

Chapter 10: Ecology

Non-Technical Summary

Chapter 10: Ecology of the Environmental Impact Assessment Report for the Proposed Development has been prepared by Avian Ecology Ltd., and provides an assessment of potential effects of the Proposed Development upon ecological (excluding ornithology) features in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines (2018).

The Proposed Development is for an alternative design to the consented Lochluichart Wind Farm Extension II (2020) (the 'Consented Development'). The variation of design is detailed in Chapter 3, and largely comprises an increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.

The assessment largely relies on information submitted to inform the application for the Consented Development, and has been informed through desk study, field surveys and consultation with relevant stakeholders. Where relevant, information from the operational Lochluichart Wind Farm, Lochluichart Wind Farm Extension (the 'Operational Schemes') and Corriemoillie Wind Farm has been referred. Field surveys undertaken have consisted of:

- Extended Phase 1 habitat survey (2017);
- National Vegetation Classification (NVC) survey (2017);
- Bat Activity Surveys (2015, also being updated 2021); and,
- Protected Mammal Surveys (2017, being updated 2021).

The Proposed Development does not form part of any statutory or non-statutory designated site for nature conservation. Two such nationally and internationally designated sites are located within 5km; Beinn Daerg Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), and Fannich Hills SAC and SSSI. By virtue of spatial separation, absence of hydrological connectivity and embedded 'good practice' construction techniques, no direct or indirect upon any designated site for nature conservation will occur.

The Site is upland in character and dominated by habitats typical of the region. The majority of habitats comprise large areas of blanket bog and wet heath communities, developing on peat of variable depth. Blanket bog is the most prominent habitat type on the northern slopes where the ground is much wetter and north facing. Centrally and towards the south the bog becomes more heath-like, with wet dwarf shrub heath dominating.

Resultant habitat losses and disturbance and the potential for pollution events has been minimised through sensitive scheme design and the implementation of good practice construction techniques, to be detailed within a Construction Environmental Management Plan (CEMP). The Proposed Development will result in very small permanent losses of the total area of habitat, which is not considered to be significant or affect the integrity of such habitats at a local scale. Temporary habitat losses, whilst larger, will be reversible following the completion of construction activities.

Bat surveys completed in 2015 recorded very low levels of bat activity within the study area, comprising that of common pipistrelle and soprano pipistrelle only. The Proposed Development has, in large, avoided the placement of turbines within habitats of value for bats and where possible adopted a 50m stand-off distance from typical bat habitat features following recommendations in statutory guidance. The majority of habitats to be affected by the development are of low suitability for commuting and foraging bats. As such, habitat losses are not considered to be significant, or likely to affect the conservation status of bat species. Mitigation measures to ensure legislative compliance during any tree works are proposed to protect individual bats and their roost sites. As with all wind farms, operational impacts upon bat species are difficult to characterise; however the risk of operational mortality is generally acknowledged to be minimal at locations with low bat activity such as the Proposed Development. Subsequently the mortality risk to bats is considered to be very low based on the currently available information, and no measurable increase in mortality is currently anticipated as a result of the increased turbine tip height above the Consented Development.

Water voles were identified within the Site and a single pine marten scat was found. No other evidence of protected mammals was found and the habitats were considered unlikely to support wildcat or badger. Any potential impacts upon terrestrial mammals are unlikely to be significant. Impacts on water voles have been largely avoided by the minimisation of water crossings and sensitive design of crossings and pre-construction surveys provided as part of the CEMP. Mitigation measures are proposed to ensure legislative compliance during the construction and decommissioning phases.

Incidental observations of common lizard were made during habitat surveys, and adders are also likely to be present. Significant adverse impacts upon reptile species are not anticipated. As individual reptiles are protected against intentional or reckless killing and injuring, measures are proposed to ensure legislative compliance during the construction and decommissioning phases.

The Proposed Development is known to fall within a sub-catchment area where salmon are absent, although brown trout are present year-round. The two watercourse crossings required for the development follow current SEPA guidance and will maintain existing bed substrate, hydraulic connectivity and passage for fish and additional wildlife, such as water vole. No significant adverse impacts upon fisheries are therefore predicted.

Subsequently the Proposed Development is not anticipated to lead to significant adverse effects for any protected or notable species and habitats.

In recognition of responses received from The Highland Council and NatureScot additional surveys are proposed to be undertaken in Spring, Summer and Autumn 2021 for bats and other terrestrial mammals. An updated assessment of effects will be provided thereafter.

