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## 7. ECOLOGY

### 7.1 Introduction

- 7.1.1 This Chapter evaluates the importance of the nature conservation interest (terrestrial) and the potential effects likely as a result of the Proposed Development.
- 7.1.2 This Chapter 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 likely residual impacts of the Proposed Development after mitigation measures have been implemented.
- 7.1.3 The assessment has been prepared by a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), at Blairbeg Consulting Ltd, based in Inverness-Shire, Scotland. The assessment has been carried out in line with CIEEM's code of conduct and relevant standards and guidance.

### 7.2 Scope of Assessment

#### *Study Area*

- 7.2.1 The Proposed Development is approximately 23.3 km in length. The Study Area for this assessment incorporates land within 250 m of the Proposed Development. The Study Area comprises conifer plantation woodland managed for commercial forestry with open heath and mire habitats in the northern section of the site. Large sections of the Dalchork forest through which the OHL passes through have been clearfelled. Within the forestry complex there are open rides and firebreaks dominated by bog, mire and wet grassland communities, along with several watercourses. To the north of the plantation, there are a small number of fields of wet grassland around Crask. There are no major waterbodies within the Study Area, with the alignment of the route being designed to avoid Loch Dubh Cùl na Capulich at the northern end of Dalchork forest.
- 7.2.2 Within some areas of the open ground and felled areas within Dalchork forest, peatland restoration has been undertaken by means of drain and furrow blocking and the installation of peat dams and barriers.
- 7.2.3 There are several moderately sized watercourses within the Study Area that would be oversailed by the OHL and the underground cable section would pass underneath the River Tirry. The majority of the Study Area lies within the River Shin Catchment, with the very northerly end lying within the River Naver Catchment. The main watercourses present within the Study Area are the Allt a' Chràisg; Allt an Drochaidean Beaga, Fèith a' Chaorunn, Fèith Osdail, Allt Chaiseagail, Allt a' Bhreac-leathaid and the River Tirry.

### 7.3 Consultation

- 7.3.1 Key points raised by consultees through the consultation process which are of relevance to the subject area of ecology are detailed in **Table 7-1**:

**Table 7-1: Ecology Issues Raised During Consultation**

Consultee	Issue	Action
<b>Brora District Salmon Fishery Board – Scoping Response</b>	(No response)	The Brora District Salmon Fishery Board was contacted via email on 14 May and 25 October 2019 but gave no response.

Consultee	Issue	Action
<b>Kyle of Sutherland Fishery Board – Scoping Response</b>	The Tirry catchment is the subject of a salmon restoration project involving the Kyle of Sutherland District Salmon Fishery Board, SSE and SEPA. As such, it is vital that maximum attention is given to protecting the aquatic and riparian environment throughout any development activity.	<p>Potential effects of the Proposed Development on freshwater habitats are identified and discussed in Section 7.7 and 7.8.</p> <p>Appropriate mitigation measures to protect salmonids and the freshwater habitats on which they are reliant are included in section 7.9.</p> <p>Further mitigation to protect watercourses is also included in <b>Chapter 10: Hydrology, Hydrogeology, Geology and Soils.</b></p>
<b>Kyle of Sutherland District Salmon Fisheries Trust – Scoping Response</b>	<p>Kyle of Sutherland Fisheries hold electrofishing site data from this area, which can be provided in map format.</p> <p>The methodology for laying the cable under the River Tirry was requested.</p>	The methodology for laying the cable was issued to the Trust via email on 20 December 2019.
<b>Marine Scotland – Scoping Response</b>	Marine Scotland recommended the Kyle of Sutherland and the Brora District Salmon Fishery Boards and the Kyle of Sutherland Fisheries Trust be contacted for more information on local fish populations.	Responses from the Fisheries Trust can be found above. The Brora District Salmon Fishery Board did not respond to correspondence.
<b>Scottish Environment Protection Agency (SEPA) – Scoping Response</b>	<p>Concerns relate to the protection of and Groundwater Dependent Terrestrial Ecosystems (GWDTEs) including:</p> <ul style="list-style-type: none"> <li>poles and associated construction works for poles should not be located in wetland areas identified as part of the extended phase 1 habitat survey; and</li> <li>if this is not possible then our Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and GWDTE should be followed.</li> </ul>	<p>Areas of GWDTE and peatland habitats have been mapped in <b>Figure 7.3</b> and their NVC communities described in Section 7.5.</p> <p>Potential effects of the Proposed Development on GWDTE habitats are described in Section 7.7 and 7.8.</p> <p>Mitigation measures including mitigation by design and mitigation by practice are described in section 7.9.</p>
<b>Scottish Natural Heritage (SNH) – Pre-application</b>	Concerns were raised in relation to the indicative alignment traversing a section of the Ben Klibreck Site of Special Scientific Interest (SSSI), citing potential adverse effects on blanket sphagnum bog and a small strip of marsh / marshy grassland. The OHL would cross an area of blanket bog likely to be very wet and sensitive to disturbance, and it would be challenging to construct and maintain the OHL in this area without damaging the habitat. SNH considered that modification of the proposed route could avoid impacts on	The alignment was amended to traverse west of the Crask Inn, rather than through a short section of SSSI to the east, avoiding it altogether.

Consultee	Issue	Action
<p><b>SNH – Scoping Response</b></p>	<p>the SSSI altogether, and included a suggested realignment.</p> <p><u>European (Natura) Protected Areas</u> The EIA should include a Habitat Regulations Appraisal (HRA) for each Natura site, and if necessary, an Appropriate Assessment should also be undertaken.</p> <p><u>Ben Klibreck SSSI</u> We advise that a full NVC survey should be undertaken for the section of the route through the SSSI. We advise that the limit of deviation for this section is too large and that NVC surveys will help to limit the scope of deviation. SNH advise low ground pressure machines should be used for all construction within the SSSI and poles should not be dragged across the site. Construction compounds or pulling points to tension the line should not be located within the SSSI. We would not support the construction of built tracks within the SSSI. SNH also advise a restoration plan should also accompany the EIA detailing what restoration methods will be used to ensure fragile habitats recover successfully. The plan should also detail what monitoring and subsequent actions will be undertaken to ensure restoration is successful.</p> <p><u>Carbon Rich Soils, Deep Peat &amp; Priority Peatland Habitat</u> SNH advise the methods to protect Class 1 and 2 priority peatland should be detailed in construction method statements. A restoration plan should also be provided to show how any damage to this habitat will be restored on completion of works. We advise that any peatland within Dalchork forest which has undergone restoration to be classified as Class 1 or 2 peatland habitat and therefore the same principles set out above would apply to these areas.</p> <p><u>Protected Species</u> SNH advise that surveys should be undertaken to inform the presence of</p>	<p>This Chapter identifies the protected areas within the vicinity of the Proposed Development in Section 7.5 and assesses the potential effects it may have on designated sites in Section 7.7 and 7.8. HRA for the Natura sites is discussed in Section 7.7 with full details provided in <b>Appendix 7.4</b>. A targeted NVC survey was undertaken to include the section of the OHL located within the SSSI, Phase 1 habitats are mapped in <b>Figure 7.2</b> with NVC codes matching polygons in <b>Figure 7.3</b> provided in <b>Appendix 7.2</b>.</p> <p>Details on the impacts of the Proposed Development on the SSSI are detailed in Section 7.7 and 7.8, with mitigation measures including advice from SNH detailed in Section 7.9. Excavation at pole locations would be required as detailed in <b>Chapter 3</b>. Methods of reinstatement would be detailed in construction method statements, as part of the Construction Environmental Management Plan (CEMP). Monitoring of restoration is detailed in Section 7.10.</p> <p>Details on measures to protect peatland habitats are detailed in Section 7.9. Methods of reinstatement would be detailed in construction method statements, as part of the CEMP.</p> <p>Protected species surveys were undertaken in line with methodologies</p>

Consultee	Issue	Action
	<p>protected species. If a protected species could be affected by the proposal, mitigation should be identified and a Species Protection Plan supplied within the EIA report.</p>	<p>described in <b>Appendix 7.1</b>. This chapter assesses the potential effects it may have on protected species in Section 7.7 and 7.8, with appropriate mitigation to reduce any potential impacts detailed in Section 7.9. As otters are a qualifying feature of the Caithness and Sutherland Peatlands SAC, potential impacts and appropriate mitigation are also discussed in <b>Appendix 7.4</b>.</p>
<p><b>SNH - Additional Consultation (Gate Check Report)</b></p>	<p>In addition to advice provided in the pre-application and Scoping advice detailed above, the following guidance was provided:</p> <p><b>Ben Klibreck SSSI</b></p> <p>SNH welcome the revision of the route to restrict the number of poles in the SSSI to no more than 5. Areas of blanket bog within the SSSI should be avoided.</p> <p>We advise the use of low ground pressure machines for all construction within the SSSI, with the number of machine movements limited. All poles and any other materials should be transported to site using a helicopter to minimise ground disturbance. Any damage arising from construction should be restored upon completion.</p> <p><b>Peatland Action Restoration Area</b></p> <p>SNH welcome the revision to the alignment to avoid the majority of peatland restoration areas within Dalchork Forest. SNH request that the area of recent peatland restoration that is crossed by the alignment in the north of Dalchork Forest is monitored pre and post construction by means of a drone survey to allow for a comparison of habitat condition.</p> <p>Depending on the results of post-construction habitat condition assessment in this area, restoration may be required, the extent of which and prescribed methodology should be agreed with SNH and FLS. The requirement for a compensatory restoration area cannot be ruled out.</p> <p><b>Freshwater pearl mussels</b></p>	<p>The targeted NVC survey has allowed poles to be located out with areas of blanket bog, see <b>Figure 7.3</b>.</p> <p>Details on mitigation measures including advice from SNH is detailed in Section 7.9.</p> <p>Excavation at pole locations would be required as detailed in Chapter 3. Methods of reinstatement would be detailed in construction method statements, as part of the Construction Environmental Management Plan (CEMP).</p> <p>Monitoring of restoration is detailed in Section 7.10.</p> <p>As far as is practicably possible the alignment has been designed to avoid areas of peatland restoration, shown in <b>Figure 2.5</b>.</p> <p>Measures to avoid and minimised disturbance to peatland restoration areas is provided in sections 7.8 and 7.9, with details on pre- and post-construction monitoring provided in section 7.10.</p> <p>The potential impacts of the Proposed Development on freshwater pearl</p>

Consultee	Issue	Action
	We advise that the River Tirry could support freshwater pearl mussels, impacts of the use of bentonite on water quality during drilling should be considered. The EIA report should detail what mitigation and pollution prevention measures will be put in place.	mussel is detailed in sections 7.7 and 7.8. Mitigation measures to protect watercourses (including the risk from use of chemicals such as bentonite) are detailed in Chapter 10: Hydrology, Hydrogeology, Geology and Soils, with a summary provided in section 7.9.

