11 Habitats and Biodiversity

This chapter assesses the potential impact of the proposed Scheme on terrestrial and freshwater species and habitats. This ecological impact assessment is presented in context of the dualling of the A96 between Inverness and Nairn (including Nairn bypass) and was carried out in accordance with all relevant legislation and guidelines. The approach is based on Design Manual for Roads and Bridges (DMRB) and the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance.

The study area was defined as the proposed Scheme footprint plus a 500m buffer to create a 1km wide survey area, with variations to take into account standard survey guidance for specific ecological features.

Arable land and other types of farmland comprise the majority habitat types within the ecology study area together with other areas of semi-natural habitats represented by woodland, marshy grassland, wet heath and freshwater habitats. Some of these are valuable habitat supporting protected species including badgers, bats, breeding birds, red squirrels, otters and water voles.

There are four sites designated for nature conservation in the vicinity of the proposed scheme; the Inner Moray Firth Special Protection Area (SPA), Loch Flemington SPA, Longman and Castle Stuart Bays Site of Special Scientific Interest (SSSI) and Kildrummie Kames SSSI. Areas of Ancient Woodland Inventory (AWI) habitat are also present within the ecology study area.

Potential impacts will be mitigated through the application of best practice guidance for construction and operation together with specific measures such as provision of bat boxes, creation/enhancement of habitats through replacement planting, and inclusion of fencing to direct animals to safe crossing points. The proposed Scheme also includes embedded mitigation as part of the design such as dry mammal underpasses and an enhanced overbridge.

There are no significant long-term negative residual impacts on terrestrial or freshwater receptors following implementation of proposed mitigation measures.

Significant positive residual impacts are anticipated with increased safe permeability for species including badger and otter through provision of suitably designed crossing locations.

11.1 Introduction

11.1.1 This chapter presents the results of the DMRB Stage 3 Ecological Impact Assessment (EcIA) for the A96 Dualling Inverness to Nairn (including Nairn Bypass) scheme (hereafter referred to as the proposed Scheme) in relation to impacts on terrestrial and freshwater species, habitats and ecosystems.

11.1.2 Assessment of the proposed Scheme has been undertaken in context of it being a proposal to dual the A96 between Inverness and Nairn (including Nairn Bypass). Some potential impacts on ecological features associated with road operations are already experienced by the species and habitats in some of the areas from the adjacent existing A96. However, there are potential additional impacts as the route is offline such as (but not limited to):

- habitat loss;
- severance of animal commuting routes; and
- disturbance.

11.1.3 The chapter is supported by the following appendices and figures which are cross referenced where relevant:

- Appendix A11.1 (Legislation and Policy Framework);
- Appendix A11.2 (Ecological Methods and Baseline);
- Appendix A11.3 (Mitigation Protocol);
- Appendix CA11.1 (Confidential Appendix – Badger and Otters);
- Figure 11.1 (Ecological Designations);
- Figure 11.2 (Phase 1 Habitat);
- Figure 11.3 (Bat Habitat Assessment);

- Figure 11.4 (Bat Transect Activity 2015);
- Figure 11.5 (Bat Transect Activity 2016);
- Figure 11.6 (Protected Species);
- Figure 11.7 (Breeding Bird Survey Sectors);
- Figure 11.8 (Wintering Birds – Greylag Goose Foraging Distribution);
- Figure 11.9 (Wintering Birds – Pink-Footed Goose Foraging Distribution);
- Figure 11.10 (Aquatic Surveys);
- Figure C11.1 (Badger Activity (confidential));
- Figure C11.2 (Otter Activity (confidential));and
- Figure 9.5 (Landscape and Ecological Mitigation).

11.1.4 Appendix A11.2 (Ecological Methods and Baseline) also includes details of species' scientific (Latin) names.

11.1.5 Appendix CA11.1 (Confidential Appendix – Badger and Otters) is not published with the Environmental Statement due to the potential risk to protected species from locational data being publicly available. These data will be submitted as a confidential report to Scottish Natural Heritage (SNH) and Transport Scotland.

11.1.6 The aims of this EcIA are to:

- identify the presence and status of species, habitats and ecosystems (ecological features) of conservation significance within the study area through consultation, desk-based research and field surveys;
- evaluate the importance of ecological features;
- identify any anticipated potential impacts;
- present hierarchical mitigation measures to address the identified potential impacts; and
- assess the residual impacts following the assumed successful implementation of any required mitigation (during and post construction).

11.1.7 Further considerations related to the habitats and biodiversity assessment are addressed separately within the following chapters:

- Chapter 7 (Air Quality);
- Chapter 9 (Landscape);
- Chapter 12 (Geology, Soils, Contaminated Land and Groundwater); and
- Chapter 13 (Road Drainage and Water Environment).

Legislative and Policy Background

11.1.8 Appendix A18.1 (Planning Policy Context for Environmental Assessment) describes the planning policies and guidance from national to local level which are relevant to Habitats and Biodiversity. An assessment of the compliance of the proposed Scheme against all development plan policies relevant to this environmental topic is reported in Appendix A18.2 (Assessment of Development Plan Policy Compliance) and a summary overview is provided in Section 18.4 (Assessment of Compliance) in Chapter 18 (Policies and Plans).

11.1.9 The legislative background for this chapter is a combination of international conventions and directives and national legislation designed to protect wildlife. Full details can be found in Appendix A11.1 (Legislation and Policy Framework), however the principal legislative framework for the EcIA include:

- The Wildlife and Countryside Act 1981 (as amended) (WCA) (including updates in Scotland);
- Protection of Badgers Act 1992 (as amended by WANE);
- The Conservation (Natural Habitats, &c.) Regulations (1994) (as amended in Scotland);
- The Water Framework Directive (European Council Directive 2000/60/EC);
- The Nature Conservation (Scotland) Act 2004;
- Establishing measures for the recovery of the stock of European eel (European Council Regulation 1100/2007);
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- Wildlife and Nature Conservation (Scotland) Act WANE 2011 (WANE); and
- Directive 2014/52/EU of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment (2014).

11.1.10 Alongside this DMRB Stage 3 EcIA, a Habitats Regulations Assessment (HRA) (Jacobs 2016) has been undertaken of the proposed Scheme. The HRA considers the implications of the proposed Scheme on the conservation objectives of European/Ramsar sites. Likely significant effects related to wintering birds and breeding Slavonian grebe were identified within the HRA but, after the application of mitigation and further assessment, it was considered that adverse effects on site integrity were unlikely.

11.2 Methodology

Approach to the Assessment

11.2.1 The approach to this assessment is based on the guidance provided in:

- DMRB Volume 11, Section 2, Part 5: HA 205/08 Assessment and Management of Environmental Effects (Highways Agency Scottish Executive, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2008);
- DMRB Volume 11, Section 3, Part 4: Ecology and Nature Conservation (Highways Agency, Scottish Executive Development Department, Welsh Assembly Government and The Department of Regional Development 1993);
- DMRB Interim Advice Note 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment' (Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2010) (hereafter referenced as IAN130/10); and
- the Chartered Institute for Ecology and Environmental Management's Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition (CIEEM 2016 supersedes the IEEM (2006) guidelines).

11.2.2 In addition to DMRB and CIEEM guidance, other policy documents and published guidance taken into account in the preparation of this chapter include:

- Scottish Transport Appraisal Guidance (STAG) (Transport Scotland 2014);
- Planning for Natural Heritage: Planning Advice Note 60 (Scottish Executive 2000);
- Planning Advice Note 1/2013: Environmental Impact Assessment (Scottish Government 2013a); and
- SNH handbook on environmental impact assessment (SNH 2013a).

Baseline from Field Survey

Study Area

11.2.3 The study area for DMRB Stage 3 comprised an area up to 500m from the centre line of the proposed Scheme, creating a 1km-wide survey area (Figure 11.1) in line with DMRB guidance (Highways Agency, Scottish Executive Development Department, Welsh Assembly Government and The Department for Regional Development 2001a) which states that survey width should be dependent on the habitats and species present and on the scale and extent of the proposed Scheme.

11.2.4 Variations were made to the study area for specific features depending on sensitivity, mobility and habitat range and were undertaken in line with current standards (see below and Appendix A11.2: Ecological Methods and Baseline).

Desk Study

11.2.5 A desk study for DMRB Stage 3 was undertaken to review existing relevant literature and to obtain ecological information within the study area and the wider area. This included data collated to inform the A96 Dualling Inverness to Nairn (including Nairn Bypass) DMRB Stage 2 Assessment Report (Jacobs 2014):

- survey data from Scottish Badgers (Appendix CA11.1: Confidential Appendix – Badger and Otters);
- aquatic data from Scottish Environment Protection Agency (SEPA) (where available); and
- protected species information from SNH (Appendix CA11.1: Confidential Appendix – Badger and Otters).

11.2.6 Phase 1 habitat data collected as part of the DMRB Stage 2 assessment (Jacobs 2014) was also used to inform the DMRB Stage 3 assessment.

11.2.7 Further information for the desk study was obtained from the following online resources and direct consultation:

- Joint Nature Conservation Committee (JNCC) website (JNCC 2016);
- National Biodiversity Network (NBN) gateway website (National Biodiversity Network 2016);
- Saving Scotland's Red Squirrels (Saving Scotland's Red Squirrels 2016);
- Scotland’s Environment website (Scotland’s Environment Web Partnership 2016);
- SEPA River Basin Management Plans Interactive Map (RBMP) (SEPA 2013);
- Environment Agency (EA) River Habitats Survey Data Map (EA 2016);
- SNH Information Service (SNH 2016a);
- Findhorn, Lossie and Nairn Fisheries Trust (FNLFT 2015);
- Corn Bunting data from Royal Society for the Protection of Birds (RSPB); and
- Deer Vehicle Collision (DVC) data from BEAR Scotland.

11.2.8 NBN searches were taken up to 10km from the proposed Scheme to take into account the highly mobile nature of some species and the level at which some data are available (10km grid square). Further details of NBN datasets used and the licensing arrangements are provided in Appendix 11.2.

Field Surveys

11.2.9 All field surveys were undertaken according to standard methods and best practice guidelines, with variations where necessary to take into account local conditions and/or DMRB Stage 3 design of the proposed Scheme. Full details of field surveys can be found in Appendix A11.2 (Ecological Methods and Baseline), and summarised details are provided below in Table 11.1. Phase 1 habitat surveys undertaken in 2015 targeted key habitat areas and gaps in the data from previous surveys (Jacobs 2010 and 2013). Previously collected Phase 1 habitat information was ground-truthed to capture any changes.

Table 11.1: Summary of Field Surveys Undertaken

Survey Type	Guidance	Dates of Survey	Area Covered
Phase 1 habitat surveys	JNCC (2010)	August to September 2015	Targeted sites and ground-truthing up to 500m buffer either side of the proposed Scheme centreline.
Otter	Chanin (2003) Highways Agency, Scottish Executive Development Department, The National Assembly for Wales and The Department for Regional Development (2001b)	October to November 2015	250m up and downstream of watercourse crossings (100m on small watercourses).
Bats	Hundt (2012) Collins (2016) Surveys in 2015 followed the Bat Conservation Trust (BCT) 2nd edition of the Good Practice Guidelines (Hundt, 2012) and surveys in 2016 followed the 3rd edition of the BCT Guidelines, where appropriate, which were published in February 2016 (Collins 2016). The appropriate versions are referred to where relevant in Appendix A11.2: Ecological Methods and Baseline.	September 2015 to July 2016	Roost surveys were undertaken within a 50m-wide buffer from the proposed Scheme footprint. Transects and passive monitoring were undertaken within a 100m buffer either side of the proposed Scheme centreline. Passive recorders were installed at various locations within 100m of the footprint o the proposed Scheme to measure bat activity within different habitat types and gain an understanding of the way in which bats were using the landscape. The following habitat types were surveyed: • Edge (e.g. woodland edge, wide forest rides, hedgerows, railway corridors); • Closed (e.g. narrow forest rides or closed canopy woodland), open (e.g. over 200m from edge habitat, with no strong linear features in the vicinity);and, • Riparian (e.g. associated with watercourses).
Water vole	Strachan, Moorhouse and Gellino (2011)	October to November 2015	100m-wide buffer either side of the proposed Scheme centreline.
Badger	SNH (2003) Highways Agency, Scottish Executive, Development Department, The National Assembly for Wales and The Department for Regional Development (2001c) Reynolds and Harris (2005) Delahay, Brown, Mallinson, Spyvee, Handoll, Rogers and Cheesman (2000	December 2015 to March 2016	Walkover surveys within 500m-wide buffer either side of the proposed Scheme centreline. Bait marking surveys within 500m radius of selected main setts.

Survey Type	Guidance	Dates of Survey	Area Covered
Pine marten	N/A	August 2015 to March 2016	Habitat suitability and incidental records within the 500m-buffer either side of the proposed Scheme centreline.
Red squirrel	N/A	August 2015 to March 2016	Habitat suitability and incidental records within the 500m-buffer either side of the proposed Scheme centreline.
Great crested newt (GCN) Habitat Suitability Index (HSI) Environmental Deoxyribose Nucleic Acid (eDNA)	ARG UK (2010) Oldham, Keeble, Swan and Jeffcote 2000) O'Brien and Hall 2012 Jehle, Orchard and Barratt 2013 Biggs, Ewald, Valentini, Gaboriaud, Griffiths, Foster, Wilkinson, Arnett, Williams and Dunn (2014)	June to July 2015	Ponds within a 500m wide buffer either side of the proposed Scheme centreline.
Reptiles	Sewell, Griffiths, Beebee, Foster and Wilkinson (2013) Froglife (1999) Highways Agency Scottish Executive, Welsh Assembly Government and The Department for Regional Development Northern Ireland (2005)	July to October 2015	Suitable habitat (Edgar, Foster and Baker 2010) under the footprint of the proposed Scheme and a 50m buffer either side of the proposed Scheme centreline.
Breeding bird surveys	Bibby, Burgess, Hill and Mustoe (2000)	June and July 2015	250m either side of the proposed Scheme centreline.
Wintering bird surveys	Keller, Gallo-Orsi, Patterson and Naef-Daenzer (1997) Patterson, Lambie, Smith and Smith (2013)	January 2014 to March 2014 October 2014 to April 2015	Areas of suitable habitat adjacent to the proposed Scheme. Survey approach was discussed and agreed with SNH (Jacobs 2015a).
Aquatic habitat assessments	N/A	June and July 2015	Watercourses within a 250m buffer to either side of the proposed Scheme.
River Habitat Surveys (RHS)	EA (2010)	August 2015	Three watercourses, in areas of suitable habitat within a 250m buffer to either side of the proposed Scheme.
Freshwater fish	Scottish Fisheries Co-ordination Centre (SFCC) (2007a and 2007b)	August 2015	Three watercourses, in areas of suitable habitat within a 250m buffer to either side of the proposed Scheme.
Aquatic macroinvertebrate surveys	EA (2012) ISO 7828 (1994) EA (2008) ISO 10870 (2012)	August and October 2015	Thirteen watercourses, in areas of suitable habitat within a 250m buffer to either side of the proposed Scheme.
Macrophyte surveys	Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG) (2014)	August 2015	Six watercourses, in an area of suitable habitat adjacent within a 250m buffer to either side of the proposed Scheme.
Pond survey	Pond (Action 2002)	August 2015	Seven ponds within a 250m buffer to either side of the proposed Scheme.

11.2.10 The presence of existing deer fencing within the study area was also recorded during surveys.

11.2.11 Lab-based analysis was also undertaken with regard to aquatic plant and macroinvertebrate samples to identify species and calculate ecological/site condition metrics; for further details refer to Appendix A11.2 (Ecological Methods and Baseline).

11.2.12 Incidental records and information taken from the landowners consultation were used to identify the presence of any other ecological features of conservation interest.

Impact Assessment

11.2.13 In accordance with CIEEM (2016), the impact assessment focused on important ecological features. Importance of ecological features in the study area, and the nature of potential impacts on important features (including duration, extent and reversibility), are defined using the criteria set out below.

Importance

11.2.14 The general approach to defining the importance of ecological features followed CIEEM guidelines (CIEEM 2016). The approach was also in line with advice given in DMRB Interim Advice Note 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment' (Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2010). Criteria for importance of ecological features are shown in Table 11.2 below. Ecosystems, habitats and species were assigned levels of importance for nature conservation based on these criteria. The list of examples provided in Table 11.2 is not exhaustive. Ecological features which did not meet the criteria for at least 'authority' importance were assessed as being of 'less than authority'.

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

Table 11.2: Importance Criteria for Ecological Features

Importance	Criteria	Example of Ecological Feature
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	**Ecosystems and Habitats** • internationally designated areas; or • rivers classified as High Status under the Water Framework Directive (WFD); or • smaller watercourses that are undesignated but which are connected to, or have functionally important habitat for internationally designated areas. **Species** • a host species for another, viable and internationally important population of a species of international conservation concern (e.g. brown trout is a host for freshwater pearl mussel); or • any regularly occurring population of an internationally important species, which is threatened or rare in the UK (such as certain populations of Annex I bird species).
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	**Ecosystems and Habitats** • nationally designated site, e.g. a Site of Special Scientific Interest (SSSI); • areas of land or water that are important in maintaining the viability of a nationally important population or key habitat in the wider area; or • a viable area of a priority habitat identified as requiring conservation action in the Scottish Biodiversity List (SBL). **Species** • a regularly occurring population/number of a nationally important species; or • any species that is a qualifying feature of a nationally designated site.

Importance	Criteria	Example of Ecological Feature
	biodiversity and ecosystems at a national level, as defined in the Scottish Biodiversity Strategy (SBS) (Scottish Government 2013b and 2015).	
Regional	**Ecosystems and Habitats** *Ecosystems or habitats essential for the maintenance of:* • communities and assemblages that occur within regionally important sites or localities listed as being of conservation importance in the Highland Biodiversity Action Plan (BAP) (Highland Environment Forum 2015) or within undesignated areas that meet the criteria for such designation; • key habitat systems listed in the Highland BAP (Highland Environmental Forum 2015); 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 (Highland Environment Forum 2015)	**Ecosystems and Habitats** • areas that support key habitats as highlighted within the Highland BAP (Highland Environment Forum 2015), whether designated or undesignated; or • any river classified as Good Status or above under the WFD and capable of supporting salmonid populations. **Species** • any regularly occurring population of a species listed on a regional BAP; or • any species listed on the Moray Firth SNH Natural Heritage Futures area as a characteristic terrestrial species (SNH 2002 and 2009a).
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 at authority area level, as defined for in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004)	**Ecosystems and Habitats** • individual semi-natural ancient woodland sites that are greater than 0.25ha, but which are not linked to a wider network of ancient woodland sites **Species** • any regularly occurring, locally significant population of a species that is listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004)

11.2.16 The importance of bats and associated ecological features throughout the proposed Scheme was determined using the guidance set out in 'Valuing Bats in Ecological Impact Assessment' (Wray, Wells, Long and Mitchell-Jones 2010).

11.2.17 Deer and invasive non-native species (INNS) were scoped out from ecological evaluation due to their lack of conservation status. Deer are discussed in this chapter in the context of potential for Deer Vehicle Collisions (DVCs) during the operational phase of the proposed Scheme, which could have implications regarding human safety and animal welfare. INNS are discussed in the context of their potential as a risk to biodiversity and, under the WCA, legal responsibilities to prevent their transfer.

Impact Magnitude

11.2.18 Once a feature's importance had been determined, consultation responses, previous project experience (knowledge and assessment of construction methods and operational activities), and professional judgement were used to identify the potential impacts of the proposed Scheme on ecological features.

11.2.19 For the purposes of this assessment, the term 'impact magnitude' is taken to represent the overall characterisation of positive or negative impacts in accordance with DMRB guidance, Volume 11, Section 2, Part 5 HA205/08 Assessment and Management of Environmental Effects (Highways Agency Scottish Executive, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2008), 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).

11.2.20 The magnitude (and character) of impacts is defined using the criteria set out in Table 11.3. Impact magnitude was identified as high, medium, low or negligible, taking into account the above impact characterisation approach.

Table 11.3: Impact Magnitude and Characterisation for Ecological Features

Impact Magnitude	Impact Characterisation
High	A permanent effect on the distribution and/or abundance of a habitat, species assemblage/community or population. A permanent effect is one which results in changes to the distribution of habitats over more than one season, one which changes the availability of critical habitats for a species over multiple generations, changes to the fecundity of a species, or one which has the potential to affect an entire cohort of juveniles of a species. 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	A long-term but reversible effect on the distribution and/or abundance of a habitat, species assemblage/community or population, such as an effect that changes the distribution of habitats that are replaceable within the lifetime of the proposed Scheme, in either form or ecosystem function, but not within a single season or life cycle of any species that depends on such habitats. Also applies to changes the distribution of a species rendering it able to re-colonise a habitat, but not within a single season or life cycle. 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	A short-term reversible effect on the distribution and/or abundance of a habitat, species assemblage/community or population, and one which within normal fluctuations observed in the ecology of the feature.
Negligible	A short-term reversible effect on the distribution and/or abundance of a habitat, species assemblage/community or population, unlikely to be detectable by monitoring, and is therefore not referenced as a magnitude in Table 11.5.

