats are likely to be present and will provide alternative habitat for use.

8.2.28. Junctions at Granish and the A938 could result in fragmentation of habitat for brown hare (Table 8.5). However, it is considered likely that the risk of this occurring is low. Habitat at the A938 on the northbound side consists of conifer plantation woodland and heath, which is less diverse than that found southbound which includes mixed, semi-natural broadleaved and conifer woodlands, grassland, bog and heaths and flush. It is therefore likely that brown hare will preferentially use the southbound habitat. At Granish, on both the northbound and southbound sides, the habitat consists of semi-

natural and plantation broadleaved woodland, and small areas of semi-improved grassland. This area is less diverse and considered sub-optimal for brown hare, which is considered likely to use more diverse habitat further south of the proposed junction.

8.2.29. Similarly, to mountain hare, adult brown hares are very mobile and likely to move out of the vicinity of construction activities. Breeding brown hares are more likely to be at risk as leverets (young hares) depend on cover to stay hidden from predation. Thus, the risk of direct mortality as a result of the proposed works is considered moderate during the breeding season of February to September (inclusive) (Table 8.5).

8.2.30. Disturbance from construction activities may affect brown hare (Table 8.5). Whilst they are mobile and can move out of the immediate danger from works, noise, dust and the presence of people may result in an area additional to the footprint of works being avoided by the species. This may include habitat otherwise suitable for the species. Brown hare is unlikely to move out into homogenous areas of conifer woodland, which is a dominant habitat across the Proposed Scheme, or upland areas, which would bring them into competition with mountain hare. Therefore, brown hare may have to travel further to find suitable habitat away from disturbance.

8.2.31. Overall following implementation of embedded and additional mitigation measures, no significant impacts on brown hare are anticipated as a result of the Proposed Scheme.

Table 8.5: Brown Hare - Specific Impacts, Mitigation and Residual Impacts - Construction

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
Mixed woodland, scrub, grassland, ruderal, heath and farmland habitats at Lilnwilg Farm, Granish; Kinveachy, Carrbridge (southbound and northbound); southbound near Baddengorm; and northbound at An Slochd Beag of Local value	Direct mortality	Extent: Works in these locations could result in direct mortality during the brown hare breeding season prior to mitigation. Effect: Direct negative Duration: Medium term Frequency and timing: Recurring Reversibility: Irreversible Likelihood: Unlikely Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E13, SMC-E14 P11-E16 P11-E55	Not significant
	Disturbance	Extent: Works in these locations will result in disturbance to brown hare from construction related noise, dust and night-time working. Effect: Direct negative Duration: Temporary Frequency and timing: Recurring Reversibility: Reversible Likelihood: Likely	SMC-E1, SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E12 SMC-E13, SMC-E14, P11-E55	Not significant

Location and Value	Potential Impact	Characterisation of Impact (Pre-mitigation)	Mitigation	Residual Impact
		Impact Descriptor: Low		
Granish	Fragmentation	Extent: Widening across the Proposed Scheme may decrease connectivity to suitable areas of habitat, this effect is considered to be greatest across habitat intersected by the proposed junction of Granish. Effect: Direct negative Duration: Long term Frequency and timing: Constant Reversibility: Reversible Likelihood: Certain Impact Descriptor: Medium	SMC-E1, SMC-E2, SMC-E9, SMC-E10, SMC-E11, SMC-E12, SMC-E13, SMC-E14, P11-E23 P11-E32 P11-E33 P11-E55	Not significant

8.3. Operation

8.3.1. Operation impacts relate to severance effects as a result of the wider carriage-way and the collision risk associated with this.

8.3.2. In order to assess severance effects, a review has been undertaken with respect to the current provision for passage under the A9 and the level of passage that will be provided once the Proposed Scheme is operational.

8.3.3. The results of the review of the existing and proposed structures crossing the Proposed Scheme are presented in Annex B with regards to red squirrel, pine marten and wildcat, and discussed in relation to all of the species considered in this report below. Current and potential permeability of the A9 is shown on Figure 12.24.