## 7.4 Methodology

### *Desk Study*

7.4.1 Baseline data on the nature conservation interest of the Study 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 September 2018;  
SNH Site Link website (<http://gateway.snh.gov.uk>) – accessed September 2018; 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).

7.4.2 Further information on the 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), the Sutherland Local Biodiversity Action Plan (LBAP)) and relevant published literature (i.e. relevant guidance documents and scientific papers).

### *Field Survey*

7.4.3 The field survey methodology is detailed within **Appendix 7.1**.

### *Issues Scoped Out*

7.4.4 The following surveys have been scoped out of the assessment:

- freshwater habitat survey: it is anticipated that construction would be undertaken in accordance with best practice measures and pollution prevention guidelines, with wood poles located at a minimum of 20 m from watercourses, therefore significant impacts to fish and their habitats are not anticipated, but any potential impacts are discussed in Section 7.7 and 7.8; and
- specific surveys for reptiles and amphibians will not be required. With implementation of best practice construction methodology and adoption of the Applicant's Species Protection Plans (SPPs), significant effects on these ecological receptors are not anticipated.

### *Assessment of Effects*

7.4.5 The assessment has been undertaken according to the current guidance detailed by the CIEEM (2018)<sup>1</sup>.

<sup>1</sup> Chartered Institute of Ecology and Environmental Management (2018). Guidelines for ecological impact assessment in the UK and Ireland. Winchester: CIEEM

7.4.6 The assessment of the significance of predicted impacts on ecological receptors is based on both the 'sensitivity' of a receptor and the nature and magnitude of the effect that the Proposed Development would have on it. Effects in biodiversity may be direct (e.g. the loss of species or habitats), or indirect (e.g. effects due to noise, dust or disturbance on receptors located within or outside the Study Area).

#### ***Sensitivity / Importance of Ecological Receptors***

7.4.7 The evaluation methodology has been adapted from the CIEEM Guidelines. A key consideration in assessing the effects of any development on flora and fauna is to define the areas of habitat and the species that need to be considered. This requires the identification of a potential zone of influence, which is defined as those areas and resources that may be affected by biophysical changes caused by project activities, however remote from a site.

7.4.8 In identifying these receptors, it is important to recognise that a development can affect flora and fauna directly (e.g. the land-take required) and indirectly, by affecting land beyond the development site (e.g. through noise generation or hydrological impacts). The approach that has been undertaken for this assessment is to identify 'sensitive ecological receptors' (species and habitats that are both valued in some way and could be affected by the Proposed Development) and separately, to consider legally protected species.

7.4.9 It is impractical for an assessment of the ecological effects of a development to consider every species and habitat that may be affected; instead it should focus on valued ecological receptors. These are species and habitats that are both valued in some way and could be affected by the Proposed Development. Where there is no potential for valued ecological receptors to be affected significantly, it is not necessary for them to be considered.

7.4.10 The sensitivity of species populations and habitats is assessed with reference to:

- their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations);
- any social benefits that species and habitats deliver (e.g. relating to enjoyment of flora and fauna by the public); and
- any economic benefits that they provide.

7.4.11 Both species' populations and habitats have been valued using the following scale: Very High, High, Medium, Low, Very Low and Negligible.

7.4.12 The approach taken in this assessment is that a species population that is considered to be of medium or greater importance in biodiversity conservation terms is considered to be a sensitive ecological receptor. Therefore, if a species population is considered to be of low value, the Proposed Development would not have a significant effect on the receptor in question. Exceptions are if the species population has been identified as having a high social or economic value or if the species is legally protected.

7.4.13 A similar approach is adopted for habitats i.e. if a habitat is considered to be of very low value, the Proposed Development would not have a significant effect on the receptor in question. The exception would be if the habitat has economic or social value (e.g. an open space that is used extensively for informal recreation by local people, where the area's wildlife is an important contribution to this value).

7.4.14 Ecological features have been valued using the scale set out in **Table 7-2** below, with examples provided of criteria used when defining the level of value.

**Table 7-2: Scale of Value**

Sensitivity of Receptor	Examples (Guidance to Evaluation)
<b>Very High (International)</b>	<p>An internationally important site e.g. Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar (or a site proposed for, or considered worthy of such a designation);</p> <p>A regularly occurring substantial population of an internationally important species (listed on Annex IV of the Habitats Directive)</p>
<b>High (National)</b>	<p>A nationally designated site e.g. Site of Special Scientific Interest (SSSI), or a site proposed for, or considered worthy of, such designation;</p> <p>A viable area of a habitat type listed in Annex 1 of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole;</p> <p>A regularly occurring substantial population of a nationally important species, e.g. listed on Schedules 5 &amp; 8 of the 1981 Wildlife and Countryside Act;</p> <p>A feature identified as a priority species / habitat in the UK BAP.</p>
<b>Medium (Regional)</b>	<p>Regional areas of internationally or nationally important habitats which are degraded but are considered readily restored;</p> <p>A regularly occurring, locally significant population of a species listed as being nationally scarce.</p>
<b>Low</b>	<p>Viable areas of priority habitat identified in the LBAP or smaller areas of such habitat which are essential to maintain the viability of a larger habitat as a whole;</p> <p>A site designated as a non-statutory designated site e.g. Site of Importance for Nature Conservation (SINC), or a site listed on the Ancient Woodland Inventory (AWI) or Semi-natural Ancient Woodland Inventory (SNAWI);</p> <p>A regularly occurring, substantial population of a nationally scarce species, including species listed on the UK and Local BAPs e.g. common frog (a UK BAP species).</p> <p>Areas of nationally important habitats which are degraded and have little or no potential for restoration;</p> <p>A good example of a common or widespread habitat in the local area, e.g. those listed as broad habitats on the LBAP;</p> <p>Species of national or local importance, but which are only present very infrequently or in very low numbers within the subject area.</p>
<b>Very Low</b>	<p>Areas of habitat which have value to the local environment, or populations of regularly occurring common species of local conservation interest;</p> <p>Local areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest;</p> <p>Common and widespread species.</p>
<b>Negligible</b>	<p>Areas of limited ecological value, which are not representative of semi-natural habitat and do not support wildlife of conservation interest.</p>

### **Magnitude of Effect**

7.4.15 Effects can be permanent or temporary; direct or indirect; adverse or beneficial and can be cumulative. Effects can vary according to scales of size, extent, duration, timing and frequency of impacts. These factors are brought together to assess the magnitude of the effect on the 'conservation status' of the particular valued ecological receptors, and on the 'integrity' of the habitats that support them:

- integrity is the coherence of the ecological structure and functions of a site or habitat that enables it to sustain its plant and animal communities and populations; and
- conservation status is the ability of a habitat, a plant or animal community or population to maintain its distribution and / or extent / size.

7.4.16 Conservation status is therefore largely determined by the extent to which integrity is maintained. It follows that habitats may or may not be valued ecological receptors in their own right.

7.4.17 Wherever possible, the magnitude of the effect is quantified. Professional judgement is then used to assign the effects on the receptors to one of four classes of magnitude, as defined in **Table 7-3**.

**Table 7-3: Magnitude of Effect**

Magnitude	Definition
<b>High</b>	A permanent or long-term effect on the integrity of a site or conservation status of a habitat, species assemblage / community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status
<b>Medium</b>	A permanent or long-term effect on the integrity of a site or conservation status of a habitat, species assemblage / community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial; this is likely to be sustainable but is unlikely to enhance its conservation status.
<b>Low</b>	A short-term but reversible effect on the integrity of a site or conservation status of a habitat, species assemblage / community, population or group that is within the range of variation normally experienced between years.
<b>Negligible</b>	A short-term but reversible effect on the integrity of a site or conservation status of a habitat, species assemblage / community population or group that is within the normal range of annual variation.

#### ***Significance of Effect***

7.4.18 The significance of an effect results from the value of the ecological receptor and the magnitude of effect on it. **Table 7-4** below illustrates a matrix, which is used in this assessment as guidance for impact assessment.

7.4.19 Major and Moderate effects are considered to be significant in the context of the EIA Regulations. Minor and Negligible effects are not considered to be significant.

**Table 7-4: Magnitude of Effect**

Value of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
Very High	Major	Major	Moderate	Minor
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

#### ***Limitations to the Assessment***

7.4.20 Phase One habitat surveys were conducted in September 2018, in the optimal time of year (i.e. between the months of April to September) within the Study Area; however, it is recognised that some early flowering species may not have been apparent at the time of survey. Further surveys were undertaken in May and September 2019 to survey additional areas following further refinement of the alignment; these surveys did not highlight any data gaps in the plant species noted during the initial surveys.

7.4.21 There were some small areas within the Study Area that were inaccessible for ecological surveys; these were restricted to a handful of areas of severely wind-thrown trees. This lack of access is considered unlikely to affect the conclusions of this assessment.

## 7.5 Baseline Conditions

### *Designations*

7.5.1 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 (defined as the Study Area) and the zones as displayed on **Figure 7.1: Designated Sites of Nature Conservation Importance** and described below.

#### Internationally Designated Sites

7.5.2 Potential effects of the Proposed Development on internationally designated sites are considered for all sites that fall within 10 km of the Proposed Development.

7.5.3 Five designated Special Areas of Conservation (SACs) and RAMSAR sites were identified within 10 km of the Proposed Development. A summary of their citations is provided in **Table 7-5** and their locations shown on **Figure 7.1: Designated Sites of Nature Conservation Importance** (page 1 of 3).

**Table 7-5: Summary of Internationally Designated Sites**

Site Name	Distance from Application Site and Direction	Reason for Designation
<b>Caithness and Sutherland Peatlands SAC / RAMSAR</b>	0 km The Proposed Development crosses this SAC and RAMSAR site at the northerly extent of the route (see Figure 7.1, page 3 of 3).	Designated for one of the best examples of blanket bog in the world, supporting many nationally rare mosses, vascular plants and other vegetation. Qualifying habitats include: acid peat-stained lakes and ponds, blanket bog, clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels, depressions on peat substrates, very wet mires often identified by an unstable 'quaking' surface and wet heathland with cross-leaved heath ( <i>Erica tetralix</i> ). Qualifying species include marsh saxifrage and otter.
<b>River Naver SAC</b>	0 km The Proposed Development crosses this SAC site at the northerly extent of the route (see Figure 7.1, page 3 of 3).	Designated for internationally important populations of Atlantic salmon ( <i>Salmo salar</i> ) and Freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ). The designation runs the length of the River Naver, from where the river flows into the sea at Bettyhill on the north coast, south to Loch Naver and includes the River Vagastie which flows through the northern section of the Study Area. Along with the River Borgie, this designation represents the northern extreme for freshwater pearl mussel in the UK.