Introduction

- 10.1. This Chapter of the Environmental Impact Assessment Report (EIA Report) has been prepared by Avian Ecology Ltd. and provides an assessment of potential effects on ecological features in relation to the construction, operation and decommissioning of the proposed Lochluichart Wind Farm Extension II (hereafter referred to as 'the Proposed Development').
- 10.2. The Proposed Development is for an alternative design to the consented Lochluichart Extension II (2020) development (the 'Consented Development'). The variation of design is detailed in Chapter 3, and largely comprises an increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.
- 10.3. The EIA Report documentation included for the Consented Development is referred to throughout this assessment, where appropriate.
- 10.4. The assessment is based upon baseline data, comprising specifically targeted ecological field surveys of important and legally protected ecological receptors identified during desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies, survey data sources and is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom (CIEEM, 2018ⁱ) and NatureScot'sⁱⁱ Environmental Impact Assessment Handbookⁱⁱⁱ.
- 10.5. Additional ecological surveys are scheduled for 2021 in accordance with Scoping responses and subsequent correspondence (Table 10.1) and the Chapter and assessment will be updated in due course. For the purposes of this Chapter, an assessment is undertaken on the best available information derived through field surveys undertaken between 2015 and 2017 and extensive desk study information, including post construction monitoring reports from Corriemoillie Wind Farm.
- 10.6. The specific objectives of this Chapter are to:
 - establish and describe the baseline ecology conditions;
 - identify key ecological features and any potentially significant effects upon them; and
 - identify and describe any mitigation measures required to address any potentially significant effects.
- 10.7. The Chapter is supported by the following figures and technical appendices presented in Volumes 3 and 4:
 - **Figure 10.0:** Statutory Designated Sites
 - **Figure 10.1:** Phase 1 Habitat Plan
 - **Figure 10.2:** NVC Habitat Plan
 - **Figure 10.3:** Bat Survey Plan
 - **Figure 10.4:** Protected Mammal Survey Methodologies
 - **Figure 10.5:** Protected Mammal Survey Results
 - **Appendix 10.A:** Habitats and Vegetation
 - **Appendix 10.B:** Desk Study and Protected Species
 - **Appendix 10.C:** Consultation

10.8. Figures and technical appendices are referenced in the text where relevant.

Project Description

10.9. A detailed description of the Proposed Development is provided in Chapter 3 'Description of the Proposed Development'.

Proposed Development Overview

10.10. The Site boundary is defined by the red line boundary presented on **Figures 10.0 to 10.4** (herein referred to as the 'Site').

10.11. The location of the Proposed Development turbines and infrastructure remain unchanged from the Consented Development. The only changes relate to an increase in tip height and minor increases in foundation sizes and temporary construction laydown areas.

10.12. The Site covers an area of 596ha and is located on open moorland between Loch Glascarnoch and the A835 road to the north, and Lochluichart and the A832 to the south. The Operational Schemes (Lochluichart Wind Farm and Lochluichart Extension Wind Farm) are located directly to the south, and the Corriemoillie Wind Farm (hereafter referred to as 'Corriemoillie') is located to the southeast. Further expanses of open moorland lie to the north and west of the Site.

10.13. Upland habitats predominate across the Site, comprising blanket bog, heathland and pockets of plantation woodland. Several watercourses drain the Site within the River Bran sub-catchment.

Key Legislation and, Policy and Guidance

10.14. In the preparation of this chapter, reference has been made to the following key pieces of planning policy, legislation and guidance:

National

- The Conservation of Habitats and Species Regulations 2010, as amended in Scotland via the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 ("The Habitats Regulations");
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012^{iv});
- Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition (Collins, 2016^v);
- Bat surveys: Good Practice Guidance 2nd edition (Hundt, 2012^{vi});
- Bats and onshore wind turbines: survey, assessment and mitigation (SNH, 2019a^{vii});
- Good Practice During Wind Farm Construction (SNH, 2019^{viii});
- Guidance on Assessing the Impacts of Groundwater Abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTEs) (Scottish Environmental Protection Agency (SEPA) 2017^{ix});

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018**Error! Bookmark not defined.**);
- General pre-application and scoping advice for onshore wind farms (NatureScot, 2020^x);
- NatureScot Carbon and Peatland map (2016^{xi});
- Standing Advice for Planning Consultations – Protected Species: Badger (NatureScot, 2020a^{xii});
- Standing Advice for Planning Consultations – Protected Species: Bats (NatureScot, 2020b^{xiii});
- Standing Advice for Planning Consultations – Protected Species: Freshwater Pearl Mussel (NatureScot, 2020c^{xiv});
- Standing Advice for Planning Consultations – Protected Species: Great Crested Newt (NatureScot, 2020d^{xv});
- Standing Advice for Planning Consultations – Protected Species: Otter (NatureScot, 2020e^{xvi});
- Standing Advice for Planning Consultations – Protected Species: Pine Marten (NatureScot, 2020f^{xvii});
- Standing Advice for Planning Consultations – Protected Species: Red Squirrel (NatureScot, 2020g^{xviii});
- Standing Advice for Planning Consultations – Protected Species: Water Vole (NatureScot, 2020h^{xix});
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017^{xx};
- Article 17 Habitats Directive Report 2019: Species Conservation Status Assessment: 2019’ (JNCC, 2019^{xxi});
- The Wildlife and Countryside Act 1981 (as amended in Scotland under the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011)^{xxii}; and,
- The Nature Conservation (Scotland) Act 2004;
- The Protection of Badgers Act 1992^{xxiii};
- Scottish Planning Policy (2014);
- Scottish Biodiversity List (SBL) 2020; and
- The United Kingdom Biodiversity Action Plan (UK BAP) Priority Species and Habitats (2007).