8.3.4. Where a structure has been designed for mammal passage, and with particular respect to the requirements of wildcat, 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 species requiring cover from detection/predation are not discouraged or prevented from entering or exiting the culvert.

8.3.5. Overall, 24 structures are proposed which will allow mammal passage. At the time of writing it is not possible to confirm the design of all proposed culverts, however culverts are likely to consist of dimensions of 1.2m x 1.2m and be located within +/- 50m of the current location. Where this is not possible, a commitment to alternative provision is made for the passage of mammals in these locations, unless constraints such as flood risk make design changes for mammal passage unacceptable.

8.3.6. Lighting of structures is confined to underpasses at Grampian Road Underpass, Old Meall Road Underpass, Granish Junction and NMU/maintenance Underpass. Lighting will be motion sensing and thus the effect of lighting disturbance will be reduced. The

following sections discuss the suitability of the proposed and existing structures in relation to each of the species included within this report.

Red Squirrel

8.3.7. 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.

8.3.8. 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 their current usage of suitable habitat either side of the A9.

8.3.9. Permeability across the road will increase as the majority of proposed 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; and will improve upon those that do exist. The Proposed Scheme will result in a minimum of 15 locations which will be suitable for passage (see Figure 12.24), an increase of eight passages compared to baseline conditions (Annex B).

8.3.10. Given the commitment to improve habitat connectivity through embedded design and mitigation, the impact of severance on red squirrel as a result of operation is not considered to be significant.

Pine Marten

8.3.11. Pine marten may be affected by severance and the increased risk of mortality from crossing the widened road. However, as previously identified, the northbound side is generally considered to provide higher quality habitat relative to the southbound side, with one potential crossing point appearing to be of value to pine marten at Feith Mhor. This crossing will be improved as part of the embedded mitigation.

8.3.12. The Proposed Scheme will result in a minimum of 16 locations which will be suitable for passage (see Figure 12.24), an increase of 10 passages compared to baseline conditions (Annex B). Given the commitment to improve habitat connectivity through provision of mammal ledges as part of the embedded design, the impacts of severance on pine marten as a result of operation are considered to be not significant and are likely to improve passage for pine marten.

Wildcat

8.3.13. Wildcat may be affected by genetic isolation as a result of severance and the increased risk of mortality from crossing the widened road.

8.3.14. The Proposed Scheme will result in a minimum of 21 locations which will be suitable for passage (see Figure 12.24), an increase of 12 passages compared to baseline conditions (Annex B). Structures will be made suitable for passage as mammal ledges and soft verges are embedded in the design of these. Altogether this will greatly improve passage for wildcat, ensuring there is a passage approximately every 1.5-2.5km within suitable habitat; and more than the minimum of 13 crossings necessary to meet wildcat requirements across the approximate 25km route.

8.3.15. Permanent fencing will be installed to further direct wildcat to safe crossing structures as per Annex B, as permanent fencing has been shown to significantly reduce road mortality of the species in addition to the provision of suitable crossing structures[xxxi].

8.3.16. Fencing will not be installed at Dulnain Bridge, Slochd Beag Bridge, Slochd Summit 2 Footbridge, Slochd Mhuic Culvert or Black Mount.

8.3.17. Dulnain Bridge and Slochd Beag Bridge are existing expansive bridges with existing riparian habitat (Dulnain Bridge) and railway embankments (Slochd Beag) likely to be preferred corridors for movement due to vegetative cover and good visibility across the crossing. Fencing in these locations is not considered to improve these crossings for wildcat.

8.3.18. Fencing will not be installed at Slochd Beag Bridge, Slochd Summit 2 Footbridge or Slochd Mhuic Culvert which are at the furthest extent in the north of the Proposed Scheme. These structures are located in close proximity to poor habitat with poor connectivity further north of Slochd into the wider environment and it is not, therefore, considered necessary to provide a crossing

8.3.19. An area between chainages 19,500 and 20,500 at Black Mount (Figure 12.25) is dominated by habitat of Regional value for wildcat. In this location, habitat of Regional value dominates the north and southbound side, with habitat of National value found within the wooded areas further to the north. A large extent (approximately 1.4km) of habitat of Regional value is located immediately adjacent to the A9, but surrounded by habitat of greater value. It is considered likely that wildcat will preferentially commute through the habitat of National value on the northern side, especially where enabled by existing, high quality passageways at Slochd Beag Bridge, Baddengorm Bridge and Dulnain Bridge. For this reason, it is not considered necessary to provide fencing in this location.