Impact Significance

11.2.21 In general accordance with CIEEM (2016) and the preceding guidance (IEEM 2006), a significant impact is an impact (negative or positive) on the integrity of a defined site or ecosystem and/or on the conservation status of habitats and species. Significance of impacts is also determined taking cognisance of relevant DMRB (IAN130/10, Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2010), and SNH (2013a) guidance.

11.2.22 Integrity is the coherence of ecological structure and function, across a site's whole area, which enables it to sustain a habitat, complex of habitats and/or the levels of populations of species. 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

11.2.23 The impact significance terms are explained below (Table 11.4) and take cognisance of DMRB (IAN130/10, Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2010), CIEEM (2016) and SNH (2013a) guidance.

Table 11.4: Description of Significance Categories

Significance Category	Typical Description
Major	Associated with features of international, national or regional importance. Likely to be a damaging impact or loss of integrity. Effects likely to be permanent and irreversible resulting in a loss of structure and/or function. If beneficial, they will have a significant positive effect on the international, national or regional feature.
Moderate	Associated with features of international, national, regional or authority area importance. Likely to be a damaging impact or loss of integrity. Effects are likely to be long-term but reversible. If beneficial, they will have a significant positive effect on the international, national or regional feature.
Minor	Associated with features of regional, or authority area importance. Likely to be a damaging impact or loss of integrity. Effects are likely to be short-term and reversible. If beneficial, they will have a significant positive effect on the regional or authority area feature.
Negligible	No detectable effects. Effects may also be within the normal bounds of variation for a feature.

11.2.24 In accordance with DMRB (IAN130/10, Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2010), the above magnitude and importance information is taken together and applied to a matrix to categorise the significance of an impact (Table 11.5). Professional judgement is relied on to decide on the most appropriate category to apply to an impact. Impacts can be adverse or beneficial, either decreasing or improving the health, ecological status or viability of a population, species or habitat.

11.2.25 Only impacts on important ecological features (authority area importance or above) were progressed through the detailed assessment process. For example, an area of amenity grassland would be evaluated as of less than authority area ecological importance, and would not progress through the assessment process as this only includes features of authority area importance or above. However, any impact on a SSSI would progress through the assessment process as such sites are designated as nationally important. Detailed mitigation would, however, be required to be developed during pre-construction to ensure that any potential breaches of legislation are avoided, regardless of significance, a feature's importance or significance of impact (e.g. damage to active birds' nests).

11.2.26 Where impacts were assessed as being Major or Moderate these were considered to be potentially significant under the terms of the EIA Regulations, and would require further assessment and development of mitigation to reduce impacts where feasible.

Table 11.5: Impact Significance

Importance \ Magnitude	High	Medium	Low
International	Major	Major	Moderate
National	Major	Moderate	Moderate
Regional	Major	Moderate	Minor
Authority area	Moderate	Minor	Negligible

Mitigation

11.2.27 Potential mitigation measures have been considered during this assessment and take into account best practice, legislation, guidance and professional experience.

11.2.28 As described in Chapter 1 (Introduction) and Chapter 5 (Overview of Assessment) the mitigation commitments and monitoring frameworks identified in the Strategic Environmental Assessments (SEAs) for the Strategic Transport Projects Review (STPR) (Jacobs, Faber Maunsell, Grant Thompson and Tribal Consulting 2008) and A96 Dualling Programme (CH2M 2015 and 2016) have also been taken into consideration in relation to the mitigation proposals.

11.2.29 The mitigation commitments relevant to habitats and biodiversity detailed within the STPR SEA include:

- areas of recognised biodiversity importance should, where practicable, be avoided and the location of new infrastructure should recognise the presence of any protected species and habitats. It should also be designed to avoid or limit the fragmentation of habitats, including non-designated habitats where appropriate;
- all potential adverse effects on European designated sites should be avoided;
- landscape maintenance should be undertaken by means that conserve, and where possible enhance, the development of species and their habitats which are protected or of high nature conservation interest in or adjacent to interventions;
- land drainage characteristics necessary to support a diverse flora and fauna or particular species of interest already found on the site should be conserved; cumulative effects of interventions should be considered, particularly where they share a common or closely associated corridor; and
- habitats, including (without limitation) native woodland, woodland edge, wetlands, species rich grassland and heathland, rock and scree should be managed so as to conserve, and where possible enhance their nature conservation value. All underpasses and over structures should be designed and located so as to maximise the opportunity for wildlife crossing, so assisting in reducing fragmentation, whilst not impairing the function of the structure. The provision of vegetated margins should be considered and all opportunities should be taken for locating suitable structures as close as practicable to likely wildlife crossing points.

11.2.30 The mitigation commitments relevant to habitats and biodiversity detailed within the A96 Dualling Programme SEA include:

- local ecology surveys at later design stages will inform locally appropriate mitigation and species management plans;
- seek to avoid designated sites and other important areas for nature conservation wherever possible in design and option development;
- maintain species and habitat connectivity where possible
- watercourse crossing designs to avoid or minimise land-take or works affecting the riparian zone;
- crossing locations to avoid areas that could adversely impact important salmon spawning or juvenile habitats;
- in-channel structures and works will be avoided within all watercourses where possible;
- avoidance will be adopted for introduction of new/ permanent in-channel barriers to salmon passage and percussive construction works in proximity to the key rivers during sensitive salmon migration periods;
- road alignment to minimise habitat fragmentation where habitat loss is unavoidable;
- road design to incorporate appropriate species crossing infrastructure to minimise habitat fragmentation and severance;
- key mitigation measures would include underpasses and wildlife bridges, habitat restoration and creation of new areas of native woodland;
- where AWI/native woodland is unavoidable, aim to minimise fragmentation and maintain woodland integrity and connectivity;
- where avoidance of forestry is not possible, consideration must be given to management of forestry waste and appropriate guidance followed; and
- further screening of the potential for options to affect Special Areas of Conservation (SACs) and SPAs (Natura sites) would be required at subsequent stages of design and agreed with Scottish Natural Heritage.

11.2.31 The specific mitigation measures in relation to the proposed Scheme are discussed further in Section 11.5 (Mitigation).

Consultation

11.2.32 A summary of the consultation process is provided in Chapter 6 (Consultation and Scoping). Consultation included agreement on the survey scope, methods and study areas for the assessed features, with input from the following key statutory consultees:

- SEPA;
- SNH; and
- The Highland Council.

11.2.33 SNH advised that slender naiad, a European protected species present in Loch Flemington, should be included within the screening/scoping report for the proposed Scheme (SNH 2015a).

Limitations

11.2.34 Land access constrained surveys for one species group, a summary of this is given below with further details presented in Appendix A11.2 (Ecological Methods and Baseline).

11.2.35 In relation to breeding birds, only one survey visit was conducted at each sector due to seasonal constraints due to lack of land access. However targeting of key habitat areas meant that sufficient data were gathered to provide a widespread indication of the species assemblage present throughout the proposed Scheme area. In addition to this a precautionary approach was taken for breeding birds throughout the assessment.

11.3 Baseline Description and Evaluation

11.3.1 This section summarises the existing ecological conditions that have been determined through a combination of desk study, consultation and field surveys shown in Table 11.6. Detailed information can be found in Appendix A11.2 (Ecological Methods and Baseline), on Figure 11.1 to Figure 11.10, in Appendix CA11.1 (Confidential Appendix – Badger and Otters), and in supporting Figures C11.1 and C11.2).

11.3.2 The legal and conservation status of these ecological features is provided in Table 11.6 along with a short justification for the assigned conservation importance of each feature. Further detail is included within Appendix A11.1 (Legislation and Policy Framework).

A96 Dualling: Strategic Environmental Assessment

11.3.3 The Programme SEA Tier 2 Environmental Report (CH2M 2015) was published in 2015 and the Post Adoption Statement (CH2M 2016) in 2016, and includes key findings in relation to biodiversity regarding Key Local Issues and Strategic Mitigation. These are in accordance with good practice guidance in road design and the consideration of biodiversity and conservation interests. The outcomes and guidance of the SEA were reviewed and taken into consideration as part of the Habitats and Biodiversity impact assessment and mitigation proposals.

11.3.4 The Strategic Mitigation principles are summarised above (paragraph 11.2.29). The specific SEA Key Local Issues that relate to the proposed Scheme are summarised below:

<u>Key Local Issues</u>

- Internationally and nationally designated sites are present throughout the study area.
- Scottish AWI and Native Woodland Survey of Scotland (NWSS) sites are found throughout the study area.
- Loss of woodland, some of which is specifically managed to encourage habitat for key species.

- Greater cognizance should be attributed to the role and value of trees, woodland and forests, minimizing the removal of woodland and/or loss of important connectivity between woodlands for biodiversity and wildlife habitat purposes.
- Large populations of wildlife some of which are endangered, with concerns over the protection of these species, during and after construction.
- The protection of plant and tree species which are indigenous to specific areas within the dual carriageway alignment.

Biodiversity Action Plans

11.3.5 The study area for the proposed Scheme is covered by the regional Highland BAP 2015 - 2020 (Highland Environmental Forum 2015). This contains a number of local plans for each of the Highland Council's administrative areas, of which the Inverness and Nairn BAP is relevant to the study area (Inverness and Nairn Biodiversity Group 2004).

11.3.6 The Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004) includes: 34 habitats in six broad groups, 26 plants (vascular plants, bryophytes and lichens), 21 mammals, 62 birds and 14 species of fish, some of which are within the study area and could be potentially affected by the proposed Scheme (Table 11.6).

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Table 11.6: Legal Status, Baseline and Evaluation of Terrestrial and Aquatic Features

Features	Legal/BAP Status	Baseline	Justification	Importance
Designated Sites				
Inner Moray Firth SPA (8515) NH 672528, NH 580480, NH 800590, NH 705473, NH 730500 (JNCC 2015b)	Natura 2000 site under Conservation (Natural Habitats, &c) Regulations 1994 (as amended in Scotland)	Four statutory designated sites (Table 11.6) lie within the study area (Figure 11.1). No additional sites that lie outside the 500m study area, were assessed as being likely to be affected by the proposed Scheme. There are no locally designated sites of nature conservation interest identified within the study area.	A 2339.23ha site designated for its non-breeding bird assemblage (including wintering and migrating geese, ducks and waders), breeding common tern and feeding area for osprey. Comprises the Beauly Firth and Inverness Firth which together form the easternmost estuarine component of the Moray Basin ecosystem (SNH 2016c). The site includes two bays (Longman and Castle Stuart) to the east of Inverness which are coincident with the Longman and Castle Stuart Bays SSSI.	International
Loch Flemington SPA (8527) NH 810520 (JNCC 2015b, SNH 1996, Jacobs 2015a)			A 21ha site designated for breeding Slavonian grebe. Loch Flemington SPA is a small, shallow eutrophic loch 8km south-west of Nairn. The site is of special nature conservation and scientific importance because it supports a nationally important population of breeding Slavonian grebe, however it has not been known to have bred at the site since 2005 and the site is now classed as being in an unfavourable condition. Within the EC this species breeds only in Britain, Sweden and Finland, and because of its rarity it is listed as requiring special conservation measures under Article 4.1 of The Wild Birds Directive (SNH 2016d). The SPA lies within the Kildrummie Kames SSSI (see below).	National
Longman and Castle Stuart Bays SSSI (1675) NH 715496 (SNH 2008a)	Designated under the Nature Conservation (Scotland) Act 2004		A 421.5ha site designated for its non-breeding bird assemblage, eelgrass beds, mudflats and saltmarsh. Longman and Castle Stuart Bays sweep north-eastwards from Inverness for approximately 8km to Fisherton. The site extends across the same area as the Inner Moray Firth SPA. The intertidal mudflats of Longman and Castle Stuart Bays support a diverse assemblage of wintering wildfowl and waders (SNH 2016e). SNH indicated that the site is close to an area of major current and proposed industrial, retail, amenity and residential development, and that these could lead to impacts on the quality of water entering the site and to disturbance of wintering birds.	National
Kildrummie Kames SSSI (845) NH830530 (SNH 2009b)			A 641.83ha site designated for its freshwater habitats (eutrophic loch), juniper scrub, open water transition fen and for its Quaternary geology and geomorphology (Quaternary of Scotland). Kildrummie Kames SSSI lies approximately 15km east of Inverness and 7km south-west of Nairn. It is important for its glacial landforms and biological features (SNH 2016f). Loch Flemington is in an unfavourable condition due to presence of invasive species. Great crested newts have been reported from the loch. The juniper scrub is also in an unfavourable condition due to lack of regeneration. In their site management statement for the Kildrummie Kames SSSI, SNH pointed out that the site falls within the A96 Corridor Master Plan and would be adjacent to a proposed new town at Tornagrain. SNH further indicated that increased recreation and access would need to be carefully managed to avoid disturbance to breeding Slavonian grebes.	National
Habitats and Plant Species				
AWI woodland (3 'Other' (on Roy map)) River Nairn Woodland East	AWI is regarded as an important and irreplaceable national resource. Actions for ancient woodland have also been identified in the Highland BAP (Highland Environment Forum 2015) to protect relict areas. Lowland mixed deciduous and wet woodland are listed on the SBL. Wet and riparian woodlands are listed on Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004). Actions for riparian woodland have also been identified in the Highland BAP (Highland Environment Forum 2015).	Over 404ha of woodland listed on the AWI (SNH 2008b) falls within the study area. There were two areas of category 3 woodland 'Other (on Roy map)', equivalent to 3% of all AWI woodland in the study area. One area of 4.4ha was located on either side of the River Nairn, south of the town of Nairn (Figure 11.1) (Target Note 35 within Figure 11.2 and Appendix A11.2: Ecological Methods and Baseline), whilst the other was at Boath House, Auldearn (6.8ha). There was also one small area (0.6ha, approximately 0.1%) of Category 2a 'Ancient (of semi-natural origin)' woodland to the south of Howford Bridge at the edge of the study area (Figure 11.1). The NWSS and AWI categories can be found in all relevant Target Notes in Appendix A11.2 (Ecological Methods and Baseline).	AWI habitat is classed as an important and irreplaceable national resource that should be protected and enhanced, as should other native and long established woodlands with high nature conservation value (SNH undated). The Scottish Government's policy on control of woodland removal states that there is a strong presumption against removing ancient semi-natural woodland or plantations on ancient woodland sites. The woodland is species-rich and contains eight potential ancient woodland indicators.	National
AWI woodland (3 'Other' (on Roy map)) River Nairn Woodland West AWI woodland (2b LEPO)	AWI is regarded as an important and irreplaceable national resource. Actions for ancient woodland have also been identified in the Highland BAP (Highland Environment Forum 2015) to protect relict areas. Lowland mixed deciduous, wet woodland and native pine woodland are listed on the SBL. Wet, riparian and native pine woodlands are listed on Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004). Actions for riparian woodland have also been identified in the Highland BAP (Highland Environment Forum 2015).	Over 404ha of woodland listed on the AWI (SNH 2008b) falls within the study area. The majority of this (97%) was category 2b 'Long-established (of plantation origin)' (LEPO) (Figure 11.1). The NWSS and AWI categories can be found in all relevant Target Notes in Appendix A11.2 (Ecological Methods and Baseline).	Area of AWI, but reduced to a line of trees along the riverside with the remaining area under arable cultivation. The area is relatively species-poor and is not of a standard to be classed as a BAP or SBL habitat. Generally coniferous plantation, sometimes young and sometimes developed. Ground flora usually relatively un-diverse. Often active commercial. The woodland is not of a standard to be classed as a BAP or SBL habitat.	Authority
AWI woodland (2b LEPO) in currently non-wooded areas	AWI is regarded as an important and irreplaceable national resource. Actions for ancient woodland have also been identified in the Highland BAP (Highland Environment Forum	Over 404ha of woodland listed on the Ancient Woodland Inventory (AWI, SNH 2008b) falls within the study area. However, not all listed areas were found to be woodland. Some areas were commercial woodland, and were either in the process of being clear felled or had already been so. Additionally, a large area had been cleared under the footprint of	AWI on grassland or quarry; no evidence of woodland species present at these sites.	Less than authority

Features	Legal/BAP Status	Baseline	Justification	Importance
	2015) to protect relict areas.	Blackcastle Quarry (approximately 20ha) whilst small areas near Wester Hardmuir Wood were agricultural grassland (approximately 5.6ha) (Figure 11.1).		
Non-AWI Woodland Broadleaved woodland Coniferous plantation woodland	Lowland mixed deciduous woodland is listed on the SBL.	Areas of non-AWI woodland occur across the proposed Scheme area. Woodland at Tornagrain, Crook and Russell's Wood (ch9450 to ch9550, ch22800 to ch23150, and ch25100 to ch25300) are located within or adjacent to large areas of AWI woodland. Area at Glenbeg (ch2250 to ch2300) is classed as 'nearly-native' on the NWSS. Details relating to woodland habitats can be found in the Terrestrial habitats section below and Diagram 11.1 and 11.2.	Non AWI woodland that is generally not of a standard to be classed as a BAP or SBL habitat, but is woodland that abuts AWI and sharing some of the same characteristics, or woodland that is classed as native or nearly native (broadleaved) woodland and >50% semi-natural on the NWSS.	Authority
Non-AWI Woodland Broadleaved woodland Coniferous plantation woodland	Lowland mixed deciduous and native pine woodland are listed on the SBL.	Areas of non-AWI woodland occur across the proposed Scheme area. Areas of broadleaved and coniferous plantation woodland near Allanfearn (ch3000), Milton of Gollanfield (ch12800 to ch13050) and Balnaspirach shelter belts (ch20650 and ch21250) are not listed on either the AWI or the NWSS and have a reduced diversity in comparison with other woodland areas. Details relating to woodland habitats can be found in the Terrestrial habitats section below and Diagram 11.1 and 11.2.	Woodland areas not listed on the AWI and not of a standard to be classed as a BAP or SBL habitat.	Less than authority
Bluebell Woodland Glenbeg Woodland; River Nairn (east bank).	Listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Woodland areas where native bluebells were a prominent feature of the ground flora were located at Target notes 4 and 35 (Figure 11.2 and Appendix A11.2: Ecological Methods and Baseline).	Plants are widespread and occasionally dominant in these woodlands. Along the River Nairn, the most abundant areas for bluebell are not at the location of the crossing.	Authority
Raised bog (Blàr nam Fiadh)	Scotland's National Peatland Plan (SNH 2015b) seeks to manage, restore and improve peatland sites. Peatlands have also been identified within the Highland BAP (Highland Environment Forum 2015) and there is a future action to identify sites for further peatland restoration work.	The wet heath habitat (28.6ha or <1% of the study area) (Diagram 11.1 and Figure 11.2) is a remnant of raised bog known as Blàr nam Fiadh (SWT 1994) (Target Notes 19 and 20, Figure 11.2 and Appendix A11.2: Ecological Methods and Baseline) and located to either side of the Aberdeen to Inverness Railway Line. The vegetation has been determined (SWT 1994) as the National Vegetation Classification (NVC) type M18 Erica tetralix-Sphagnum papillosum raised mire (Rodwell 1991) with M2 Sphagnum cuspidatum/recurvum pool community.	The site is a raised bog remnant and degraded raised bogs still capable of natural regeneration are a potential Special Area of Conservation feature (7120, JNCC (2015c)). Selection within the UK as a Special Area of Conservation feature is based on a site's ability to be restored to active bog and therefore contribute to attaining favourable conservation status for raised bogs as a whole. Parts of the Blàr nam Fiadh site are known to have a peat depth of 6m to 7m. However, the site is surrounded by agricultural grassland, plantation woodland and an active quarry and therefore likely to be limited in its ability to be fully effectively restored.	National
Arable	N/A	The results of the Phase 1 habitat surveys can be seen in Figure 11.2, with a summary in Diagram 11.1. A full list of Target Notes can be found in Appendix A11.2 (Ecological Methods and Baseline). Marshy grassland and swamp habitat to the east and south of the study area are likely to be a remnant of the wider raised bog area (Target Note 22 and 24, Figure 11.2 and Appendix A11.2: Ecological Methods and Baseline).	Arable farmland is an extensive habitat found across the country. The intensification of farming has resulted in a large decline in its botanical interest. Under appropriate management arable field margins can be important refuges for rare arable plants but under normal extensive management, arable land has limited ecological interest.	Less than authority
Improved grassland	N/A		Improved grassland is one of the most intensively managed habitat types. The habitat is widespread throughout the Scottish lowlands and is botanically species-poor with limited ecological interest.	Less than authority
Poor semi-improved grassland	N/A		Poor semi-improved grassland is less intensively managed than improved grassland and therefore contains species characteristic of neutral grassland. However, it is species-poor and generally not differentiable into acid/calcareous.	Less than authority
Marsh/marshy grassland	Purple moor-grass and rush pastures is listed on the SBL.		Marshy grassland varies in its quality across the site. The habitat at this location is not of high quality being species-poor (largely soft-rush).	Less than authority
Tall ruderal and scrub	N/A		Tall ruderal and scrub habitats are common and widespread and rapidly develop on derelict sites. They often have low species diversity.	Less than authority
Slender naiad (Loch Flemington)	European Protected Species under the Conservation (Natural Habitats, &c). Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015).	Loch Flemington, part of the Kildrummie Kames SSSI (and also a SPA), is a site for slender naiad (a submerged rooted macrophyte). Studies have indicated that the plant has been present in the Loch for at least 100 years (Bennion, Clarke, Davidson, Morley, Rose, Turner and Yong 2008). Slender naiad is a European Protected Species, although it is not listed as a biodiversity feature of Loch Flemington SSSI.	All known sites are located in Scotland. The site at Loch Flemington is the only known site in this part of the country. Its main sites are the machair lochs in the Western Isles, with other mainland lochs in Argyll, Dumfries, Perthshire, Stirlingshire, Westerness populations size is 38-46; there may have been a decline in the number of sites.	National
Juniper Balblair Kildrummie Kames Hardmuir Wood	Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015). Listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Juniper is a designated feature of the Kildrummie Kames SSSI and was also found at Hardmuir Wood (Target Note 66 within Figure 11.2 and Appendix A11.2: Ecological Methods and Baseline). Data received from the Botanical Society of Britain and Ireland (BSBI) indicated its presence to the west of Loch Flemington near Balblair.	Over three quarters of Britain's native juniper population is found in Scotland (Plantlife 2016) and is a national priority for conservation (Forestry Commission 2013).	National
White ramping-fumitory (Allanfearn Farm)	Listed on the SBL.	Data received from the BSBI indicated the presence of white ramping-fumitory near to the existing A96 and Allanfearn Farm.	Although classed as not scarce, in Scotland the plant is mainly found in the Moray Firth area (Preston, Pearman and Dines 2002) and has a 25% or more decline in abundance or range in Scotland.	National
Terrestrial Species				
Otter See Appendix CA11.1 (Confidential Appendix - Badgers and Otters) and Figure C11.2	European Protected Species (EPS) under the Conservation (Natural Habitats, &c) Regulations1994 (as amended in Scotland). Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Otter have been recorded in the Dalcross and Inverness Airport area between 2003 and 2007 and at Loch Flemington between 2002 and 2009 (NBN 2016). Otter activity was recorded on seven of the 27 watercourses and water bodies surveyed in 2015 (Figure C11.2 and Appendix CA11.1: Confidential Appendix – Badger and Otters). This activity was largely recorded on five watercourse systems in four distinct areas: eight otter resting sites were recorded comprising five holts and three couches. No resting sites were situated directly under the footprint of the proposed Scheme (Appendix CA11.1: Confidential Appendix – Badger and Otters).	Recent publications by SNH indicate that otter populations are increasing and that they are now widespread within Scotland - locally, it has been confirmed that Inverness city centre supports breeding otters (Findlay, Alexander and Macleod 2015; SNH 2015c). SNH have indicated that otter populations in the East Highland area, which includes the Moray Firth and River Nairn, may be at or near carrying capacity (Strachan 2007). Otter have been recorded at three distinct locations within the study area.	Regional
Bats (breeding, hibernation sites, and	All UK bat species are EPS under the Conservation (Natural Habitats, &c) Regulations	Detailed baseline information is presented in Appendix A11.2 (Ecological Methods and	One confirmed roost of rarer species (brown long-eared) present in a building (Petty West	Regional