#### Nationally Designated Sites

7.5.4 Potential effects of the Proposed Development on nationally designated sites are considered for all sites that fall within 5 km of the Proposed Development.

7.5.5 Five Sites of Special Scientific Interest (SSSIs) designated for their biological features were identified within 5 km of the Proposed Development. A summary of their citations are provided in **Table 7-6** and their locations shown in **Figure 7.1: Designated Sites of Nature Conservation Importance** (page 2 of 3).

**Table 7-6: Summary of Nationally Designated Sites**

Site Name	Distance from Application Site and Direction	Reason for Designation
<b>Ben Klibreck SSSI</b>	0 km The Proposed Development crosses this SSSI at the northerly extent of the route (see <b>Figure 7.1</b> , page 3 of 3).	Designated for its alpine heath blanket bog, Moine geology, upland birch woodland and oligotrophic lochs. The high slopes and summits of Ben Klibreck support a range of alpine heath communities and has one of the largest extents of the dwarf shrub community of the nationally scarce alpine bearberry ( <i>Arctostaphylos alpinus</i> ) and mountain azalea ( <i>Loiseleuria procumbens</i> ). The lower slopes of Ben Klibreck are covered in a range of bog types including those that have developed on watersheds, valleys and sloping ground, giving rise to different surface patterns and pool types.
<b>Cnoc an Alaskie SSSI</b>	0 km The Proposed Development crosses this SSSI at the northerly extent of the route (see <b>Figure 7.1</b> , page 3 of 3).	This SSSI forms part of the Caithness and Sutherland Peatlands SAC / RAMSAR site and covers a large area of blanket bog habitat. Notified for its blanket bog habitats, breeding greenshank and breeding bird assemblage. A range of bog types and associated pool systems are supported within the site. The wetter areas have extensive carpets of bog-moss ( <i>Sphagnum</i> species). The blanket bog grades into wet heath vegetation as the slope increases and the depth of the peat decreases. Species of note include marsh clubmoss ( <i>Lycopodiella inundata</i> ) and the nationally scarce dwarf birch ( <i>Betula nana</i> ).
<b>Lairg and Strath Brora Lochs SSSI</b>	1.5 km east	Lairg and Strath Brora Lochs SSSI comprises eight freshwater lochs which support nationally important numbers of breeding black-throated divers ( <i>Gavia arctica</i> ). Four of the lochs lie within 5 km of the Proposed Development: Loch Beannach (1.5 km east), Loch Dola (2.5 km south-east), Loch Tigh na Creige (2.9 km east) and Loch Craggie (4.1 km south-east).
<b>Strath Carnaig and Strath Fleet Moors SSSI</b>	1.9 km south-east	This SSSI comprises two large upland areas between Dornoch and Lairg, designated for its nationally important population of breeding hen harrier ( <i>Circus cyaneus</i> ). The area supports a diverse mosaic of habitats suitable for nesting and foraging hen harriers including heather moorland (wet and dry heath), blanket bog, acid grassland, native woodland and plantation forestry with open areas.
<b>Grudie Peatlands SSSI</b>	3.6 km south-west	This SSSI forms part of the Caithness and Sutherland Peatlands SAC / RAMSAR site and covers a large area of blanket bog habitat. Designated for its nationally important blanket bog habitats and breeding populations of dunlin, golden plover and greenshank. The site contains a number of different blanket bog types, including valleyside, terrace and saddle mires. The site is notable for its relative abundance of the nationally scarce dwarf birch ( <i>Betula nana</i> ) and a diverse range of less common bog sphagnum species such as <i>Sphagnum pulchrum</i> , <i>S. fuscum</i> , <i>S. imbricatum</i> and <i>S. magellanicum</i> .

#### Local Sites of Nature Conservation Interest

- 7.5.6 There are no areas within 1 km of the Proposed Development included on the Ancient Woodland Inventory (AWI).
- 7.5.7 There are no Local Nature Reserves, wildlife sites or other local designated sites within 5 km of the Proposed Development.

7.5.8 Priority peatland mapping<sup>2</sup>, as displayed on **Figure 10.4: Peatland Classification**, indicates areas of Class 1 peatland (areas likely to be of high conservation value) in the northern section of the Study Area and within open areas within the Dalchork forest complex.

### ***Habitats and Vegetation***

7.5.9 **Figure 7.2:** Phase 1 Habitat Survey shows the vegetation according to Phase One Habitat types. Areas of habitat identified as GWDTE or peatland are mapped in **Figure 7.3: GWDTE and Peatland Habitats** to highlight locations of sensitive habitats. Polygon identification numbers are shown in **Figure 7.3** for any wetland habitats, with details on their NVC classification provided in **Appendix 7.2**. Target Note locations and photographs are presented in **Appendix 7.2**.

7.5.10 Full descriptions of habitats, vegetation communities therein and associated notes on location and condition are included below.

7.5.11 A total of 1,173 hectares (Ha) of habitats were mapped in the Study Area. Habitat types recorded are summarised in **Table 7-7** and described below.

**Table 7-7: Phase One Habitats recorded within the Study Area**

<b>Phase One Habitat</b>	<b>Area (Ha)</b>
Acid grassland	5.40
Bare Ground	0.59
Basin mire	0.62
Blanket bog	60.14
Broadleaved woodland – plantation	10.97
Broadleaved woodland – semi-natural	0.19
Buildings and gardens	0.24
Coniferous woodland – plantation	279.51
Coniferous woodland – recently felled	475.40
Coniferous woodland – semi-natural	0.82
Cultivated / disturbed land	0.13
Dry dwarf shrub heath – acid	3.94
Dry modified bog	0.48
Flush and spring – acid flush	11.88
Marsh / marshy grassland	52.68
Marsh / marshy grassland / scattered trees	0.27
Neutral grassland – semi-improved	5.27
Quarry	3.09
Road	5.61
Running water	5.38
Scattered trees – broadleaved	2.25
Scattered trees – coniferous	9.48
Scrub – scattered	0.43
Standing water	0.21
Swamp	0.32
Track	13.33
Wet dwarf shrub heath	63.37
Wet modified bog	161.19
<b>TOTAL</b>	<b>1173.19</b>

<sup>2</sup> Scottish Natural Heritage (2016). The Carbon and Peatland Map. <http://gateway.snh.gov.uk/natural-spaces/index.jsp>

### **Habitat Descriptions**

#### Acid grassland

7.5.12 Acid grassland is found in discrete areas on better drained soils within the Study Area. It is restricted to small areas adjacent to access tracks and roads, along some drier banks of watercourses and on knolls where the Fèith Osdail watercourse joins the River Tirry (Target Note [TN] 34). The majority of acid grassland within the Study Area was unimproved and corresponded to the NVC U4b *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile*, *Holcus lanatus*-*Trifolium repens* sub-community. These areas were grazed short by deer, with little in the way of shrubs present. Sheep's fescue (*Festuca ovina*) and wavy hair-grass (*Deschampsia flexuosa*) were the dominant grass species, with sweet vernal grass (*Anthoxanthum odoratum*), Yorkshire fog (*Holcus lanatus*) and occasional common bent (*Agrostis capillaris*). The most commonly occurring herbaceous plants were tormentil (*Potentilla erecta*) and heath bedstraw (*Galium saxatile*), with heath rush (*Juncus squarrosus*) and eyebright (*Euphrasia* sp.) also present.

#### Bare Ground

7.5.13 Small discrete areas of bare ground present within the Study Area include lay-down areas within the Dalchork forest complex and a car parking area near the Crask Inn.

#### Basin Mire

7.5.14 A single area of basin mire, a type of fen habitat, is located around Loch Dubh in the southern half of the Study Area (polygon ID 156, **Figure 7.3**). The area has a cover of sedges over a carpet of semi-aquatic *Sphagnum* moss. Bottle sedge (*Carex rostrata*) dominated the vegetation layer, with only small tussocks of soft rush (*Juncus effusus*) and purple moor-grass present (TN 38). *Sphagnum* mosses were abundant around the edges of the water logged area and were likely present throughout, but access to the centre of the mire was not possible due to its 'quaking' surface. This is an example of a M4 *Carex rostrata* – *Sphagnum recurvum* mire. This habitat is not crossed by the OHL.

#### Blanket bog

7.5.15 Blanket bog was the fifth most frequently recorded habitat, comprising 5 % of the Study Area. The greatest extent of blanket bog occurs north of Crask, where the Study Area overlaps with several designated areas. It is also prevalent on the open ground near Loch Dubh Cùl na Capulich (TN 9). Elsewhere within the Study Area, this habitat occurs in smaller patches, often in a mosaic with other habitats such as modified bog and wet heath. Blanket bog habitats within the Study Area were frequently found in a mosaic with bog pools, conforming most commonly with M2 *Sphagnum cuspidatum/recurvum* and M3 *Eriophorum angustifolium* bog pools communities (TN 10).

7.5.16 The M19 *Calluna vulgaris*-*Eriophorum vaginatum* blanket mire is the most common mire community. The co-dominants, heather and hare's tail cottongrass form a sward with common cottongrass (*Eriophorum angustifolium*) and cross-leaved heath (*Erica tetralix*), with *Sphagnum capillifolium*, *Cladonia*, and occasionally *Hylocomium splendens* the main species present in the bryophyte layer. The small shrubs of Dwarf birch (*Betula nana*) was found occasionally within this habitat (TN 12), most frequently around Loch Dubh Cùl na Capulich.

7.5.17 M17 *Trichophorum germanicum* – *Eriophorum vaginatum* blanket mire was found occasionally within the Study Area. This community had an abundance of heather, cross-leaved heath, deergrass, roundleaved sundew and a carpet of *Sphagnum* moss including *Sphagnum capillifolium* and *S. papillosum*. Where the M17b *Cladonia* sub-community was found, *Racomytrium lanuginosum* mounds were common (TN 9). Smaller areas of M17a *Drosera rotundifolium*-*Sphagnum* sub-community was found within wetter areas of the blanket bog, particularly on the open ground north of Loch Cùl na Capulich, where it forms a mosaic with M19 blanket mire.