8.3.20. The construction of underpasses designed with the requirements of wildcat as specified above are likely to reduce the effects of severance and direct mortality on this species in addition to embedded mitigation measures for habitat creation (Table 7.1). This is considered to reduce the potential impact of severance to a non-significant level. However, given the status of this species it is recommended that the effectiveness of the underpasses for wildcat is monitored (see section 9 below).

Notable Species

8.3.21. Hedgehogs, mountain hare and brown hare could experience higher mortality from road collisions as a result of the Proposed Scheme. The range of underpasses, which have been designed for bats, wildcat, otter and deer, are considered to provide a range of sizes and conditions suitable for the passage of these species. Hedgehogs, which share habitat requirements with wildcat, may particularly benefit from enhancements for wildcat. Hares, which may require good visibility through culverts in order to be incentivised to cross[xxxiii], may particularly benefit from underpasses for deer and bats. Implementation of these measures is considered to result in an overall a non-significant impact to these species.

9. Monitoring

9.1. Introduction

9.1.1. This section includes monitoring measures for wildcat identified following completion of the impact assessment.

9.2. Wildcat

9.2.1. A monitoring plan for wildcat will be developed by a suitably qualified ecologist in consultation with CNPA and SNH. The monitoring plan will include pre-construction, construction and post-construction monitoring surveys of the species. The purpose of the monitoring will be to determine the usage of underpasses designed for the species, which will be implemented for a period to be agreed with CNPA and SNH. The results will be reported to CNPA, SNH and Transport Scotland at agreed intervals; where review of the monitoring programme will be made and remedial measures applied (where required) to capture sufficient data for the purpose, for subsequent monitoring, until the end of the agreed monitoring period.

10. Conclusions

10.1.1. This impact assessment has considered the potential effects of the Proposed Scheme on red squirrel, pine marten, wildcat, brown hare, mountain hare and hedgehog. The impact assessment has been informed by dedicated field surveys for red squirrel and pine marten. Detailed desk studies have been undertaken for red squirrel, pine marten, wildcat, brown hare, mountain hare and hedgehog.

10.1.2. Potential impacts during construction of the Proposed Scheme include habitat loss, severance, direct mortality and disturbance.

10.1.3. Suitable red squirrel habitat was identified throughout the Proposed Scheme. Suitable habitat will be lost but measures during construction will avoid direct effects. Habitat creation is integral to the design scheme and ensures connectivity is maintained and improved and thus impacts on red squirrel are considered to be temporary and not significant.

10.1.4. Impacts on pine marten are not considered to be significant as large sections in the north of the Proposed Scheme are of poor habitat suitability for the species. Remaining areas of Authority Area and Local value habitat will be lost in the south of the Proposed Scheme. Surveys undertaken concluded pine marten were likely to be present in low densities within Authority Area and Local value habitat here, as little conclusive evidence for their presence was found. As with red squirrel, habitat creation and improvement of connectivity will ensure impacts are temporary and thus not significant.

10.1.5. The Proposed Scheme was identified as falling within a Wildcat Priority Area for Conservation by SNH. This area is of National value for the species. Following a detailed review of habitat across the Proposed Scheme, suitable habitat for wildcat was further refined. Areas of National value to wildcat based on the species requirements were considered to be located at Craigellachie, Granish, Kinveachy and Baddengorm. Impacts during construction on wildcat were considered to be low due to their low density across the area, and thus not significant.