Features	Legal/BAP Status	Baseline	Justification	Importance
key habitats)	1994 (as amended in Scotland). There are 10 species of bat known to occur in Scotland and all, with the exception of Leisler's bat, are listed on the SBL. Soprano pipistrelle and brown long-eared bat are listed as a priority species on the Highland BAP (Highland Environment Forum 2015). Soprano pipistrelle, common pipistrelle, Natterer's bat, Daubenton's bat and brown long-eared bat are listed on the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004). Leisler's bat is an International Union for Conservation of Nature (IUCN) Red List species (Least Concern). This species is defined as 'rarest' within Scotland (Wray et al. 2010). A small population of this species is known to be present in the north-east of Scotland (Russ, 2012, p123). The estimated Scottish population is 250 (Battersby and Tracking Mammals Partnership 2005). Nathusius' pipistrelle is defined as 'rarest' within Scotland (Wray, Wells, Long and Mitchell-Jones 2010). It is considered to be widespread but rare in Britain (Russ 2012, p155). The estimated UK population is 16,000, but no data are available on the Scottish population and there is limited data on breeding roosts (Battersby and Tracking Mammals Partnership 2005).	Baseline) and summarised below. The desk study identified six bat species present within the vicinity of the proposed Scheme (Appendix A11.2: Ecological Methods and Baseline). Surveys of buildings (Figure 11.3) identified bat roosts in two buildings within 30m of the proposed Scheme. Petty West Church, Tornagrain (BB15) contained a brown long-eared roost (likely maternity roost), a common pipistrelle roost (likely non-breeding) and a soprano pipistrelle roost (likely non-breeding). Bayview, Milton of Culloden (BB 1.24a) contained a soprano pipistrelle roost (likely non-breeding). No roosts were identified within buildings under the footprint of the proposed Scheme. Surveys of structures and trees under the footprint and to 50m of the proposed Scheme (Figure 11.3) found no evidence of roosting bats. Commuting and foraging activity were recorded at two of the structures including the following species: common pipistrelle, soprano pipistrelle and Myotis sp. (likely Daubenton's and/or Natterer's). At least five species were recorded within the four habitat area types (open, closed, edge and riparian) (Figure 11.4 and Figure 11.5) during the transect and passive surveys. These included common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, Myotis sp. (likely Daubenton's and/or Natterer's) and brown long-eared bats. Edge habitat showed the highest rate of bat activity. Leisler's bat was recorded at Balnaspirach Cottage in 2010. No further evidence of Leisler's has been identified through targeted bat surveys and consultation at this or any other location within the study area.	Church) within the study area. Potential maternity/hibernation building/structure roosts present within the study area (possible presence of rarer species). High and moderate roost potential buildings/structures within the study area (possible presence of rarer species). Potential maternity/hibernation tree roosts within the study area (possible presence of rarer species). High value foraging and commuting habitat - woodland and watercourses (complex habitat with unknown number of roosts nearby, possible presence of rarer species and large numbers of bats).	
Bats (non-breeding areas)			Three confirmed roosts of common species present in two buildings (Petty West Church and Bayview) within the study area. Potential non-breeding building/structure roosts (low potential roosts) within the study area. Potential tree roosts within woodland assessed as containing moderate roost potential. Moderate to low value foraging and commuting habitat - woodland and watercourses (moderately complex or un-complex habitat with unknown number of roosts nearby, possible presence of rarer species and small numbers of bats).	Authority
Badger	Protection of Badgers Act 1992 (as amended). Listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	A total of 272 badger setts were recorded in the study area, based on the data sources described below. The types of setts found are detailed in Table 11.7. Full details of badger activity within the study area can be found in the Appendix CA11.1 (Confidential Appendix – Badger and Otters) and Figure C11.1. A summary is provided here. NBN (2016) records indicate that badgers are present in the vicinity of the proposed Scheme, mainly between Inverness and Brackley. Studies undertaken for other proposed developments in the surrounding area recorded badger setts and field signs in the Stratton area, south of Tornagrain and south of Nairn (WSP Environment and Energy 2009, Applied Ecology 2011a and 2011b, RSK Environmental Ltd 2010) and Appendix A11.2: Ecological Methods and Baseline). The DMRB Stage 2 assessment recorded 20 setts throughout the DMRB Stage 2 study area (Jacobs 2014). In addition, Scottish Badgers provided information on the locations of setts and wildlife vehicle incidents (WVIs) within the study area (Chapter 6: Consultation and Scoping). Following walkover surveys for DMRB Stage 3 conducted throughout the proposed Scheme, evidence of badger activity was found along the entirety of the route.	Badgers have been recorded in high numbers throughout the study area (Appendix CA11.1: Confidential Appendix – Badgers and Otters). Although considered widespread across Scotland, badgers are subject to persecution and high mortality associated with collisions on roads. Badger is also identified as a characteristic terrestrial species within the Moray Firth Natural Heritage Futures report (SNH 2002).	Regional
Water vole	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland) (WCA). Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Water vole have been recorded to the southwest of Inverness and in the Ardersier – Fort George area (NBN 2016) but there are no records for the species within the study area. No evidence for the presence of water vole had been recorded in previous surveys for the A96 (Atkins 2008; Jacobs 2010; Jacobs 2014). Surveys undertaken in 2015 recorded water vole on a tributary of the Scretan Burn (Inshes Burn, Surface Water Feature (SWF) 01) within the Inverness Retail and Business Park (Figure 11.6). Suitable habitat was recorded on other watercourses (SWF02; SWF03; SWF07; SWF08; SWF16; SWF18; SWF21; SWF26; SWF31), but no evidence was recorded elsewhere within 100m of the proposed Scheme. However, the presence of American mink (a significant predator of water vole; SNH, 2016b) was recorded on three watercourses within the study area (Scretan Burn, Cairnlaw Burn and River Nairn). For more information see paragraph 11.3.29.	Water voles have undergone population declines in recent years (Jefferies 2003) and are now one of the UK's most endangered mammals.	Regional
Red squirrel	Schedule 5 of the WCA. Listed on the SBL as a species for which conservation action is needed. Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Desk-based information (Saving Scotland's Red Squirrels, 2016) indicated that red squirrels have been recorded in Culloden and Balloch to the south of the proposed Scheme near Inverness, and also in the vicinity of Delnies Wood and within Nairn township. The data cover the period of 2010-2015, with the majority of the records being from 2015. Previous surveys by Atkins (2008) also recorded evidence of red squirrel present in Tornagrain Wood. Red squirrel data collected during the DMRB Stage 2 (Jacobs 2014) and Stage 3 surveys are shown on Figure 11.6. The observations made by Jacobs' ecologists (a combination of sightings and feeding signs) showed that red squirrels were largely confined to coniferous woodlands around Blackcastle Quarry, Crook and Russell's Wood.	This species is widespread within Scotland although there has been widespread decline in population and range. Priority woodlands for red squirrel have been identified within the surrounding area at Culbin Forest (east of Nairn), Culloden (south of the proposed Scheme) and Cawdor Estate (north of the proposed Scheme) (Poulsom, Griffiths, Broome and Mayle 2005).	Regional
Pine marten	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (WCA). Listed on the SBL. Listed in the Highland BAP (Highland	Pine marten have been recorded within Brackley wood to the south of the proposed Scheme in 1992 (NBN 2016). The DMRB Stage 2 surveys (Jacobs 2014) recorded a pine marten WVI near Culloden (NH 69821 45995) (Figure 11.6). A pine marten scat was also recorded during previous surveys in Tornagrain Wood (Atkins 2008).	This species is widespread throughout Scotland and well established in the Highlands (Croose, Birks, Schofield and O'Reilly 2014) However, the species is still rare in the UK with population estimates ranging from 2,600 to around 3,500 adult martens in Scotland (SNH 2016j).	Regional

Features	Legal/BAP Status	Baseline	Justification	Importance
	Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	No evidence of pine marten was recorded during the DMRB Stage 3 surveys.		
Reptiles (Common lizard)	Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Desk study did not return any records for slow-worm or adder within the study area. Common lizard has been recorded to the north-east of Nairn and in the Inverness Airport area (NBN 2016) although these were also outside the study area. DMRB Stage 3 surveys identified 17 sites as potentially suitable for reptiles and nine of these were identified for further survey (Figure 11.6). Low numbers of common lizard were recorded at four of these locations (reptile surveys areas 8, 9, 11, 12) (Figure 11.6 and Appendix A11.2: Ecological Methods and Baseline). Incidental observations noted a single common lizard at Blackcastle Quarry. No other reptile species were recorded.	Common lizard is a local priority species in the Highlands. Suitable habitat for this species is scarce within the study area due to a predominance of arable land in the surrounding area.	Regional
Scottish wildcat	EPS under the Conservation (Natural Habitats, &c) Regulations1994 (as amended in Scotland). Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland) (WCA). Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015), and the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	The location of the proposed Scheme does not fall within one of the Scottish wildcat priority areas (Littlewood 2014). Desk study did not return any records for Scottish wildcat within the vicinity of the proposed Scheme (NBN 2016). In the course of undertaking DMRB Stage 3 surveys for other ecological features, no evidence to indicate the presence of Scottish wildcat was recorded.	Scottish wildcats are rare and extremely elusive (Davis and Gray 2010, and Kilshaw 2010). No evidence of their recent presence in the study area could be determined and therefore the species was scoped out of further assessment.	N/A
Amphibians (common toad, common frog, palmate newt)	Common toad is listed on the SBL and in the Highland BAP (Highland Environment Forum 2015). Common toad, common frog, and palmate newt are listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Records on NBN (2016) showed common frog and common toad at locations scattered throughout the study area. No records were available for palmate or smooth newt except within Pond 2. Two other ponds (Ponds 7 and 11 on Figure 11.6) have been identified as hosting other amphibian species: common frog, palmate newts and unidentified efts (young of palmate/smooth newts) (Atkins 2008). Common frog, common toad and palmate or smooth newt (larvae) were recorded from five ponds surveyed (Ponds 6, 7, 25, 39, 40). All ponds in which amphibians had been recorded, either historically or currently, had 'good' or 'excellent' habitat suitability.	These species are local priority species in the Highlands.	Authority
Great crested newt	European Protected Species under the Conservation (Natural Habitats, &c). Listed on the SBL. Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	GCN has been recorded at a location near Meikle Kildrummie within the study area, (NBN 2016). In addition, GCN was recorded at Pond 2 outside the study area, a location also identified in a previous A96 study (Atkins 2008). Loch Flemington has also been identified as a breeding GCN waterbody (Figure 11.1) (SNH 2013b). Thirty nine ponds were identified within the study area through the desk study, using online aerial imagery and maps. Eighteen of these were subject to Habitat Suitability Index (HSI) assessment and of these 15 were assessed as 'good' or 'excellent' and therefore subject to eDNA testing for the presence of GCN (Figure 11.6 and Appendix A11.2: Ecological Methods and Baseline). All ponds tested were negative for the presence of eDNA, indicating that GCN were not present. The other ponds were either scoped out as unsuitable (17 ponds) or access was not possible (four ponds).	Inverness and Nairn represents the northernmost limit of this species natural range. They have been determined to be native to the area (O'Brian and Hall 2012) with newts in the Highland population being genetically distinct from the other UK populations (Jehle 2013).	National
Wintering geese (pink-footed goose and greylag goose)	Greylag goose are a qualifying feature of the Inner Moray Firth Ramsar site. Pink-footed goose and greylag goose are listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Four goose species were recorded during the surveys (pink-footed, greylag, barnacle and Greenland white-fronted), with pink-footed goose the most abundant followed by greylag goose (Figure 11.8, Figure 11.9, Appendix A11.2: Ecological Methods and Baseline and Diagram 11.3). Average counts (peak monthly counts between January 2014 and April 2015) showed over 7500 for pink-footed goose and over 400 for greylag goose, the latter being one of the over-wintering designated features of the Inner Moray Firth SPA (see above). All goose species also contribute to the overwintering assemblage qualification (a site regularly supporting at least 20,000 waterfowl) of the SPA. Further information can be found in Appendix A11.2 (Ecological Methods and Baseline) and Jacobs (2015c, 2016).	Non-breeding pink-footed goose and greylag goose are listed as a qualifying feature of the Moray and Nairn Coast RAMSAR site (SNH 2016g). Non-breeding greylag goose is also listed as a qualifying feature of the Inner Moray Firth Ramsar site (SNH 2016h). Pink-footed goose and greylag goose have both been recorded foraging at sites along the route of the proposed Scheme. The UK supports the entire global population of wintering Icelandic/Greenland breeding pink-footed goose (not including the Svalbard breeding population which overwinter in the Netherlands, Denmark and Belgium); between 50 - 66% of the UK population are present in Scotland during winter and autumn. The UK also supports 90% of the global population of Icelandic breeding greylag geese (not including the Scottish breeding population). Geese numbers in the study area are high and do not appear to be limited by the availability of habitat (McLaughlan 2016). Latest data show that geese forage up to within 50m of the existing A96 and only use approximately 2% of the total potentially available habitat in the area. Additionally, foraging site fidelity is low, current data show that geese do not continuously use the same fields for foraging.	International
Wintering waterfowl (curlew, oystercatcher, teal, wigeon and goldeneye)	Qualifying features of the Inner Moray Firth SPA (see previous evaluation for this). Curlew are listed on the SBL and in the Highland BAP (Highland Environment Forum 2015). Curlew and goldeneye are listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	An additional 12 species were recorded during the wintering bird surveys, five of which are qualifying species of the Inner Moray Firth or Moray and Nairn Coast SPA's (Table 3). Notable records include whooper swan, golden plover, curlew, teal and wigeon. Further information can be found in Appendix A11.2 (Ecological Methods and Baseline) and Jacobs (2015c, 2016).	All five species are listed as part of the non-breeding waterfowl assemblage for the Inner Moray Firth SPA (SNH 2016c). Oystercatcher and wigeon are listed as part of the non-breeding waterfowl assemblage for the Moray and Nairn Coast SPA (SNH 2016i). Curlew, oystercatcher, teal, wigeon and goldeneye have been recorded along the route of the proposed Scheme. Curlew and oystercatcher are widespread waders within Scotland although in recent years there has been decline in curlew population and range; curlew was red listed in the Birds of Conservation Concern for the first time in 2015 (Eaton, Aebischer, Brown, Hearn, Lock, Musgrove, Noble, Stroud and Gregory 2015). Wigeon, teal and goldeneye are all widely distributed across Scotland during the winter. Latest data show that wintering waterfowl (curlew, oystercatcher, teal wigeon and goldeneye) forage up to within 200m of the existing A96 and share the same types of foraging sites as geese.	International
Breeding birds	Of the 54 breeding species, 24 were listed as species of conservation concern, either red-listed or amber-listed (Eaton, Aebischer, Brown,	Breeding bird surveys were undertaken across 11 survey sectors (Appendix A11.2: Ecological Methods and Baseline and Figure 11.7) which had been pre-identified as areas likely to have potential to have ornithological value and/or be representative of the area's	Regional importance has been attributed to the breeding bird assemblage present throughout the proposed Scheme, primarily due to the importance of the area for farmland bird species (Appendix A11.2: Ecological Methods and Baseline).	Regional