Local

- The Highland Council (THC) Onshore Wind Energy Supplementary Guidance (2016);
- Highland’s Statutorily Protected Species. Supplementary Guidance (2013^{xxiv}).

- The Ross and Cromarty (East) Biodiversity Action Plan (LBAP); and
- The Ross and Cromarty East Local Plan 2007.

Scope of Assessment

- 10.15. The assessment presented herein has been undertaken with reference to CIEEM guidance (2018)^{xxv}, and focuses on those activities that could impact and potentially generate significant effects on ecological features.
- 10.16. Desk study and field survey information has been used to inform the valuation of ecological features and the selection of important ecological features 'scoped-in' to a detailed assessment.
- 10.17. The desk study has been undertaken to identify potentially sensitive ecological features within at least 2km of the Site boundary, extended out to 5km for statutorily designated sites for nature conservation.
- 10.18. The scope of field surveys undertaken has been guided by consultation and existing relevant survey information gathered for the Consented Development and the Operational Schemes and Corriemoillie, which provide an extensive existing baseline dataset for the Proposed Development and immediate surrounding area.
- 10.19. The Consented Development was supported by baseline surveys undertaken between 2015 and 2017 within the Site.
- 10.20. Existing information obtained to inform the Lochluichart Wind Farm Extension Environmental Statement (ES) included baseline surveys undertaken between 2009 and 2010 which covered the Site. With existing information obtained to inform Corriemoillie including a series of baseline and post construction surveys undertaken 2009 and 2016, providing partial coverage of the Site and immediate surrounding area.
- 10.21. As per NatureScot (SNH, 2020^{viii}) guidance, there are some species that with standard mitigation measures are unlikely to experience significant effects as a result of the Proposed Development (e.g. invertebrates, reptiles and amphibians) and as such, do not require surveys to inform an EIA.
- 10.22. The assessment presented within this Chapter considers the following main potential effects upon ecological features associated with wind farm developments, which include:
- Habitat Loss / Deterioration – direct and indirect loss and deterioration of habitats;
 - Mortality / loss of life – incidental loss of life or injury through construction activities to species; and,
 - Disturbance / Displacement of Species –disturbance and displacement of faunal species; loss, damage or disturbance to their breeding and/or resting places.
- 10.23. The potential for effects are considered as a result of the Proposed Development alone and cumulatively, in-combination with the Operational Schemes and Corriemoillie.

Consultation

-
- 10.24. Table 10.1 below details a summary of consultations undertaken as part of the assessment process. A summary of responses obtained is provided along with how these have been addressed.
- 10.25. Full copies of consultation documentation related to the Consented Development are provided in **Appendix 10.C**.

Table 10.1 Consultation

Consultee	Date	Stage	Summary of Response	How Response has been addressed
The Highland Council	17/11/2020	Scoping	<p>The EIAR should provide new updated baseline survey information of the animals (mammals, reptiles, amphibians, etc).</p> <p>The EIAR should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local Biodiversity Action Plans.</p> <p>New bat surveys are required as the Consented Developments surveys are now out of date and the survey methodology has been updated since the last surveys were carried out.</p> <p>The EIAR should also designate sites in the vicinity of the proposed development and the water environment. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant.</p> <p>The EIAR should evidence consultation input from the local fishery board(s) where relevant.</p> <p>The EIAR should incorporate any necessary amendments in the proposed Water Construction Management Plan for the site.</p> <p>The EIAR should also include an</p>	<p>A mammal walkover will be undertaken in spring/summer 2021 followed by an updated assessment of effects.</p> <p>Habitats within the Site are highly unlikely to have considerably changed in the intervening period between the consented application and the Proposed Development. The habitat baseline used to inform the Consented Development is considered appropriate for use for the Proposed Development.</p> <p>Bat surveys following NatureScot guidance (SNH, 2019) will be undertaken in spring, summer and autumn 2021 followed by an updated assessment of effects. The habitats within the Site are highly unlikely to have changed and remain low risk for bats, therefore potential effects are unlikely to have changed between the Consented Development and the Proposed Development.</p> <p>Potential effects on designated sites and the water environment (fisheries) are considered and mitigation provided, where required.</p> <p>Potential effects on GWDTEs are discussed separately in Chapter 12: Hydrology.</p>