- 7.5.18 Although there are several occurrences of blanket mire habitat within the Study Area, there are only two areas which are crossed by the OHL and underground cable (polygon ID: 40 and 134).
- 7.5.19 Within open areas of the Dalchork forest complex, there is evidence that peatland restoration has been undertaken either by means of installation of dams in drains or by removing stumps and infilling forestry furrows (TN 15).

#### Broadleaved Woodland

- 7.5.20 Native woodland plantings occur in some areas of felled coniferous plantation woodland in two areas within the Dalchork forest complex (TN 41). Another recent planting has been undertaken in the southern section of the Study Area in fields previously used for rough grazing north of Dalchork bridge. In addition to these areas of recent planting, more mature stands of planted broadleaves are present on the southern banks of the Fèith Osdail watercourse and adjacent to the A836 public road as it passes between the coniferous woodland blocks in the northern section of the Study Area. These areas are planted predominantly with downy birch (*Betula pubescens*) and rowan (*Sorbus aucuparia*).
- 7.5.21 Scattered broadleaved trees are found around the edges of a number of coniferous plantation forestry blocks, species are typically downy birch and rowan with occasional sycamore (*Acer pseudoplatanus*) and willow (*Salix spp.*). Although broadleaves are present, they do not constitute more than 10 % of the plantation forestry blocks, therefore these areas are still classified as coniferous woodland rather than mixed woodland.
- 7.5.22 A small pocket of semi-natural broadleaved woodland is present within the Dalchork forest complex and are likely to be self-seeded downy birch which have established outwith the main forestry coupes (TN 19).

#### Buildings and Gardens

- 7.5.23 Buildings and gardens present within the Study Area are limited to those at Crask, including the Crask Inn, a croft house and associated farm buildings.

#### Coniferous Woodland

- 7.5.24 A significant proportion of the Study Area (64 %) comprises of coniferous plantation, either as standing commercial crop or felled, most of which is managed by Forestry and Land Scotland (formerly Forest Enterprise Scotland). Sitka spruce (*Picea sitchensis*) and Lodgepole pine (*Pinus contorta*) are the main tree species present. The plantation is at various stages; newly planted Sitka spruce is reaching thicket stage, some mature stands of trees remain, but the majority of the woodland within the Study Area (40 %) has been felled (TN 44). Shrub and field layers are absent from the majority of the standing plantation woodland. Within mature stands, little light penetrates through the canopy and the field layer beneath the trees is dominated by dropped needles with no vegetation except for at the edges of the coupes. In the open rides between the coupes, remnant bog vegetation remains, with the predominant habitat being wet modified bog. Thicket and pre-thicket stage newly planted coupes on previously felled areas have varied vegetation present between the planted trees, including rosebay willowherb (*Chamerion angustifolium*), heather and purple moor-grass.
- 7.5.25 In areas where felling has taken place, the ground is disturbed and brash remains in many coupes at various stages of decay. Brash mats used to extract timber are still evident in many coupes (TN 13). In other areas, the majority of brash has been removed from the coupe. Vegetation regenerating in these felled areas varies dependent on the ground conditions and the time elapsed since felling. In drier areas, rosebay willowherb has become the dominant species growing throughout the brash (TN 11), in other wetter areas, bog species such as hare's tail cottongrass and *Sphagnum* mosses are recolonising.

7.5.26 A small stand of semi-natural coniferous woodland is present within the Dalchork forest complex, in a clearing west of Rhian, on the southern banks of the Abhainn Sgeamhaidh, which comprises a small group of Scot's pine (*Pinus sylvestris*) trees.

Cultivated / Disturbed Land – Arable

7.5.27 Cultivated land was restricted to a small area of south of Crask used for growing vegetable crops.

Dry Dwarf Shrub Heath – Acid

7.5.28 Dry heath is infrequent across the Study Area and is restricted to small discrete areas, typically along banks of watercourses or on track-side bunds (TN 18), often occurring in a mosaic with marsh / marshy grassland. Two areas of more extensive dry dwarf shrub heath, of the H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath community are present south of Cnoc a' Ghiubhais, where heather dominates, with occasional bilberry (*Vaccinium myrtillus*) and scattered Sitka spruce trees. The OHL passes close to these two areas but does not cross them.

Dry Modified Bog

7.5.29 Areas of dry modified bog are confined to a handful of forestry rides where the ground conditions are notably drier than most of the other rides within the forest complex. The habitat is characterised by the presence of hare's-tail cottongrass, which often forms tussocks dominating the sward. Heather and *Sphagnum* mosses are rare in these areas, with *Cladonia* lichens occasional throughout the bryophyte layer. Areas of dry modified bog are typically derived from M19 blanket bog, but degradation in the form of drainage, grazing or burning shifts the community toward the floristically impoverished M20 *Eriophorum vaginatum* blanket mire. The M20a sub-community which is relatively species poor was the predominant vegetation type in these areas. Areas of this community are shown on **Figure 7.3: GWDTE and Peatland Habitats**, polygon ID 100 and 124). The OHL does not cross either of these areas.

Flush and spring – acid flush

7.5.30 Acid flush habitats were widespread and found along slow moving watercourses and in wet, gently sloping areas with dense stands of soft rush co-dominant with star sedge (*Carex echinata*). The flush habitats were all acidic due to the water coming off the surrounding peaty soils being acidic and low in base nutrients. The M6c *Carex echinata* – *Sphagnum recurvum/auriculatum* mire, *Juncus effusus* sub-community is the most prevalent type of acid flush found within the Study Area. These flushes were generally species poor with *Potentilla erecta*, *Polytrichum commune* and *Sphagnum spp.* throughout. Smaller areas of the star-sedge sub-community M6a are present in some of the wetter areas along the Allt a' Chràisg in the northern section of the Study Area. This vegetation community does not typically support a rich flora or rare plant species, however it does contribute to the diversity of vegetation of upland marginal habitats, with wet soft areas providing valuable habitat to invertebrates. Typically the water table is high in these habitats. These habitats are considered to be highly dependent on groundwater. Although several of these habitats occur within the Study Area, only five areas are either crossed or passed within 25 m by the OHL: polygons with ID 2, 22, 80, 129 and 138 (refer to **Figure 7.3**).

Marsh / Marshy Grassland

7.5.31 There are several vegetation communities within this classification, comprising 5 % of the Study Area, most of which have some degree of dependency on ground water. Typically these communities are located along watercourses, adjacent to tracks and in association with grazed pasture fields where a degree of nutrient enrichment has occurred. The marsh / marshy grassland communities recorded within the Study Area were:

- M23 – *Juncus effusus/acutiflorus* – *Galium palustre* rush pasture;
- MG10 – *Holcus lanatus* – *Juncus effusus* rush-pasture;

- MG9 – *Holcus lanatus-Deschampsia caespitosa* grassland;
- M25 – *Molinia caerulea – Potentilla erecta* mire;

- 7.5.32 Where soft rush dominated habitats have more flowering plants in the sward than acid flush communities and little or no *Sphagnum* or *Polytrichum commune* moss in the bryophyte layer, it is classified as rush-pasture. The M23b *Juncus effusus/acutiflorus – Galium palustre* rush-pasture, *Juncus effusus* sub-community was found mostly in the northern half of the Study Area, in strips associated with watercourse banks and in association with track-side ditches. The exception to this is the larger area of marshy grassland adjacent to the access track south of Cnoc a' Ghiubhais (TN 17, polygon ID 54). This habitat is considered to be highly dependent on groundwater.
- 7.5.33 The other rush-pasture and grassland habitats that are considered to be marsh / marshy grassland found within the Study Area are MG10 *Holcus lanatus – Juncus effusus* rush-pasture and MG9 *Holcus lanatus – Deschampsia cespitosa* grassland. Both habitats are considered to be moderately dependent on groundwater and were found alongside watercourses, access tracks and around the in-bye fields at Crask (TN 22, 40). Both MG9 and MG10 were often found in a mosaic together.
- 7.5.34 In certain conditions, such as shallow peat and better drained soils the M25 *Molinia caerulea – Potentilla erecta* mire is considered to fall within the marsh / marshy grassland category. Purple moor-grass is the most abundant species found in this community and typically the associated flora is poor, usually soft rush or sharp-flowered rush (*Juncus acutiflorus*), with grasses such as velvet bent (*Agrostis canina*) and Yorkshire-fog occasionally occurring. This habitat was found in a small number of gently sloping forestry rides where the peat was not as deep as surrounding areas, it is considered to be moderately dependent on groundwater.
- 7.5.35 All four marsh / marshy grassland NVC communities identified in 7.5.31 above are considered to be either highly (M23) or moderately (MG10, MG9 and M25) dependent on groundwater. The locations of these habitats are highlighted on **Figure 7.3: GWDTE and Peatland Habitats**. Many of these habitats are linear, occurring along trackside ditches and verges and within forestry rides, many of which will be oversailed by the OHL. Only four areas are crossed by either the OHL or the cable which are likely to be unavoidable: polygon ID 32, 34, 54 and 76 (refer to **Figure 7.3**)

#### Neutral Grassland – Semi-improved

- 7.5.36 Semi-improved neutral grassland was restricted to small areas around the in-bye fields around Crask, the banks of the River Tirry (TN 7) and the edges of rush-pasture fields near Dalchork bridge in the south. These areas are subject to extensive drainage and were most likely marsh / marshy grassland prior to drainage. The grass species present were sweet vernal-grass, red fescue (*Festuca rubra*) and Yorkshire fog (*Holcus lanatus*). Soft rush was present in small tussocks but was not a dominant feature of the vegetation unlike marshy grassland.

#### Quarry

- 7.5.37 Three small disused quarries are present within the Study Area adjacent to the tracks within the Dalchork forest complex. Some contain small areas of standing water. In one such quarry, bottle sedge has colonised over a carpet of *Sphagnum* mosses, this corresponds to NVC M4 *Carex rostrata – Sphagnum recurvum* mire (TN 23).

#### Roads and Tracks

- 7.5.38 The single track A836 public road runs parallel to the Proposed Development on the west side of the Dalchork forest complex. Within the forest there are several existing access tracks used for timber haulage (TN 18). Several existing bridges and culverts are in place where the tracks traverse watercourses within the forested area.

### Running Water

7.5.39 The majority of the Study Area lies within the River Shin Catchment, with the very northerly end lying within the River Naver Catchment. The main watercourses present within the Study Area are:

- the Allt a' Chràisg (tributary of the Vagastie River) (TN 1);
- the Allt an Drochaidean Beaga, Fèith a' Chaorunninn (TN 22), Fèith Osdail (TN 32), Allt Chaiseagail (TN 42), Allt a' Bhreac-leathaid (all tributaries of the River Tirry) and the River Tirry (TN 7) itself.