Features	Legal/BAP Status	Baseline	Justification	Importance
	Hearn, Lock, Musgrove, Noble, Stroud and Gregory 2015) whilst 16 were listed on the SBL (Scottish Government 2013) and 12 on the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004). See Appendix A11.2 (Ecological Methods and Baseline) for full list.	character. In total, 1,895 records of birds were logged in these eleven sectors, of which 1,464 represented breeding records. Seventy-three bird species were recorded (Appendix A11.1: Legislation and Policy Framework), of which 54 species were confirmed to have bred. Two of the non-breeding bird species recorded are listed on Schedule 1 of the WCA: red kite (one bird) and common crossbill (four birds).		
Corn bunting	Listed in the Highland BAP (Highland Environment Forum 2015), and Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Corn bunting was the most notable breeding species recorded during field surveys. A single singing male was recorded within Sector 4 – Brackley, on 5 June 2015 (Figure 11.7). Information provided by the RSPB (Stephan 2016) indicated that eight corn bunting territories have been recorded within the vicinity of three farms in the area: Milton of Gollanfield, Balspardon and Poolton (2014 data), down from a peak of 10-16 territories in 2006-2008 (Maggs and Perkins 2009; Perkins, Maggs, Watson and Wilson 2011). Consultation has indicated that this decline is due to the cessation of targeted agricultural management (Stephan 2016).	The three farms, Milton of Gollanfield, Balspardon and Poolton, are of known importance for the last remaining population of corn bunting in the Highlands. This population is the last remnant of the species in the Highlands, with the nearest population 30km away, east of Kinloss (Maggs and Perkins 2009). It has been estimated that the 10-16 pairs present in 2006-2008 represented up to 2% of the overall Scottish population (Maggs and Perkins 2009). A study in east Scotland reported an 83% population decline in the species between 1989 and 2007 (Watson, Perkins, Maggs and Wilson 2009) due to changing farming practices leading to a loss of safe nesting habitat and winter seed provisions. As the corn bunting is a sedentary species it is more susceptible to impacts such as habitat loss and fragmentation. As such the red (Eaton, Aebischer, Brown, Hearn, Lock, Musgrove, Noble, Stroud and Gregory 2015) and SBL-listed (conservation action needed) corn bunting is of notable conservation concern in relation to the proposed Scheme.	National
Barn owl	Schedule 1 of the WCA. Listed on the SBL. Listed in the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).	Desk study did not return details regarding the presence of barn owl within the study area. No nests or sites with high nesting potential were recorded under the footprint of the proposed Scheme. Three incidental records of barn owl were made in 2016 during bat surveys.	Barn owls are widely distributed throughout the UK. They are listed as green status (Eaton, Aebischer, Brown, Hearn, Lock, Musgrove, Noble, Stroud and Gregory 2015) and SBL-listed (conservation action needed).	Regional
Aquatic Habitat and Species				
Aquatic Habitat River Nairn	WFD designated. Spawning burns are listed on the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004) as priority habitats.	SEPA 2013 WFD Overall and Hydrogeomorphology classifications of Moderate for all three watercourses. Data received from the FNLFT indicates that a population of salmon is maintained in the River Nairn and that spawning is occurring in the river. Assessed by Jacobs as being of high habitat quality due to good flow and substrates with abundant supporting habitat for aquatic species. Substrates suitable for salmonid spawning were present. RHS semi-natural. See Appendix A11.2 (Ecological Methods and Baseline) and Figure 11.10.	Good habitat conditions for designated fish species was observed, including spawning gravels for salmonids. Abundant habitats for macroinvertebrates were also observed. Multiple fish species of conservation interest were found in this watercourse and a spawning population of salmon is maintained in the river.	National
Aquatic Habitat Cairnlaw Burn			Good habitat conditions for designated fish species were observed in these burns, including spawning gravels for salmonids. Abundant habitats for macroinvertebrates were also observed.	Regional
Aquatic Habitat Auldearn Burn				Regional
Aquatic Habitat SWF31	Spawning burns are listed on the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004) as priority habitats.	Assessed by Jacobs as being of high habitat quality due to good flow and substrate conditions with supporting habitat for aquatic species (Appendix A11.2: Ecological Methods and Baseline, and Figure 11.10). Substrates may be suitable for salmonid spawning, but some silt was observed. The watercourse is artificially connected to a pond in its lower reaches.	Good habitat conditions for designated fish species and macroinvertebrates were observed in this watercourse, but silt was present and the watercourse was artificial in its lower reaches.	Authority area
Aquatic Habitat Balnagowan Burn	WFD designated.	SEPA 2013 WFD Overall and Hydromorphology classification of Bad (Appendix A11.2: Ecological Methods and Baseline). Assessed by Jacobs as being of medium habitat quality due to low flow and high proportion of fine substrates (Figure 11.10).	This burn is not expected to support healthy populations of designated aquatic species due to unsuitable habitat conditions.	Less than authority area
Aquatic Habitat Rough Burn	N/A	Assessed by Jacobs as being of medium habitat quality due to good flow and substrate conditions (Figure 11.10). Natural barriers were noted.	Although good habitat for aquatic species was observed, natural barriers will prevent migration of designated fish species.	Less than authority area
Aquatic Habitat SWF01, Scretan Burn, SWF04, SWF05, Kenneth's Black Well, SWF07, Fiddler's Burn, SWF09, SWF10, SWF11, SWF13, SWF14, SWF15, SWF16, SWF18, Alton Burn, SWF24, SWF33, SWF36, SWF37	N/A	Assessed by Jacobs as being of low to medium habitat quality due to poor flow conditions, high proportions of fine substrates (Figure 11.10). Many appeared ephemeral. Barriers to migration present at SWF01, Scretan Burn and Kenneth's Black Well.	These burns are not expected to support populations of designated aquatic species due to the poor habitat conditions observed, barriers on some watercourses and the ephemeral nature of many of the watercourses.	Less than authority area
Fish Cairnlaw Burn	All three burns are WFD designated. Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. IUCN Critically Endangered (European eel). European Commission (2007) Council Regulation (1100/2007/EC) Establishing measures for the recovery of the stock of European eel. Annex II and V of Council Directive 92/43/EEC (salmon). Annexe II of Council Directive 92/43/EEC (brook, river and sea lamprey species).	SEPA 2013 WFD Fish classification of High (Appendix A11.2: Ecological Methods and Baseline). European eel and brown (sea) trout were present (Table 11.9 and Figure 11.10).	European eel are critically endangered and reported numbers in the area are low (DEFRA 2010). Fish habitat was assessed as optimal in the River Nairn and Auldearn Burn and intermediate in the Cairnlaw Burn. Substrates suitable for salmonid spawning were observed and a population of brown trout was present that was composed of multiple age classes (including young of year), indicating that brown (sea) trout are spawning in all three watercourses.	International
Fish River Nairn		SEPA 2013 WFD Fish classification of High (Appendix A11.2: Ecological Methods and Baseline). European eel, salmon and brown (sea) trout were present (Table 11.9 and Figure 11.10).		International
Fish Auldearn Burn		SEPA 2013 WFD Fish classification of High (Appendix A11.2: Ecological Methods and Baseline). European eel, lamprey and brown (sea) trout were present (Table 11.9 and Figure 11.10).		International

Features	Legal/BAP Status	Baseline	Justification	Importance
	Annexe V of Council Directive 92/43/EEC (river lamprey). Schedule 3 of the Conservation (Natural Habitats &c) Regulations 1994 (as amended in Scotland) (salmon). Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. European eel, salmon, brown (sea) trout and brook, river and sea lamprey are listed on the SBL. European eel, salmon and brook, river and sea lamprey are listed on the Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004).			
Macroinvertebrates Auldearn Burn	WFD designated.	SEPA 2013 WFD Macroinvertebrate (Whalley Hawkes Paisley Trigg (WHPT)) classification of High (Appendix A11.2: Ecological Methods and Baseline). Auldearn Burn supported a healthy and diverse macroinvertebrate community of moderate/fairly high conservation value. The Jacobs site classification was Good (Figure 11.10). The regionally notable stonefly (Protonemura meyeri) is present. The species is well distributed in Scotland (NBN 2016).	Auldearn Burn supported a diverse macroinvertebrate community of high quality that included a species of conservation interest.	Authority area
Macroinvertebrates River Nairn		SEPA 2013 WFD Macroinvertebrate (WHPT) classifications of High (Appendix A11.2: Ecological Methods and Baseline). The River Nairn supported a healthy and diverse macroinvertebrate community of moderate/fairly high conservation value with Jacobs site classification of High (Figure 11.10). No species of conservation interest were recorded.	All three watercourses supported diverse macroinvertebrate communities of high or good quality.	Authority area
Macroinvertebrates Cairnlaw Burn		SEPA 2013 WFD Macroinvertebrate (WHPT) classification of Good (Appendix A11.2: Ecological Methods and Baseline). Cairnlaw Burn supported a healthy and diverse macroinvertebrate community of moderate conservation value and had a Jacobs site classification of Good (Figure 11.10). No species of conservation interest were recorded.		Authority area
Macroinvertebrates Rough Burn		SEPA 2013 WFD Macroinvertebrate (WHPT) classification of High (Appendix A11.2: Ecological Methods and Baseline). Rough Burn supported a macroinvertebrate community of moderate conservation value and had a Jacobs site classification of high/Good (Figure 11.10). No species of conservation interest were recorded.		Authority area
Macroinvertebrates Balnagowan Burn		SEPA 2013 WFD Macroinvertebrate (WHPT) classification of Moderate (Appendix A11.2: Ecological Methods and Baseline). Balnagowan Burn supported a macroinvertebrate community of low diversity and low/moderate conservation value and had a Jacobs site classification of moderate/poor (Figure 11.10). No species of conservation interest were recorded.	This watercourse supported a macroinvertebrate community of moderate/poor quality and typified by low diversity.	Less than authority area
Macroinvertebrates Scretan Burn	N/A	Scretan Burn supported a macroinvertebrate community of low diversity and low/moderate conservation value and had a Jacobs site classification of poor (Figure 11.10). No species of conservation interest were recorded.	This watercourse supported a macroinvertebrate community of poor quality and typified by low diversity.	Less than authority area
Macroinvertebrates SWF13	N/A	The macroinvertebrate communities observed in these watercourses were typified by low diversity and low, moderate or fairly high conservation value. No species of conservation interest were recorded.	These watercourses supported macroinvertebrate communities of poor/moderate quality and were typified by low diversity.	Less than authority area
Macroinvertebrates SWF14, SWF15, SWF16				Less than authority area
Macroinvertebrates Fiddler's Burn				Less than authority area
Macroinvertebrates SWF18, Alton Burn				Less than authority area
Macrophytes Fiddler's Burn, SWF16, SWF18	Blunt-fruited water starwort listed on the SBL.	The macrophyte community in these three watercourses was typified by low diversity and medium ecological value (Figure 11.10). Blunt-fruited water starwort was collected from all three watercourses.	These watercourses supported macrophyte communities of medium ecological value. Although blunt-fruited water starwort is listed on the SBL, it is not considered to be at particular risk in Scotland.	Authority area
Macrophytes Auldearn Burn	WFD designated.	SEPA 2013 WFD Macrophyte classification of High (Appendix A11.2: Ecological Methods and Baseline). Auldearn Burn had a high macrophyte diversity compared to other surveyed sites and had a Jacobs site classification of Good (Figure 11.10). No species of conservation interest were recorded.	Auldearn Burn supported a diverse macrophyte community of high/good quality.	Authority area
Macrophytes SWF13, SWF14	N/A	The macrophyte community in these watercourses was typified by low diversity and was considered to be of low ecological value (Appendix A11.2: Ecological Methods and Baseline, and Figure 11.10). No species of conservation interest were recorded.	These watercourses supported macrophyte communities of low ecological value and were typified by low diversity.	Less than authority area
Ponds	Ponds are listed on the Inverness and Nairn	The PSYM category for this pond, based on Jacobs surveys, was poor (Appendix A11.2:	This pond contained limited habitat for aquatic species and was typified by low abundance and	Less than authority

Features	Legal/BAP Status	Baseline	Justification	Importance
P4	BAP (Inverness and Nairn Biodiversity Group 2004) as priority habitats.	Ecological Methods and Baseline, and Figure 11.10). Macrophyte and macroinvertebrate diversity and abundance were both low, and important pond macrophyte taxa (e.g., dragonflies, alderflies, and beetles) were only present in low abundance and diversity.	diversity of aquatic plants and macroinvertebrates.	area
Ponds P1, P2, P3, P6, P7		P1, P2 and P3 were assessed as being of low value. P1 is artificial and located in a quarry, and P2 and P3 are both ephemeral and offered little habitat for aquatic species (Appendix A11.2: Aquatic Habitats and Figure 11.10). P6 and P7 were assessed as being of medium value, but P6 is an ornamental pond heavily impacted by eutrophication and P7 is heavily shaded and impacted by eutrophication (Appendix A11.2: Ecological Methods and Baseline, and Figure 11.10).	These ponds offered limited habitat for aquatic species and were assessed as being of low or medium ecological value.	Less than authority area
Ponds P5		Pond P5 was assessed as being of high value based on the good habitat conditions and noted macrophyte community (Appendix A11.2: Ecological Methods and Baseline, and Figure 11.10).	P5 was not considered further because it was determined that there was no impact pathway between the pond and the proposed Scheme.	N/A

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Terrestrial Habitats

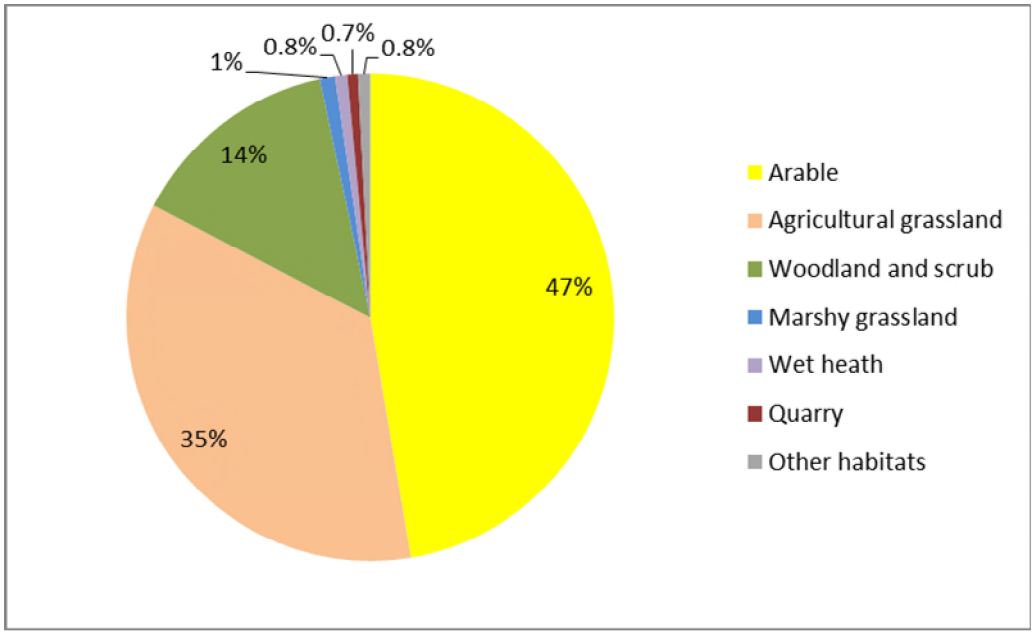
11.3.7 The results of the Phase 1 habitat surveys can be seen in Figure 11.2, with a summary in Diagram 11.1. A full list of Target Notes can be found in Appendix A11.2 (Ecological Methods and Baseline). Agricultural land accounted for 82% of the mapped habitats within the 500m buffer either side of the proposed Scheme. Of this agricultural land, arable land accounted for 47% whilst agricultural grassland (improved and semi-improved grassland types) accounted for another 35%.

11.3.8 Woodland and scrub (including felled woodland) covered over 504ha of the study area (14%).

11.3.9 All other habitat types accounted for less than 4% of the study area (approximately 130ha), of which marshy grassland (and swamp), wet heath and Blackcastle Quarry made up the majority.

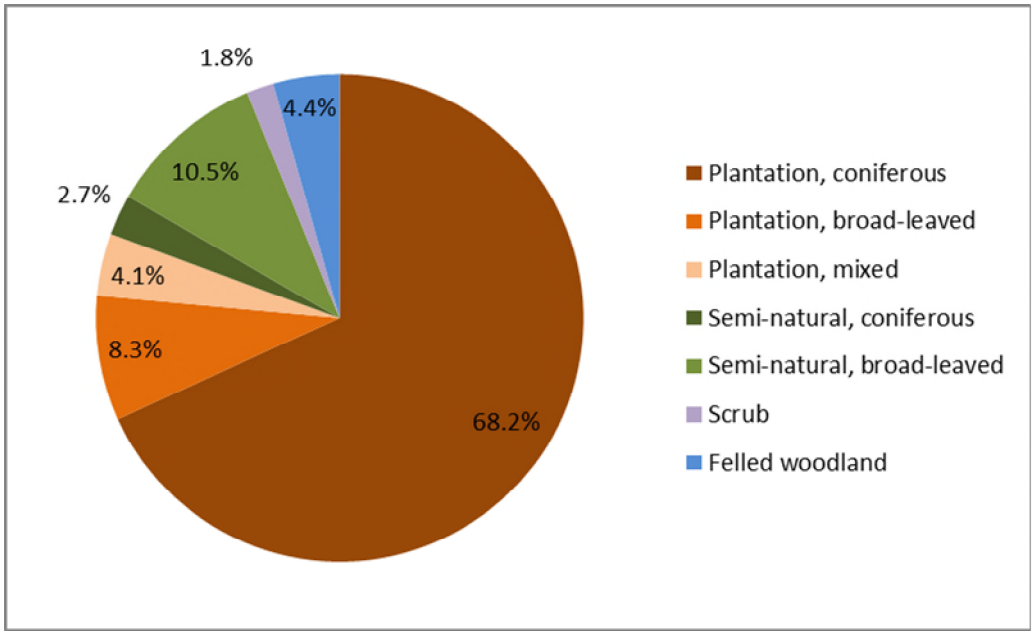
11.3.10 'Other habitats' as indicated in Diagram 11.1 included amenity grassland, acid grassland and tall ruderal vegetation (approximately 30ha).

Diagram 11.1: Broad Habitat Types found in the Study Area



11.3.11 Of the 504ha of woodland and scrub, plantation woodland, and particularly coniferous plantation woodland, was the predominant type (Diagram 11.2), accounting for 80% of all woodland. Only 13% of woodland was semi-natural woodland (mainly broad-leaved). The coniferous plantation woodland included large areas of Scots pine-dominated woodland although Sitka spruce was also recorded. Small pockets of broad-leaved woodland were scattered throughout the study area; the largest was approximately 3.8ha.

Diagram 11.2: Woodland and Scrub Habitat Types found in the Study Area



Protected Species

11.3.12 Additional information on badger, deer and wintering geese is provided below.

Badger

11.3.13 The total numbers of setts found broken down by type is set out below in Table 11.7. Further detail of setts within road sections is detailed in the Appendix CA11.1 (Confidential Appendix – Badgers and Otters).

Table 11.7: Breakdown of Setts Found Along the A96 Corridor

	Sett Type				
	Main	Subsidiary	Annexe	Outlier	Total
Total	28	30	14	200	272

Deer

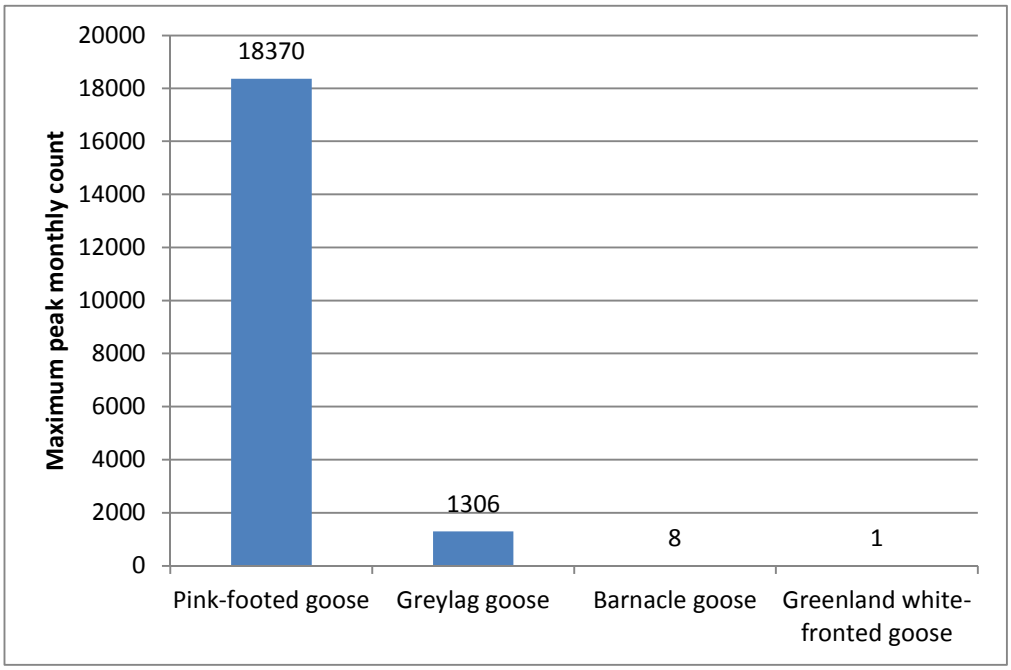
11.3.14 Deer casualties have been recorded along the length of the proposed Scheme. In a nine year period (2007 to 2015 inclusive), DVCs involving 32 deer were recorded over the existing A96 between Inverness and Hardmuir. This is equivalent to approximately one DVC per 9km of the existing A96 per year. No information on deer species was provided but NBN indicates that only roe deer have been recorded in this area. However, there have also been informal indications that sika deer may be present.

11.3.15 Deer fencing was recorded around one area of woodland, a section of Bognafuaran Wood. Due to its location (the woodland section was not adjacent to any road) it was considered that the fencing was primarily concerned with protecting the woodland, and not from preventing the movement of deer onto the road.

Wintering Geese

11.3.16 The peak monthly counts (between January 2014 and April 2015) for geese species recorded within the study area are shown in Diagram 11.3.

Diagram 11.3: Peak Monthly Counts for Four Goose Species



Barn Owl

11.3.17 No barn owl nests were identified and consultation responses did not report any records of barn owl at less than the 10km square scale. Three landowner responses recorded the presence of owls (species not defined) around Nairn.

11.3.18 There were three sightings of barn owls during ecological surveys for other receptors; all during June/July 2016. All three sightings were towards the western end of the proposed Scheme with two on the outskirts of Inverness. One sighting was on the existing A96 at the junction with Barn Church Road (C1032) in a reduced speed area (50mph).

Aquatic Habitats

Aquatic Habitat Assessment

11.3.19 A total of 26 watercourses were identified as being potentially impacted by the proposed Scheme and aquatic habitat assessments surveys were undertaken on all of these watercourses (Figure 11.10). Assessments were made based on professional judgement and 13 of the 26 watercourses were targeted for further surveys because they were assessed as having the potential to support species of conservation interest (Table 11.8). Baseline descriptions are presented in Table 11.6 and Appendix A11.2 (Ecological Methods and Baseline).

Table 11.8: Watercourses and Associated Targeted Aquatic Surveys. Q=quantitative, T=timed.