Consultee	Date	Stage	Summary of Response	How Response has been addressed
			assessment of any additional effects on Ground Water Dependent Terrestrial Ecosystems (GWDTE), arising from any increase in the development's footprint (foundations and crane pads).	
NatureScot	12/11/2020	Scoping	Bat surveys undertaken to inform the consented development are outdated and therefore further surveys should be undertaken in accordance with NatureScot guidance (SNH, 2019).	Bat surveys will be undertaken in spring, summer and autumn 2021 followed by an updated assessment of effects.
	30/04/2021	Survey scoping response	Recommended bat surveys comprise a spring, summer and autumn period, in accordance with NatureScot guidance (SNH, 2019).	
RSPB	3/11/2020	Scoping	Requested an HMP be included within the application to benefit peatland habitats.	A HMP will be delivered post consent through a suitably worded planning condition.

Baseline Methodology

Desk Study

- 10.26. A desk study was undertaken to collate existing information on the presence of designated sites for nature conservation and existing records of protected and notable habitats and faunal species, within the Site and surrounding area.
- 10.27. The following key sources were consulted:
- NatureScot Sitelink (<http://gateway.snh.gov.uk/sitelink/>);
 - National Biodiversity Network (NBN) Database; and,
 - Highland Biological Recording Group (HBRG).
- 10.28. The following documents in relation to the adjacent Lochluichart Wind Farm Extension and Corriemoillie were also reviewed:
- Corriemoillie Wind Farm 'Revised' ES and Post Consent Reports 2016:
 - Terrestrial Mammal Surveys (badger, bats, otter, pine marten, red squirrel, water vole, wildcat) 2014^{xxvi};
 - Phase 1 Habitat Survey Report 2016^{xxvii};

- Lochluichart Wind Farm Extension ES 2011 and appendices which include the following baseline surveys:
 - Extended Phase 1 Habitat Survey 2010;
 - National Vegetation Classification Survey 2010;
 - Terrestrial mammal surveys including otter, water vole, red squirrel, badger, pine marten, wildcat and bats 2010;
 - Freshwater pearl mussel surveys 2010;
- Corriemoillie Wind Farm ES 2010 and appendices which include the following baseline surveys:
 - Extended Phase 1 Habitat Survey 2008, 2009 and 2010; and
 - Terrestrial mammal surveys including bats, otters, water voles, red squirrel and badger 2009.

Field Surveys

- 10.29. Surveys undertaken for the Consented Development have been used to inform the Proposed Development. As the locations of the proposed infrastructure remain unchanged from the Consented Development, baseline surveys undertaken for the Consented Development provide sufficient coverage for the Proposed Development. The following section provides a summary of these surveys along with surveys undertaken for the Operational Schemes and Corriemoillie which are relevant to the Proposed Development application.
- 10.30. Detailed field survey methodologies are provided in **Appendix 10.A** and **Appendix 10.B** or within the corresponding documents for the Operational Schemes and Corriemoillie.

Habitats

- 10.31. An Extended Phase 1 habitat survey and National Vegetation Classification (NVC) survey was undertaken within the Site in 2010 to inform Lochluichart Wind Farm Extension. An updated habitat walkover survey was completed on 1st July 2015 to identify any material changes in baseline habitats recorded within the Site since 2010.
- 10.32. A further Extended Phase 1 habitat survey and NVC survey was also undertaken in 2017 to inform the Consented Development which included areas within 250m of the Proposed Development infrastructure.
- 10.33. All surveys were undertaken in accordance with industry guidance applicable at the time:
 - JNCC - Handbook for Phase I Habitat Survey – a Technique for Environmental Audit 2010^{xxviii};
 - Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) 2009^{xxix}; and,
 - National Vegetation Community Users’ Handbook – 2006^{xxx}.
- 10.34. Habitat survey methods were extended to include the additional recording of specific features indicating the presence, or likely presence, of protected or notable species.

Bats

- 10.35. A survey to identify trees with bat roost potential was undertaken within the Site in 2010 as part of baseline surveys to inform the Lochluichart Wind Farm Extension. The survey was undertaken in accordance with BCT guidance applicable at the time of survey (2007^{xxxix}).
- 10.36. Bat activity surveys were undertaken to inform the Consented Development 2015 with reference to BCT guidance (Hundt, 2012^{xxxii}), comprising a manual and automated monitoring sampling surveys during the summer and autumn periods. Survey areas are presented on **Figure 10.3**.