7.5.40 Throughout the Study Area there are several other smaller unnamed tributaries and ditches. Further details on watercourses within the Study Area is contained in **Chapter 10: Hydrology, Hydrogeology and Soils**.

### Scattered Trees

7.5.41 Stands of scattered trees occur in the southern section of the Study Area between the A836 public road and the Proposed Development. They are present in small scattered groups amongst the mire and wet heath vegetation. Typically the trees are conifer (either Sitka spruce or Lodgepole pine) although a small number of downy birch also occur.

### Scrub

7.5.42 Stands of scrub are rare throughout the Study Area, confined to a few small stands of willow and gorse. Common gorse (*Ulex europaeus*) is restricted to the bunds at the edge of access tracks where the ground is stony and free-draining. Willow (*Salix cinerea*) occurs occasionally along track side verges, around disused quarries and adjacent to the A836 public road. Willow also occurs scattered throughout some of the mire and wet heath habitats (TN 21).

### Standing Water

7.5.43 No large water bodies are present within the Study Area. Loch Dubh is within the Study Area, however the area of open water is not as large as OS mapping would suggest as the majority of the surface is covered with vegetation (TN 38). Other locations where standing water is present is limited to small ponds within old quarries situated adjacent to the tracks within the forest. The Proposed Development also passes within 260 m of Loch Dubh Cùl na Capulich in the northern section of Dalchork forest, which falls just outwith the Study Area.

### Swamp

7.5.44 East of the Abhainn Sgeamhaidh watercourse crossing there are three stands of vegetation dominated by tall single-species stands of reed canary-grass (*Phalaris arundinacea*) within an area of felled forestry, classified as swamp habitat at the Phase 1 Habitat Survey level (TN 29). In these areas the water table was high, with vegetation composition matching the NVC community S28 *Phalaris arundinacea* tall-herb fen. This habitat is not considered to be dependent on groundwater.

### Wet Dwarf Shrub Heath

7.5.45 Wet dwarf shrub heath comprises 5 % of the Study Area and occurs as small areas within rides and open glades within the forestry, but is most prevalent within the open ground north of Crask (TN 2).

7.5.46 The M15c *Trichophorum germanicum* – *Erica tetralix*, *Cladonia* sub-community is the sub-community occurring most frequently within the Study Area. In this habitat, cross-leaved heath (*Erica tetralix*) and Purple moor-grass are locally abundant in places. *Sphagnum capillifolium* was the most commonly found *Sphagnum* species, with *Cladonia* lichens and *Racomitrium lanuginosum* mounds found frequently throughout the bryophyte layer. Other species present within the sward included round-leaved sundew (*Drosera rotundifolia*), bog myrtle (*myrica gale*), bog asphodel (*Narthecium ossifragrum*), marsh lousewort (*Pedicularis palustris*) and heath

milkwort (*Polygyna serpyllifolia*). M15b *Trichophorum germanicum* – *Erica tetralix* wet heath, the typical sub-community was found to occur less frequently than M15c and has a reduced occurrence of *Cladonia* lichens in the bryophyte layer.

7.5.47 Waterlogged depressions and shallow pools were common in wet heath habitats: M2 *Sphagnum cuspidatum/recurvum* and M3 *Eriophorum angustifolium* bog pools communities were both present.

7.5.48 Wet dwarf shrub heath is considered to be moderately dependent on groundwater, the location of this habitat is highlighted on **Figure 7.3**: GWDTE and Peatland Habitats. There are extensive areas of wet heath north of Crask which will be crossed by the OHL and underground cable (polygon ID 3 and 26) and around the Abhainn Sgeamhaidh watercourse crossing point (polygon ID 101 and 108).

#### Wet Modified Bog

7.5.49 Following coniferous woodland, wet modified bog was one of the most common habitats, comprises 14 % of the Study Area. This habitat was found frequently in forest rides, around watercourse margins and in open ground. Species composition of this habitat varied throughout the Study Area. Typically, purple moor-grass was the dominant plant species with occasional hare's tail cottongrass, deergrass, heather and cross-leaved heath. *Sphagnum* mosses were not as frequently recorded in this habitat compared to the M19 and M17 blanket mire habitats (TN 24, 37). It is likely that much of the plantation woodland has been established on blanket bog habitats and the remnant bog vegetation found within forestry rides is a modified version of former blanket bog.

7.5.50 The wet modified bog habitats were mostly represented by M25a *Molinia caerulea* – *Potentilla erecta* mire *Erica tetralix* sub-community. This habitat is considered to be moderately dependent on groundwater and is highlighted on **Figure 7.3**: GWDTE and Peatland Habitats. There are large sections of wet modified bog which are crossed by OHL and underground cable (polygon ID: 1, 23, 38, 39, 83, 127, 135, 139 and 141).

#### **Notable Plant Species**

7.5.51 The majority of the plant species recorded within the Study Area are not considered to be of particular conservation concern (e.g. nationally threatened or rare) and are typical of the habitats in which they were found. However, the nationally scarce dwarf birch (*Betula nana*) was found across the site, mostly within the modified bog habitats in forestry rides and the blanket bog habitats north of Crask and around Loch Dubh Cùl na Capulich (TN 12).

#### **Invasive Species**

7.5.52 No invasive species listed under Schedule 9 of the Wildlife and Countryside Act were found within the Study Area.

#### **Protected Species**

7.5.53 Protected species surveys recorded signs of water vole, otter and pine marten within the Study Area. Locations of recorded signs and shelters are displayed in **Figure 7.4**: Protected Species Survey and further details are given in **Appendix 7.3**.

#### Water Vole

7.5.54 Four active water vole colonies were found within the Study Area. Two colonies are found along the Allt Drochaidean Beaga watercourse within the Dalchork forest, these two colonies are within 100 m of each other, divided by an existing forestry access track. The colony west of the existing access track (ID 8) comprising of 7 burrows, is located 90 m to the nearest pole location and 25 m from the track. The colony east of the existing access track (ID 10) comprising of 11 burrows, is located 54 m from the nearest pole and 35 m from the track.

These two colonies are likely to be connected, with multiple feeding signs located within proximity to the burrows.

7.5.55 A further two colonies are located on a tributary of the Abhainn Sgeamhaidh, divided by an existing forestry access track. The colony north of the track (ID 20) comprises 4 burrows located 48 m from the existing access track and 118 m from the nearest pole location. The colony south of the track (ID 23) comprises 8 burrows and is located 12 m from the access track and 40 m from the nearest pole location. As above, these colonies are likely to be connected despite the presence of an access track between both sets of burrows.

7.5.56 The low gradients and predominance of peat substrates in the watercourse banks make many of the smaller watercourses within the Study Area suitable for colonisation by water voles.

#### Otter

7.5.57 Evidence of otter was found along the Allt a' Chràisg in the northern extent of the Study Area, along the Fèith Osdail in the centre of the Study Area and along Allt Chaiseagail in the southern extent of the Study Area. Evidence of otters was restricted to a low number of spraints and a collection of footprints, no resting sites or shelters were identified, indicating that otters may use the Study Area for foraging and be breeding elsewhere.

#### Pine Marten

7.5.58 Pine marten activity in the form of scats was frequent throughout the forestry components of the Study Area. Pine marten scat was identified in a total of twenty-four locations and were usually found along tracks, paths and forestry rides. No den sites were located during surveys, although suitable habitat for breeding pine marten does exist in the Study Area in areas where remaining stumps and brash provide hollows and crevices and amongst the remaining conifer timber crop.

#### Other

7.5.59 No evidence of any other protected mammal species was identified during the course of surveys.

## **7.6 Potential Effects**

7.6.1 During the enabling and construction works, forestry felling, the installation of temporary and permanent access routes, the installation of wood poles, the installation of the underground cable and the construction of the sealing end structures all have the potential to impact upon the ecological environment.

7.6.2 Based on the consultation responses and known environmental sensitivities, this assessment considers the following potential effects:

- impacts on designated sites;
- habitat loss;
- fragmentation of habitats;
- impacts on Groundwater Dependant Terrestrial Ecosystems (GWDTE); and
- disturbance and displacement of protected species.

7.6.3 The potential effects which may arise from the Proposed Development relate to the construction phase. There are no anticipated effects from the operational phase of the Proposed Development. It is anticipated that construction would commence in June 2020 with completion by March 2022.

## 7.7 Ecological Receptors

7.7.1 Following the results of the desk study and baseline surveys detailed in Section 7.5, a number of Valued Ecological Receptors (VERs) have been identified. These VERs and their assessment values are shown in **Table 7-8** below.

**Table 7-8: Summary of Valued Ornithological Receptors (VORs) within the Study Area.**

Valued Ecological Receptor	Legislation and Guidance	Conservation Value
<b>Designated Sites</b>		
<b>Caithness and Sutherland Peatlands SAC</b>	Located within the Study Area, designated for nationally important upland habitats and populations of otter and marsh saxifrage.	International
<b>River Naver SAC</b>	Located within the Study Area, this site qualifies for SAC status due to the presence of freshwater pearl mussel and Atlantic salmon.	International
<b>Ben Klibreck SSSI</b>	Located within the Study Area, designated for nationally important upland habitats.	National
<b>Cnoc an Alaskie SSSI</b>	Located within the Study Area, designated for nationally important upland habitats.	National
<b>Grudie Peatlands SSSI</b>	Located 3.6 km south-west of the Proposed Development. Designated for its nationally important upland habitats. The site is not considered to be hydrologically connected to the Proposed Development and is not considered further in this assessment.	National
<b>Lairg and Strath Brora Lochs SSSI</b>	Located 1.5 km east of the Proposed Development. Designated for its nationally important population of black-throated divers and the habitats that support the species. The site is not considered to be hydrologically connected to the Proposed Development and is not considered further in this assessment.	National
<b>Strath Carnaig and Strath Fleet Moors SSSI</b>	Located 1.9 km south-west of the Proposed Development. Designated for its nationally important population of hen harriers and the habitats that support the species. The site is not considered to be hydrologically connected to the Proposed Development and is not considered further in this assessment.	National
<b>Habitats</b>		
<b>Blanket bog</b>	Blanket bog is the fourth most common habitat within the Study Area, with several habitat types present categorised as EC Habitats Directive Annex I habitats. Areas of this habitat are classified as Class 1 peatland in the Carbon and Peatland Map <sup>3</sup> . This habitat supports the nationally scarce dwarf birch which was found occasionally within the Study Area.	Regional
<b>Wet dwarf shrub heath</b>	Wet heath is the fifth most commonly recorded habitat within the Study Area, and is categorised as EC Habitats Directive Annex I habitat.	Regional
<b>Acid flush</b>	Acid flush is present throughout the Study Area along slow moving watercourses and in gently sloping areas. The M6 NVC community is listed in the Scottish Biodiversity List as a priority habitat and are considered to have a high dependency on groundwater.	Regional