Site	Name	Type	River Habitat Survey	Fish Habitat	Electro-fishing	Macro-invertebrates	Macrophytes
SWF02	Scretan Burn	Burn	-	-	-	✓	-
SWF03[1]	Cairnlaw Burn	Burn	✓	✓	Q, T	✓	-
SWF08	Fiddler's Burn	Ditch	-	-	-	✓	✓
SWF12[1]	Rough Burn	Burn	-	-	-	✓	-
SWF13	Unnamed	Ditch	-	-	-	✓	✓
SWF14	Unnamed	Ditch	-	-	-	✓	✓
SWF15	Unnamed	Ditch	-	-	-	✓	-
SWF16	Unnamed	Ditch	-	-	-	✓	✓

Site	Name	Type	River Habitat Survey	Fish Habitat	Electro-fishing	Macro-invertebrates	Macrophytes
SWF18	Unnamed	Ditch	-	-	-	✓	✓
SWF19[1]	Balnagowan Burn	Burn	-	-	-	✓	-
SWF22	Alton Burn	Ditch	-	-	-	✓	-
SWF23[1]	River Nairn	River	✓	-	T	✓	-
SWF26[1]	Auldearn Burn	Burn	✓	✓	Q	✓	✓

[1]WFD designated watercourses

11.3.20 Seven ponds were identified as potentially being impacted by the proposed Scheme and habitat assessment surveys were conducted at these ponds (Appendix A11.2: Ecological Methods and Baseline). Assessments were made based on professional judgement and one pond, P7, was targeted for further surveys (Figure 11.10 and Table 11.6).

River Habitat Survey

11.3.21 Data provided by the EA for two RHS surveys conducted in July 2005 upstream of the proposed Scheme indicates that the River Nairn is predominantly unmodified in this area (EA 2016).

11.3.22 RHS was undertaken on the Cairnlaw Burn, River Nairn and Auldearn Burn and classifications were made on the degree of modification in each watercourse based on the Habitat Modification Score (HMS) (Figure 11.10 and Table 11.6).

Aquatic Species

Freshwater Fish

11.3.23 A desk-based review of available data confirmed the presence of Atlantic salmon, brown (sea) trout, European eel and lamprey species in the catchment. Atlantic salmon and sea trout angler catch returns for the River Nairn are presented in Appendix A11.2 (Ecological Methods and Baseline) (FNLFT 2015); NBN 2016). All of the watercourses that were subject to survey have a SEPA 2013 WFD fish classification of High.

11.3.24 Table 11.9 and Figure 11.10 summarise the results of quantitative and timed fish surveys. The presence of different age classes of fish in the Cairnlaw Burn and Auldearn Burn indicate that these watercourses had a wide range of connected habitats suitable for both juvenile and adult fish.

Table 11.9: Number of Fish with Size Range (mm) from each of the Surveyed Watercourses

Species	Cairnlaw Burn	River Nairn	Auldearn Burn
Atlantic salmon	-	1 (70)	-
Brown (sea) trout	79 (40 – 160)	16 (55 – 95)	58 (32 – 150)
European eel	4 (70 – 110)	4 (90 – 120)	2 (160 – 260)
Lamprey	-	-	15 (35 – 115)
Three-spined stickleback	1 (22)	-	4 (25 – 32)

Aquatic Macroinvertebrates

11.3.25 Macroinvertebrate samples were collected from 13 watercourses and metrics were calculated that described conservation value and pressure from organic pollution and general degradation, low flow and fine sediments. Baseline descriptions are presented in Figure 11.10, Table 11.6 and Appendix A11.2 (Ecological Methods and Baseline).

Macrophytes

11.3.26 Macrophyte surveys were undertaken at six locations; Fiddler's Burn, SWF13, SWF14, SWF16, SWF18 and Auldearn Burn, and only Auldearn Burn was suitable for WFD site classification

(Figure 11.9). Baseline descriptions are presented in Figure 11.10, Table 11.6 and Appendix A11.2 (Ecological Methods and Baseline).

Other Aquatic Species

Freshwater Pearl Mussels

11.3.27 The freshwater pearl mussel, an internationally important mollusc, is noted to be present in several rivers in the Inverness and Nairn area, and is a priority conservation species (Highland Environmental Forum 2015). However, during a DMRB Stage 2 Assessment Habitats Regulations Appraisal meeting between Jacobs and SNH (McLaughlan and Reid 2013), SNH advised that the species is not present in the River Nairn, and as such will not be discussed further.

Invasive Non-Native Species

11.3.28 Plant and animal INNS were recorded throughout the study area. Four plant species: Himalayan balsam, giant hogweed, giant knotweed and Japanese knotweed were recorded, mainly along watercourses (Table 11 in Appendix A11.2: Ecological Methods and Baseline and Figure 11.2).

11.3.29 Two INNS animal species are known to be present within the study area. American mink were recorded on the Scretan Burn, Cairnlaw Burn and River Nairn (Table 11.6) and American signal crayfish have been recorded in the lower reaches of the River Nairn and on one of its tributaries, the Geddes Burn (McLaughlin, Reid 2013; FNLFT 2012). In addition, as indicated in paragraph 11.3.14, sika deer may also be present.

Evaluation

11.3.30 The evaluations presented in Table 11.6 take into account baseline conditions and utilise the criteria in Table 11.2, to develop an understanding of the implications for features that may be affected by the proposed Scheme.

11.3.31 The evaluation of bats and associated ecological features throughout the proposed Scheme was undertaken using the guidance set out in 'Valuing Bats in Ecological Impact Assessment' (Wray, Wells, Long and Mitchell-Jones 2010).

11.3.32 Deer and INNS were scoped out from ecological evaluation as explained in Section 11.2 (Methodology).

11.4 Impacts

11.4.1 Potential impacts on ecological features for the proposed Scheme are as described below, with actual impacts relating to terrestrial habitat loss set out in paragraphs 11.4.27 to 11.4.29 and Table 11.10.

11.4.2 Impacts on features of less than authority area importance are not discussed, as explained in paragraph 11.2.24.

11.4.3 Where an impact is initiated in construction but also occurs throughout operation (e.g. permanent habitat removal under the footprint of the carriageway), it is discussed only within operational impacts.

11.4.4 No impacts are predicted for six features either during the construction or operational phases of the proposed Scheme as no effects pathways were identified. This was either due to the physical separation of the proposed Scheme from a feature, or the lack of a relevant pathway such as hydrological connectivity. The six features were:

- Loch Flemington SPA;
- Kildrummie Kames SSSI;
- raised bog;

- slender naiad;
- juniper; and
- white ramping-fumitory.

11.4.5 For some features impacts were limited to either construction or operational phases only.

Construction

11.4.6 Construction impacts may include:

- injury or mortality of protected species due to vegetation removal, vehicle movements or becoming trapped in uncovered holes and pipes;
- temporary habitat loss in working areas, including site compounds and temporary access tracks – some habitat loss can be permanent (or long-term) where the habitat lost is not straightforwardly replaceable such as ancient woodland;
- temporary habitat fragmentation due to disturbance and instream activities;
- disturbance to protected species from noise, lighting and movement of vehicles and increased human activity;
- sediment release and runoff from construction works;
- generation of dust from use of haul routes, earth movement and soil storage;
- temporary hydrological changes to terrestrial and aquatic habitats; and
- accidental spread of INNS (plants and animals).

Operation

11.4.7 Operational impacts may include:

- injury and mortality of protected species from vehicle collisions;
- permanent loss of habitats, including shading of aquatic habitats, under footprint of the proposed Scheme;
- fragmentation and severance of habitats, especially watercourses including loss of fish passage;
- disturbance to protected species from traffic noise and lighting;
- pollution from road runoff; and
- hydrological changes from runoff, structures and realignment of watercourses.

11.4.8 Under the footprint of the proposed Scheme there is predicted to be a total land-take of approximately 249ha. Over 83% comprised agricultural land (arable, improved grassland and semi-improved grassland). Woodland accounted for 13%, with semi-natural woodland accounting for 1.6% of the losses. A breakdown of habitats predicted to be lost can be seen in Diagram 11.4.

Diagram 11.4: Habitats Predicted to be Lost under the Footprint of the Proposed Scheme

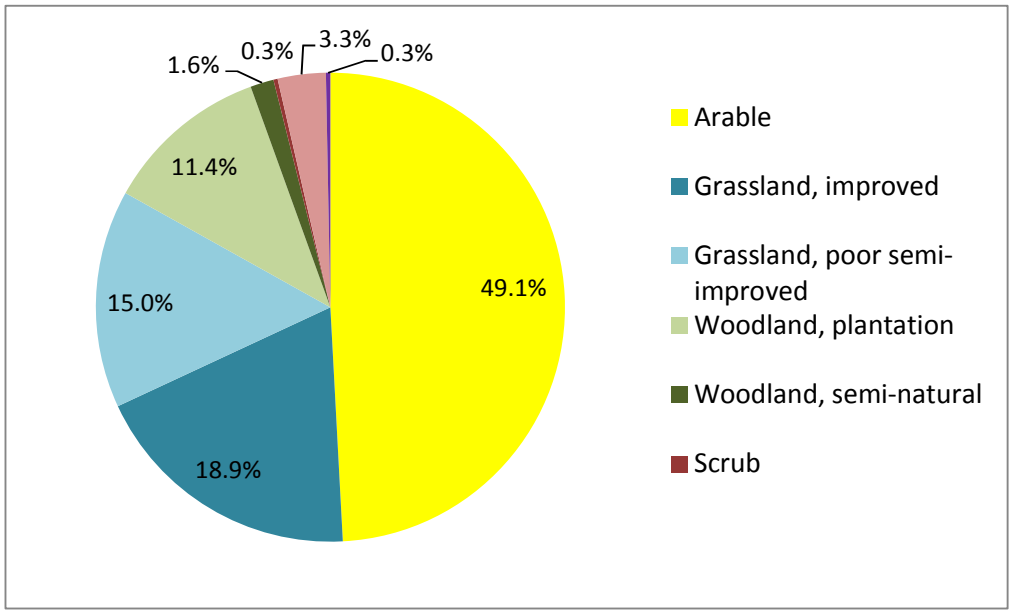


Table: 11.10: Description of Potential Impacts (without Mitigation)

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
Construction					
Inner Moray Firth SPA	International	Runoff from construction works including sediment release and chemicals from accidental spillage in the following locations: • Scretan Burn (ch1250); and • Cairnlaw Burn (ch2280 and ch2530).	Pollution of Scretan and Cairnlaw Burn which feed into the SPA/SSSI resulting in reduced water quality resulting in mortality of its species assemblages. Dependent on the magnitude of the pollution event this could result in permanent reductions in the quality of the SPA/SSSI habitats and their species assemblages. Long-term, reversible, possible, and localised to the Longman Bay area of the SPA/SSSI.	Moderate	Major
Longman and Castle Stuart Bays SSSI	National			Moderate	Major
AWI woodland (3 'Other' (on Roy map)) River Nairn Woodland East	National	Potential loss of approximately 0.05ha of AWI (3) woodland on the east side of the River Nairn within the land made available (LMA) and not under the footprint of the proposed Scheme.	Loss of AWI woodland. Opportunities will be identified during construction to protect and retain AWI woodland within the LMA. The small area predicted to be lost is not considered to be ecologically significant due to the recolonization potential from adjacent woodland.	Low	Moderate
AWI woodland (3 'Other (on Roy map)) River Nairn Woodland West	Authority	Potential loss of approximately 0.07ha of AWI (3) woodland on the west side of the River Nairn within the land made available (LMA) and not under the footprint of the proposed Scheme.	Loss of AWI woodland. Opportunities will be identified during construction to protect and retain AWI woodland within the LMA.	Low	Moderate
AWI woodland (2b LEPO)	Authority	Potential loss of approximately 12.5ha of AWI (2b) within the LMA and not under the footprint of the proposed Scheme. Approximately 6.5ha has been designated as woodland to be retained.	Loss of AWI woodland. Approximately 6.5ha has been designated as woodland to be retained resulting in a loss of 6.0ha. This effect would be long-term.	Medium	Moderate
Non-AWI woodland Broad-leaved woodland	Authority	Potential loss of approximately 5.3ha of non-AWI woodland of which approximately 4.6ha has been designated as woodland to be retained.	Loss of non-AWI woodland. Approximately 0.7ha is predicted to be lost. The small area predicted to be lost is not considered to be ecologically significant.	Low	Negligible
Bluebell woodland	Authority	Operational impacts only			
Otter	Regional	Construction related activities, including vehicle movement in the following areas: • Scretan Burn (ch1120 to ch1300); • Cairnlaw Burn (ch1680 to ch2300); • Rough Burn (ch7460 to ch7550); and • Auldearn Burn (ch26710 to ch26810).	Direct mortality of individuals from collisions or entrapment in pits, pipes or machinery. Unlikely to occur in sufficient numbers to affect the wider population. Although short-term, the effect would be permanent and negative.	Low	Minor
		Noise, vibration and light spill associated with construction related operations including earth movement, in the areas	Disturbance of an EPS leading to its avoidance of key places of shelter and rest. Known resting sites are	Low	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		indicated above.	situated more than 30m from the proposed Scheme. It is not therefore considered that any disturbance would cause declines in population. This effect would be short-term and reversible.		
Bats (breeding, hibernation sites and key habitats)	Regional	Construction related activities, including vehicle movement and vegetation clearance in potential maternity/hibernation tree roosts within footprint and up to 50m from the proposed Scheme (for locations refer to Figure 11.3): • BT1 (ch3000) and BT16 (ch3000).	Direct mortality of an EPS during removal of roosting habitat or by vehicle collision. This effect would be permanent and negative.	High	Major
		Noise, vibration and light spill associated with construction related operations including blasting, piling and earth movements in the following: • One high potential and two moderate potential maternity/hibernation buildings/structures under the footprint of the proposed Scheme (BS25 (ch7520), BB1.10 (ch1800) and BS1 (ch19470) (Figure 11.3); • One confirmed roost (likely maternity) within 30m of the proposed Scheme (BB15 (ch9600)) (Figure 11.3); • Twenty-three high potential and 23 moderate potential maternity/hibernation structures/buildings within 50m of the footprint of the proposed Scheme (Figure 11.3); • Potential maternity/hibernation tree roosts within study area and up to 50m of the proposed Scheme at locations indicated above; and • High value foraging and commuting habitat at the River Nairn: BW47 (ch22400 to ch22500).	Disturbance of an EPS leading to the abandonment of roost sites and increased energy expenditure during roosting periods and avoidance of commuting routes and foraging areas. This would lead to reduced breeding success. This effect would be short-term and reversible.	Low	Minor
		Surface water runoff and spill events into watercourses at the River Nairn (ch22400 to ch22500).	Pollution of watercourse resulting in reduced prey availability, leading to a decline in foraging habitat quality. This effect would be short-term and reversible.	Low	Minor
Bats (non-breeding areas)	Authority area	Construction related activities, including vehicle movement and vegetation clearance in tree roosts within woodland with high to low roost potential at the following locations: • Cairnlaw BW25 (ch1700 to ch1800); • Cairnlaw BW26 (ch2200 to ch2300); • BW28 (ch2950 to ch3050); • Culloden BW48 (ch3850 to ch3950); • Tornagrain BW19 (ch8900 to ch9200 and ch9400 to	Direct mortality of an EPS during removal of roosting habitat or by vehicle collision. This effect would be permanent and negative.	High	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		ch10200); • Balspardon BW31 (ch14300 to ch14600); • Balnaspirach BW42 (ch20600 to ch20700); • River Nairn BW47 (ch22400 to ch22500); • Crook BW13 and BW14 (ch22850 to ch23450); and • Wester Hardmuir BW8 (ch29700 to ch30200).			
		Noise, vibration and light spill associated with construction related operations including blasting, piling and earth movements in the following: • One low potential non-breeding structure lies under the footprint of the proposed Scheme (BS12.1 at ch16100) (Figure 11.3); • Two buildings with three confirmed roosts (likely non-breeding) lie within 30m of the footprint of the proposed Scheme (BB15 (ch9600) and BB 1.24b (ch2700)) (Figure 11.3); • Eighteen low potential non-breeding buildings/structures lie within 50m of the footprint of the proposed Scheme (for locations refer to Figure 11.3); • Tree roosts within woodland with high to low roost potential at locations indicated above; and • Moderate value foraging and commuting habitat at the following locations: o Balspardon: BW31 (ch14300 to ch14600); o Tornagrain: BW19 (ch8900 to ch9200 and ch9400 to ch10200); o Crook: BW13 (ch22900 to ch23400) and BW14 (ch22850 to ch22900); o Wester Hardmuir: BW8 (ch29700 to ch30200); o Rough Burn (ch7450 to ch7500); and o Auldearn Burn (ch26700 to ch26800).	Disturbance of an EPS leading to the abandonment of roost sites, increased energy expenditure during roosting periods and avoidance of commuting routes and foraging areas. This would lead to reduced breeding success. This effect would be short-term and reversible.	Low	Negligible
		Surface water runoff and spill events into watercourses at: • Rough Burn (ch7450 to ch7500); and • Auldearn Burn (ch26700 to ch26800).	Pollution of watercourse resulting in reduced prey availability, leading to a decline in foraging habitat quality. This effect would be short-term and reversible.	Low	Negligible
Badger	Regional	Construction related activities, including vehicle movement and vegetation clearance throughout the proposed Scheme.	Direct injury or mortality of badgers from collisions or animals becoming trapped in uncovered holes and pipes.	Low	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
			Mortality of individuals is permanent and negative, however given the large and wide ranging population in this area it is unlikely to have a significant effect on the status of the badger population in the area.		
		Noise, vibration and light spill associated with construction related operations including blasting, piling and earth movements throughout the proposed Scheme.	Temporary disturbance of badgers leading to a change in the distribution of local population(s). This effect would be reversible and negative.	Low	Minor
Water vole	Regional	Operational impacts only.			
Red squirrel Pine marten	Regional	Construction related activities, including vehicle movement and vegetation clearance at the following locations: • Tornagrain Wood (ch19560 to ch10510); • Woodland at Blackcastle Quarry (ch17900 to ch18600) (and associated local roads around Drumdivan); • Woodland at Crook (ch22890 to ch23400); • Skene Park (ch23800 to ch24010); • Russell's Wood (ch24700); • Wester Hardmuir Wood (ch29680 to ch30420); and • Woodland along Scretan Burn (ch1250) (in relation to pine marten).	Direct mortality of individuals from vehicle collisions and destruction of dreys during vegetation clearance. This effect would be permanent and negative.	High	Major
		Noise, vibration and light spill associated with construction related operations including blasting, piling and earth movements, in the areas indicated above for red squirrel.	Disturbance leading to avoidance of key habitats for foraging and drey/denning sites leading to some displacement of population(s). This effect would be temporary, reversible and negative.	Low	Minor
Common lizard amphibians	Authority area	Construction related activities, including vehicle movement and vegetation clearance at the following locations for common lizard: • Site 8 (ch18450 to ch18800); • Site 9 (ch21300); • Site 11 (ch23900); and • Site 12 (ch25800 to ch25900). And for amphibians: • Ponds 6 and 7 (ch8600 to ch9400); • Loch Flemington (ch13400 to ch15800); • Ponds 25, 25.1, 25.2, 26 and 27 (ch18400 to ch19500); • Pond 39 (ch30400); and	Direct mortality of individuals. Mortality of individuals is permanent and negative, but effect is short-term during construction.	High	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		• Pond 40 Nairn (West) Junction.			
		Noise, vibration and light spill associated with construction related operations earth movements, in the areas indicated above.	Disturbance leading to avoidance of key habitats for foraging and shelter leading to some displacement of population(s). This effect would be temporary, reversible and negative.	Low	Negligible
Amphibians	Authority area	Surface water runoff and spill events into watercourses, in the following areas: • Ponds 6 and 7 (ch8600 to ch9400); • Ponds 25, 25.1, 25.2, 26 and 27 (ch18400 to ch19500); and • Pond 39 (ch30400).	Pollution of habitat leading to reduced water quality and altered habitat. This effect would be temporary, reversible and negative.	Low	Negligible
Great crested newt	National	Construction related activities, including vehicle movement and vegetation clearance in the following locations: • Terrestrial habitat (ch13400 to ch15800) (near Loch Flemington); and • Terrestrial habitat (ch19400 to ch21100).	Mortality of individuals within terrestrial habitats. This effect would be permanent and negative.	Medium	Major
		Noise, vibration and light spill associated with construction related operations earth movements, in the areas indicated above.	Disturbance leading to avoidance of terrestrial habitats and displacement of population(s). This effect would be temporary, reversible and negative.	Low	Moderate
Wintering geese (pink-footed goose and greylag goose)	International	Noise, vibration and light spill associated with construction related operations including blasting, piling and earth movements.	Disturbance leading to avoidance of habitats and displacement of population(s). However, with surplus foraging habitat available, the effect of noise disturbance on the geese and waterfowl is expected to be short-term and reversible.	Low	Moderate
Waterfowl (curlew, oystercatcher, teal, wigeon and goldeneye)				Low	Moderate
Breeding birds	Regional	Construction related activities, including vehicle movement and vegetation clearance throughout the proposed Scheme.	Direct mortality and disturbance due to vegetation clearance during the breeding season. Short-term but significant effect due to habitat loss and disturbance caused by construction.	Medium	Moderate
	Regional	Noise, vibration and light spill associated with construction related operations including earth movements throughout the proposed Scheme.	Disturbance leading to avoidance of habitats and displacement of population(s). The effect would be short-term and reversible.	Medium	Moderate
Corn bunting	National	Construction related activities, including vehicle movement and vegetation clearance within arable land west of Milton at Gollanfield farm (ch11500) to the east of Poolton Farm	Direct mortality to this species due to clearance and disturbance of arable land, field margins and areas of scrub grassland.	High	Major

