

Chapter 10: Terrestrial Ecology

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Glossary of Terms

Annex I Habitats	Habitats identified on Annex I of the Habitats Directive which are considered to be particularly vulnerable and are mainly, or exclusively, found within the European Union.
Annex II Species	Species listed on Annex II of the Habitats Directive for which core areas of habitat must be protected and managed in accordance with the ecological requirements of the species.
Article 10 features	Features of the landscape of major importance due to linear and continuous structure or combination as habitat “stepping stones” for the movement of wild fauna and flora.
Berne Convention	Berne Convention on the Conservation of European Wildlife and Natural Habitats 1979.
Biodiversity Action Plan	A plan developed at a Local or National level (UK BAP) outlining objectives for the improvement of biodiversity which identifies priority species and habitats as a focus for conservation and enhancement.
Bonn Convention	The Convention on the Conservation of Migratory Species of Wild Animals 1979 - Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species listed in Appendix I of the Convention.
CIEEM	Chartered Institute of Ecology and Environmental Management.
Construction Environmental Management Plan (CEMP)	A document detailing measures to be followed during construction of a development to ensure that it is built in an environmentally sensitive manner.
COSHH (Control of Substances Hazardous to Health)	In relation to the Control of Substances Hazardous to Health Regulations 2002 which requires employers to prevent or reduce their workers' exposure to substances that are hazardous to their health.
Directive	A form of European Union legislation which directs Member States to pass relevant domestic legislation and less out the objective or policy which needs to be attained.
ECow (Ecological Clerk of Work)	An ecological consultant employed to monitor construction works and advise of any ecological sensitivities, along with appropriate methods and measures to minimise effects.
GWDTE (Ground Water dependent Terrestrial Ecosystem)	Wetlands which critically depend on groundwater flows or chemistries. They are safeguarded by the Water Framework Directive and are sensitive to hydrological and ecological changes caused by developments.
Habitats Directive	European legislation - Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
Higher plants	Plants of more complex construction and not classified as ‘lower plants’ including all vascular plants and ferns.
Highland-wide Local Development Plan (HwLDP)	Forms the basis for spatial planning within the Highland Council area as a whole.
JNCC (Joint Nature Conservation Committee)	The public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
LBAP (Local Biodiversity Action Plan)	A plan, outlining objectives for the improvement of biodiversity at Local Authority level which identifies priority species and habitats as a focus for conservation and enhancement.
Lower plants	Plants of relatively simple or primitive characteristics such as algae, mosses and liverworts.
National Biodiversity Network (NBN)	A collaborative partnership including many UK wildlife conservation organisations, Government, country agencies, environmental agencies, local environmental records centres and voluntary groups created to exchange biodiversity information.
Non-avian	Excluding birds or those related to birds.
NVC (National Vegetation Classification)	A recognised system of classification and description of plant communities of Britain.

Phase One Habitat Classification	A standardised system to record semi-natural vegetation and other wildlife habitats which presents the user with a basic assessment of habitat type and potential importance for nature conservation.
PMP (Peat Management Plan)	A document detailing the quantities and locations of peat to be excavated, stored and re-used and methods for doing this.
Priority habitats	Habitats identified in the UK or Local Biodiversity Action plans as a focus for conservation and enhancement.
Priority species	Species identified in the UK or Local Biodiversity Action plans as a focus for conservation and enhancement.
Ramsar Convention	The Convention on Wetlands 1971 - intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
Red data lists	Lists of threatened species based on criteria identified by International Union for Conservation of Nature (IUCN).
SAC (Special Area of Conservation)	European protected sites designated under the EC Habitats Directive that make a significant contribution to conserving the habitat types and species identified in Annexes I and II of the Directive.
Scoping Opinion	The written opinion of the determining authority as to the scope and level of detail of information to be provided in an EIA report.
SBL (Scottish Biodiversity List)	A list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.
SEPA (Scottish Environment Protection Agency)	A non-departmental public body tasked with the protection of the environment and human health in Scotland.
Significant Effects	Effects deemed to be significant in relation to the EIA Regulations.
SNH (Scottish Natural Heritage)	The body responsible for promoting, caring for and improving natural heritage in Scotland, and advising Government on natural heritage issues.
SPA (Special Protection Area)	European protected sites classified for rare and vulnerable birds (as listed on Annex I of the Birds Directive), and for regularly occurring migratory species in accordance with Article 4 of the Directive.
SSSI (Site of Special Scientific Interest)	Nationally designated areas of land and water considered to best represent the natural heritage in terms of their flora, fauna, geology, geomorphology or a mix of these features.
Stakeholders	Organisations and individuals who can affect or may be affected by The Proposed Development.
Study Area	A defined area within which the assessment has been undertaken.
Target Notes	Location specific notes providing an overview of habitat types present and features of interest to supplement the Phase 1 Habitat survey.
UK BAP (UK Biodiversity Action Plan)	A UK-wide plan outlining objectives for the improvement of biodiversity which identifies priority species and habitats as a focus for conservation and enhancement.
UK Post-2010 Biodiversity Framework	Superseding the UK BAP. A framework which shows how the work of the four UK countries joins up with work at a UK level and the aims of the EU biodiversity strategy.
Vascular plants	All plants that have vascular tissues (xylem and phloem) for conducting water and minerals.

10 Terrestrial Ecology

10.1 Executive Summary

- 10.1.1 This Chapter describes the ecological (terrestrial) sensitivities present within the anticipated zone of effect for the Revised Coire Glas Pumped Storage Scheme ('The Proposed Development').
- 10.1.2 Desk and field surveys were undertaken for identified receptors including sites designated for nature conservation interest, habitat and vegetation, and protected species, according to best practice methodologies.
- 10.1.3 No sites designated for nature conservation (terrestrial ecology) will be affected by The Proposed Development.
- 10.1.4 Habitats potentially affected by The Proposed Development include a range of Annex 1 habitat communities of woodland, mire and heath types. Further to proposed mitigation measures, residual effects on these receptors are considered to be not significant.
- 10.1.5 Protected species potentially affected by The Proposed Development include otter (*Lutra lutra*), water vole (*Arvicola amphibius*), pine marten (*Martes martes*) and bat species. Further to proposed mitigation measures, residual effects on these receptors are considered to be not significant.
- 10.1.6 Mitigation measures for habitat receptors include avoidance of sensitive habitats, pollution prevention and control measures and best practice reinstatement of disturbed ground.
- 10.1.7 Mitigation measures for protected species receptors include avoidance of working near places of shelter (outwith an appropriate distance to avoid disturbance), raising awareness amongst the workforce of the presence of sensitive species, and adoption of best practice working methods to avoid disturbance in areas where sensitive species may occur.

10.2 Introduction

- 10.2.1 This Chapter evaluates the importance of the nature conservation interest (terrestrial) and the potential impacts predicted as a result of the Revised Coire Glas Pumped Storage Scheme (The Proposed Development), as described in Chapter 3: Description of Development. It outlines the methodologies used to assess potential effects on internationally and nationally protected habitats, flora and fauna (non-avian) both within the footprint of The Proposed Development and the surrounding area. It presents an assessment of the significance of potential impacts on sensitive ecological receptors, along with suggested mitigation measures to avoid or reduce the impacts; and an assessment of predicted residual impacts of The Proposed Development after mitigation measures have been implemented.

10.3 Scope of Assessment

Study Area

- 10.3.1 The study area for this assessment incorporates land within 500 metres (m) of all above-ground infrastructure associated with The Proposed Development. This study area

encompasses the entirety of the Coire Glas, a long glen running south-west from Kilfinnan towards the summit of Sron a Choire Gairbh. To the north, the study area encompasses eastern slopes of Ben Tee and the Allt na Cailliche catchment, along with a proposed access route from White Bridge through Glen Garry Forest. A strip of land from North Laggan to the mouth of the Allt Glas Dhoire is also included, being the route for proposed accesses to the lower reservoir works.