10.1.6. Minor impacts on hedgehog and brown hare have been identified during construction where vegetation clearance as part of enabling works could affect these species at sensitive times. These times are considered to be the hibernation period for hedgehog and the breeding period for brown hare. Mountain hare was considered unlikely to be affected as suitable habitat identified for the species was limited to the very north (Slochd) of the Proposed Scheme. Mitigation measures are proposed which will ensure that any impacts are not significant.

10.1.7. Operational impacts as a result Proposed Scheme on all species consisted severance and the associated collision risk. The location and specification of underpasses have been designed in alignment with species-specific requirements, therefore these impacts are not considered to be significant and the increase in suitable structures for passage is likely to improve passage across the road.

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Annex A. Pine Marten DNA Analysis Results

A.1. Scat 1, NH 85497 23597

WARWICK
THE UNIVERSITY OF WARWICK

EcoWarwicker
Ecological Forensics

18 May 2017

Re: Bat Identification Results for Juliette Linford, Atkins

Bat job number 9447, received 05 May 2017
Sample labelled: Scat 1, NH 85497 23597 PCR amplification successful. DNA sequence:
GCAACCGTAATTACCAACTTGCTGTCAGCCATCCCCTACATTGGAACC

Phylogenetic analysis identification: *Martes martes*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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A.2. Scat 2, NH 85548 23549

WARWICK
THE UNIVERSITY OF WARWICK

EcoWarwicker
Ecological Forensics

18 May 2017

Re: Bat Identification Results for Juliette Linford, Atkins

Bat job number 9448, received 05 May 2017
Sample labelled: Scat 2, NH 85548 23549 PCR amplification successful. DNA sequence:
TGTGCAACCGTAATTACCAACTTGCTGTCAGCCATCCCCTACATCGGAATC
Phylogenetic analysis identification: *Martes martes*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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A.3. Scat 3, NH90631 20821

WARWICK
THE UNIVERSITY OF WARWICK

EcoWarwicker
Ecological Forensics

7 June 2017

Re: Bat Identification Results for Juliette Linford, Atkins

Bat job number 9570, received 25 May 2017
Sample labelled: Scat 3, NH 90631 20821 PCR amplification successful. DNA sequence:
GCAACCGTAATTACCTAACTTGCTGTCAGCCATCCCCTACATCGGAACCAGTCTTGT
AGAGTGAATCTGAGGAGGT

Phylogenetic analysis identification: *Martes martes*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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Annex B. Permeability Review

Table B1.1 Permeability Review of Existing and Proposed Structures for Red Squirrel, Pine Marten and Wildcat