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		(ch17000) including Brackley Junction.	This effect would be permanent and negative to this small, important population of corn bunting.		
		Noise, vibration and light spill associated with construction related operations including earth movements, in the areas indicated above.	Habitat loss due to disturbance. The loss of this habitat will reduce the availability of safe nesting areas, insect-rich summer foraging habitat and provisions of winter seed crop spanning multiple seasons during the construction phase. This may have ongoing consequent effects on breeding success and winter survival rates for the species. Habitat fragmentation due to disturbance may have an effect on territory distribution as construction activities dissect known corn bunting territories. This effect will be long-term and negative.	High	Major
Barn owl	Regional	Noise, vibration and light spill associated with construction related operations including earth movements.	Disturbance leading to avoidance of habitats and displacement of population(s). The effect would be short-term and reversible.	Low	Minor
Aquatic habitat Key attributes: water quality and instream habitat.	National	Construction activities associated with the bridge over the River Nairn (ch22400 to ch22500) could result in runoff of contaminants and/or sediment.	Pollution leading to reduced water quality in the river. Smothering of substrates important to aquatic species from input of fine sediments. These will cause long-term, reversible effects.	Medium	Moderate
	National	Dewatering and substrate removal during construction activities for the River Nairn (ch22400 to ch22500) bridge piers and drainage associated with the proposed Scheme.	Temporary loss of small area of habitat leading to reduced habitat availability. Changes in hydrology leading to alteration of habitat. The extent of the work is expected to be localised. This will be a short-term, reversible effect.	Low	Moderate
Aquatic habitat Key attributes: instream habitat, water quality and hydrology.	Regional	Dewatering and substrate removal during construction works for structures associated with the proposed Scheme at the following locations: • Cairnlaw Burn (ch1700 to ch2300); and • Auldearn Burn (ch26700 to ch26800).	Fragmentation and temporary loss of habitat. This will be a short-term, reversible effect.	Low	Minor
		Construction activities for structures associated with the proposed Scheme could result in runoff of contaminants or sediments at the locations above.	Pollution leading to reduced water quality in the burns. Inputs of fine sediments smothering important substrates for aquatic species. These will cause long-term, reversible effects.	Medium	Moderate
		Changes in hydrology from over pumping of water due to construction activities for structures associated with the proposed Scheme at the locations above.	Changes in hydrology leading to functional alteration of habitat conditions in the burns. This will be a short-term, reversible effect.	Low	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
Aquatic habitat Key attribute: water quality	Authority area	Construction activities for structures associated with the proposed Scheme could result in runoff of contaminants or sediments into SWF31 (ch27300 to ch27400).	Pollution leading to reduced water quality in the river. Smothering of substrates important to aquatic species from input of fine sediments. This will be a short-term, reversible effect.	Medium	Minor
Fish Key attributes: Atlantic salmon, trout spawning habitat and physiology, and European eel habitat.	International	Construction activities for structures associated with the proposed Scheme could result in release of contaminates runoff or input of sediments into the River Nairn (ch22400 to ch22500).	Reduced water quality leading to negative physiological implications. Inputs of fine sediments inundating spawning substrates and reduce egg viability. This will be a short-term, reversible effect.	Low	Moderate
		Dewatering during construction activities for the River Nairn (ch22400 to ch22500) bridge piers and drainage associated with the proposed Scheme.	Mortality of fish from dewatering activities. This will be a permanent and negative effect.	High	Major
		Dewatering during construction activities for the River Nairn (ch22400 to ch22500) bridge piers and drainage associated with the proposed Scheme.	Temporary loss of small area of habitat and changes in hydrology leading to reduced habitat availability and alteration. The extent of the work is expected to be localised. This will be a short-term, reversible effect.	Low	Moderate
		Noise, vibration and lighting associated with construction activities for the River Nairn (ch22400 to ch22500) bridge piers and drainage associated with the proposed Scheme.	Disturbance leading to avoidance of habitats. This will be a short-term, reversible effect.	Low	Moderate
Fish Key attributes: European eel, lamprey species, trout habitat and water quality.	International	Instream works such as culverts and headwall construction associated with the proposed Scheme at the following locations: • Cairnlaw Burn (ch1700 to ch2300); and • Auldearn Burn (ch26700 to ch26800).	Direct mortality of fish. Both burns contain European eel, a species of international importance. Loss of any individuals will have a permanent effect on eel populations in the watercourses. This will be a permanent and negative effect.	High	Major
		Dewatering and substrate removal in watercourses due to construction activities associated with the proposed Scheme at the above locations.	Temporary loss of habitat and changes in hydrology leading to reduced habitat availability and alteration. Fragmentation of the watercourses could prevent fish from accessing important habitats. This will be a short-term, reversible effect as fish will be able to recolonise the areas.	Low	Moderate
		Construction activities for the proposed Scheme could result in contaminated runoff or input of sediments at the above locations.	Pollution leading to reduced water quality in the burns. Can have negative physiological implications. Inputs of fine sediments can inundate spawning substrates and reduce egg viability. This will cause short-term, reversible effects.	Low	Moderate
		Noise, vibration and lighting associated with construction	Disturbance leading to avoidance of habitats.	Low	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		works on the proposed Scheme and culverts at the above locations.	European eels are especially photophobic and lighting could discourage migration. This will be a short-term, reversible effect.		
Macroinvertebrates Key attributes: macroinvertebrate habitat availability and physiology.	Authority area	Construction activities for the proposed Scheme could result in runoff of contaminants or sediments at the following location: • River Nairn (ch22400 to ch22500)	Pollution leading to reduced water quality. Can have negative physiological implications. Inputs of fine sediments can smother macroinvertebrate habitat and affect the gills of some species. This will cause a short-term, reversible effect.	Medium	Minor
		Dewatering during construction activities for bridge piers and drainage associated with the proposed Scheme at the location above.	Temporary loss of small area of habitat and changes to hydrology leading to reduced habitat availability. The extent of the work is expected to be localised. This will be a short-term, reversible effect.	Low	Negligible
Macroinvertebrates Key attributes: macroinvertebrate community composition and habitat availability.	Authority area	Instream construction works such as inserting/extending culverts and installing headway associated with the proposed Scheme at the following locations: • Cairnlaw Burn (ch1700 to ch2300); • Auldearn Burn (ch26700 to ch26800); and • Rough Burn (ch7500).	Direct mortality is a permanent negative effect, but unlikely to have a substantial effect on the wider population in these watercourses.	Medium	Minor
		Construction activities for structures associated with the proposed Scheme at the above locations.	Temporary loss of macroinvertebrate habitat and changes in hydrology. Fragmentation may also occur if habitat loss causes a barrier to migration. This will be a short-term, reversible effect.	Medium	Minor
		Construction activities for structures associated with the proposed Scheme could result in contaminated runoff or input of sediments at the above locations.	Pollution leading to reduced water quality in the burns. Inputs of fine sediments can smother macroinvertebrate habitat and affect the gills of some species. This will be a short-term, reversible effect.	Medium	Minor
Macrophytes Key attributes: macrophyte community diversity and abundance.	Authority area	In-channel works including the removal of natural bed, bank and riparian zone for inserting/extending culverts and installing headwalls at the following locations: • Fiddler's Burn (ch4700); • SWF16 (ch10400 to ch10700); • SWF18 (ch12700 to ch13000); and • Auldearn Burn (ch26700 to ch26800).	Direct mortality of macrophytes. This will be a permanent, irreversible effect but will not have a long-term impact on the macrophyte assemblage.	Medium	Minor
		Removal of natural bed, bank and riparian zone for inserting/extending culverts and installing headwalls and	Loss of in-channel habitat, riparian habitat and habitat beyond the direct footprint of the installations.	Medium	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		works associated with construction of drainage at the above locations.	This will be a permanent, irreversible effect but will not have long-term impact on the macrophyte assemblage.		
		Pollution (including sediments) from in-channel works such culverts and headwall construction, earthworks adjacent to watercourses and from diffuse surface runoff and outfalls draining the works site at the above locations.	Reduction in water quality resulting in the loss of macrophytes or reduced viability of macrophyte assemblage. This will be a temporary and reversible effect, and will not have a long-term impact on macrophytes assemblages.	Medium	Minor
		Dewatering or over pumping for culvert installation and extension at the above locations. An increase in surface runoff from riparian vegetation clearance may influence natural flow types.	Changes in the flow regime could result in the loss of flow sensitive species. In-channel habitat for macrophytes could be modified due to altered flow regime influencing natural geomorphological process (deposition, scour) and changes in water quality. This will be a short-term, reversible effect.	Medium	Minor
INNS	N/A	Transfer of INNS during construction in the following locations: • Inshes Burn; • Scretan Burn (ch1100 to ch1300); • Cairnlaw Burn (ch1800 to ch2300); • ch3000; • Tornagrain (ch9500 to ch9600); • River Nairn (ch22400 to ch22500); • Crook plantation (ch22900 to ch23400); • Auldearn Burn (ch26700 to ch26800); and • Plantation at Easter Hardmuir (ch30500 to ch31000).	Reduction in biodiversity, through loss of habitat, reduction in species-richness and a loss of species which the habitat(s) support. Long-term, irreversible (without management) and likely. With the potential for the effects to spread beyond the scope of the initial impact area.	High	Major
Operation					
Inner Moray Firth SPA	International	Increase in road runoff due to increase in impervious surfaces at the following locations: • Scretan Burn (ch1250); and • Cairnlaw Burn (ch2280 and ch2530).	Pollution of Scretan and Cairnlaw Burn which feed into the SPA resulting in reduced water quality for the SPA and reduction in biodiversity. This effect would be long-term, reversible and negative.	Medium	Major
Longman and Castle Stuart Bays SSSI	National			Medium	Moderate
AWI woodland (3 'Other' (on Roy map)) River Nairn Woodland East	National	Loss of approximately 0.18ha and 0.11ha of AWI (3) habitat on the east and west side of the River Nairn under the footprint of the proposed Scheme (road, associated cutting/embankments and shading from River Nairn crossing).	Loss of AWI habitat. Potential to retain some canopy at the river edge as well as ground flora (see Figure 9.5). This effect would be permanent and negative.	Medium	Moderate
AWI woodland (3 'other' on Roy map)	Authority			Medium	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
River Nairn woodland west		Loss of approximately 24.7ha of AWI (2b) habitat under the footprint of the proposed Scheme (road and associated cutting/embankments). Loss of approximately 8.43ha of non-AWI woodland habitat under the footprint of the proposed Scheme (road and associated cutting/embankments). Loss of woodland and scrub (including AWI and non-AWI woodland) predicted to be approximately 33.1ha (13% of total habitat loss).			
AWI woodland (2b LEPO)	Authority		Loss of AWI. This effect would be permanent and negative.	High	Moderate
Non-AWI woodland Broadleaved woodland near Glenbeg (ch2250 to ch2300) Dalcross road (ch9450 to ch9550) Milton of Gollanfield (ch12850 to ch13075) Crook plantation (N) (ch22900 to ch23150) Russell's Wood (ch25150 to ch25300) Crook plantation (W) (ch22850 to ch22900)	Authority		Loss of woodland area. This effect would be permanent and negative.	High	Moderate
Bluebell Woodland: Glenbeg woodland; River Nairn (east bank).	Authority		Loss of individual plants at two locations leading to a short to long-term effect (reduction) on the bluebell populations until numbers become re-established.	Medium	Minor
Otter	Regional	Increased and new road footprint at the following locations: • Scretan Burn (ch1120 to ch1300); • Cairnlaw Burn (ch1680 to ch2300); • Rough Burn (ch7460 to ch7550); and • Auldearn Burn (ch26710 to ch26810).	Direct mortality of individuals through road-traffic related incidents. This effect would be permanent and negative.	Low	Minor
		Severance of habitat by the proposed Scheme (road and associated cutting/embankments), at locations indicated above.	Fragmentation of connecting terrestrial habitats leading to increase in barriers to movement and reduced access to resources for the species within the catchment. This effect would be permanent and negative.	Low	Minor
		Noise, vibration and light spill associated with operation of the road and increased traffic, at locations indicated above.	Disturbance of an EPS leading to its avoidance of key places of shelter and rest. However, as known resting sites are situated more than 30m from the proposed Scheme, it is not considered that any disturbance will cause declines in population. This effect would be permanent and negative.	Low	Minor
		Increase in road runoff due to increase in impervious surfaces, at locations indicated above.	Pollution leading to decreased water quality resulting in reduced fitness of individuals and a reduction in	Low	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
			prey resource. This effect would be permanent and negative.		
	Regional	Loss of terrestrial habitat under the footprint of the proposed Scheme (road and associated cutting/embankments) at the following locations: • Scretan Burn (ch1120 to ch1300); • Rough Burn (ch7460 to ch7550); • Auldearn Burn (ch26710 to ch26810); and • Cairnlaw Burn (ch1680 to ch2300).	Permanent reduction in availability of foraging and commuting habitat. However, habitat loss is not considered extensive enough to cause declines in population. This effect would be permanent and negative.	Medium	Moderate
Bats (breeding, hibernation sites and key habitats)	Regional	Loss of roost habitat under the footprint of the proposed Scheme (road and associated cutting/embankments) in: • One high potential and two moderate potential maternity/hibernation buildings/structures lie under the footprint of the proposed Scheme (BS25 (ch7520), BB1.10 (ch1800) and BS1 (ch19470) (Figure 11.3); and • Potential maternity/hibernation tree roosts under the footprint of the proposed Scheme (Figure 11.3): o BT1 (ch3000) and BT16 (ch3000).	Permanent loss of roost sites which could result in mortality of bats and reduced breeding success. This effect would be permanent and negative.	High	Major
		Loss of roost habitat under the footprint of the proposed Scheme (road and associated cutting/embankments) in high value foraging and commuting habitat at the River Nairn: BW47 (ch22400 to ch22500).	Permanent loss and fragmentation of habitat and reduced availability of foraging resources. This effect would be permanent and negative.	Medium	Moderate
		Disturbance of roosts from noise, vibration and light spill associated with operation of the road and increased traffic in: • One confirmed roost (likely maternity) within 30m of the proposed Scheme (BB15 (ch96000)) (Figure 11.3); • Twenty-three high potential and 23 moderate potential maternity/hibernation structures/buildings lie within 50m of the footprint of the proposed Scheme (Figure 11.3); and • Disturbance as a result of light spill predicted at Smithton Junction and Brackley Junction.	Disturbance of an EPS leading to the abandonment of roost sites, increased energy expenditure during roosting periods. This would lead to reduced breeding success. This effect would be permanent and negative.	High	Major
		Disturbance of roosts from noise and vibration associated with operation of the road and increased traffic in high value foraging and commuting habitat at the River Nairn: BW47 (ch22400 to ch22500).	Disturbance of an EPS leading disruption to commuting routes/flight paths and avoidance of foraging areas. This would lead to reduced breeding success. This effect would be permanent and negative.	Medium	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		Increase in road runoff due to increase in impervious surfaces at the River Nairn BW47 (ch22400 to ch22500).	Pollution of watercourse resulting in reduced prey availability, leading to a decline in foraging habitat quality. This effect would be permanent and negative.	Medium	Moderate
Bats (non-breeding areas)	Authority	Loss of roost habitat under the footprint of the proposed Scheme (road and associated cutting/embankments) at: • Potential non-breeding building/structure roosts at BS12.1 (ch16100); and • Tree roosts within all woodland assessed as containing high to low roost potential at the following locations: o Cairnlaw BW25 (ch1700 to ch1800); o BW28 (ch2950 to ch3050); o Culloden (BW48 ch3850 to ch3950); o River Nairn BW47 (ch22400 to ch22500); o Cairnlaw BW26 (ch2200 to ch2300); o Balnaspirach BW42 (ch20600 to ch20700); o Crook BW13 (ch22850 to ch23450); o Tornagrain: BW19 (ch8900 to ch9200 and ch9400 to ch10200); o Balspardon: BW31 (ch14300 to ch14600) o Crook: BW13 (c22900 to ch23400) and BW14 (ch22850 to ch22900); and o Wester Hardmuir: BW8 (ch29700 to ch30200).	Permanent loss of roost sites which could result in mortality of bats. This effect would be permanent and negative.	High	Moderate
		Loss of roost habitat under the footprint of the proposed Scheme (road and associated cutting/embankments) at: • Moderate value foraging and commuting habitat at the following locations: o Tornagrain: BW19 (ch8900 to ch9200 and ch9400to ch10200); o Balspardon: BW31 (ch14300 to ch14600) o Crook: BW13 (c22900 to ch23400) and BW14 (ch22850 to ch22900); o Wester Hardmuir: BW8 (ch29700 to ch30200); o Rough Burn (ch7450 to ch7500); and o Auldearn Burn (ch26700 to ch26800).	Permanent loss and fragmentation of habitat and reduced availability of foraging resources. This effect would be permanent and negative.	Medium	Minor
		Disturbance of roosts from noise, vibration and light spill associated with operation of the road and increased traffic in	Disturbance of an EPS leading to the abandonment of roost sites, increased energy expenditure during	High	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		the following locations: • Non-breeding building/structure roosts: o Two buildings with three confirmed roosts (likely non-breeding) lie within 30m of the proposed Scheme (BB15 (ch9600) and BB 1.24b (ch2700)) (Figure 11.3); o Eighteen low potential buildings/structures lie within 50m of the footprint of the proposed Scheme (Figure 11.3); • Tree roosts within all woodland assessed as containing high to low roost potential at locations indicated above; and • Disturbance as a result of light spill not predicted at Nairn (East) Junction.	roosting periods. This effect would be permanent and negative.		
		Disturbance of roosts from noise vibration and light spill associated with operation of the road and increased traffic in: • Moderate value foraging and commuting habitat in locations indicated above; and • Disturbance as a result of light spill predicted at Brackley Junction and Mid Coul Junction.	Disturbance of an EPS leading to disruption to commuting routes/flight paths and avoidance of foraging areas. This would lead to reduced breeding success. This effect would be permanent and negative.	Medium	Minor
		Increase in road runoff due to increase in impervious surfaces at: • Rough Burn (ch7450 to ch7500); and • Auldearn Burn (ch26700 to ch26800).	Pollution of watercourse resulting in reduced prey availability, leading to a decline in foraging habitat quality. This effect would be permanent and negative.	Medium	Minor
Badger	Regional	New road footprint.	Direct mortality of badgers caused by collision with road traffic. This effect would be permanent and negative.	High	Major
		Loss of habitat under the footprint of the proposed Scheme (road and associated cutting/embankments).	Reduction of foraging and commuting habitat within social group territories reducing the carrying capacity of the area in respect to badgers. This effect would be long-term and negative.	High	Major
		Severance of habitat by the proposed Scheme (road and associated cutting/embankments).	Habitat fragmentation/isolation which would restrict/preclude movement for the purposes of badger ecological function and genetic flow. This effect would be permanent and negative.	High	Major
		Noise and vibration along the proposed Scheme and light spill at junctions associated with the operation of the road and increased traffic.	Altered use of habitats and disturbance of badger habitat leading to a change in the distribution of local population(s) and a reduction in available resources.	Medium	Moderate

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
			This effect would be long-term and neutral.		
		Loss of two main setts under the footprint of the proposed Scheme (road and associated cutting/embankments) (Appendix CA11.1: Confidential Appendix – Badgers and Otters).	Direct destruction of badger setts and loss of associated habitat. This effect would be permanent and negative.	High	Major
Water vole	Regional	Loss of habitat connectivity under the footprint of the proposed Scheme (road and associated cutting/embankments) at Inshes Burn.	Fragmentation of connecting terrestrial habitats leading to increase in barriers to movement and access to resources for the species within the catchment. This effect would be permanent and negative although as significant barriers to movement currently exist between the proposed Scheme and the water vole population, there is unlikely to be a significant impact to the population.	Low	Minor
Red squirrel	Regional	Increased and new road footprint at the following locations: • Tornagrain Wood (ch19560 to ch10510); • Woodland at Blackcastle Quarry (ch17900 to ch18600) (and associated local roads around Drumdivan); • Woodland at Crook (ch22890 to ch23400); • Skene Park (ch23800 to ch24010); • Russell's Wood (ch24700); • Wester Hardmuir Wood (ch29680 to ch30420); and • Woodland along Scretan Burn (ch1250) (with respect to pine marten).	Direct mortality of animals caused by collision with road traffic. Although this effect would be permanent and negative to the low number of individuals affected, there is unlikely to be a significant impact to the overall population.	Low	Minor
Pine marten		Loss of habitat under the footprint of the proposed Scheme (road and associated cutting/embankments), at the locations indicated above.	Permanent reduction in availability of habitat to red squirrel and pine marten that rely on it for food, shelter and breeding. Failure to meet objectives as set out in SNH Moray Firth natural heritage futures and SBS. This effect would be permanent and negative.	High	Major
		Severance of habitat by the proposed Scheme (road and associated cutting/embankments), at the locations indicated above.	Fragmentation of habitat and links between woodland areas. Failure to meet objectives as set out in SNH Moray Firth natural heritage futures and SBS. This effect would be permanent and negative.	High	Major
Common lizard amphibians	Authority area	Increased and new road footprint at the following locations for common lizard: • Site 8 (ch18450 to ch18800); • Site 9 (ch21300);	Direct mortality of individuals through road-traffic related incidents. Although this effect would be permanent and negative, there is unlikely to be a significant impact to the overall population due to the low number of individuals	Low	Negligible