- 10.3.2 The buffer varies in size in some areas around Meall nan Dearcag and in Glen Garry forest as a result of variations in access track routeing and infrastructure location during the design process. The site varies in altitude from approximately 50 m above sea level to 935 m above sea level.
- 10.3.3 The Proposed Development encompasses a mosaic of agricultural, forestry and moorland habitats. There are two larger commercial conifer plantations in Glen Garry and South Laggan Forest, fragments of mature native broadleaved woodland near Kilfinnan and along Allt a' Choire Ghlais and a number of smaller fragments of mixed woodland on lower ground between Kilfinnan and North Laggan. Farmland on low ground around Kilfinnan is generally improved pasture. Higher ground within Coire Glas and on eastern slopes of Ben Tee is an open expanse of moorland with a mosaic of heath, mire and grassland habitats. At higher altitudes on Ben Tee and slopes and ridges surrounding Coire Glas to the west and south, montane heaths and grasslands are prevalent.
- 10.3.4 There are a number of small burns and waterbodies within the study area, principally tributaries of the Allt a'Choire Ghlais, which in turn feeds the Kilfinnan burn before draining into Loch Lochy, and the Allt na Cailliche which drains north from Ben Tee to feed the River Garry.

Scoping and Consultation

- 10.3.5 A Scoping Opinion was received from the Scottish Government in July 2017 and is included in Appendix 4.1. The relevant consultees for terrestrial ecology were Scottish Natural Heritage (SNH) and Scottish Environment Protection Agency (SEPA).
- 10.3.6 The following table summarises the relevant ecological issues raised during scoping.

Table 10.1: Ecological issues raised during Consultation

Consultee	Summary Response	Comment/Action Taken
Scottish Environment Protection Agency (SEPA)	Undertaking a new National Vegetation Classification (NVC) survey across the study area should inform the identification of moderately and highly Groundwater Dependent Terrestrial Ecosystems (GWDTE), and their proximity to proposed infrastructure, to be provided by way of mapping. Where avoidance of impacts on GWDTE is unavoidable, suitable mitigation measures should be outlined.	An NVC survey (see Figures 10.3a-10.3l) has been carried out across the study area, identifying GWDTE, with results provided in Figures 10.5a-10.5f and a full quantitative assessment of impacts is included within this Chapter. Appropriate mitigation measures are detailed within this assessment.
Scottish Natural Heritage (SNH)	Impacts of the proposal on carbon rich soils, deep peat and priority peatland habitat should be assessed, describing	An NVC survey has been carried out across the study area, identifying peatland areas, with results provided in Figures 10.2a-10.2f

Consultee	Summary Response	Comment/Action Taken
	<p>the overall size and scale of the resource including the type of peatland likely to be affected, quantity of resource to be lost and any loss of function of the habitat resulting from the development.</p> <p>Peatland features/types and detail of their condition should also be detailed.</p>	<p>and Figures 10.3a-10.3l, and a full quantitative assessment of impacts is included in this Chapter. Details on type and condition of peatland habitats within the study area are provided in Appendix 10.2: Habitat Descriptions. Appropriate mitigation measures are detailed within this assessment.</p>

10.4 Policy, Legislation & Guidance

International Legislation

10.4.1 Most international biodiversity legislation, e.g. the Bonn and Berne Conventions, is implemented through European or domestic legislation. The exception to this is the Ramsar Convention (1971) which addresses the conservation and wise use of wetlands, full account of which has been taken in this assessment.

European Legislation

10.4.2 The assessment takes account of the requirements of, or advice given in, the following legislation:

- The EC Habitats Directive (1992); and
- EC guidance documents on implementation of the Habitats Directive.

National Legislation

10.4.3 The assessment takes further account of the requirements of, or advice given in, the following:

- The Conservation of Habitats and Species Regulations (2010). These Regulations succeed the original Conservation (Natural Habitats, &c) Regulations (1994) and consolidate all the various amendments made to the 1994 Regulations in respect of England and Wales (herein referred to as the 'Habitat Regulations');
- The Nature Conservation (Scotland) Act, as amended (2004);
- The Wildlife and Countryside Act (1981), as amended; and
- The Protection of Badgers Act (1992).

Policy

10.4.4 The principal policy documents addressing biodiversity that are relevant to The Proposed Development are:

- Highland-wide Local Development Plan (2012), as detailed in Chapter 5: Planning Policy, with specific reference to the following policies:
 - Policy 28 – Sustainable Design
 - Policy 57 – Natural, Built and Cultural Heritage
 - Policy 58 – Protected Species

- Policy 59 – Other Important Species
- Policy 60 – Other Important Habitats and Article 10 Features
- Highland Council Planning Guidance;
- The UK Biodiversity Action Plan (UKBAP). Although superseded by the UK Post-2010 Biodiversity Framework in 2012, the UKBAP remains a useful resource for assessing UK conservation status and informs regional conservation priorities; and
- The Scottish Biodiversity List (SBL).

10.5 Methodology

Desk Study

- 10.5.1 Baseline data on the nature conservation interest of the survey area and its surroundings, including information on sites designated for nature conservation and protected species records, were sought from the following sources:
- Joint Nature Conservation Committee (JNCC) website (<http://www.jncc.gov.uk/>) – accessed November 2017;
 - SNH Site Link website (<http://gateway.snh.gov.uk>) – accessed November 2017;
 - The National Biodiversity Network website (<http://data.nbn.org.uk/>) (NBN Gateway) – accessed November 2017; and
 - Large-scale 1:10,000 Ordnance Survey (OS) maps in conjunction with colour 1:25,000 OS map (to determine the presence of ponds and other features of nature conservation interest).
- 10.5.2 Further information on potential nature conservation features that have potential to be affected by The Proposed Development was obtained through searches of internet sources (e.g. UK Biodiversity Action Plans (UKBAP), Scottish Biodiversity List (SBL), Local Biodiversity Action Plans (LBAP)) and the relevant published literature (i.e. Relevant guidance documents and scientific papers).
- 10.5.3 The desk study identified the following potential receptors:
- Designated sites;
 - Vegetation and Habitats listed on Annex 1 on EU Habitats Directive, UK BAP Habitat List and Scottish Biodiversity list;
 - Protected species including:
 - European Otter (*Lutra lutra*);
 - Scottish wildcat (*Felix sylvestris*);
 - Badger (*Meles meles*);
 - Water vole (*Arvicola amphibius*);
 - Red squirrel (*Sciurus vulgaris*);
 - Pine marten (*Martes martes*);
 - Bat species;

- Wood ants; and
- Invasive non-native species.

Field Survey

Habitats and Vegetation

- 10.5.4 Habitats across the survey area were mapped using the National Vegetation Classification (NVC) (Rodwell 1991), and the Phase One Habitat Classification (JNCC 2010). Mapping polygons were delineated based on the composition of NVC communities and sub-communities. Where areas were considered to comprise mosaics or complexes of different habitat communities, the proportion of each was estimated in percentage terms. Polygons were laterally assigned a Phase One Habitat Classification, according to the relationships described in Phase One Habitat Classification (JNCC 2010).
- 10.5.5 Following the field survey, the conservation status of each habitat recorded was identified based on the following:
- Annex I habitats listed on the EC Habitats Directive, as translated into British and Scottish law by The Conservation (Natural Habitats, &c.) Regulations 1994 and subsequent legislation;
 - UK Biodiversity Action Plan (UKBAP) priority habitats. Although superseded by the UK Post-2010 Biodiversity Framework in 2012, the UKBAP remains a useful resource for assessing UK conservation status and informs regional conservation priorities; and
 - Scottish Biodiversity List (SBL) priority habitats for conservation.
- 10.5.6 Target Notes were also collected to provide an overview of the habitat types present, features of interest and to place The Proposed Development in the context of the wider area (see Appendix 10.3: Target Notes).
- 10.5.7 Plant species of national significance (as defined below) are recorded as target notes and included in Appendix 10.3: Target Notes:
- Higher plant species or Lower plants (bryophytes) listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU), on the respective red data lists for Great Britain as based on International Union for Conservation of Nature (IUCN) criteria;
 - Nationally rare (NR) – occurring in 15 hectads¹ or fewer in Great Britain; or
 - Nationally scarce (NS) – occurring in 16-100 hectads in Great Britain; and
 - UK Biodiversity Action Plan (UKBAP) priority species.
- 10.5.8 As part of the NVC survey, any wetland habitats were evaluated in terms of their potential to be groundwater-dependent terrestrial ecosystems (GWDTEs). This was done based on the hydrogeological setting of each NVC community identified, and with reference to SEPA

¹ An area of 10 km x 10 km square.

guidance (SEPA, 2014), modified from the United Kingdom Technical Advisory Group (UKTAG) list of NVC communities and associated groundwater dependency scores.

10.5.9 Nomenclature for vascular plants follows Stace (2010), bryophytes and liverworts follow Atherton et al (2010) and for lichens Dobson (2011). Phase 1 habitat maps were digitised using the ArcView 10.1 GIS package.