Terrestrial Mammals

- 10.37. A survey for other terrestrial mammals including otter, water vole, red squirrel, pine marten, wildcat and badger was undertaken within the Site in 2010 to inform the Lochluichart Wind Farm Extension. Additional surveys were undertaken in 2017 adopting guidance methodologies applicable at the time:
- NatureScot Protected Species Advice for Developers;
 - Pine Marten (SNH, 2017a^{xxxiii});
 - Wildcat (SNH, 2017b^{xxxiv});
 - Badger (SNH, 2017c^{xxxv});
 - Otter (SNH, 2017d^{xxxvi});
 - Water vole (SNH, 2017e^{xxxvii});
 - Red squirrel (SNH, 2017f^{xxxviii});
 - UK BAP Mammals – Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation 2012^{xxxix};
 - Water Vole Conservation Handbook (Strachan *et al.*, 2011^{xl}); and
 - Water Vole Mitigation Handbook (Dean *et al.*, 2016^{xli}).
- 10.38. Full details for 2017 surveys are provided within **Appendix 10.B**.

Freshwater Pearl Mussel

- 10.39. A survey for fresh water pearl mussel was carried out in 2010 to inform the Lochluichart Wind Farm Extension. The survey aimed to identify specific sites that were most likely to harbour freshwater pearl mussels using information on their habitat preferences. Once suitable areas were identified, target species searches were undertaken in accordance with guidance applicable at the time (Cosgrove and Young, 1998^{xlii}; Young *et al.*, 2001b^{xliii}).

Fisheries

- 10.40. A fish habitat survey carried out by the Cromarty Fisheries Trust in 2006 (2006)^{xliv} identified a number of locations within the Site which possessed adequate substrate to support breeding populations of Salmonid fish in particular brown trout. An electrofishing survey was subsequently undertaken in 2009^{xlv} within the Site to inform the Lochluichart Wind Farm Extension. Seven locations were surveyed using a multi-pass electro-fishing method.
- 10.41. Through consultation for Lochluichart Wind Farm Extension, the Cromarty Firth Fisheries Board confirmed the absence of migratory fish (salmon) within the Site. Subsequently further detailed electrofishing surveys to inform the Consented Development were not undertaken.

Assessment Methodology and Significance Criteria

- 10.42. Impact assessment has been undertaken in accordance CIEEM guidelines (2018).
- 10.43. Ecological Impact Assessment (EcIA) as defined within the Guidelines is 'a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems'.
- 10.44. The process includes the following stages:
- determination and evaluation of important ecological features;
 - identification and characterisation of impacts;
 - identify significant effects of impacts in the absence of mitigation;
 - outline of mitigating measures to avoid and reduce significant effects;
 - assessment of the significance of any residual effects after such measures; and,
 - identification of appropriate compensation measures to offset significant residual effects.
- 10.45. In line with CIEEM (2018) an 'Impact' is defined as an action resulting in changes to an ecological feature and 'Effect' is defined as an outcome to an ecological feature from an impact.

Determining Importance

- 10.46. In accordance with the CIEEM guidelines (2018), an EcIA need only assess in detail, impacts upon important ecological features i.e. those that are considered important and potentially significantly affected by a Proposed Development. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts. Where ecological features are not considered important enough to warrant further consideration, or where they will not be significantly affected, these are scoped out of the assessment presented here, with justification for exclusion provided.
- 10.47. Relevant European, National and Local guidance from governments and specialist organisations has been referred to in order to determine the importance of ecological features. In addition, importance has also been determined using professional judgement and taking account of the results of baseline surveys and the importance of features within the context of the geographical area.
- 10.48. Importance does not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.
- 10.49. For the purposes of this assessment the importance of an ecological feature is considered within a defined geographical context from Local to International, as outlined below in Table 10.2.

Table 10.2 Geographic scale of ecological feature importance.

Importance	Definition
International	<p>A Special Area of Conservation (SAC) and/or Ramsar site or candidate site (or cSAC).</p> <p>Large areas of priority habitat listed under Annex I of the Habitats Directive, and smaller areas of such a habitat that are essential to maintain the viability of that ecological resource.</p> <p>A regularly occurring, nationally significant population of any internationally important species, listed under Annex II or Annex IV of the Habitats Directive.</p>
National	<p>A nationally designated site e.g. Site of Special Scientific Interest (SSSI), or area meeting criteria for national level designations.</p> <p>Significant extents of a priority habitat identified in the UKBAP / Scottish Biodiversity List, or smaller areas which are essential to maintain the viability of that ecological resource.</p> <p>A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / Scottish Biodiversity List priority species and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p>
Regional	<p>Viable areas of key semi-natural habitat identified in the UKBAP.</p> <p>A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / Scottish Biodiversity List priority species and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p> <p>Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including areas of semi-natural woodland exceeding 0.25ha.</p>
Local	<p>Sites of Importance for Nature Conservation or equivalent sites selected on local authority criteria. Local Nature Reserves.</p> <p>Other species of conservation concern, including species listed under the Local BAP (LBAP). Areas of habitat or species considered to appreciably enrich the ecological resource within the local context e.g. species-rich flushes or hedgerows. Areas of semi-natural ancient woodland smaller than 0.25ha.</p> <p>All other species and habitats that are widespread and common and which are not present in locally, regionally or nationally important numbers or habitats which are considered to be of poor ecological value (e.g. commercial forestry).</p>