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
		• Site 11 (ch23900); and • Site 12 (ch25800 to ch25900). Increased and new road footprint at the following locations for amphibians: • Ponds 6 and 7 (ch8600 to ch9400); • Loch Flemington (ch13400 to ch15800); • Ponds 25, 25.1, 25.2, 26 and 27 (ch18400 to ch19500); • Pond 39 (ch30400); and • Pond 40 (Nairn (West) Junction).	affected.		
		Loss of habitat under the footprint of the proposed Scheme (road and associated cutting/embankments), at the locations indicated above.	Reduction in available common lizard habitat. Reduction in amphibian terrestrial and suitable aquatic habitat (loss of two seasonal ponds under the footprint of the proposed Scheme; Ponds 25.1, 25.2) This effect would be permanent and negative.	High	Moderate
		Severance of habitat by the proposed Scheme (road and associated cutting/embankments), at the locations indicated above.	Fragmentation of habitat and links between areas of suitable habitat. This effect would be permanent and negative.	High	Moderate
Amphibians	Authority area	Increase in road runoff due to increase in impervious surfaces at the following locations: • ch4800 to ch6400; • ch8600 to ch9400; • ch13400 to ch15800; • ch184001 to ch9500; and • ch30400.	Pollution resulting in habitat loss and degradation or the mortality of amphibians. This effect would be temporary and reversible.	Medium	Minor
		Alteration of habitat as a result of the proposed Scheme at the locations indicated above.	Hydrological changes resulting from modifications to land drainage and overland flow. Dependent on the magnitude of the hydrological change this could be a permanent and negative effect.	Medium	Minor
Great crested newt	National	Loss of their terrestrial habitat under the footprint of the proposed Scheme (road and associated cutting/embankments), at the locations: • Terrestrial habitat (ch13400 to ch15800) (near Loch Flemington); and • Terrestrial habitat (ch19400 to ch21100).	Reduction in available terrestrial habitat. This effect would be permanent and negative.	High	Major
Wintering birds (pink-footed goose and greylag goose)	International	Construction impacts only. Analysis of the wintering bird data to facilitate the HRA			

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
Wintering waterfowl (curlew, oystercatcher, teal, wigeon and goldeneye)		(Jacobs 2016) indicated that geese made up 97% of all observed SPA/RAMSAR qualifying species. These species (greylag and pink-footed geese) utilised approximately 11% and 30% of the available habitat within the surveyed area of 6,964ha. The area lost under the proposed Scheme footprint represented a loss of 2.5% of this available habitat and <0.2% of the available habitat within the 20km goose maximum foraging distance (SNH 2013c). This indicated that there was a significant area of habitat available to geese outside the influence of the proposed Scheme, and that therefore there would be no operational impacts at the population level as a result of habitat loss. The potential for impacts as a result of disturbance were also considered to be not significant at the population level. (Jacobs 2016).			
Breeding birds	Regional	New road footprint.	Direct mortality of individuals through road-traffic related incidents. Although this effect would be permanent and negative to the low number of individuals affected, there is unlikely to be a significant impact to the overall breeding bird assemblage.	Low	Minor
		Severance of habitat by the proposed Scheme.	Fragmentation of breeding habitat which could result in reduced breeding success. Failure to meet conservation objectives set out in SBS and Highland BAP (Highland Environment Forum 2015). This effect would be long-term and negative.	Medium	Moderate
		Loss of habitat under the footprint of the proposed Scheme (road, embankments, cuttings).	Loss of suitable breeding habitat which could result in reduced breeding success. Failure to meet conservation objectives set out in SBS and Highland BAP (Highland Environment Forum 2015). This effect would be long-term and negative.	Medium	Moderate
Corn bunting	National	Loss of approximately 8.15ha of potential nesting habitat under the footprint of the proposed Scheme (road, embankments, cuttings), in the areas indicated above.	Habitat loss will have a permanent, negative, effect on the provision of safe nesting habitat and year-round food sources. Failure to meet conservation objectives set out in SBS and Highland BAP (Highland Environment Forum 2015). Due to the small, sedentary, population present these effects may negatively affect this species over multiple generations.	High	Major

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
Barn owl	Regional	New road footprint.	Mortality of foraging individuals through road-traffic related incidents. This effect would be permanent and negative to the low number of individuals affected. However, barn owls in the area are habituated to the existing A96.	Medium	Moderate
Aquatic habitat Key attributes: water quality and instream habitat.	National	Increase in runoff of contaminants and sediments into the River Nairn (ch22400 to ch22500) due to structures associated with the proposed Scheme.	Reduction of water quality. This will be a negative effect that can have long-term implications.	Low	Moderate
		Increase in sediment inputs to the River Nairn (ch22400 to ch22500) from silt collected in road drainage.	Inputs of fine sediments can smother substrates that are important for aquatic species. This will be a recurring, short-term negative effect.	Medium	Moderate
Aquatic habitat Key attributes: water quality, instream habitat and hydrology.	Regional	Loss of habitat under structures associated with the proposed Scheme at the following locations: • Cairnlaw Burn (ch1700 to ch2300); and • Auldearn Burn (ch26700 to ch26800).	Loss of habitat for aquatic species. This effect will be permanent and irreversible.	High	Major
		Culverts associated with the proposed Scheme create unnatural flow and substrate conditions that will fragment both burns at the above locations.	Discontinuity in flow and substrate conditions that could discourage or prevent migration of aquatic species. This will be a permanent effect.	High	Major
		Increase in contaminant runoff from the road near both burns at the above locations.	Pollution leading to reduced water quality in both burns. This will be a long-term, negative effect.	Medium	Moderate
		Increase in sediment inputs at the above locations from silt collected in road drainage.	Inputs of fine sediments resulting in smothering substrates that are important for aquatic species. This effect will be recurring but short-term.	Low	Minor
		Streamflow will be altered within the culverts associated with the proposed Scheme at the above locations.	Change in hydrology leading to altered substrate movement in this section of the stream and scouring of substrates at the culvert outlet. This would discourage upstream migration of aquatic species. This will be a permanent, irreversible effect.	High	Major
Fish Key attribute: instream habitat availability.	International	Increase in contaminant and sediment runoff from the proposed Scheme into the River Nairn (ch22400 to ch22500).	Pollution leading to decreased water quality. Fine sediment inputs resulting in smothering of important substrates. These impacts can alter the amount and quality of habitat for fish species. These effects will be recurring, but short-term.	Low	Moderate
Fish Key attributes: hydrology, water	International	Loss of habitat under structures such as culverts associated with the proposed Scheme at the following locations:	Permanent habitat loss resulting in fish losing access to potentially important feeding or spawning habitat.	High	Major

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
quality, physiology and spawning habitat.		• Cairnlaw Burn (ch1700 to ch2300); and • Auldearn Burn (ch26700 to ch26800).	This will be a permanent, irreversible effect.		
		Culverts associated with the proposed Scheme create unnatural flow and substrate conditions that may fragment the watercourses at the above locations.	Change in hydrology leading to altered substrate movement in this section of the stream and scouring of substrates at the culvert outlet. This would discourage or prevent upstream migration by fish. This will be a permanent effect.	High	Major
		Increase in contaminant runoff from the road near watercourses at the above locations.	Pollution leading to reduced water quality in the watercourses. This will be a negative effect that can have long-term implications.	Medium	Major
		Increase in sediment inputs from silt collected in road drainage at the above locations.	Inputs of fine sediments resulting in smothering of substrates important for juveniles and spawning adults. This effect will be recurring but short-term.	Low	Moderate
Macroinvertebrates Key attribute: instream habitat availability.	Authority area	Increase in contaminant and sediment runoff from the proposed Scheme into the River Nairn (ch22400 to ch22500).	Pollution leading to decreased water quality. Input of fine sediments that can smother important substrates. These impacts can alter the amount and quality of habitat for macroinvertebrates. These effects will be recurring, but short-term.	Medium	Minor
Macroinvertebrates Key attributes: instream habitat, water quality and physiology.	Authority area	Loss of habitat under structures associated with the proposed Scheme. Culverts associated with the proposed Scheme create unnatural flow and substrate conditions that may fragment the burns. Impacts will be at the following locations: • Cairnlaw Burn (ch1700 to ch2300); • Auldearn Burn (ch26700 to ch26800); and • Rough Burn (ch7500).	Permanent habitat loss and habitat fragmentation for species with poor or no flying adult stages. This will be a permanent, irreversible effect.	High	Moderate
		Increase in contaminant runoff from the road near watercourses at the above locations.	Pollution leading to reduced water quality in both burns. This will be a long-term negative effect.	High	Moderate
		Increase in sediment inputs from silt collected in road drainage at the above locations.	Inputs of fine sediments resulting in smothering macroinvertebrate habitat and affect to gills of some species. This effect will be recurring but short-term.	Medium	Minor
Macrophytes Key attribute: macrophyte community diversity and	Authority area	Loss of habitat loss from new and/or extended culverts and headwalls at the following locations: • Fiddler's Burn (ch4700);	Permanent habitat loss for macrophytes under the direct footprint of the installations. Shading caused by new in-channel structures will limit macrophyte growth.	Medium	Minor

Ecological feature	Importance	Potential impact	Effect	Magnitude	Significance
abundance.		• SWF16 (ch10400 to ch10700); • SWF18 (ch12700 to ch13000); and • Auldearn Burn (ch26700 to ch26800).	No long-term effect on the macrophyte assemblage. Permanent, irreversible but localised effect.		
		Increase in contaminant runoff from road at the above locations.	Pollution resulting in a reduction in water quality and loss of macrophytes or reduced viability of macrophyte assemblage. Inputs of fine sediments resulting in loss of macrophytes through direct smothering of substrate and reduced photosynthesis due to high turbidity levels. This effect will be recurring but short-term.	Medium	Minor
		Increase in the conveyance of water flowing through culverts, increased volume of runoff due to the increased surface area of the road and embankments/cutting and improved drainage system at the above locations.	Hydrological changes (quantity and dynamics of flow). Modification to the current flow regime resulting in the loss of flow sensitive species. Flow modifications influencing geomorphological processes (i.e. erosion and deposition), affecting habitat availability for macrophytes particularly around culvert insertions and outfalls. This will be a negative permanent effect.	Medium	Minor
INNS	N/A	Construction impacts only.			

11.5 Mitigation

11.5.1 Mitigation measures for the proposed Scheme in relation to Habitats and Biodiversity are detailed below and take into account best practice, legislation, guidance and professional experience. The mitigation commitments identified in the SEAs for the STPR (Jacobs, Faber Maunsell, Grant Thompson and Tribal Consulting 2008) and A96 Dualling Programme (CH2M 2015 and 2016) have also been taken into consideration.

11.5.2 As noted in Section 11.2 (Methodology), mitigation would follow a hierarchical approach to mitigation design, in the following order (CIEEM 2016; SNH 2013a; Scottish Government 2013a):

- avoid adverse impacts in the first instance;
- where avoidance is not possible, reduce the adverse impacts through mitigation; and
- where significant adverse residual impacts remain, measures to offset the adverse impacts at a site-specific level may be required (compensation).

11.5.3 This section outlines mitigation measures proposed to avoid, reduce or offset the potential adverse effects of the proposed Scheme on biodiversity and nature conservation in accordance with best practice guidance and UK, Scottish and local government environmental impact, planning and sustainability policies.

11.5.4 The principles and objectives for mitigation associated with the proposed Scheme have been developed through an iterative design process and consultation with SNH, SEPA and other relevant stakeholders (Chapter 6: Consultation and Scoping).

11.5.5 The proposed mitigation is designed to produce a net gain for biodiversity where practicable in line with policy and guidelines (CIEEM 2016). It has also been designed to deliver biodiversity objectives including, but not limited to:

- Highland BAP (Highland Environmental Forum 2015);
- Natural Heritage Futures (SNH 2002, 2009a);
- Inverness and Nairn BAP (Inverness and Nairn Biodiversity Group 2004);
- Highland-wide Local Development Plan Strategic Environmental Assessment (The Highland Council 2015);
- Highland Forest and Woodland Strategy (The Highland Council 2006);
- The Highland Council's Supplementary Guidance (The Highland Council 2013a, 2013b, 2013c); and
- Scottish Forestry Strategy (Scottish Executive 2006).

11.5.6 It is expected that all impacts of Negligible significance and the majority of impacts of Minor significance would be mitigated through the application of best working practice (e.g. mitigation of potential pollution impacts) through adherence to standard best practice and guidelines, such as the SEPA Pollution Prevention Guidelines (PPGs) (SEPA 2003) as set out in the Mitigation Protocol (Appendix A11.3: Mitigation Protocol).

11.5.7 Significant ecological impacts (Moderate or above) are expected to be mitigated through a combination of best practice/typical mitigation methods which are set out in the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) and mitigation targeted to specific locations (Table 11.11).

11.5.8 It should be noted that elements of the mitigation strategy such as habitat creation, fencing and underpasses have been strategically designed, where practicable, to provide mitigation for numerous features simultaneously. For example, bats would utilise underpasses and overbridges if designed and managed through careful control of lighting and planting, even though their principal purpose may be to mitigate impacts to other species such as otter.

Ecological Clerk of Works (ECoW) (Mitigation Item E1)

11.5.9 A suitably qualified (or team of suitably qualified) Ecological Clerk of Works (ECoW) will be employed by the appointed contractor to supervise the construction works, undertake 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. An employer's agent ecologist will observe that the appointed contractors ECoW are suitably qualified to undertake their role and will audit the contractual obligations with regards the ecological safe-guarding and ecological mitigation requirements.

Construction Environmental Management Plan (CEMP) (Mitigation Item GR1+GR2)

11.5.10 A CEMP will be produced by the appointed contractor which will set out the intended methods of effectively managing potential environmental impacts resulting from construction of the proposed Scheme. It will contain specific environmental objectives, environmental risks and the proposed mitigation such as dust and soil management, storage of chemicals and use of SEPA PPGs (SEPA 2003). It will also contain, where relevant, method statements as a means of controlling environmental risks including biosecurity maintenance (including control of INNS).

Species Protection Plans (Mitigation Item E2)

11.5.11 Species Protection Plans will be prepared for EPS (and other species, including badgers, as necessary) by the appointed contractor as part of the CEMP and shall implement the environmental commitments identified in this ES (Table 11.11) where applicable. The Species Protection Plans will be prepared to ensure that essential mitigation strategies required for safeguarding protected species are implemented as part of the contract, and will be updated as appropriate if any additional licences and mitigation measures or amendments to the agreed mitigation are identified. The plans will be developed in consultation with all relevant stakeholders including SNH.

Habitat Management Plans (Mitigation Item E3)

11.5.12 Habitat Management Plans will be prepared for habitats of conservation interest (AWI and other woodland) by the appointed contractor as part of the CEMP and shall include the environmental commitments identified in this ES (Table 11.11) where applicable. The Habitat Management Plans will be prepared to ensure that essential mitigation strategies required for protecting and managing habitats are implemented as part of the contract and will be updated as appropriate if any additional mitigation measures or amendments to the agreed mitigation are identified. The Habitat Management Plans will also make reference to INNS management plans where appropriate.

Mitigation Items

11.5.13 Mitigation is described in Table 11.11 and within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) **(Mitigation Item GR1+GR2)**. Mitigation such as planting is described in Chapter 9 (Landscape) and also shown on Figure 9.5. Impacts of Negligible significance have not been detailed further in Table 11.11 as these would be fully mitigated though implementation of the Mitigation Protocol (Appendix A11.3: Mitigation Protocol and paragraph 11.5.5).

11.5.14 It will be the contractual responsibility of the appointed Contractor to ensure that mitigation is implemented during the works and that all relevant licences, should they be required, are in place prior to commencement of works.

11.5.15 It should be noted that SNH consider ecological data acquired on EPS to have a limited time frame of 12 months before becoming outdated, therefore, updated otter and bat surveys will be required at an appropriate time prior to construction commencing.

11.5.16 Should the presence of EPS within the study area change, additional mitigation may be required.

11.5.17 New planting will constitute an important part of the mitigation proposals for direct replacement of habitat as well as that for faunal species for foraging and lying-up. Information on planting locations is provided in Table 11.11 and shown on Landscape Figure 9.5.

Table 11.11: Ecological Mitigation for Habitats and Species

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
Inner Moray Firth SPA Longman and Castle Stuart Bays SSSI	Pollution from construction runoff	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP**. (Mitigation Item GR1+GR2)**	Construction	Negligible
	Pollution from operational runoff	Implementation of Sustainable Drainage Systems e.g. Basin and Pond (hereafter referred to as SUDS) treating water outflowing into the Scretan and Cairnlaw Burns **(Mitigation Item E4)**	Construction/Operation	Negligible
AWI woodland (3 'Other' (on Roy map)) River Nairn East Woodland	Loss of habitat under the footprint of the proposed Scheme/within the LMA and/or as a result of shading or reduced clearance	New woodland planting to replace habitat to be lost at the following locations: • ch1200 to ch1700; • ch1800 to ch2700; • ch2800 to ch3000; • ch7100 to ch7500; • ch8500 to ch9500; • ch10200 to ch10500; • ch10600 to ch11300; • ch12200 to ch12300; • ch14100 to ch14300; • ch14600 to ch14800; • ch16200 to ch16550; • ch17600 to ch18300; • ch18550 to ch21300; • ch21650 to ch22100; • ch22400 to ch22450; • ch22800 to ch27700; • ch28300 to ch29650; and • ch29800 to ch30900. **(Mitigation Item E5)**	Construction/Operation	Minor

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
AWI woodland (3 'Other' (on Roy map)) River Nairn West Woodland (including area of arable land) (2b) (LEPO)		Species mixes will reflect native woodland mixes to replace non-native plantations. Planting would support local and regional BAP objectives to enhance structural diversity including: • AWI woodland soil would be re-used where appropriate to maintain soil microbial biodiversity and provide a seed bank; • management would be undertaken in AWI woodland to be retained, to support BAP objectives, including the retention of dead and fallen wood; and • development of a woodland Habitat Management Plan **(Mitigation Item E3 and E5)**		Negligible
Non-AWI woodland	Loss of habitat under the footprint of the proposed Scheme/within the LMA	New woodland planting to replace habitat to be lost (locations as above). Development of a woodland Habitat Management Plan. **(Mitigation Item E3)**	Construction/Operation	Negligible
Bluebell woodland				
Otter	Injury or mortality due construction related activities	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance due to noise and vibration during construction			Negligible
	Mortality due to vehicle collisions during operation	Provision of culverts suitable for passage by otters at the following locations: • ch1240; • ch1750; • ch2280; • ch2540; • ch4710; • ch6300; • ch7540; • ch8890; • ch10210; • ch12600; • ch12700; • ch22450; • ch23400; and • ch26750.	Construction/Operation	Negligible
	Severance of habitat by the proposed Scheme			Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
		(Mitigation Item E6) Provision of mammal proof fencing to prevent access onto the dual carriageway alignment by otter. Fencing would be positioned in such a way that otter would be directed to safe crossing points (see impacts on Badger for full extents of mammal-proof fencing). **(Mitigation Item E14)**		
	Disturbance due to noise, vibration and light spill during operation	Lighting shall be designed to avoid illuminating watercourses. **(Mitigation Item E12)**	Construction/Operation	Minor
	Loss of terrestrial habitat under the footprint of the proposed Scheme	New scrub woodland planting to mitigate fragmentation of existing habitat and replace habitat to be lost under the footprint of the proposed Scheme, at the following locations: • ch1600 to ch2000; • ch2600 to ch3800; • ch4800 to ch5300; • ch8300 to ch8500; • ch14000 to ch14200; • ch15300 to ch15450; • ch15800 to ch16300; • ch17100 to ch17550; and • ch25900 to ch26000. **(Mitigation Item E7)**	Construction/Operation	Negligible
	Pollution of watercourses due to road runoff	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Operation	Negligible
Bats (breeding, hibernation and non-breeding sites)	Mortality due to construction related activities.	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance of roost sites during construction		Construction	Negligible
	Pollution of watercourses due to construction runoff	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Loss of roost habitat under the footprint of	Provision of bat boxes to mitigate for woodland habitat loss, and for the fragmentation of commuting routes. Bat boxes to be provided at the	Construction/Operation	Minor