10.5.10 Fieldwork was carried out in August and September 2017.

Protected Species

10.5.11 Protected species surveys were undertaken in August and September 2017 and followed the methodologies described below:

Otter

10.5.12 Otter field signs that were searched for, as described in Bang & Dahlstrøm (2001) and Sargent & Morris (2003), include:

- Holts – these are underground features where otters live. They can be tunnels within bank sides, underneath root plates or boulder piles, and even man-made structures such as disused drains. Holts are used by otters to rest up during the day, and are the usual site of natal or breeding sites. Otters may use holts permanently or temporarily;
- Couches – these are above ground resting-up sites. They may be partially sheltered, or fully exposed. Couches may be regularly used, especially in reed beds and on in-stream islands. They have been known to be used as natal and breeding sites. Couches can be very difficult to identify, and may consist of an area of flattened grass or earth. Where rocks or rock armour are used as couches, these can be almost impossible to identify without observing the otter in situ;
- Prints – otters have characteristic footprints that can be found in soft ground and muddy areas;
- Spraints – otter faeces are often used to mark territories, usually deposited on in-stream boulders. They can be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains;
- Feeding signs – the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter;
- Paths – these are terrestrial routes that otters take when moving between resting-up sites and watercourses, or during high flow conditions when they will travel along bank sides in preference to swimming; and
- Slides and play areas – slides are typically worn areas on steep slopes where otters slide on their bellies, often found between holts/couches and watercourses. Play areas are used by juvenile otters in play, and are often evident by trampled vegetation and the presence of slides. These are often positioned in sheltered areas adjacent to the natal holt.

10.5.13 Any of the above signs are diagnostic evidence of the presence of otter, however, it is often not possible to identify couches with confidence unless other field signs are also present. Spraint is the most reliable identifiable evidence of the presence of this species.

10.5.14 Any evidence of otter presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Scottish wildcat

10.5.15 Field signs of Scottish wildcat are described in Davis & Gray and SNH (2011). Field evidence searched for includes:

- Dens;
- Prints;
- Scat;
- Scratching posts; and
- Sightings.

10.5.16 Any of the above can be taken as diagnostic evidence that cats are present in the area. However, further surveys are required in order to identify if the cats present are wildcat or are a hybridisation with domestic cats i.e. feral cats.

10.5.17 If signs were found then further field survey methods would be required in order to establish if a den is present and if it is active. This can take several days/weeks depending upon the potential numbers of cats and habitat suitability. In areas where there are signs of wildcats camera traps can be used to try and verify presence and also to prove if a wildcat/hybrid or feral cat is present based on pelage (coat characteristics) characters. This would be the third step in the survey process if required (following the initial site assessment).

10.5.18 The key criteria for identifying Scottish wildcat are complex due to their ability to interbreed with domestic and feral cats. Scottish wildcat features and recognition are summarised in research by Kitchener et al., 2005 with clear methods for identification based on pelage from the study of dead cats. However with live cats in the field this is more problematic due to the difficulty in observing cats. In addition it is believed from field research that true wildcats are now very rare in the field with very low populations in many areas with much larger feral populations now present. Detailed field research is still required to accurately determine wildcat densities in many areas.

10.5.19 Any evidence of Scottish wildcat presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Badger

10.5.20 Badger field signs that were searched for, as described in Neal & Cheeseman, Bang & Dahlstrøm and SNH (2002), included:

- Setts;

- Prints;
- Latrines (and dung pits used as territorial markers);
- Hairs; and
- Feeding signs (snuffle holes).

10.5.21 Any of the above signs can be taken as diagnostic evidence of the presence of badger. Any evidence of badger presence was recorded.

Water vole

10.5.22 The methodology prescribed in Strachan & Moorhouse (2006, 2011) was followed in order to search for field signs of water vole. The field signs searched for included:

- Faeces – recognisable by their size, shape, and content. If not too dried-out these are also distinguishable from rat droppings by their smell;
- Latrines – faeces, often deposited at discrete locations known as latrines;
- Feeding stations – food items are often brought to feeding stations along pathways and hauled onto platforms. Recognisable as neat piles of chewed vegetation up to 10 cm long;
- Burrows – appear as a series of holes along the water’s edge distinguishable from rat burrows by size and position;
- Lawns – may appear as grazed areas around land holes;
- Nests – where the water table is high. Above ground woven nests may be found;
- Footprints – tracks may occur at the water’s edge and lead into bank side vegetation. May be distinguishable from rat footprints by size; and
- Runways in vegetation – low tunnels pushed through vegetation near the water’s edge, less obvious than rat runs.

10.5.23 Any of the above signs can be taken as diagnostic evidence of the presence of water vole. Any evidence of water vole presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Red squirrel

10.5.24 Through areas of woodland, and within 200 m of The Proposed Development infrastructure, any sightings of red squirrel, signs of feeding and evidence of active dreys were recorded.

10.5.25 Any evidence of red squirrel presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Pine marten

10.5.26 The field signs searched for included:

- Scats – These are typically dark in colour and 4-12 cm long x 0.8-1.8 cm in diameter. They often have a coiled twisted appearance, typical of many mustelid scats. Scats will often contain food remains including fur, feathers, bone, plant content and seeds. Scats vary tremendously in size, shape and colour, and it's difficult even for experts to identify some pine marten scats. Scats are placed in latrines at well-used dens (e.g. on lids of den boxes), as well as at sites elsewhere in an individual's home range, where they probably fulfil a social communication role;
- Footprints – The five-toed but slightly cat-like forefoot imprints measure approximately 40 x 45 mm for females and 55 x 65mm for males; fur on the underside of feet in winter may blur prints and make them look larger, especially in soft snow, but pine martens have less fur on their feet pads than stone martens (present in continental Europe). Indistinct trails of bounding martens (stride length 60-100 cm) may resemble those of hares, with prints in groups of two or three where one or both hind feet have registered over prints of forefeet; and
- Den sites – Dens are usually not distinctive unless revealed by visible concentration of scats. Elevated den sites are preferred to keep martens safe from predators and provide insulation and shelter from the elements, and so hollow trees, owl boxes and the roofs of dwelling houses are often used, as well as purpose-built pine marten den boxes. Where such elevated dens are absent, they may den on the ground in rabbit burrows, rocky outcrops or under tree roof plates.

10.5.27 Any evidence of pine marten presence was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Bats

10.5.28 The methodology prescribed involved a habitat assessment - walking over the survey area and inspecting areas of potential interest as foraging and roosting habitat for bat species. This survey took into account the following:

- The extent and quality of foraging and commuting habitat within the survey area;
- The proximity of The Proposed Development to areas designated for bats (SSSI and SAC); and
- The presence of buildings, bridges, trees or other features that may support or are known to support bat roosts.

10.5.29 Any potential roost features were recorded onto 1:10,000 scale survey maps in the field. The location of all signs and potential roost features was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Wood Ants

10.5.30 Wood ant nests were recorded onto 1:10,000 scale survey maps in the field. The location of all wood ant nests was also recorded via the use of a handheld GPS.

Non-native/invasive species

- 10.5.31 Non-native and/or invasive terrestrial plants and algae were recorded onto 1:10,000 scale survey maps in the field. The location of all non-native/invasive species was also recorded via the use of a handheld GPS.

Assessment of Effects

- 10.5.32 The assessment has been undertaken according to the current guidance detailed by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2016). Methodologies for assessment of effects are included in Appendix 10.1: Assessment Methodology.
- 10.5.33 There are no known operational, consented or submitted development proposals within 5 km of The Proposed Development which may create any significant cumulative effects. The impact of The Proposed Development on the ecological value of the site is not anticipated to extend beyond the site boundary. None of the habitats or species present are anticipated to be affected by further renewable energy developments or other developments in the immediate vicinity. No cumulative impact or effects on ecology are anticipated as a result of this development proposal.

Limitations to the Assessment

- 10.5.34 Habitat and vegetation surveys were carried out late in the optimum season (early Autumn), and as a result some higher plant species may not have been recorded due to surveys taking place outwith their flowering season. All surveys were carried out in periods where vegetation was not obscured by snow-lie. It is considered that all habitats were identifiable to a community level.
- 10.5.35 Areas of dense coniferous plantation are largely impenetrable. The area could therefore not be fully accessed to undertake protected species survey. Survey was carried out around the perimeter of the denser forest areas, and the results from this form the basis of the assessment.
- 10.5.36 Bat habitat assessment was carried out, but the species, usage and population status of any bats using potential roost features is not known. If tree felling is required a thorough search of potential roost features will be undertaken by a licensed bat worker.