Structure Code	Structure Name	Chainage	Grid Reference	Current Dimensions	Current Suitability for Red Squirrel (RS)	Current Suitability for Pine Marten (PM)	Current Suitability for Wildcat (WC)	Proposed Dimensions (width, height, length/m)	Potential Suitability for Red Squirrel	Potential Suitability for Pine Marten	Potential Suitability for Wildcat
A9 1100	Allt Chriochaidh	570	NH 85673 09525	4m span	Unsuitable - wet and no mammal ledge, likely to deter use			4 x 1.5 x 21.8	Bridge will include mammal ledge and additional vegetative cover		
A9 1100 C69	Loch Alvie Creep Mammal Underpass	1500	NH 86477 09994	2m diameter	Suitable - underpass for mammals in agricultural land			3.5 x 3.2 x 30.1	Will be enhanced with vegetative cover		
A9 1100 C70	Caochan Burn Culvert	1700	NH 86645 10088	1.9m diameter	Unsuitable - wet and no mammal ledge, likely to deter use			2.5 x 2.5 x 100	Culvert will be widened and will include mammal ledge; will include enhanced vegetative cover to encourage use		
A9 1110	Ballinluig Pedestrian Underpass	1925	NH 86857 10176	3.8m diameter	Suitable - likely to be low levels of use as outside of nearest town Aviemore	Unsuitable - wider area of limited value for pine marten	Suitable - likely to be low levels of use as outside of nearest town Aviemore	To be confirmed	To be enhanced with vegetative cover	Unsuitable - wider area of limited value for pine marten	To be enhanced with vegetative cover
A9 1120	Lynwilg Underpass	2680	NH 87591 10321	3.8m diameter	Unsuitable - in poor habitat		Suitable - agricultural land, likely to be low levels of use	4.3 x 4.3 x 70	Unsuitable - in poor/surrounded by poor habitat		
A9 1121*	Aviemore South Junction	2820	NH 87623 10301	Not applicable	No current structure			55 x 7.7 x 15	Unsuitable - in poor habitat		Unsuitable – heavy traffic
A9 1120 C19	Lynwilg Farm Culvert	2880	NH 87783 10331	0.85 diameter	Unsuitable - in poor habitat		Unsuitable - culvert considered too small	To be confirmed	Unsuitable - in poor habitat and going to be demolished		
A9 1130	Criche Bridge	3540	NH 88370 10607	6m span	Unsuitable - in poor habitat		Unsuitable - wet and no mammal ledge, likely to deter use	6 x 3.4 x 38	Unsuitable - in poor habitat		Culvert will be widened and will include mammal ledge; will include enhanced vegetative cover to encourage use
A9 1140	Grampian Road Underpass	4733	NH 89155 11456	3.7m diameter	Unsuitable - crossing for a public road and in poor habitat for RS			7.8 x 4.3 x 38	Unsuitable - crossing for a public road and lighting of structure.		
A9 1150	Craigellachie Nature Reserve Underpass	5290	NH 89149 12014	3.8m diameter	Unsuitable - in poor habitat	Suitable - whilst may be used by public, high quality habitat considered to encourage use by these species		3.8 x 3.8 x 33.5	Unsuitable - in poor habitat and lighting of structure	To be enhanced with vegetative cover	
A9 1150 C7	Loch Puladdern Culvert	5430	NH 89136 12149	0.5m diameter	Unsuitable - large extent of wet habitat here likely to deter use			1.2 x 1.2 x 38	Unsuitable - large extent of wet habitat here likely to deter use		
A9 1150 C87	Milton Sheep Creep	7000	NH 89270 13700	1.9m diameter	Suitable - considered less likely to be disturbed by residential area	Unsuitable - human disturbance from residential area		2 x 2 x 34	To be enhanced with vegetative cover at entrances	Unsuitable - human disturbance from residential area	
A9 1150 C92	Milton Culvert	7090	NH 89307 13778	0.8m diameter	Unsuitable - in poor habitat	Unsuitable - human disturbance from residential area		1.2 x 1.2 x 44	Unsuitable - in poor habitat	Unsuitable - human disturbance from residential area	
A9 1150 C95	Steallan Dubh	7170	NH 89332 13856	2.4m diameter	Unsuitable - in poor habitat	Unsuitable - human disturbance from residential area		2.5 x 2.5 x 40	Unsuitable - in poor habitat	Unsuitable - human disturbance from residential area	
A9 1160	Milton Caravan Site Underpass	7250	NH 89359 13939	5.9m diameter	Suitable - considered less likely to be disturbed by	Unsuitable - human disturbance from residential area		5.8 x 4.8 x 26.1	Suitable - considered less likely to be disturbed by human use	Unsuitable - human disturbance from residential area	