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	the proposed Scheme	following minimum densities and locations: • high potential: 10 boxes per hectare lost; • moderate potential: five boxes per hectare lost; and • low potential: one box per hectare lost.		
		<u>High</u> • ch1700; • ch2950; • ch3870; and • ch22450. <u>Medium</u> • ch2250; • ch2750; • Milton of Culloden road (U1144) (ch2100 to ch2770); • ch20500; • ch20650; and • ch23100. <u>Low</u> • ch9200; • ch9600; • ch14500; • ch18900; • ch23900; • ch24650; and • ch29630. **(Mitigation Item E8)**		
		Surveys did not identify roosts within the structures and buildings under the footprint. If pre-construction surveys identify roosts within these structures and buildings, mitigation should be dealt with through licensing (refer to Appendix 11.3 Mitigation Protocol). **(Mitigation Item GR1+GR2)**		
	Loss and fragmentation of commuting and foraging habitat under the footprint of the proposed Scheme	New woodland planting to mitigate fragmentation of existing habitat and replace habitat to be lost under the footprint of the proposed Scheme at the following locations: • BW20 (ch1150 to ch1250);	Construction/Operation	Minor

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
		• BW25, Cairnlaw (ch1550 to ch1800); • BW26, Cairnlaw, (ch2250 to ch2300); • BW27, Cairnlaw (ch2550); • BW28, Milton of Gollanfield (ch3000); • BW48, Culloden (ch3900); • BW19 Tornagrain, (ch8900), (ch9150), (ch9460), (ch10200); • BW31 Balspardan (ch14300 to ch14600); • BW42 Balnaspirach (ch20500 to ch20700); • BW13/14, Crook (ch22800 to ch22900); • River Nairn, BW47 (ch22400 to ch22500); and • BW8 (ch29800 to ch30400). **(Mitigation Item E9)**		
		The measures to be considered in consultation with an ecologist to develop site-specific mitigation at potential severance points, and at locations identified within species management plans, are provided in the following text: • Planting or retention of tall mature trees at crossing points to form 'hop-overs' (Limpens 2005) maintaining connectivity with existing landscape features. • Dense thickets parallel to the road are recommended at crossing points to force low flying species such as Myotis and brown long-eared bats to fly up high over the road. • For species that would fly through vegetation such as brown long-eared bats an additional barrier may be required (wooden screen or mesh 4 – 5m high). • Lighting should be designed to avoid illumination of crossing points. • Mitigation should be developed and capable of functioning before the barrier effect occurs. Preconstruction surveys are essential to update the baseline in order to determine the bat species present and use of commuting routes. Coupled with post construction monitoring this would allow a robust assessment to be made on the success of the mitigation. **(Mitigation Item E10)**		

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
		New hedgerow planting to mitigate fragmentation of existing habitat and replace habitat to be lost under the footprint of the proposed Scheme, at the following locations: • ch2200 to ch2800; • ch3000 to ch4000; • ch4400 to ch6100; • ch6500 to ch7100; • ch13000 to ch13200; • ch13400 to ch15200; • ch15300 to ch16400; • ch16600 to ch17100; • ch18000 to ch18600; • ch20700 to ch22300; • ch23900 to ch24650; • ch26100 to ch26500; • ch27300 to ch28700; • ch29100 to ch29600; and • ch30400 to ch31200. **(Mitigation Item E9)**		

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
		Provision of culverts, underpasses and the use of overbridges on the proposed Scheme which would be suitable for multiple species including passage by bats to mitigate fragmentation of habitat, to increase permeability of the road to bats and reduce barrier effects at the following locations: <u>Culverts/Underpasses:</u> • C09 (Rough Burn Culvert) ch7525; • C18 (Alton Burn Culvert) ch19610; • Farm track ch18850; • Unnamed road ch22900; and • C20 (Auldearn Burn Culvert) ch26750 <u>Overbridges</u> • BW48 (Culloden); • BW19 (Tornagrain); • ch9600; • BW17; • ch17600; • BW14 and BW13 (Crook/Skene Park); and • ch23850 **(Mitigation Item E11)**		
	Disturbance due to noise, vibration and light spill during operation	Lighting shall be designed to avoid illuminating bat sensitive habitat, in areas of known bat activity, locations adjacent to watercourses and along woodland edges. **(Mitigation Item E12)**	Construction/Operation	Negligible
	Pollution of watercourses due to operational runoff	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Construction/Operation	Negligible
Badger	Injury or mortality due construction related activities	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance due to noise and vibration during construction			Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Mortality due to vehicle collisions during operation	Provision of: • culverts suitable for passage by badgers; • Dry Mammal Underpasses (DMU); and • Underpasses and enhanced overbridge (an overbridge with a grass verge as a minimum). To increase permeability of the road to badgers, at the following locations: ch1240, ch1750, ch2280, ch2540, ch4400, ch4710, ch5400, ch6300, ch6760, ch7100, ch7540, ch7900, ch8900, ch9150, ch10210, ch10530, ch12700, ch14350, ch14600, ch18850, ch19700, ch20650, ch22450, ch23150, ch23400, ch25500, ch26400, ch26750, ch28300 and ch29660. **(Mitigation Item E6)**	Construction/Operation	Moderate Positive
	Severance of habitat by the proposed Scheme	Provision of mammal proof fencing to prevent access onto the dual carriageway alignment by badger and otter. Fencing would be positioned in such a way that badger and otter would be directed to safe crossing points. Reinstatement of existing fencing at the following location: ch10500 (Mid Coul Junction, Inverness Airport Road). Provision of new mammal proof fencing at the following locations: • ch800 to ch3050; • ch3900 to ch8300; • ch8750 to ch9650; • ch9800 to ch10500; • ch13850 to ch15100; and • ch18350 to ch21400; • ch22650 to ch27250; and • ch29200 to ch30200. • Additionally at the embankments at River Nairn. **(Mitigation Item E14)**	Construction/Operation	Minor
	Loss of foraging and commuting habitat under the footprint of the proposed Scheme	New woodland planting to replace habitat to be lost (see mitigation for AWI woodland loss for details of new woodland planting).	Construction/Operation	Minor

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Loss of two main setts under the footprint of the proposed Scheme	Provision of replacement badger sett to mitigate for loss of main setts. See Appendix CA11.1 (Confidential Appendix – Badgers and Otters) for further details. **(Mitigation Item E13)**	Construction/Operation	Negligible
	Disturbance due to noise, vibration and light spill during operation	Lighting shall be designed to avoid illuminating badger sensitive habitat. **(Mitigation Item E12)**	Construction/Operation	Minor
Red squirrel Pine marten	Mortality due to construction related activities	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance due to noise and vibration during construction			Negligible
	Mortality due to vehicle collisions during operation	Provision of: • culverts suitable for passage by red squirrel and pine marten; • Dry Mammal Underpasses (DMU); and • underpasses and enhanced overbridge . to mitigate fragmentation of habitat and to increase permeability of the road at the following locations: • ch1240; • ch17600; • ch22900; • ch23150; and • ch23400. **(Mitigation Item E6)**	Construction/Operation	Minor
	Loss of habitat under the footprint of the proposed Scheme	New woodland planting to mitigate fragmentation of existing habitat and replace habitat to be lost under the footprint of the proposed Scheme (see mitigation for AWI woodland loss for details of new woodland planting **(Mitigation Item E5)**). Enhancement of woodland to be retained including planting trees of different age and species composition, e.g. Scots pine, birch, and alder, as appropriate, and as incorporated into Habitat Management Plans.**(Mitigation Item E15)**	Construction/Operation	Minor
	Severance of habitat by the proposed Scheme			Minor
Common lizard Amphibians	Mortality during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas.	Construction	Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Loss of Habitat under the footprint of the proposed Scheme	SUDS and creation of new species rich grassland planting to be provided at: ch1200, ch1600, ch2200, ch2350, ch2950, ch4950, ch6250, ch6400, ch8500, ch8800, ch10100, ch10250; ch10900, ch1275, ch15800, ch16800, ch22200, ch23350, ch23450, ch26700, ch26800 and ch28850. **(Mitigation Item E16)** Creation of replacement seasonal pond habitat. • ch18100 to ch18300. **(Mitigation Item E17)**	Construction/Operation	Minor
	Severance of habitat by the proposed Scheme	Provision of habitat for reptiles reflecting that lost. Including appropriately located hibernacula (hibernation sites) at the following locations. • ch16900; • ch22200; • ch23400; and • ch25700. **(Mitigation Item E18)**		Minor
Great crested newt	Mortality of individuals within terrestrial habitats during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance due to noise and vibration during construction			Negligible
	Loss of terrestrial (non-breeding) habitat under the proposed Scheme	Design of SUDS with surrounding planting and terrestrial habitat. Creation of new species rich grassland planting, at the following locations: • ch1200 to ch1600; • ch2100 to ch2400; • ch2900; • ch4900; • ch6100 to ch6400; • ch8500; • ch8800; • ch10100 to ch10300; • ch10900;	Construction/Operation	Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
		• ch12800; • ch15600; • ch16900 to ch17100; • ch19800; • ch22200; • ch2300 to ch23500; • ch25700; • ch26600 to ch26800; and • ch28800. **(Mitigation Item E19)**		
Wintering geese Waterfowl	Disturbance due to noise and vibration during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
Breeding birds	Mortality of individuals within terrestrial habitats during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Disturbance due to noise and vibration during construction			Negligible
	Mortality due to vehicle collisions during operation	No suitable mitigation is available for this impact.	N/A	Minor
	Loss of Habitat under the footprint of the proposed Scheme	New scrub woodland, woodland and hedgerow planting. Woodland planting at locations identified as mitigation for AWI woodland, hedgerow planting is identified for bats, and scrub woodland planting at the following locations: • ch2600 to ch3800; • ch8300 to ch8500; • ch14000 to ch14200; • ch15300 to ch15450 • ch15300 to ch16300; and • ch17100 to ch17550. **(Mitigation Item E7)**	Construction/Operation	Negligible
	Severance of habitat by the proposed Scheme		Construction/Operation	Negligible
Corn bunting	Mortality of individuals within terrestrial habitats during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys,	Construction	Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Disturbance due to noise and vibration during construction	species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**		Negligible
	Loss of Habitat under the footprint of the proposed Scheme	New species rich grassland planting to provide foraging habitat at SUDS at Milton of Gollanfield (ch12800) and Gollanfield (ch15700). Provision of singing posts and creation of hedgerows to provide connectivity, at locations between ch13400 and ch14100, and along access roads to Polfalden. **(Mitigation Item E20 and E21)**	Construction/Operation	Negligible
Barn owl	Disturbance due to noise and vibration during construction	Measures set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol) including but not limited to pre-construction surveys, species protections plans and control of working areas. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Mortality of foraging individuals through road-traffic related incidents.	Woodland and scrub planting will encourage barn owls to fly up and over the new carriageway, and discourage them from foraging within the highway boundary. **(Mitigation Item E7 and E5)**	Operation	Negligible
Aquatic Habitats	Pollution of watercourses including the River Nairn, Cairnlaw Burn, Auldearn Burn and SWF31 due to construction runoff	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Temporary loss of habitat through dewatering and sediment removal during construction activities for the River Nairn	Application of best practice guidance this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Negligible
	Temporary loss of habitat through dewatering and sediment removal during construction activities for Cairnlaw Burn and Auldearn Burn			Negligible
	Changes in hydrology from over pumping at for Cairnlaw Burn and Auldearn Burn during construction			Negligible
	Pollution of the River Nairn, Cairnlaw Burn and Auldearn Burn due to operational runoff	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Operation	Negligible
	Increase in sediment inputs to the River Nairn, Cairnlaw Burn and Auldearn Burn during operation			Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Loss of aquatic habitat at Cairnlaw Burn and Auldearn Burn	Approximately 400m of Cairnlaw Burn ch1700 to ch2300 and 140m of Auldearn Burn ch26700 would be lost under the proposed Scheme. A new realigned section of both watercourses would be provided, which would be of equal or greater quality to those sections lost to the proposed Scheme. This would include, but be not limited to; designing appropriate meanders, creating heterogeneous flow and substrate conditions and planting appropriate species in the riparian zone. **(Mitigation Item E22)**		Minor
	Discontinuity of flow which could discourage or prevent migration of aquatic species at Cairnlaw Burn and Auldearn Burn	In channel works and structures to be constructed in accordance with best practice guidance, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
	Change in hydrology leading to altered substrates within Cairnlaw Burn and Auldearn Burn			Minor
Fish	Pollution of watercourses during construction which supports Atlantic salmon and trout including their spawning habitat, European eel and lamprey species	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Temporary loss of habitat through dewatering during construction activities for the River Nairn and dewatering and sediment removal for Cairnlaw Burn and Auldearn Burn	Application of best practice guidance, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
	Mortality of fish during potential dewatering to allow construction activities, including for outfalls, on the River Nairn and instream construction activities for Cairnlaw Burn and Auldearn Burn	Measures to remove and relocate fish prior to works commencing, this is detailed further within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
	Disturbance of fish due to construction activities on the River Nairn, Cairnlaw Burn and Auldearn Burn	Application of best practice guidance, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
	Pollution of the River Nairn, Cairnlaw Burn and Auldearn Burn, due to operational runoff, altering the amount of habitat available for fish	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Construction/Operation	Negligible
	Increased sediment inputs Cairnlaw Burn	Implementation of SUDS along the proposed Scheme. **(Mitigation Item**		Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	and Auldearn Burn, due to operational runoff	**GR3)**		
	Loss of habitat resulting in loss of access to feeding or spawning habitat in inputs Cairnlaw Burn and Auldearn Burn	Application of best practice guidelines, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). Spawning areas lost would be identified and replaced in the dual carriageway alignment. **(Mitigation Item GR1+GR2)**		Minor
	Changes in hydrology in inputs Cairnlaw Burn and Auldearn Burn discouraging upstream movement of fish	In channel works and structures to be constructed in accordance with best practice guidance, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
Macroinvertebrates	Pollution of the River Nairn , Cairnlaw Burn, Auldearn Burn and Rough Burn smothering invertebrate habitat and affecting the gills of some species	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP. **(Mitigation Item GR1+GR2)**	Construction	Negligible
	Temporary loss and fragmentation of macroinvertebrate habitat during construction activities	Application of best practice guidance, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1)**		Negligible
	Mortality of invertebrates during instream works in Cairnlaw Burn, Auldearn Burn and Rough Burn	Measures to remove and relocate fish prior to works commencing, this is detailed further within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1)**		Negligible
	Pollution of the River Nairn , Cairnlaw Burn, Auldearn Burn and Rough Burn due to operational runoff	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Construction/Operation	Negligible
	Increased sediment inputs Cairnlaw Burn and Auldearn Burn, due to operational runoff			Negligible
	Habitat loss and fragmentation due to culverts associated with the proposed Scheme	Application of best practice guidance during culvert construction, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Minor
Macrophytes	Pollution of watercourses due to construction works	Measures to control pollution set out within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol), this would be delivered through the application of the CEMP. **((Mitigation Item GR1+GR2)**	Construction	Negligible
	Mortality of macrophytes due to instream construction works	Measures to remove and relocate fish prior to works commencing, this is detailed further within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Negligible
	Loss of in channel habitat du to instream and bankside construction works	Application of best practice guidance during construction, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol).		Negligible

Feature Affected	Potential Impact	Mitigation	Phase	Residual Impact Significance after Mitigation
	Changes to flow regimen due to dewatering or culvert installation	**(Mitigation Item GR1+GR2)**		Negligible
	Pollution of Fiddlers Burn, SWF16, SWF18 and Auldearn Burn during operation	Implementation of SUDS along the proposed Scheme. **(Mitigation Item GR3)**	Construction/Operation	Negligible
	Loss of macrophyte habitat form new or extended culverts	Application of best practice guidance during culvert construction, this is detailed within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**		Negligible
	Hydrological changes from increased flows in culverts resulting in flow modification affecting habitat suitability for macrophytes			Negligible
INNS	Transfer of INNS during construction	Implementation of an Invasive Species Management Plan during construction, this is detailed further within the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). **(Mitigation Item GR1+GR2)**	Construction	Minor
Deer	Deer may collide with vehicles using the A96	The contractor would be required to undertake a deer collision risk assessment and implement any fencing identified as required. **(Mitigation Item E23)**	Operation	Negligible

11.5.18 Totals for areas of new planting and lengths of hedgerow planting are provided in Table 11.12.

Table 11.12: Total Areas and Lengths of Proposed Landscape and Ecological Mitigation

Habitat	Landscape Planting	Ecological Planting	Ecological and Landscape Planting	Total
Woodland Habitats				
Coniferous	1.8ha	—	3.4ha	5.2ha
Deciduous	0.7ha	—	1.1ha	1.8ha
Mixed	39.9ha	3.5ha	13.8ha	57.2ha
Riparian	5.9ha	—	3.2ha	9.1ha
Scrub	132ha	0.2ha	—	13.4ha
Grassland Habitats				
Species-rich	135.5ha	—	—	135.5ha
Wet	25.9ha	—	—	25.9ha
Other Habitats				
Hedgerows	29.3ha	—	—	29.3km

11.6 Monitoring

11.6.1 Monitoring of mitigation implementation during the construction phase will be undertaken by the ECoW (paragraph 11.5.8). This includes adherence to Species Protection Plans, Habitat Management Plans and the CEMP.

11.6.2 Post construction monitoring will be undertaken as necessary, and as directed in the Species Protection and Habitat Management Plans and any derogation licences required for the proposed Scheme. Monitoring would feed into an adaptive management approach by determining the effectiveness of the mitigation employed and informing whether further mitigation, maintenance or changes in mitigation approach would be required to ensure continuation of the conservation status of ecological features is maintained. This monitoring would be undertaken by the trunk road Operating Company for north-east Scotland (currently BEAR Scotland).

11.7 Residual Impacts

11.7.1 Potential impacts of Minor or Negligible significance identified from the project pre-mitigation are anticipated to be fully mitigated by the implementation of the proposed mitigation measures i.e. the adherence to environmental plans including the CEMP, Species Protection Plans, the application of best practice and appropriate construction guidelines set out in the Mitigation Protocol (Appendix A11.3: Mitigation Protocol).

11.7.2 For other potential Major and Moderate impacts identified pre-mitigation in Section 11.4 (Impacts), mitigation is identified in Table 11.11 and Section 11.5 (Mitigation). This includes the application of mitigation measures set out in the Mitigation Protocol (Appendix A11.3: Mitigation Protocol). All residual impacts after the proposed mitigation is applied were assessed to be either of Negligible or Minor significance (short-term and reversible), with the exception of those outlined below.

11.7.3 There are no significant long-term Major or Moderate negative residual impacts on features expected following successful implementation of proposed mitigation measures. Temporary residual impacts were predicted, which include the following:

- The footprint of the proposed River Nairn crossing would have a negative residual impact on ancient woodland due to the loss of tree cover resulting from the loss of habitat under the footprint of the proposed Scheme and any other lost within the LMA, and as a result of shading and/or reduced clearance from the bridge structure. With the implementation of the proposed woodland planting, there are no predicted significant residual impacts on ancient woodland with a Minor residual impact on biodiversity in the long-term on the eastern side of the river and a Negligible residual impact on the western side of the river.. Additionally, a reduction in tree cover combined with a targeted habitat management plan for the ancient woodland could support the development of a scrub and ground flora community characteristic of ancient

woodland, creating greater habitat diversity and new ecological niches. The management of INNS species in this area would also improve the overall condition of the habitats.

- With the implementation of the proposed woodland planting and species mixes, there are no predicted significant residual impacts on other areas of AWI woodland lost under the footprint of the proposed Scheme. The residual impact would be a Negligible negative residual impact. All of these areas are classed as Long-established of Plantation Origin and include areas of non-native conifers. Mitigation would include new planting using a mix of locally-appropriate species to support woodland objectives within the local and regional BAPs, and where feasible utilising soil from sites to be lost to maintain the microbial biodiversity.
- During the take-up phase of proposed planting/habitat creation areas, the footprint of the proposed Scheme is predicted to result in a negative residual impact in the medium-term due to habitat severance for bats and red squirrels. This impact would be temporary in nature. It is anticipated that once cover is established, habitats and woodland corridors connecting currently fragmented woodlands would mitigate any residual impact of the proposed Scheme to Minor significance. In addition to this, enhancement of existing woodland for red squirrel and creation of additional edge habitat providing bat foraging habitat would ensure the maintenance of the conservation status of the species during the take-up period. Maintaining woodland, such as shelter belts will benefit bat species which fly at treetop level. Connectivity would be further enhanced with the provision of hedgerow planting, overbridges, culverts and mammal underpasses which have been shown to be utilised by both bats and red squirrel.
- With the implementation of pollution control measures and measures relating to habitat loss, fragmentation and hydrological flows, there are no predicted significant residual impacts on aquatic features as a result of the proposed Scheme. The residual impact would be a Minor negative residual impact.

11.7.4 Significant positive residual impacts are also anticipated with increased safe permeability for species including badger and otter through provision of suitably designed crossing locations such as DMU, culverts and overbridges and provision of mammal proof fencing at appropriate locations. This is predicted to lead to a decrease in wildlife vehicle incidents and therefore a reduction in road related mortality.

Summary of Residual Impacts

11.7.5 The proposed Scheme would have no Major or Moderate long-term negative residual impacts with regards to the habitat and biodiversity features identified within the study area. Some temporary residual impacts would remain in the short to medium term until mitigation measures become established. A positive residual impact is predicted as a result of the greater safe permeability of the proposed Scheme to badgers and otter with reduces rates of mortality once constructed.

11.8 References

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