10.6 Baseline Conditions

Sites Designated for Nature Conservation

- 10.6.1 The zone of sensitivity for ecological features varies according to the characteristics of the feature and the nature of the potential impact. In this assessment, impacts are assessed for within the site (as defined by the site boundary) and the zones as displayed on Figure 10.1: Sites Designated for Nature Conservation, and described below.

Internationally Designated Sites

- 10.6.2 Potential effects of The Proposed Development on internationally designated sites are considered for all sites that fall within 20 km of the site.

- 10.6.3 Within this zone, no internationally designated sites are carried forward for further assessment. The following internationally designated sites were scoped out of further assessment, as explained below:

West Inverness-shire Lochs SPA

- 10.6.4 The SPA (also a SSSI) qualifies by supporting a breeding population of European importance of Annex 1 species Black-throated Diver (*Gavia arctica*). Ornithological interests are addressed in Chapter 11: Ornithology and not included for further assessment in this Chapter.

Glen Tarff SAC

- 10.6.5 The SAC (also a SSSI) qualifies for habitats of international importance. The habitats include upland mixed ash woodland. The designation is 9.1 km from the site at its closest point. Qualifying features are localised, with no possible pathway for effects on these features.

Ben Nevis SAC

- 10.6.6 The SAC (also a SSSI) qualifies for habitats of international importance. The habitats include scree, alpine and subalpine heaths and calcareous grasslands, blanket bog, Caledonian forest, dry and wet heaths, montane grasslands and willow scrub, tall herb communities, western acidic oak woodland and plants in crevices. The designation is 15.5 km from the site at its closest point. Qualifying features are localised, with no possible pathway for effects on these features.

Creag Meaghiadh SAC

- 10.6.7 The SAC (also a SSSI) qualifies for habitats of international importance. The habitats include scree, alpine and subalpine heaths, blanket bog, dry and wet heaths, montane grassland and willow scrub, tall herb communities and plants in crevices. The designation is 13.5 km from the site at its closest point. Qualifying features are localised, with no possible pathway for effects on these features.

Ness Woods SAC

- 10.6.8 The SAC (also a SSSI) qualifies for habitats and species of international importance. The habitats include mixed woodland on base-rich soils and western acidic oak woodland, and the site is also designated for Otter (*Lutra lutra*). The designation is 14.7 km from the site at its closest point. Qualifying features are localised, with no possible pathway for effects on these features.

River Spey SAC

- 10.6.9 The SAC (also a SSSI) qualifies for species of international importance. The species include Atlantic salmon (*Salmo salar*), Freshwater pearl mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Sea lamprey (*Pteromyzon marinus*). The designation is 12.7 km from the site at its closest point. Qualifying features are localised and lie within a separate, distinct watershed with no possible pathway for effects on these features.

River Moriston SAC

- 10.6.10 The SAC (also a SSSI) qualifies for species of international importance. The species include Atlantic salmon (*Salmo salar*), Freshwater pearl mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Sea lamprey (*Pteromyzon marinus*). The designation is 10.1 km from the site at its closest point. Qualifying features are localised and lie within a separate, distinct watershed with no possible pathway for effects on these features.

Nationally Designated Sites

- 10.6.11 Potential effects of The Proposed Development on nationally designated sites are considered for all sites that fall within 5 km of the site. Within this zone, no nationally designated sites are carried forward for further assessment. The following nationally designated sites were scoped out of further assessment, as explained below:

South Laggan Fen SSSI

- 10.6.12 The SSSI is notified for transition open fen. The designation lies outwith the footprint of the site, qualifying features are localised and lie within a separate, distinct watershed with no possible pathway for effects on these features.

Garry Falls SSSI

- 10.6.13 The SSSI is notified for upland mixed ash woodland and bryophyte assemblage. The designation lies outwith the site of The Proposed Development, qualifying features are localised with no possible pathway for effects on these features.

Parallel Roads of Lochaber SSSI

- 10.6.14 The SSSI is notified for geological interest. Geological interests are addressed in Chapter 14: Geology and Water Environment and not included for further assessment in this Chapter.

Habitats and Vegetation

- 10.6.15 Figure 10.2a to Figure 10.2f: Phase One Habitat Survey, show the vegetation according to Phase One Habitat types. Figure 10.3a to Figure 10.3l: NVC Survey Results, display dominant NVC types and polygon codes for cross-reference with Appendix 10.5: NVC Polygon data.
- 10.6.16 Full descriptions of habitats, vegetation communities therein and associated notes on location and condition are included in Appendix 10.2: Habitat Descriptions and Appendix 10.3: Target Notes, and a Species List is outlined in Appendix 10.4.
- 10.6.17 A total of 2090.15 hectares (Ha) of habitats was mapped in the study area. Habitat types recorded are summarised in Table 10.2.

Table 10.2: Phase One Habitats recorded within the Study Area

Phase 1 Habitat	Area (Ha)
Acid grassland - flushed	12.05
Acid grassland - unimproved	55.13
Bare ground	3.13
Bare peat	0.09
Bare rock	13.23
Blanket bog	113.21
Bracken - continuous	76.89
Broadleaved woodland - semi-natural	74.97
Buildings and gardens	7.65
Calcareous grassland - flushed	3.15
Calcareous grassland - unimproved	2.13
Coniferous woodland - plantation	417.28
Coniferous woodland - semi-natural	73.37
Dry dwarf shrub heath - acid	191.04
Dry dwarf shrub heath - oceanic	180.24
Dry heath/acid grassland mosaic	35.34
Dry modified bog	87.04
Flush and spring - acid flush	6.85
Flush and spring - basic flush	5.74
Flush and spring - bryophyte dominated spring	0.00
Improved grassland	26.69
Lichen/bryophyte heath	96.36
Marsh/marshy grassland	17.76
Mixed woodland	11.70
Mixed woodland - semi-natural	0.40
Montane heath/dwarf herb	67.76
Neutral grassland - semi-improved	10.20
Neutral grassland - unimproved	9.30
Open water	1.97
Quarry	0.97
Running water	2.54
Scattered trees	0.35
Scattered trees - broadleaved	0.30
Scattered trees - coniferous	0.09
Scree	15.10
Scrub - continuous	1.71
Wet dwarf shrub heath	373.91
Wet dwarf shrub heath - flushed	103.72
Wet heath/acid grassland mosaic	20.09
Wet modified bog	26.34
TOTAL	2090.15

- 10.6.18 All habitats that qualify as Annex 1 Habitats on the EC Habitats Directive have been classed as being of Medium sensitivity due to their conservation importance. Habitats that are classified as qualifying interests of designations, or those that are out with a designation boundary, but on which qualifying interests are functionally dependent, are assessed within the sites designated for nature conservation section and not carried forward for assessment here.
- 10.6.19 There are no habitats recorded within the study area considered to be of High or Very High sensitivity, with all Annex 1 Habitats identified within the study area being relatively common and widespread in a local and regional context e.g. dominant woodland, heath and mire vegetation communities as described, or are assessed as being relatively species-poor or highly modified fragments of habitat (see Appendix 10.2). Other Annex 1 Habitats may only be present across small areas or highly localised, but considered relatively common, and whilst these may be highly sensitive and vulnerable to possible effects, they are considered to be of only regional significance e.g. communities of sedge mires, springs and fens.
- 10.6.20 Table 10.3 summarises the vegetation communities identified within the study area that are considered to be of Medium sensitivity. The locations of these habitats are displayed on Figure 10.4a to Figure 10.4f: Priority or Sensitive Habitats. All other habitats recorded within the study area are considered to be of Low or Very Low sensitivity.