Characterising Impacts

10.50. Once identified, the potential impacts arising from the proposed scheme are described making reference to the following characteristics as appropriate:

- positive or negative;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and,
- reversibility.

10.51. The assessment only makes reference to those characteristics relevant to understanding the ecological effect and determining the significance.

10.52. The criteria used to determine the magnitude of impact are set out in Table 10.3.

Table 10.3 Impact magnitude.

Magnitude	Description
High	The effect (either on its own or with other proposals) may adversely or positively affect the biodiversity conservation status of a site/population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Medium	Biodiversity conservation status of a site or population would not be adversely or positively affected, but some element of the functioning might be affected and the effect on the site/population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Minor	Neither of the above applies, but some minor adverse or beneficial effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area.
Negligible	No observable effect in either direction.

Determining Significance

- 10.53. For the purposes of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.
- 10.54. CIEEM guidelines on ecological impact assessment note that "*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.*
- 10.55. In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).
- 10.56. Significant effects are expressed with reference to an appropriate geographic scale. For example, a significant effect on a nationally designated site is likely to be of national significance. However, the scale of significance does not necessarily always relate to the importance of an ecological feature. For example, an effect on a species which is considered of national importance may not have a significant effect upon its national population.
- 10.57. For the purposes of this assessment, the significance of effects are primarily expressed with reference to the regional, national or international scale (as relevant) in line with NatureScot's interests of species status at wider spatial levels. The significance of effects at a local scale is also assessed where sufficient information allows a meaningful assessment.
- 10.58. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.
- 10.59. Where the ecological assessment proposes measures to mitigate adverse effects on ecological features, a further assessment of residual ecological

effects, taking into account any ecological mitigation recommended, has been undertaken.

- 10.60. CIEEM (2018) guidelines discourage the use a matrix table as commonly set out in EIA Report Chapters to determine 'significant' and 'non-significant' effects. For the purposes of the assessment presented herein, Table 10.4 below sets out adapted CIEEM terminology, which also shows the equivalent EIA terms. The following assessment will summarise impacts in accordance with EIA significance terminology to allow consistency with other chapters.

Table 10.4: Significance.

Effect (EIA Significance)		Geographical scale at which residual effect is significant following CIEEM guidelines
Neutral	Negligible	No Significant Effect on ecological integrity or conservation status.
Non-significant	Minor Adverse	Local
Significant	Moderate Adverse	Regional or other local authority area
	Major Adverse	National or International

Assessment of Cumulative Effects

- 10.61. Potentially significant cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location.
- 10.62. Cumulative effects have therefore been assessed for ecological features subject to a detailed assessment. The assessment is based on the consideration of residual effects i.e. assuming that proposed mitigation measures (where relevant) are implemented.
- 10.63. For the purposes of this assessment the potential for significant cumulative effects includes consideration of the Operational Schemes, Corriemoillie and the proposed Kirkan Wind Farm.
- 10.64. Potential cumulative effects would not occur with the Consented Development as the Proposed Development is proposed as an alternative to the Consented Development and only one of the developments will be constructed.
- 10.65. This is considered to provide the most appropriate and informed approach to assessment for development at this locale.

Limitations

- 10.66. It is acknowledged that the baseline surveys for bats and terrestrial mammals are outdated and industry standard guidance has been updated in the interim period between the submission of the Consented Development planning application and Proposed Development. This includes the recently published NatureScot's guidance for bats and wind energy developments (SNH, 2019).
- 10.67. The assessment has been informed by the best available information at this time and as detailed through Scoping responses from consultees, additional surveys will be undertaken in Spring, Summer and Autumn 2021 to provide

an updated baseline for bats and terrestrial mammals. The assessment of effects will therefore be updated as required.

- 10.68. The age of data for all other identified ecological features (habitats, fisheries, reptiles, amphibians) is also over 2 years old; however, in recognition of the proposed embedded mitigation, pre-construction surveys and nature of the Proposed Development, any potential impacts on these features are highly unlikely to result in significant effects and therefore no limitations to the assessment are anticipated for any other ecological features.