Structure Code	Structure Name	Chainage	Grid Reference	Current Dimensions	Current Suitability for Red Squirrel (RS)	Current Suitability for Pine Marten (PM)	Current Suitability for Wildcat (WC)	Proposed Dimensions (width, height, length/m)	Potential Suitability for Red Squirrel	Potential Suitability for Pine Marten	Potential Suitability for Wildcat
					human use						
A9 1162 & A9 1163	Old Meall Road Underpass	7370	NH 89398 14054	9.6m span	Unsuitable - in poor habitat	Unsuitable - human disturbance from residential area		10 x 5.7 x 10	Unsuitable - in poor habitat and lighting of structure	Unsuitable - human disturbance from residential area and lighting of structure.	
A9 1150 C11/A9 1160 C14	Culvert 1	7470	NH 89429 14141	1m diameter	Unsuitable - in poor habitat	Unsuitable - wet and no mammal ledge, likely to deter use		1.2 x 1.2 x 74	Unsuitable - in poor habitat	Culvert will include mammal ledge; will include enhanced vegetative cover to encourage use	
A9 1170	Granish Underpass	8100	NH 89673 14718	3.8m diameter	Unsuitable - in poor habitat	Suitable - agricultural access, likely to be low levels of use		To be confirmed	Unsuitable - in poor habitat	Suitable - vegetative cover to encourage use	
A9 1170 C6	Shunem Culvert	8440	NH 89815 15019	0.9m diameter	Unsuitable - wet, small, no mammal ledge, likely to deter use			1.2 x 1.2 x 40	Unsuitable – no mammal ledge provided		
A9 1171*	Granish Junction Underpass	8750	NH 89962 15309	Not applicable	No current structure			26.5 x 6.7 x 15	Unsuitable - unlikely to cross here due to poor habitat on SB side	Unsuitable - heavy traffic	
A9 1170 C12	Allt Na Criche	9120	NH 90080 15651	1.6m diameter	Unsuitable - wet, small, no mammal ledge, likely to deter use			2.5 x 2.5 x 64.0	Culvert will be widened and will include mammal ledge; will include enhanced vegetative cover to encourage use		
A9 1170 C20	Avielochan 2	9880	NH 90234 16398	1.5m diameter	Unsuitable - wet, small, no mammal ledge, likely to deter use			1.2 x 1.2 x 46(+/-)	Unsuitable - large wet area unlikely to be used		
A9 1170 C23	Avielochan 4	10250	NH 90361 16742	1m diameter	Unsuitable - wet, small, no mammal ledge, likely to deter use			1.2 x 1.2 x 44(+/-)	Unsuitable - large wet (marshy) area unlikely to be used		
A9 1170 C32	Laggantygowan Creep Mammal Underpass	11220	NH 90874 17531	2.2m diameter	Unsuitable - in poor habitat		Suitable - underpass for mammals in agricultural land	Not applicable	Unsuitable - in poor habitat		
A9 1170 C50*	Allt Cnapach Culvert	12210	NH 91044 18519	1.6m diameter	Unsuitable - in poor habitat	Suitable - dimensions sufficient and in suitable habitat		2.5 x 2.5 x 44	Unsuitable - in poor habitat	Connective vegetative cover at entrances and on southbound side to be enhanced	
A9 1175*	New Underpass Ch. 12360	12360	NH 91051 18589	Not applicable	No current structure			8 x 3.5 x 40	Unsuitable - in poor habitat	Soft verge will be included, and connective vegetative cover on southbound side enhanced	
A9 1170 C53	Kinveachy Kennels Culvert	12610	NH 91077 18986	0.9m diameter	Unsuitable - in poor habitat		Unsuitable – considered to be too small	1.2 x 1.2 x 50	Unsuitable - in poor habitat		Unsuitable – no mammal ledge provided
A9 1177*	New Underbridge Ch. 14400	14400	NH 90780 20664	Not applicable	No current structure			8 x 5.3 x 27	To be enhanced with vegetative cover at entrances		
A9 1170 C75	Feith Mhor Culvert	14470	NH 90756 20740	2.1m diameter	Unsuitable - wet and no mammal ledge, likely to deter use			1.8 x 1.8 x 64	Culvert will be widened and include mammal ledge. In addition, a dry mammal pass will be provided adjacent to this structure of 1.8m x 1.8m dimensions. Both passages will include vegetative cover to encourage use		
A9 1170 C77	Crannaich 1 Culvert	14620	NH 90712 20876	1.6m diameter	Unsuitable - wet and no mammal ledge, likely to deter use			1.8 x 1.8 x 62	Culvert will be widened and will include mammal ledge; will include enhanced vegetative cover to encourage use		
A9 1170 C81	Crannaich 2 Culvert	15000	NH 90568 21241	1m diameter	Unsuitable - wet and no mammal ledge, likely to deter use		Unsuitable – considered to be too small	1.8 x 1.8 x 38	A dry mammal pass will be provided adjacent to this structure of 1.8m x 1.8m dimensions and will include enhanced vegetative cover to encourage use.		
A9 1180	Carrbridge Underpass	16550	NH 89708 22507	8.2m span	Unsuitable - public road			13 x 5 x 7.5	Passage possible at Dulnain Bridge	Unsuitable - in poor habitat	Passage possible at Dulnain Bridge