Table 10.3: Priority or Sensitive Vegetation Communities within the Study Area

Annex I habitat classification	NVC communities present within study area	Sensitivity
91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>	W7c	Medium (Regional)
91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	W17, W17b, W17c	Medium (Regional)
91C0 Caledonian forest (native stands only)	W18, W18b, W18d	Medium (Regional)
7130 Blanket bog	M1, M2, M17, M17a, M17b, M15-M17, M19, M19a, M19b, M19c, M20, M20-25, M25a	Medium (Regional)
7240 Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	M10, M10a, M11b	Medium (Regional)
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	M15, M15a, M15b, M15c, M15d	Medium (Regional)
4030 European dry heaths	H10, H10a, H12, H12a, H12b, H12-M25 H16b	Medium (Regional)
4060 Alpine and Boreal heaths	H13a, H14b, H15	Medium (Regional)
5170 Siliceous alpine and boreal grasslands	U7a, U7b, U10b	Medium (Regional)
8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia aplinae</i> and <i>Galeopsietalia ladanii</i>)	n/a (Phase 1 habitat types: Bare rock and Scree)	Medium (Regional)

10.6.21 A complete list of vegetation communities identified within the study area is included in Appendix 10.5: NVC Polygon Codes and a list of habitat community types recorded is included in Appendix 10.6: Habitat Summary Table.

10.6.22 Six higher plant species of conservation importance were identified within the study area. No lower plant species of conservation importance were identified within the study area. Plant species of conservation importance identified within the study area and their conservation status are listed in Table 10.4 below.

Table 10.4: Plant species of Conservation Importance Recorded within the Study Area.

Species	Common Name	Status
<i>Arctostaphylos alpinus</i>	Alpine bearberry	Nationally Scarce
<i>Arctostaphylos uva-ursi</i>	Bearberry	Nationally Scarce
<i>Betula nana</i>	Dwarf birch	Nationally Scarce
<i>Cornus suecica</i>	Dwarf cornel	Near Threatened
<i>Juniperus communis subsp. nana</i>	Dwarf juniper	BAP Priority Species
<i>Juniperus communis subsp. communis</i>	Juniper	BAP Priority Species

10.6.23 Locations of species listed in Table 10.4 were recorded as target notes and are summarised in Appendix 10.3: Target Notes and displayed on Figure 10.3.4 (in Appendix 10.3: Target Notes).

10.6.24 Figures 10.5a to Figure 10.5f map the groundwater dependency of the habitats present within each compartment.

10.6.25 A total of 2090.15 hectares (Ha) of GWDTE was mapped in the study area. Habitat types recorded are summarised in Table 10.5.

Table 10.5: GWDTE within the Study Area

GWDTE classification	Principal NVC communities	Area (Ha)	Sensitivity
High	W4b, W7c, M6, M6a, M6b, M6c, M6d, M6-25, M10a, M11b, M23a, M29x, M32, CG10a, CG10b	22.82	Medium (Regional)
Moderate	M15a, M15b, M15c, M15f, M25, M25-U4, MG10a, U4, U5, U5c, U6, U6c, U6d,	167.37	Medium (Regional)
Low-high	MG10a	0.13	Low (Local)
Low-moderate	MG10a, U5, U5a, U5c, U6	19.97	Low (Local)
Low	W9, W17, W17b, W17c, W17b-W18, W18b, W18d, W23a, M15, M15b, M15c, H10, H10a, H10-M25, H12, H12a, H12b, H12-M25, H13a, H14b, H21a, M15d, MG6a, U7a, U7b,	1692.38	Low (Local)

GWDTE classification	Principal NVC communities	Area (Ha)	Sensitivity
	U10, U4, U5a, U6, U6d, U20a, U20b, U20c		
Peatland	M1, M2, M3, M15, M15-17, M17, M17a, M17b, M15-M17, M17-25, M19, M19a, M19c, M19-U6, M20, M20-25, M25a	187.48	Medium (Regional)

10.6.26 All moderately and highly dependent GWDTE have been classed as being of Medium sensitivity. Areas of high GWDTE are typified by wet woodland, flushes and springs and flushed calcareous grassland present within the survey area, for which hydrological integrity is considered to be important to their function as a habitat type. High GWDTE are therefore considered to be sensitive to disturbance. Areas of moderate GWDTE are typified by some flushed wet heath and grassland communities present within the survey area, for which hydrological integrity is considered important to their function as a habitat type in some topographical or hydrological settings. Moderate GWDTE are therefore also considered to be sensitive to disturbance.

10.6.27 However no GWDTE have been classed as of High/Very high sensitivity with all GWDTE habitat types identified within the study area being relatively common and widespread in a local and regional context.

Protected Species

10.6.28 Signs of Otter, Water vole, Pine marten and Red squirrel were recorded within the study area. Potential roosts for bat species and Wood ant nests were also identified.

10.6.29 Signs of Red squirrel and Pine marten were recorded within the study area, notably within Glen Garry forest and South Laggan forest. No places of shelter were identified within the study area, however the high level of activity of Pine marten recorded in South Laggan forest and the sighting of Red squirrel in the same area indicated these species are present and could be sensitive to impacts. These species are therefore considered to be of Medium sensitivity.

10.6.30 Records of Medium sensitivity or greater are summarised below. All results from field studies are summarised in Confidential Appendix 10.7: Protected Species Results.

Otter

10.6.31 A single lie-up was recorded within the study area along the Allt na Cailliche. All Otter shelters recorded are considered to be of Very High (international) sensitivity. Signs of Otter were also recorded along the Allt na Cailliche and Allt Glas Dhoire indicating that the species more widely utilises these watercourses.

Water vole

10.6.32 Three possible colonies were identified within the survey area, with ten burrows identified in total across the three locations. No fresh feeding signs or droppings were recorded at

any possible shelters. All Water vole shelters recorded are considered to be of High (national) sensitivity.

Bat

10.6.33 Two potential bat roost features were identified within the survey area. Both potential roost features identified were aboreal property located within Glen Garry forest. Other possible roost features, including bridge structures and mature trees in proximity to proposed infrastructure were not considered to have potential to support roosting bats. All potential bat roost features recorded are considered to be of High (national) sensitivity.

Wood Ants

10.6.34 Two wood ant nests were recorded within the study area, both situated within Glen Garry forest. All wood ant nests recorded are considered to be of Medium (regional) sensitivity.

Non-native/invasive species

10.6.35 Non-native or invasive species identified within the study area are listed in Table 10.6 below.

Table 10.6: Non-native/invasive species recorded within the study area.

Species	Common Name	Status
<i>Rhododendron ponticum</i>	Rhododendron	Non-native/Invasive

10.6.36 Rhododendron (*Rhododendron ponticum*) was recorded at several locations within the study area, notably concentrated in the areas around Kilfinnan and North Laggan. Locations were recorded as target notes and are displayed on Figure 10.3.4 (in Appendix 10.3: Target Notes).

10.6.37 No other non-native/invasive species were recorded during the course of field surveys.

10.7 Potential Effects

10.7.1 The project construction method, as outlined in Chapter 3: Description of Development indicates that construction procedures would accommodate a number of measures designed to minimise impacts on terrestrial ecology receptors, including the development of a Construction Environmental Management Plan (CEMP) detailing measures to protect habitats and species, prevent pollution and a peat management plan (PMP) to minimise disruption to peatlands.

Habitats and Vegetation

10.7.2 Potential impacts on habitats include the following:

- Permanent direct habitat loss and fragmentation of habitat as a result of installation of permanent structures and associated access infrastructure;
- Temporary direct habitat loss and fragmentation of habitat as a result of installation of temporary access, opening of borrow pits and use of laydown/working areas;

- Construction-related effects: pollution from materials used or generated from the construction phase have potential to enter hydrological features; and
- Alteration to site hydrology and disturbance to peat soils through installation of permanent structures and temporary infrastructure.

Protected Species

10.7.3 There is potential for impact on the following identified features: Otter (*Lutra lutra*), Water vole (*Arvicola amphibius*), Pine marten (*Martes martes*), Red squirrel (*Sciurus vulgaris*) bat species and Wood Ants.

10.7.4 Potential impacts include the following:

- Loss of foraging habitat through construction of infrastructure;
- Disturbance to individual animals foraging or resting in proximity to construction activity (noise, lighting, vehicular movements); and
- Mortality or injury to individual animals.

Non-native/invasive species

10.7.5 Potential impacts include the following:

- Spread of non-native and invasive Rhododendron (*Rhododendron ponticum*) by movement of contaminated soil and/or transfer of plant debris on vehicles.

10.8 Mitigation

10.8.1 To limit and further minimise potential impacts on ecological features across the site, the best practice mitigation measures detailed below are proposed.