Baseline Conditions

Designated Sites for Nature Conservation

- 10.69. This section should be read with reference to **Figure 10.0**.
- 10.70. Table 10.5 provides a summary of statutory designated sites for nature conservation located within 5km of the Site boundary, extended to 10km for internationally designated sites.
- 10.71. Sites designated for ornithological features only are addressed separately in Chapter 11 'Ornithology'.

Table 10.5 Designated sites for nature conservation.

NNR: National Nature Reserve; SSSI: Site of Special Scientific Interest; SAC: Special Area of Conservation; SPA: Special Protection Area.

Site Name	Distance	Qualifying Features
Beinn Dearg SSSI, SAC	4.1km	<ul style="list-style-type: none"> • SSSI Features <ul style="list-style-type: none"> ○ Breeding bird assemblage ○ Native pinewood ○ Upland assemblage ○ Vascular plant assemblage • SAC Features <ul style="list-style-type: none"> ○ Acidic scree ○ Alpine and subalpine calcareous grasslands ○ Alpine and subalpine heath ○ Blanket bog* ○ Caledonian forest* ○ Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels ○ Dry heaths ○ High-altitude plant communities associated with areas of water seepage* ○ Montane acid grasslands ○ Mountain willow scrub ○ Plants in crevices on acid rocks ○ Plants in crevices on base-rich rocks ○ Species-rich grassland with mat-grass in upland areas* ○ Tall herb communities ○ Wet heathland with cross-leaved heath <p>*Denotes priority feature.</p>

Site Name	Distance	Qualifying Features
Fannich Hills SSSI, SAC	5km	<ul style="list-style-type: none"> • SSSI Features <ul style="list-style-type: none"> ○ Beetles ○ Flies ○ Moine SAC features <ul style="list-style-type: none"> ○ Acidic scree ○ Alpine and subalpine heaths ○ Blanket bog* ○ Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels ○ Dry heaths ○ Montane acid grasslands ○ Plants in crevices on acid rocks ○ Wet heathland with cross-leaved heath • *Denotes priority feature.
Achanalt Marshes SSSI	7.8km	<ul style="list-style-type: none"> • SSSI Features <ul style="list-style-type: none"> ○ Breeding bird assemblage ○ Flood-plain fen ○ Mesotrophic loch
Ben Wyvis NNR, SSSI, SAC	8.8km	<ul style="list-style-type: none"> • SSSI Features <ul style="list-style-type: none"> ○ Blanket bog ○ Dotterel [Breeding] ○ Dystrophic and oligotrophic lochs ○ Upland mosaic ○ Vascular plants. • SAC Features <ul style="list-style-type: none"> ○ Acidic scree ○ Alpine and subalpine heaths ○ Blanket bog* ○ Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels ○ Dry heaths ○ Montane acid grasslands ○ Plants in crevices on acid rocks ○ Tall herb communities *Denotes priority feature.

Habitats and Vegetation

- 10.72. A summary of habitats recorded within the Site is presented below and in Table 10.6. Habitats are discussed with both reference to the Extended Phase 1 habitat survey and NVC survey findings from 2017. Detailed survey results are presented in **Appendix 10.A** and illustrated on **Figures 10.1 and 10.2**.
- 10.73. The majority of habitats within the Site comprise large areas of blanket bog and wet heath communities, developing on peat of variable depth. The habitat types correspond to European wet heath and Active raised bog and blanket bog listed on Annex I of the Habitats Directive and also represent priority habitat types for the Ross and Cromarty (East) LBAP.

- 10.74. Heathland habitat communities present are dominated by varying combinations of deergrass, heather and hare’s-tail cottongrass, with peat-forming *Sphagnum capillifolium* and *S.papillosum* present. Occasional small flushes and mires dominated by grasses, rushes and sedges are also present and the Proposed Development is drained by a number of small fast flowing upland streams with stony beds.
- 10.75. The northern extent of the Site also supports areas of Scots pine plantation atop areas of blanket bog and wet heath. Plantations remain at a relatively young stage, with some areas of planting appearing unsuccessful as there are remains of dead saplings. The underlying substrate supports a high cover of sphagnum species and other features which would suggest it comprises ‘active’ bog habitat, as recognised in the Habitats Directive^{xlvi}.
- 10.76. No protected species were found during surveys undertaken in 2015 or 2017; however notable species including Alpine bearberry *Arctostaphylos alpina* (nationally scarce), dwarf birch *Betula nana* (nationally scarce) and lesser twayblade *Neottia cordata* were recorded.

Table 10.6 Key habitat summary.