<sup>3</sup> Scottish Natural Heritage (2016). The Carbon and Peatland Map. <http://gateway.snh.gov.uk/natural-spaces/index.jsp>

<b>Unimproved acid grassland</b>	This habitat accounts for a very small proportion of the overall area within the Study Area and is predominantly located along the banks of watercourses.	Local
<b>Marshy grassland</b>	This habitat is located along watercourses, adjacent to access tracks and in association with grazed pasture field where a degree of nutrient enrichment has occurred. Three of the habitats identified within the Study Area correspond to NVC communities MG9, MG10 and M25 which are considered to be moderately dependent on groundwater. A fourth habitat corresponding to NVC community M23 is considered to be highly dependent on groundwater.	Local
<b>Dry dwarf shrub heath</b>	This is categorised as EC Habitats Directive Annex I habitat, found in small pockets where the ground is better drained and accounts for less than 0.5% of the overall area within the Study Area.	Local
<b>Species</b>		
<b>Otter</b>	Otter is a qualifying feature of the Caithness and Sutherland Peatlands SAC. It was found to be present at low frequency throughout the Study Area and was not found to be breeding.	Local
<b>Pine marten</b>	Pine marten scats were recorded along access tracks and within forestry rides and suitable breeding habitat is present within the Study Area. The species is protected through Schedules 5 and 6 of the Wildlife and Countryside Act 1981.	Local
<b>Water vole</b>	Four water vole colonies were identified within the Study Area. This species and the habitats upon which it depends is protected through Schedule 5 of the Wildlife and Countryside Act. It is listed as a priority species in the Sutherland Biodiversity Action Plan.	Local
<b>Salmonids (Atlantic salmon and Trout species)</b>	Atlantic salmon and trout may be present within the watercourses within the Study Area. Atlantic salmon are a qualifying feature of the River Naver SAC and are listed on Annexes II and V of the EC Habitats Directive. Trout are a priority species under the UK Biodiversity Action Plan.	Regional
<b>Freshwater pearl mussel</b>	Freshwater pearl mussel is a qualifying feature of the River Naver SAC and suitable habitat exists within the Study Area.	National

### **Statutory Designated Sites**

- 7.7.2 The Proposed Development crosses the Caithness and Sutherland Peatlands SAC, the River Naver SAC, the Cnoc an Alaskie SSSI and the Ben Klibreck SSSI at the northerly extent of the route. The overhead line would oversail both SACs and the Cnoc an Alaskie SSSI.
- 7.7.3 Although realignment of the route has taken place to minimise the construction footprint in any of the designated sites (see section 7.9.2 below for more detail), five poles are located within the margin of the Ben Klibreck SSSI. These five poles are located within an area of wet dwarf shrub heath and have been micrositied to avoid blanket bog habitats and areas of deeper peat. The direct and permanent habitat loss would be limited to the pole locations; direct land-take is anticipated to be between 1 – 2 m<sup>2</sup> for each pole.
- 7.7.4 The Proposed Development could potentially affect the Caithness and Sutherland Peatlands SAC and River Naver SAC through degradation of water quality, disturbance of habitats and disturbance and / or mortality or injury of protected species. However, it is not predicted that construction of the Proposed Development would result in a significant effect on the qualifying features of either SAC. More information on this assessment is provided in **Appendix 7.4**.

### **Habitats**

- 7.7.5 Habitats identified within the Study Area include those of Regional (Medium) and Local (Low) ecological value.
- 7.7.6 Habitats listed as Annex I of the Habitats Directive that were identified within the Study Area include:
- European dry heaths;
  - Northern Atlantic wet heaths with *Erica tetralix*; and
  - Blanket bogs.
- 7.7.7 The M17 and M19 mire, M15 wet dwarf shrub heath and H12 dry dwarf shrub heath plant community types identified are widespread and common in a Regional context. The areas of most intact blanket bog are present in the northern part of the Study Area between Crask and the Creag Riabhach Wind Farm Substation location and is avoided by the OHL. Wet dwarf shrub heath is also most prevalent in this area and is often found in a mosaic with blanket bog habitats. The OHL and underground cable alignment avoids much of the wet heath habitat within the Study Area with the exception of three areas: between the Creag Riabhach Wind Farm Substation and the Crask Inn, opposite the Crask Inn and close to the Abhainn Sgeamhaidh watercourse crossing point. Dry dwarf shrub heath has a very restricted range within the Study Area and is avoided by the OHL.
- 7.7.8 The M20 and M25 mire plant communities are indicative of disturbed and degraded areas of blanket bog habitat from a combination of drainage, forestry plantings and browsing damage and are also considered to be widespread and common in a Regional context. Areas of M20 mire habitat is avoided by the OHL. There are several areas of M25 mire which is crossed by the OHL, (Polygon ID: 1, 23, 38, 39, 83, 127, 135, 139 and 141 as shown on **Figure 7.3**).
- 7.7.9 The GWDTE communities identified as being present within the Study Area include:
- MG10 – *Holcus lanatus* – *Juncus effusus* rush-pasture (Moderate groundwater dependence);
  - MG9 – *Holcus lanatus-Deschampsia caespitosa* grassland (Moderate groundwater dependence);
  - M23 – *Juncus effusus/acutiflorus* – *Galium palustre* rush pasture (High groundwater dependence);
  - M6 – *Carex echinata* – *Sphagnum recurvum* mire (High groundwater dependence); and
  - M25 – *Molinia caerulea* – *Potentilla erecta* mire (Moderate groundwater dependence).
- 7.7.10 Some of the GWDTE habitats listed above are regularly occurring (e.g. M25 mire, MG9 grassland and MG10 rush-pasture mire), often found as the dominant vegetation type within forest rides or along the banks of the larger watercourses within the Study Area, whereas others occur in small discrete areas associated with the edges of small, slow flowing watercourses (e.g. M6 acid flush).
- 7.7.11 A small amount of permanent habitat would be lost around the footprint of each pole. Habitat disturbance during the installation of poles, the underground cable and the sealing end structures may lead to changes in community composition in the areas surrounding the installations. Pollution of habitats from sedimented surface run-off, chemicals and fuels has the potential to result in the loss of vegetation or alteration of the vegetation communities.

### **Protected Species**

- 7.7.12 Water vole, otter and pine marten were recorded as present within the Study Area and are considered further in this assessment. All three species are considered to be of Local (Low) ecological value. Although not surveyed for, suitable habitat for freshwater pearl mussel and salmonids exists within the Study Area and are also considered further in this assessment. Freshwater pearl mussel are considered to be ecological receptors of National (High) value and salmonids are considered to be receptors of Regional (Medium) value. Due to

their absence within the Study Area, it is unlikely that the Proposed Development would have any impact on other protected species surveyed for and these are not considered any further in this assessment.

7.7.13 Felling and construction activities have the potential to cause mortality or injury to individual animals of protected species and can disturb and displace animals by means of vehicle movements, noise or lighting.

7.7.14 There is potential for watercourses to be impacted during the construction phase by a variety of pollution types including sediment and particulate run-off, giving rise to changes in water quality and pH. Pollution can also arise through chemical spills including fuels and oils. This could result in a reduction in habitat suitability for protected species such as otter, water vole, salmonids and freshwater pearl mussel which rely on water quality.

## 7.8 Assessment of Likely Effects

7.8.1 The assessment of likely significant effects associated with the Proposed Development is based on the typical activities described in Chapter 3: Description of the Development.

### ***Ben Klibreck SSSI***

7.8.2 Without any form of mitigation, the construction of the five poles located within the SSSI has the potential to cause disturbance to sensitive Annex I and GWDTE habitats. This SSSI is considered to be an ecological receptor of National (High) ecological value. An effect of low magnitude could result in an adverse effect of Moderate significance on the Ben Klibreck SSSI.

### ***Habitats including GWDTE and Annex I***

#### *Access Tracks*

7.8.3 As described in Chapter 3, the existing forestry access tracks and haul roads present within the Study Area would be utilised to reduce the requirement for new access routes. Vehicle access would be required to each pole location during construction to allow excavation and creation of foundations and pole installation. Detailed access proposals would be developed by the successful Principle Contractor with the preferred method for each pole access being selected based on the suitability to withstand expected construction loads, that which causes least environmental disturbance and consideration of the cost of installation / recovery. The range of construction access options likely to be considered include:

- use of low pressure tracked vehicles; and
- use of temporary access panels (e.g. bogmats, live Trackway, or similar).

7.8.4 The following principles would apply to access routeing and an Environmental Clerk of Works (ECoW) would be consulted prior to determination of track locations to ensure impacts on habitats are minimised:

- where wetland and peatland habitats have been identified (as shown on **Figure 7.3**), access routes would avoid these areas as far as is practicably possible;
- in areas within the Dalchork forest complex that have undergone peatland restoration (as shown on **Figure 2.5**), access routes would avoid these areas as far as is practicably possible; and
- within the Dalchork forest complex, access should be taken preferentially in areas of disturbed ground (e.g. in felled areas, with the exception of those areas which have undergone peatland restoration) rather than in undisturbed habitats such as forest rides and open glades.

#### *Pole Locations*

7.8.5 Indicative pole locations are shown on **Figure 7.3: GWDTE and Peatland Habitats**, some of which are currently placed within areas of wetland habitats. Best use of micro-siting of pole locations within the Limits of Deviation

(LOD) would be used to move pole locations out of areas of wetland habitats and peatland as far practicably possible. Poles to be microsited out with sensitive wetland habitats are highlighted on **Figure 7.3: GWDTE and Peatland Habitats**.