10.8.2 General mitigation measures:

- A Construction Environmental Management Plan (CEMP) would be developed, detailing measures to manage, control and monitor the potential effects of noise, dust, litter and personnel/vehicular movements. A Draft CEMP is included in Appendix 3.3 (see also Chapter 3: Description of Development, Section 3.12);
- An Ecological Clerk of Works (ECoW) would be appointed, specifically to provide monitoring of construction activities relating to the installation of infrastructure. The ECoW will also identify and monitor sensitive receptors immediately prior to, during and immediately after the construction phase. This will include identifying possible constraints on construction presented by the presence of protected mammals, birds and reptiles and adopting specific mitigation measures where necessary.
- Best practice pollution control measures, with reference to SEPA and Control of Substances Hazardous to Health (COSHH) guidelines, would be included in the CEMP. Particular reference would be made to managing handling, storage and use of hazardous chemicals and fuels used in the construction process. A detailed spill response plan will be developed and fully-briefed to all site operatives and forms part of the CEMP; and

- Pollution control measures would also consider the deployment of silt traps to prevent flow of silt across vegetation, with particular focus on wetland areas.

10.8.3 Measures specific to habitats and vegetation:

- Vehicular access would be restricted across unprotected ground outwith the footprint of The Proposed Development, using only load-spreading, wide-track plant, deploying bog-mats or trackway as appropriate and avoiding streams, mires, flushes and soaks where possible;
- Where possible, temporary access would be 'floated' over sensitive habitats (e.g. M15) to minimise disruption to hydrology, soil structure and vegetative material;
- Higher and lower plant species identified as being of national significance would be demarcated where they are present within 30 m of construction activity, and avoided as far as is possible to prevent their potential destruction;
- Excavated materials would be stored according to best practice taking care to separate, as far as is reasonable, turves, topsoils, soil and peat layers and boulders. Reinstatement would ensure that turves are replaced on the surface, to recreate the former habitat as far as is possible;
- During construction activities, surface water flows would be captured through a series of cut off drains to prevent water entering excavations or eroding exposed surfaces. If dewatering of excavations is required, pumped discharges would be passed through silt/sediment control measures;
- Larger flushes and runnels identified as moderate or high GWDTE would be treated as watercourses, and demarcated prior to construction works occurring. Installation of pipes and culverts would be specified where required to manage and maintain hydrological pathways, employed according to SEPA guidelines;
- Where the permanent track is located within 250 m of high GWDTE, consideration should be given to micro-siting the track alignment in liaison with the ECoW during detailed design. Such areas include NVC polygon's 111, 112, 113, 171, 224 and 394 (see Figure 10.3b, 10.3c and 10.3d); and
- In the area above Kilfinnan where there is a high concentration of high/moderate GWDTE, the footprint of the working corridor will be minimised as far as practically possible to restrict disturbance. Avoidance of the GWDTE habitats in this area may not be possible given the steepness of slope, but consideration should be given to maintaining hydrological flows when finalising the alignment of this track during detailed design.

10.8.4 Measures specific to all protected species:

- Prior to felling works and construction commencing, a professional ecologist or environmental clerk of works would undertake a pre-felling/construction survey to ascertain the presence and level of activity of all protected mammal species in the area, with particular focus on confirmed and potential shelters identified in this EIA Report;
- Any trees that are to be felled, and that have been identified as possessing potential roost features for bat species, would be checked by a licensed bat worker for evidence of use prior to forestry works commencing;

- Ramps or gently sloping faces would be employed within excavations to allow safe access/egress for any mammal species that may become trapped;
- Where possible Wood ant nests would be retained during construction. A 35 metre works exclusion zone is recommended for Wood ant nests during felling or construction works. Works exclusion zones around Wood ant nests would be clearly marked out prior to construction commencing. Were it not possible to microsite the access routes around a Wood ant nest, translocation may be considered as a last resort. Nests would be moved in a way that retains the nest architecture and the site to which the nest is to be translocated chosen carefully;
- The workforce would be briefed on the protected species present in the general area, the legislative context and potential signs of activity; and
- In the event of any significant signs of mammal activity being found, works would cease immediately in that area, and advice sought from the appointed ECoW, and if necessary the local SNH office.

10.8.5 Measures specific to non-native/invasive species:

- Measures detailed in this section are specific to *Rhododendron ponticum* identified through the course of field surveys however there may be some change in or spread of distribution of invasive non-native species prior to any construction works commencing. As a result, a professional ecologist or environmental clerk of works would undertake a pre-felling/construction survey to ascertain the distribution of non-native/invasive species in the vicinity of proposed construction works;
- Identified non-native/invasive plant species would be demarcated with an appropriate buffer to prevent their disturbance (eg. by wheel tracking, soil removal, felling) which may result in their spread;
- The workforce would be briefed on the non-native/invasive species present in the general area and the legislative context; and
- In the event of any non-native/invasive species being found, works would cease immediately in that area, and advice sought from the appointed ECoW, and if necessary the local SNH office.

10.9 Monitoring

- 10.9.1 Construction phase monitoring would be carried out by the appointed ECoW, to ensure compliance with environmental legislation and effective delivery of mitigation measures.

10.10 Residual Effects

Habitats and Vegetation

- 10.10.1 Effects are quantified according to the predicted permanent and temporary removal of habitats, and are summarised for habitats identified as being of Medium significance or greater in Table 10.7.

Table 10.7: Habitats of Medium Significance or greater directly affected by The Proposed Development

Annex 1 habitat classification	Area of effect (ha)						Total area of effect (ha)	Area of effect as % of total habitat area within survey area
	Permanent			Temporary				
	Permanent access	Inundation	Surge shaft	Borrow pits	Temporary access	Site compounds/ laydown areas		
91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles	0.211	0.000	0.000	0.000	0.000	0.000	0.211	0.322
91C0 Caledonian forest	0.017	0.000	0.000	1.000	0.000	0.000	1.017	0.245
7130 Blanket bogs*	0.472	9.226	0.000	0.000	0.024	0.000	9.722	5.198
<i>Blanket bog (modified)</i>	<i>0.200</i>	<i>8.173</i>	<i>0.000</i>	<i>0.000</i>	<i>0.024</i>	<i>0.000</i>	<i>8.397</i>	<i>4.489</i>
7240 Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	0.000	0.079	0.000	0.000	0.066	0.000	0.145	2.526
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>	4.725	28.816	0.083	2.000	0.104	0.640	36.368	7.312
4030 European dry heaths	2.421	18.574	0.000	0.000	0.104	0.000	21.099	5.189
4060 Alpine and Boreal heaths	0.034	0.000	0.042	0.000	0.000	0.000	0.076	0.078
8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia aplinae</i> and <i>Galeopsietalia ladani</i>)	0.000	0.119	0.000	0.000	0.000	0.000	0.119	0.788

**inclusive of modified blanket bog as detailed in row below*

91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles

10.10.2 Habitat loss for this habitat type is restricted to a total area of 0.211ha (0.322% of the total habitat type present within the survey area). The area to be lost comprises a small area of riparian woodland along the banks of the Allt a'Choire Ghlais where the proposed permanent access track crosses the river (FID 592). This area is in the uppermost reaches of the woodland habitat along the burn, with steep banks and sparse Downy birch and Alder tree cover. Ground-layer vegetation is dominated by Bracken and acid grassland species. It is anticipated that five mature broadleaved trees may require removal to permit

construction of access track and river crossing in this area (assuming a construction corridor width of 30 m).

91C0 Caledonian forest

- 10.10.3 Habitat loss in Caledonian forest is limited to a total of 0.017ha (0.041% of the total habitat type present within the survey area). The area to be lost comprises a single small area within Glen Garry forest, identified as a possible location for a borrow pit. The conifer woodland in this area is dominated by a scattered canopy of mature Scot's pine over an understorey dominated by Purple-moor grass. The NVC community corresponds to a variant W18d *Pinus sylvestris-Hylocomium splendens* woodland community. A smaller area (<0.02ha) will be lost where access from the existing forest road requires to be constructed up an embankment to reach an existing access to be upgraded through conifer plantation (FID 1250). The conifer woodland in this area is dominated by Birch (*Betula* sp.) with scattered Scot's pine and a heath dominated understorey typical of a W18 *Pinus sylvestris-Hylocomium splendens* woodland community. It is anticipated that mature Scot's pine trees in this area can be avoided by The Proposed Development.