Structure Code	Structure Name	Chainage	Grid Reference	Current Dimensions	Current Suitability for Red Squirrel (RS)	Current Suitability for Pine Marten (PM)	Current Suitability for Wildcat (WC)	Proposed Dimensions (width, height, length/m)	Potential Suitability for Red Squirrel	Potential Suitability for Pine Marten	Potential Suitability for Wildcat
A9 1190	Dulnain Bridge	16610 - 16620	NH 89668 22547	80.5m span	Limited suitability - tree cover discontinuous in places	Unsuitable - in poor habitat	Suitable - wide area under bridge for passage which has vegetative cover	13 x 14 x 84	To be enhanced with additional vegetative cover along riparian zone	Unsuitable - in poor habitat	To be enhanced with additional vegetative cover along riparian zone
A9 1195*	New Underbridge Ch. 17020	17020	NH 89377 22840	Not applicable	No current structure			5.3 x 5.5 x 38	Unsuitable - in poor habitat		To include soft verge and be enhanced with additional vegetative cover at entrances
A9 1200	Baddengorm Bridge	17430	NH 89117 23152	13.7m span	Suitable - bridge likely to be accessed underneath - but current ledge often wet and would be inaccessible when river in spate			To be confirmed	Mammal ledge will be included - will be modified and retrofitted to existing structure - ledges will be raised from current level to avoid inaccessibility when in spate		
A9 1204*	Blackmount Junction Underpass	18810	NH 88116 24008	Not applicable	No current structure			41.8 x 6.1 x 46	RS may cross to get to high quality habitat on southbound side. Include soft verge and vegetative cover at entrances	Unsuitable - in poor habitat for PM and heavy traffic may deter WC	
A9 1208*	New Underpass Ch. 20710	20710	NH 86333 23875	Not applicable	No current structure			8 x 5.3 x 33	Unsuitable - unlikely to aid dispersal as wider area on northbound side includes extensive bog		
A9 1210	Slochd Beag Bridge	21760	NH 85185 23885	145m span	Suitable - large bridge to allow access underneath along railway embankment and away from public road, although may lack cover in places			140 x 45 x 15	To be enhanced with vegetative cover at entrances		
A9 1206 F	Slochd Summit 2 Footbridge	23350	NH 84045 24926	1.8m span	Unsuitable - wet and no mammal ledge, likely to deter RS use	Unsuitable - in poor habitat	Unsuitable - wet and no mammal ledge, likely to deter WC use	To be confirmed	Mammal ledge will be included, connective vegetative cover to be enhanced encourage use	Unsuitable - in poor habitat	Mammal ledge will be included, connective vegetative cover to be enhanced encourage use
	NMU/maintenance underpass	23580	NH 84053 25044	Not applicable	No current structure			To be confirmed; headroom to be 3.65m	Unsuitable – to be permanently lit	Unsuitable - in poor habitat	Unsuitable – to be permanently lit
A9 1210 C39	Slochd Mor 1 Culvert	23920	NH 83762 25398	2.2m span	Unsuitable - in poor habitat			To be confirmed	Unsuitable - in poor habitat		
A9 1207 F	Slochd Summit 3 Footbridge	23930	NH 83741 25396	3m span				To be confirmed			
A9 1208 F	Slochd Summit 4 Footbridge	24120	NH 83597 25510	1.5m span				To be confirmed			
	New Underpass Ch. 24200	24320	NH 83471 25653	Not applicable				To be confirmed			
A9 1210 C46	Slochd Mor 3 Culvert	24340	NH 83486 25669	1.6m diameter				To be confirmed			
A9 1209 F	Slochd Summit 5 Footbridge	24320	NH 83439 25663	1.2m span				To be confirmed			