- 7.8.6 Direct and permanent habitat loss would be limited to the pole locations. Direct land-take is anticipated to be between 1 – 2 m<sup>2</sup> for each pole. The area of anticipated habitat loss is shown in **Table 7-9**. By micrositing poles by a maximum of 30 m, several located in sensitive habitats can be moved to less sensitive areas. Micrositing of poles would significantly reduce the impacts to areas of high groundwater dependency. Five poles remaining in the area of M23 would need to be microsited further than 30 m to avoid this habitat (NVC Polygon ID 54, **Figure 7.3**). The LOD corridor is restricted to 100 m either side of the proposed alignment, therefore, micrositing to completely avoid this habitat is unlikely to be possible.
- 7.8.7 Micrositing would only be undertaken where habitats can be moved into an area of reduced sensitivity and where land ownership boundaries allow. Many of the 27 poles located in wet heath (M15) cannot be microsited as the adjacent habitats are peatland and are likely to have deeper peat depths than their current position. Many of the 30 poles located in wet modified bog (M25) cannot be microsited out with the forestry rides they are located in due to the adjacent felled forestry blocks being part of the FLS programme of peatland restoration works. Where micrositing poles outwith wetland and peatland habitats is not possible, peat depth data would be used to microsited poles to locations of shallower peat.

**Table 7-9: Anticipated Permanent Habitat Loss of Sensitive Habitats**

Vegetation Type / GWDTE Dependency	Number of poles located in vegetation type after applying micrositing allowance of 30 m	Overall habitat loss after applying micrositing allowance (m <sup>2</sup> )
M23 (High)	5	10
M6 (High)	0	0
M15 (Moderate)	27	54
M25 (Moderate)	1	2
MG10 (Moderate)	1	2
MG9 (Moderate)	0	0
M17 (Blanket bog)	0	0
M19 (Blanket bog)	1	2
M20 (Peatland)	0	0
M25 (Peatland)	30	60
M4 (Peatland)	0	0

#### Underground Cable and Sealing End Structures

- 7.8.8 A trench for the 1.4 km section of underground cable would be excavated to a depth of approximately 1.7 m using a tracked excavator. A working corridor of 30 m for the installation of the cable would be required, and the width of the trench is anticipated to be 0.65 m. The underground cable would not pass through any areas of Annex I habitat or habitats classified as having High GWDTE dependency. It would however pass through approximately 810 m of wet modified bog (Peatland), 290 m of wet heath (Moderate GWDTE), 126 m of marsh / marshy grassland (Moderate GWDTE) and 222 m of habitats which are not considered to be GWDTE. It is not possible to microsited outwith these areas of peatland or moderate GWDTE dependency. There would be no

permanent habitat loss from the installation of the underground cable but there may be disruption of the hydrological processes that support these habitats.

- 7.8.9 In addition to the excavations required for the underground cable and each pole installation, two sealing end structures are required at each end of the underground cable section. The locations of the sealing end structures are shown in **Figure 3.1**. Each structure would require an excavation of an area approximately 5 m<sup>2</sup>. Both sealing end structures would be located in areas of wet modified bog and would result in a permanent loss of 10m<sup>2</sup> of this habitat.

#### Summary of Likely Significant Effects on Habitats Including GWDTE and Annex I

- 7.8.10 Without micrositing, overall, the area of permanent habitat loss would represent a small area and is considered to be a low magnitude effect in the context of the habitats in the wider surrounding area. Micrositing poles where possible outwith wetland and peatland areas would reduce this effect further.
- 7.8.11 Following commissioning of the Proposed Development, all construction sites would be reinstated. Reinstatement would form part of the contractual obligations for the successful Principal Contractor, with a restoration plan included as part of the CEMP.
- 7.8.12 Sensitive habitats which could potentially be affected include those of Regional (Medium) ecological importance (e.g. wet dwarf shrub heath and acid flush) and those of Local (Low) ecological value (e.g. marshy grassland). Overall the effects of habitat loss and disturbance as a result of construction of the Proposed Development is likely to be of low magnitude and therefore **not significant**.

#### **Water Vole**

- 7.8.13 Water vole colonies were identified at four locations associated with small watercourses within rides in Dalchork forest. All colonies are located further than 35 m from any proposed pole location. Two colonies (ID 8 and 19, **Figure 7.4: Protected Species Survey**) are within 25 m of the existing forestry access track. Without consideration of mitigation there is potential for the Proposed Development to have a direct impact on these water vole colonies. The impacts are likely to be of medium magnitude on a species of low (local) sensitivity, resulting in a minor adverse effect and thus **non-significant**.

#### **Otter**

- 7.8.14 Otters are known to use the watercourses within the Study Area, several of which are crossed by existing forestry access tracks. However, as no otter holts or resting places were identified during surveys, construction activity would likely only have a localised, low magnitude disturbance effect on this species. All pole installation activities would be no closer than 20 m from watercourses. The disturbance would be short-term, affecting the species indirectly by disturbing otter foraging habitat during the installation of poles close to watercourses and ditches throughout the Study Area that otters may utilise. Effects on otter during the construction of the Proposed Development are likely to be of low magnitude and therefore **not significant**.

#### **Pine Marten**

- 7.8.15 Pine marten were recorded within the plantation woodland. The felling of trees within the plantation would reduce the available habitat to pine martens. The total area of felling required for construction of the Proposed Development is set out in **Chapter 11: Forestry**, anticipated to be approximately 3.4 ha.
- 7.8.16 As there is extensive coniferous plantation woodland habitat surrounding the Proposed Development, in the wider context, the area of habitat loss suitable for pine marten is anticipated to be minor. As no dens were identified during surveys, construction activity would likely only have a localised, low magnitude disturbance

effect on this species. The disturbance would be short-term, affecting the species indirectly by disturbing pine marten habitat during the felling and installation of poles within the woodland. Effects on pine marten during the construction of the Proposed Development are likely to be of low magnitude and therefore **not significant**.

### ***Freshwater Habitats for Freshwater Pearl Mussel and Salmonids***

- 7.8.17 Construction related activities have the potential to reduce water quality of watercourses within proximity to the Proposed Development through increasing sediment deposition and through pollution incidents. The underground cable will need to cross beneath the River Tirry and this would be achieved via horizontal directional drilling (HDD) rather than an open cut technique to avoid blocking fish passage. For the HDD's, bentonite is used to aid the drilling process. Liquid bentonite is highly polluting if it enters watercourses or drains and can give rise to damage to plants and animals in watercourses. The Applicant has development General Environmental Management Plans (GEMPs) for construction works that include good practice procedures to follow when working in proximity to watercourses, the safe use, storage and disposal of bentonite and make reference to the relevant Guidance for Pollution Prevention (GPPs).
- 7.8.18 A protective buffer of 20 m would be in place around all watercourses and no new watercourse crossing points are required for the Proposed Development. Full details of construction methods to protect watercourses from pollution is provided in Chapter 10: Hydrology, Hydrogeology, Geology and Soils. When the GEMPs are combined with best practice construction methods within proximity to watercourses, the effects of the construction of the Proposed Development on freshwater pearl mussels, fish and the freshwater habitats upon which they rely are likely to be of low magnitude and not significant.

## **7.9 Mitigation**

### Mitigation by Design

- 7.9.1 The Applicant's approach to the EIA process has been to prioritise and implement mitigation in a hierarchical way. This approach focuses on developing a design through the consideration of alternative routes to avoid likely significant adverse effects as far as possible, as described in **Chapter 2** of this EIA Report.
- 7.9.2 During the Screening process, detailed consultation was undertaken with SNH regarding the alignment of the route between the Creag Riachach Wind Farm substation to the Dalchork Forest complex where there are a number of designated sites and sensitive habitats. Originally the route alignment passed through approximately 924 m of the Ben Klibreck SSSI between Crask and the River Tirry, north of the Dalchork Forest complex. This section has now been re-routed out with the boundary of the designated site, resulting in the removal of approximately 11 poles from the SSSI.
- 7.9.3 Following further consultation with SNH and FLS, the alignment has been designed to avoid areas where peatland restoration works have been carried out (as shown in **Figure 2.5**). This has been possible in all but one section of the route.

### General mitigation measures

- 7.9.4 The Applicant has developed General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) for construction works that may negatively impact upon habitats and protected species. The SPPs outline the procedures that must be followed where there is a potential for protected species to be present. Each SPP outlines the responsibilities of the Applicant and their Contractors, legislative protection for the protected species, best practice measures to follow and an approved methodology for carrying out certain mitigation activities. This suite of SPPs has been approved by SNH and would be adopted where relevant to the project.

- 7.9.5 A CEMP would be developed by the successful Principal Contractor detailing measures to manage, control and monitor the potential effects of noise, dust, litter, pollution and personnel / vehicular movements. Best practice pollution control measures, with reference to the Scottish Environmental Protection Agency (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 during the construction process. A detailed spill response plan would be developed and fully-briefed to all site operatives and forms part of the CEMP.
- 7.9.6 An ECoW would be appointed, specifically to provide monitoring of construction activities relating to the installation of infrastructure. The ECoW would also identify and monitor sensitive receptors immediately prior to, during and immediately after the construction phase. This would include identifying possible constraints on construction presented by the presence of protected mammals and adopting specific mitigation measures where necessary. The ECoW will have the authority to 'stop the job / activity' if a breach or potential breach of mitigation or legislation occurs.

#### Measures Specific to all Habitats

- 7.9.7 Where excavation is required, for example at pole locations, cable sealing end structures and trenches for the installation of the underground cable section, excavated materials would be excavated and stored according to best practice taking care to separate, as far as is reasonable, turves, topsoils, peat, soil and boulders.
- 7.9.8 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 is required, pumped discharges would be passed through silt / sediment control measures.

#### Measures Specific to Annex I Habitats and GWDTE

- 7.9.9 Areas identified as being of high groundwater dependency are limited to small areas or linear features (e.g. flushes alongside watercourses) and would be avoided by micrositing of pole locations which would seek to avoid any construction work within habitats identified as being of high groundwater dependency. Some areas identified as being of moderate groundwater dependency are widespread in nature (e.g. wet heath). Micrositing of pole locations would seek to minimise the extent of construction work within wetland and peatland habitat including GWDTE habitats. Where this cannot be avoided (e.g. in the extensive peatland habitats north of Loch Dubh Cùl na Capulich) pole locations would be microsited, informed by peat probing surveys, in order to avoid the deeper areas of peat.
- 7.9.10 The access routes would be microsited to avoid GWDTE habitats where possible and vehicular access would be restricted across unprotected ground beyond the footprint of each pole location.
- 7.9.11 Access routes would avoid other sensitive habitats where possible (e.g. blanket bog). This would not be possible in some locations (e.g. across wet modified bog between Crask and the Dalchork forest and through marshy grassland adjacent to the existing forestry access track south of Cnoc a' Ghiubhais, polygon ID 54, **Figure 7.3**). In areas where avoidance is not possible, temporary Trackway and/or the use of specialised low ground bearing pressure vehicles would be utilised to prevent damage to the surface vegetation, avoid compaction of the peat beneath and maintain hydrological pathways to prevent the temporary infrastructure from affecting these habitats and associated hydrology. Temporary Trackway would be microsited away from any features such as hags and bare peat to avoid any further risk of erosion.
- 7.9.12 In areas where low ground bearing pressure vehicles are proposed to be used to reach the pole locations, the number of vehicle passes would be kept to a minimum to avoid disturbance to the surface vegetation. These vehicles would not be permitted to make any sharp slewing movements which can rip up the surface

vegetation, exposing peat substrates. Details of vehicle movements within sensitive areas would be included in the CEMP.