7130 Blanket bogs

- 10.10.4 Loss of blanket bog habitat will total 9.722ha (5.198% of the total habitat type present within the survey area, of which 8.397ha is modified bog, 4.489% of the total habitat type present within the survey area). Habitat loss will mostly affect modified bogs (which account for 86% of all bog habitat to be lost) that are generally species-poor, not actively peat-forming and transitional to grassland and heath habitats as a result of erosion processes and grazing pressure. The majority (95%) of bog habitat which will be lost lies within the inundation zone for the proposed upper reservoir (FIDs 456, 481, 488, 536, 537 and 557). The remaining intact blanket bog to be lost largely comprises small fragments or edges of peatland areas that are transitional to adjacent habitats, particularly wet heaths, and it is considered that loss of these areas will not affect the integrity of wider expanses of peatland habitat. The larger expanses of intact, active blanket bog (blanket bog elements of FID 154, 166, 189, 255, 265, 267 and the vast majority of FID 429) are avoided by The Proposed Development.

7240 Alpine pioneer formations of the Caricion bicoloris-atrofuscae

- 10.10.5 Habitat loss of basic flushes will total 0.145ha (2.526% of the total habitat type present within the survey area). Habitat loss will occur in two principal locations. The inundation zone will account for just over half (54%) of the habitat loss, with a single area of M10a *Carex dioica-Pinguicula vulgaris Carex demissa-Juncus bulbosus* stoney flush near Loch a'Choire Ghlais (FID 486) being inundated as a result of The Proposed Development. This area of stoney flush is considered to be typical in broad structure and composition of basic flush communities present across the wider area. A temporary haul road above Kilfinnan is routed through an area of flushed grassland, with a number of basic M10a stoney flush runnels running downslope (FIDs 767, 773 and 843). This second area is considered to be impoverished in floristic composition by current impacts of high grazing pressure, with the low vegetative cover generally highly browsed and banks of flushes heavily poached by livestock.

4010 Northern Atlantic wet heaths with Erica tetralix

- 10.10.6 Habitat loss of wet heaths will total 36.368ha (7.312% of the total habitat type present within the survey area). Wet heath habitats are the most frequent habitat type recorded within the study area, and accordingly this habitat type will lose the greatest area of all habitat types as a result of The Proposed Development (accounting for 43% of all habitat loss). Primarily the habitat loss of wet heath will be a result of inundation by the upper reservoir (85% of wet heath lost), with other smaller areas lost as a result of new permanent and temporary access track construction. Two principal wet heath types are impacted upon – M15a *Trichophorum germanicum-Erica tetralix Carex panicea* sub-community wet heaths and M15c *Trichophorum germanicum-Erica tetralix Cladonia* sub-community wet heaths. Both communities are generally species-poor with no associated species of conservation concern identified within the survey area. Areas of wet heath to be lost are considered to be typical in broad structure and composition of wet heath communities present across the wider area.

4030 European dry heaths

- 10.10.7 Habitat loss of dry heaths will total 21.099ha (5.189% of the total habitat type present within the survey area). Dry heath habitats are the third most frequent habitat type recorded within the study area, and loss of dry heath accounts for 27% of all habitat loss. The majority of this habitat loss is as a result of inundation by the upper reservoir (88%). Dry heath communities in this area are considered to be fragmented and occur in mosaic with acid grassland habitats, likely a result of chronic herbivore grazing pressure. Other areas to be lost include areas within larger expanses of 'oceanic' heath dominated by H21a *Calluna vulgaris-Vaccinium myrtillus-Sphagnum capillifolium* dry heath *Calluna vulgaris-Pteridium aquilinum* sub-community on northern slopes of Meall na Dearcag. The areas of this heath type to be lost are typical of 'oceanic' heaths across the wider survey area and are often homogenous in vegetation structure and composition and generally species-poor. There are no associated species of conservation concern identified within the areas to be lost. Smaller areas of dry heath will be lost as a result of the construction of a new permanent access track and the upgrade of existing tracks, which mostly comprise areas of fragmented and species-poor H12 *Calluna vulgaris-Vaccinium myrtillus* dry heath in mosaic with grassland or *Molinia caerulea* dominated habitats.

4060 Alpine and Boreal heaths

- 10.10.8 Habitat loss of alpine and boreal heath, dominated by H13 *Calluna vulgaris-Cladonia arbuscula* heath, will total 0.076ha (0.078% of the total habitat type present within the survey area). The area will be lost as a result of access track construction to the surge and ventilation shafts (FID 1208). The area to be lost is typical in vegetation structure and composition of H13 alpine and boreal heath communities across the wider survey area.

8110 Siliceous scree of the montane to snow levels (Androsacetalia aplinae and Galeopsietalia ladani)

- 10.10.9 Habitat loss of scree will total 0.119ha (0.788% of the total habitat type present within the survey area). The area will be lost as a result of inundation by the upper reservoir (FID 482). The area of scree is not vegetated and there are no associated species of conservation concern.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

10.10.10 Effects are quantified according to the predicted permanent and temporary removal of GWDTE, and are summarised for GWDTE identified as being of Medium significance or greater in Table 10.8.

Table 10.8: GWDTE of Medium Significance or greater directly affected by The Proposed Development

GWDTE classification	Area of effect (ha)			Total area of effect (ha)	Area of effect as % of total GWDTE area within survey area
	Permanent access	Upper Reservoir (Inundation) and Dam	Temporary access		
High	0.081	1.150	0.120	1.351	5.886
Moderate	1.422	16.43	0.151	18.003	9.609

High GWDTE

10.10.11 Habitat loss of high GWDTE is limited to 1.351ha (5.886% of the GWDTE type within the survey area). Habitat loss of high GWDTE will occur principally as a result of the inundation zone of the upper reservoir, which will account for 85% of the habitat loss, encompassing four flushed areas (FIDs 486, 508, 539 and 552). Of these four areas, two are identified as acid flushes, one basic stoney flush and one flushed calcareous grassland. A temporary haul road above Kilfinnan is routed through an area of flushed acid grassland, with a number of high GWDTE basic stoney flush runnels running downslope (FIDs 767, 773 and 843). This area above Kilfinnan is considered to be impoverished in floristic composition by current impacts of high grazing pressure, with the low vegetative cover generally highly browsed and banks of flushes heavily poached by livestock.

Moderate GWDTE

10.10.12 Habitat loss of moderate GWDTE will total 18.003ha (9.609% of the GWDTE type within the survey area). The primary habitat loss of moderate GWDTE will be a result of inundation by the upper reservoir (91% of moderate GWDTE lost), with other smaller areas lost as a result of new permanent and temporary access track construction. Almost all the areas of moderate GWDTE to be lost are of wet heath habitat type, principally a flushed variant common across the study area on moderately inclined lower slopes. A temporary haul road above Kilfinnan is routed through an area of moderate GWDTE flushed acid grassland, with a number of basic flush runnels running downslope.

Summary of Residual Effects

10.10.13 Mitigation measures described in Section 10.8 are designed to minimise potential effects relating to possible pollution or hydrological disturbance.

10.10.14 The potential impacts from the installation of infrastructure associated with The Proposed Development are considered permanent in nature within the inundation zone of the upper reservoir and where permanent access tracks are to be installed and upgraded, but are highly restricted in extent when the full areas of habitat and GWDTE are taken into account.

- 10.10.15 Further to the implementation of proposed mitigation measures the effect on 91A0 Sessile Oak woodlands, 91C0 Caledonian forest, 7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*, 4060 Alpine and Boreal heaths and 8110 Siliceous scree is assessed as being of negligible magnitude. This assessment is made based on the highly restricted extent of effect (less than 1.00ha of each habitat type, and less than 3% of total habitat type within the survey area for each habitat type), along with the typical, fragmented or impoverished nature of each habitat, as described above.
- 10.10.16 The negligible amount of change due to The Proposed Development on the Medium Habitat sensitivity for 91A0 Sessile Oak woodlands, 91C0 Caledonian forest, 7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*, 4060 Alpine and Boreal heaths and 8110 Siliceous scree in the study area is therefore classed as being of **Low** significance.
- 10.10.17 Further to the implementation of proposed mitigation measures the effect on 7130 Blanket bogs, 4010 Wet heaths and 4030 Dry heaths is assessed as being of low magnitude. This assessment is based on the limited area of effect (less than 7.5% of the total habitat type within the survey area for each habitat type), along with the typical, fragmented or impoverished nature of each habitat and avoidance of effect on associated sensitive species, as described above.
- 10.10.18 The low amount of change due to The Proposed Development on the Medium Habitat sensitivity for 7130 Blanket bogs, 4010 Wet heaths and 4030 Dry heaths in the study area is therefore classed as being of **Minor** significance.
- 10.10.19 Further to the implementation of proposed mitigation measures the effect on moderate and high GWDTE is assessed as being of low magnitude. This assessment is based on the limited area of effect (less than 10% of the total habitat type within the survey area for each habitat type) and the typical or impoverished nature of each associated habitat.
- 10.10.20 The low amount of change due to The Proposed Development on the Medium GWDTE sensitivity in the study area is therefore classed as being of **Minor** significance.

Protected Species

Otter

- 10.10.21 No confirmed shelters or breeding holts were recorded within the study area. A probable lie-up (couch) was identified along the Allt na Cailliche river, with sprainting evident in the vicinity. Additionally spraint was identified along the lower reaches of the Allt Glas Dhoire, but no shelters or resting places were recorded. Populations of Otter are therefore considered to use these two watercourses sporadically for foraging, resting or territory marking purposes.
- 10.10.22 The resting place on the Allt na Cailliche lies 53 m east of the proposed permanent access track alignment.
- 10.10.23 Scheme design indicates that the footprint of proposed infrastructure would not directly impact on places of rest or foraging areas used by Otter. The appointed ECoW will advise on mitigation measures required per the CEMP. The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The

Proposed Development on the Very High Otter sensitivity is therefore classed as being of **Negligible** significance.

Water vole

10.10.24 Water vole burrows were recorded at three locations near the proposed route of the permanent access track from Glen Garry to the upper reservoir. Burrows were recorded on two tributaries of Allt a'Choire Ghlais and along Allt na Cailliche.

10.10.25 All burrows identified are located more than 40 m from the proposed route of the permanent new access track and track to be upgraded.

10.10.26 Scheme design indicates that the footprint of proposed infrastructure would not directly impact on places of rest used by Water vole. The appointed ECoW will advise on mitigation measures required per the CEMP. The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the High Water vole sensitivity is therefore classed as being of **Negligible** significance.

Pine marten

10.10.27 Signs of Pine marten were recorded widely within Glen Garry forest and South Laggan forest, principally along existing tracks and forest rides. No places of shelter for Pine marten were recorded within the study area.

10.10.28 Scheme design indicates that the footprint of proposed infrastructure generally follows that of existing infrastructure in areas of high Pine marten activity, with little additional disturbance likely to potential habitat outwith this footprint. The appointed ECoW will advise on mitigation measures required per the CEMP. The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the Medium Pine marten sensitivity is therefore classed as being of **Negligible** significance.

Red squirrel

10.10.29 Signs of Red squirrel were recorded widely within South Laggan forest, near Kilfinnan Wood. No places of shelter for Red squirrel were recorded within the study area.

10.10.30 Scheme design indicates that the footprint of proposed infrastructure follows that of existing infrastructure in areas of Red squirrel activity with little additional disturbance likely to potential habitat outwith this footprint. The appointed ECoW will advise on mitigation measures required per the CEMP. The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the Medium Red squirrel sensitivity is therefore classed as being of **Negligible** significance.

Bats

10.10.31 Two potential bat roost features were identified within Glen Garry forest.

10.10.32 The first potential roost feature is located more than 150 m from the proposed route of the new permanent access track. The second roost feature is located 10 m from the new permanent access track. Where felling is required pre-felling checks would be undertaken to ascertain the presence and status of any roosting bat populations.

10.10.33 The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the High Bat sensitivity is therefore classed as being of **Negligible** significance.

Wood Ants

10.10.34 Two Wood ant nests were identified within Glen Garry forest. Both nests are located more than 40 metres from an existing access track to be upgraded.

10.10.35 Where felling is required pre-felling checks would be undertaken to ascertain the presence and status of any further wood ant nests.

10.10.36 The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the High Wood ant sensitivity is therefore classed as being of **Negligible** significance.

Non-native/invasive species

10.10.37 The potential for impact is over a short duration (construction phase) and further to the implementation of proposed mitigation measures the overall magnitude is thought to be of Negligible impact. The effect of The Proposed Development on the High non-native/invasive species sensitivity is therefore classed as being of **Negligible** significance.

10.11 Statement of Significance

10.11.1 Residual effects and their significance are summarised below in Table 10.9.

Table 10.9: Statement of Significance

Receptor	Sensitivity	Potential Impact	Effects after mitigation					Significance
			Magnitude	Nature	Extent	Duration	Frequency/Timing	
91A0 Sessile Oak woodlands 91C0 Caledonian forest 7240 Alpine pioneer formations of the <i>Caricion bicoloris-</i>	Medium	Pollution effects, direct loss or fragmentation of areas of habitat from construction. Alteration of site hydrology through construction phase.	Negligible	Negative	Low	Long-term	Temporary and Permanent	Low Principal potential impacts during construction phase.

Receptor	Sensitivity	Potential Impact	Effects after mitigation					Significance
			Magnitude	Nature	Extent	Duration	Frequency/Timing	
<i>atrofuscae</i> 060 Alpine and Boreal heaths 8110 Siliceous scree								
7130 Blanket bogs 4010 Wet heaths 4030 Dry heaths	Medium	Pollution effects, direct loss or fragmentation of areas of habitat from construction. Alteration of site hydrology through construction phase.	Low	Negative	Low	Long-term	Temporary and Permanent	Minor Principal potential impacts during construction phase.
GWDTE	Medium	Pollution effects, direct loss or fragmentation of areas of habitat from construction. Alteration of site hydrology through construction phase.	Low	Negative	Low	Long-term	Temporary and Permanent	Minor Principal potential impacts during construction phase.
Otter (<i>Lutra lutra</i>)	Very High	Destruction of shelters/habitat. Mortality, injury or disturbance during construction phases.	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.
Water vole (<i>Arvicola amphibius</i>)	High	Destruction of shelters/habitat. Mortality, injury or disturbance during construction phases.	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.
Pine marten (<i>Martes martes</i>)	Medium	Destruction of shelters/habitat. Mortality, injury or disturbance during construction phases.	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.
Red squirrel (<i>Sciurus vulgaris</i>)	Medium	Destruction of shelters/habitat. Mortality, injury or disturbance during construction phases.	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.
Bat Species	High	Destruction of shelters/habitat. Mortality, injury or disturbance during	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts

Receptor	Sensitivity	Potential Impact	Effects after mitigation					Significance
			Magnitude	Nature	Extent	Duration	Frequency/Timing	
		construction phases.						during construction phase.
Wood ants	Medium	Destruction of shelters/habitat. Mortality, injury or disturbance during construction phases.	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.
Non-native/invasive species	High	Spread of non-native species as a result of construction/felling processes	Negligible	Negative	Low	Short-term	Temporary and Permanent	Negligible Principal potential impacts during construction phase.

10.12 Conclusion

- 10.12.1 As a result of construction and operation of The Proposed Development, eight habitat types within the study area have been evaluated as having medium (regional) sensitivity assigned according to their conservation status and levels of value/importance under a geographical scale. These include a range of Annex 1 habitat communities of woodland, mire and heath types.
- 10.12.2 Six protected species recorded within the study area were evaluated as having a significant level of value/importance under a geographical scale. Protected species potentially affected include otter, water vole, pine marten and bat species.
- 10.12.3 A single non-native/invasive species was recorded within the study area.
- 10.12.4 Proposals for mitigation relevant to identified receptors includes adherence to best practice construction methods as detailed in a project CEMP, pre-felling/construction checks to update the ecological baseline, demarcating of sensitive habitats, protected species shelters and non-native/invasive species locations prior to commencement of construction, and employment of an ECoW to provide environmental guidance and monitoring through the course of the construction period.
- 10.12.5 The potential effects on the receptors following mitigation that has been built into the scheme design were evaluated and the magnitude of impacts has been assessed to determine residual effects.
- 10.12.6 For the purposes of assessment of residual effects it has been assumed that all mitigation measures will be fully implemented.
- 10.12.7 The significance of residual effect on 91A0 Sessile Oak woodlands, 91C0 Caledonian forest, 7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*, 4060 Alpine and Boreal heaths and 8110 Siliceous scree is predicted to be Low; the residual effect on 7130 Blanket bogs, 4010 Wet heaths, 4030 Dry heaths and GWDTES is predicted to be Minor;

and for all identified protected species and non-native/invasive species, is predicted to be Negligible.

10.13 References

Databases

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