- 7.9.13 The extent of any excavations would be kept to a minimum during construction activities and reinstatement would be undertaken in line with the proposed restoration principles set out in the CEMP, ensuring that vegetation is initially stripped, suitably stored and then replaced on the surface to recreate the former habitat as far as is possible. Full reinstatement of materials would be undertaken promptly to avoid degradation of vegetation and peat through drying out.

#### Measures Specific to Works within the Ben Klibreck SSSI

- 7.9.14 Without appropriate mitigation, there is potential for the construction of the Proposed Development to have an adverse effect of minor significance on the SSSI through disturbance of habitats. To reduce the impacts to habitats during the installation of the five poles located within the boundary of the Ben Klibreck SSSI, the following specific measures would be adopted, in addition to those outlined above for GWDTE habitats:
- no temporary access tracks would be installed within the SSSI to access each pole location, instead specialised low ground bearing pressure vehicles would be used;
  - machines would be well maintained to reduce the risk of fuel / oil leaks;
  - the number of machine passes within the SSSI would be minimised and no sharp slewing movements would be permitted to prevent damage to the surface vegetation;
  - poles would not be dragged across the habitats within the boundary of the SSSI to avoid ground disturbance; poles would not be dragged across the habitats within the boundary of the SSSI to avoid ground disturbance, instead assembled pole structures would be transported to their locations by helicopter, where practicable. Any work involving helicopters will be undertaken in consultation with the Highland Raptor Study Group to avoid any disturbance to nesting eagles within the wider area; and
  - restoration around the location of the pole would be undertaken promptly in line with the Restoration Plan.

#### Measures Specific to Protected Species

- 7.9.15 Prior to construction commencing, a professional ecologist or ECoW would undertake a pre-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 Chapter. The workforce would be briefed on the protected species present in the general area, the legislative context and potential signs of activity. The successful Principal Contractor would be responsible for adherence to specific measures set out in the Applicant's SPP which include mitigation to reduce the likelihood of disturbance, mortality and injury to foraging protected species utilising the area surrounding the Proposed Development.
- 7.9.16 In the event of any significant signs of mammal activity being found additional to those identified during the course of surveys as described above, actions as set out in the Applicant's SPP would be followed and advice sought from the appointed ECoW, and if necessary the local SNH office.

#### Measures Specific to Water Vole

- 7.9.17 Without appropriate mitigation, there is potential for the construction of the Proposed Development to have an adverse effect of minor significance on water vole through disturbance, accidental mortality and / or injury to individuals. Prior to construction commencing a pre-construction water vole survey would be undertaken, focussing on where water vole have previously been identified. To minimise the risk of disturbance and injury to water vole, appropriate markers would be used to define the extent of each colony. In accordance with the Applicant's SPP, a minimum protection zone of 10 m would be marked and signed on the ground around each colony, with appropriate material to restrict work access. All works personnel, machinery, vehicles and storage

of materials would be restricted from entering protection zones. Where the existing access track passes between the water vole colonies, vehicle speed would be restricted to 10 mph.

- 7.9.18 The ECoW would continue to monitor water vole presence within the construction areas to ensure any new colonies that may become established during construction are adequately protected. All site personnel would be briefed on the presence of water vole and mitigation measures via a Toolbox Talk.

#### Measures Specific to Freshwater Pearl Mussel

- 7.9.19 To avoid adverse effects on Freshwater Pear Mussel which may be present in the River Naver SAC and the River Tirry, it is expected that the following will be included within the CEMP to ensure that works are undertaken to protect water quality and freshwater habitats:
- In accordance with PPG2 any fuel and chemical storage (including bentonite) would be bunded and would not be stored within 50 m of watercourses or waterbodies;
  - Fuel deliveries and refuelling would be undertaken by trained staff in a designated area with an impermeable base. All fuel related activities would take place more than 50 m away from any watercourse;
  - Emergency spill response kits will be available and maintained during construction works;
  - Mechanical plant would be located in designated areas and protected from run-off. Mechanical plant would be well maintained and inspected regularly for leaks;
  - Drip trays would be placed under stationary vehicles which could potentially leak fuel / oils;
  - Suitable access routes would be chosen which minimise the potential requirement for either new temporary access tracks or for tracking across open land which could contribute to the generation of suspended solids;
  - Any temporary construction / storage compounds required would be located remote from any sensitive surface water receptors and constructed to manage surface water run-off in accordance with best practice;
  - A minimum buffer of 30 m between construction works and watercourses would be implemented;
  - Any water contaminated with silt or chemicals would not be discharged directly or indirectly to a watercourse without prior treatment;
  - Silt fences, cut-off drains, silt traps and drainage will be used where appropriate to ensure that silt-laden run-off from construction activities does not enter watercourses, groundwater or aquatic waterways that have hydrological connectivity with either SAC;
  - Water for temporary site welfare facilities would be brought to site, and foul water would be collected in a tank and collected for offsite disposal at an appropriately licensed facility; and
  - The ECoW would have authority to stop any works that are or have potential to impair the water environment.

## **7.10 Monitoring**

- 7.10.1 Construction phase monitoring would be carried out by the appointed ECoW, to ensure compliance with environmental legislation and effective delivery of mitigation measures.
- 7.10.2 Prior to construction commencing a drone survey of the peatland restoration areas would be undertaken. Once construction is complete, a second survey would be undertaken to allow for comparison between pre- and post-construction habitats. Following completion of the survey, SNH and FLS would be consulted to determine whether further restoration is required in this area. Should it be deemed necessary to carry out further restoration works, the scope and methodology would be agreed with SNH and FLS prior to it being carried out.

### 7.11 Residual Effects

- 7.11.1 An assessment has been undertaken of the residual effects; those remaining following the implementation of the proposed mitigation as detailed in Section 7.9 above.
- 7.11.2 The implementation of mitigation measures to protect the Ben Klibreck SSSI and water vole during construction would reduce the potential effects on these VERs from minor to negligible.
- 7.11.3 No other significant effects (pre-mitigation) were identified. Nevertheless, good practice management measures have been identified, as detailed in Section 7.9 above, to further avoid and reduce effects. The residual effects on ecological receptors are non-significant.

### 7.12 Cumulative Impacts

- 7.12.1 There are two aspects of cumulative effect to consider:
- the cumulative effect of two or more developments on an individual animal or home range / territory; and
  - the cumulative effect of a number of developments within a region on the local / regional population of a species or the distribution of a habitat.
- 7.12.2 Other similar developments nearby include the consented Dalchork Substation and Lairg to Loch Buidhe 132 kV overhead line, running from Loch Buidhe substation to the proposed Dalchork Substation.
- 7.12.3 The Lairg to Loch Buidhe 132 kV overhead line EIA predicted no residual significant effects on flora and fauna<sup>4</sup>. The ecology chapter of the Environmental Appraisal for the Dalchork Substation<sup>5</sup> has been redacted to remove most species names; however, the Study Area for the Proposed Development overlaps that of the Study Area for the Dalchork Substation, as such potential effects on habitats and protected species are likely to be similar to those identified in this assessment.
- 7.12.4 The Proposed Development would have no significant residual effects on designated sites, habitats or species. Cumulative effects are considered to be limited to those resulting from the addition of the Proposed Development to other proposed or operational projects where there the potential for similar effects to arise. The addition of the effects identified as a result of the Proposed Development are of a sufficiently low magnitude that the likely effects associated with other developments nearby are not considered likely to result in significant cumulative effects.

### 7.13 Summary

- 7.13.1 The impact assessment on Terrestrial Ecology for the Proposed Development has been assessed under CIEEM Guidelines on Ecological Impact Assessment in the United Kingdom<sup>6</sup>. This determines which ecological receptors are significant within a geographical context before the assessment of the effects of the Proposed Development on significant receptors is undertaken.
- 7.13.2 A desk study, habitat survey and protected species surveys were undertaken in order to establish the ecological baseline, from which the ecological receptors of the Proposed Development could be identified. A summary of the results of the ecological baseline is provided in the main body of the report, along with associated figures and supporting information provided in **Appendix 7.2** and **Appendix 7.3**.
- 7.13.3 A detailed assessment of the potential effects of the Proposed Development on the surrounding Natura 2000 sites is provided in **Appendix 7.4**. The assessment concludes that no activities associated with the

<sup>4</sup> Lairg to Loch Buidhe Reinforcement EIA Report (2019). Scottish and Southern Energy Networks

<sup>5</sup> Dalchork Substation Environmental Appraisal Report (2019). Scottish and Southern Energy Networks

<sup>6</sup> Chartered Institute of Ecology and Environmental Management (2018). Guidelines for ecological impact assessment in the UK and Ireland. Winchester: CIEEM

construction of the Proposed Development are likely to have a significant effect on qualifying species of either the River Naver SAC or the Caithness and Sutherland Peatlands SAC. Furthermore, no construction related activities are contrary to the conservation objectives set out for each SAC to safeguard the integrity of each site.

- 7.13.4 No habitat receptors within the Study Area have been evaluated as having higher than Regional sensitivity assigned according to their conservation status and levels of value / importance under a geographic scale.
- 7.13.5 Protected species surveys identified water vole, otter and pine marten at low densities. To comply with legal obligations under the Wildlife and Countryside Act 1981 and the Natural Conservation (Scotland) Act 2004 legislation, pre-construction surveys would be undertaken, and site-specific mitigation included in the Applicant's SPPs would be adopted as required.
- 7.13.6 Proposals for mitigation relevant to identified receptors includes adherence to best practice construction methods as detailed in a project CEMP, pre-construction checks to update the ecological baseline, measures specific to protecting sensitive upland habitats within the Ben Klibreck SSSI, demarcation of protected species shelter locations prior to commencement of construction and the employment of an ECoW to provide environmental guidance and monitoring throughout the course of the construction period.
- 7.13.7 The potential effects on the receptors following mitigation that has been built into the design of the Proposed Development were evaluated and the magnitude of effects have been assessed to determine residual effects. There are no significant effects likely as a result of the Proposed Development.