Habitat	NVC Classification
Blanket Bog	The best community match for habitats within the Site is M17 <i>Trichophorum cespitosum-Eriophorum vaginatum</i> blanket mire. This community is typically dominated by <i>Trichophorum cespitosum</i> , <i>Eriophorum vaginatum</i> and <i>Eriophorum angustifolium</i> with <i>Calluna vulgaris</i> and <i>Erica tetralix</i> . <i>Sphagnum papillosum</i> and <i>S. capillifolium</i> are the commonest sphagnums whilst <i>Narthecium ossifragum</i> and the <i>Drosera</i> species are also present in good numbers. The sub-community present is likely to be the Cladonia sub-community M17b. The M17 <i>Trichophorum cespitosum-Eriophorum vaginatum</i> community is common and widespread throughout the North West Highlands of Scotland, but is recognised as globally rare (Averis et al., 2004).
Wet Heath	The best community match for wet heath within the Site is M15 <i>Trichophorum cespitosum-Erica tetralix</i> wet heath. This is a ubiquitous community over much of the north and west of Scotland. The community type is dominated by <i>Calluna vulgaris</i> , <i>Erica tetralix</i> , <i>Trichophorum cespitosum</i> and <i>Molinia caerulea</i> and has much <i>Narthecium ossifragum</i> and <i>Eriophorum angustifolium</i> present. The sub-community present on site is M15b typical sub-community. Whilst some grazing is thought to be essential in maintaining the structural and floristic diversity of heathland communities (Averis et al. 2004), the overabundance of <i>Trichophorum cespitosum</i> within the wet heath communities present within the Site would appear to indicate current overgrazing, particularly by deer.

Protected and Notable Species

Bats

- 10.77. The UK Habitats Directive Article 17 Report (2019) identifies that the Site is located within the known species distribution range for Daubentons *M.*

daubentonii natterers *M. nattereri*, Whiskered *M. mystacinus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *P. pygmaeus*.

- 10.78. Plantation woodland located within the Site comprises immature coniferous woodland that has generally failed to grow on the bog habitats. Trees are largely single stemmed, with narrow leaders and limbs and subsequently lack features which may be used by roosting bats. During surveys to inform the Lochluichart Wind Farm Extension in 2010, no trees with bat roost potential were recorded (assessed as Category 3 in accordance with BCT guidance (2009) applicable at the time). Extended phase 1 habitat surveys undertaken in 2015 and 2017 further confirmed the lack of suitable trees for roosting bats. In addition, studies undertaken for the Corriemoillie identified no structures suitable for bat roost potential within the vicinity of the Proposed Development.
- 10.79. Overall, the Site is considered to be of negligible bat roosting potential in accordance with BCT guidance (Collins, 2016).
- 10.80. Baseline activity surveys undertaken for the Corriemoillie recorded very low levels of activity attributable to common pipistrelle and soprano pipistrelle bats. Desk study records for the wider surrounding area also identified the known presence of brown long-eared *Plecotus auritus* and Daubenton's bat within the wider area.
- 10.81. Bat activity surveys undertaken within the Site in 2015 also recorded very low levels of activity attributed to common and soprano pipistrelle. The majority was attributed to common pipistrelle and all activity was recorded in July/August (summer).
- 10.82. Habitat structure within the Site was considered to be generally poor for bats, with the open nature lacking suitable foraging and commuting features. Moorland and heathland habitats are typically poor for bats (JNCC, 2001^{xlvii}) but wetter areas and particularly under the shelter of plantation forestry can provide some foraging opportunities. Nearby forestry and more sheltered valleys are likely to provide habitat features for bats of the highest value in the local landscape.
- 10.83. The surveys were undertaken in 2015 and therefore pre-date the recently published NatureScot guidance (SNH, 2019), so data have not been uploaded to the Ecobat database and assessment tool. The guidance can however still be referred to, to aid the determination of site risk.
- 10.84. Based on the updated bats and wind farms guidance (SNH, 2019) for Stage 1 (potential risk of a site based on habitats and development-related receptors) the Proposed Development is assessed as being of 'Low Site Risk'.
- 10.85. Stage 2 of the NatureScot (SNH, 2019) guidance requires an overall risk assessment, based on activity levels of high collision risk bat species. The data have not been uploaded to Ecobat as the surveys predate the current NatureScot guidance (SNH, 2019) therefore percentiles used to inform activity levels have not been included. However, a total of 400 bat registrations were recorded across six monitoring stations in July/August and October 2015, representing less than 0.26 bat passes per hour for common pipistrelle and 0.03 passes per hour for soprano pipistrelle. These activity levels are

considered to be very low, and representative of the exposed habitats within the Site.

- 10.86. Overall, based on the information currently available, the risk for common pipistrelle and soprano pipistrelle is concluded to be a *Low Site Risk*.

Otter

- 10.87. Baseline surveys conducted within the Site to inform the Lochluichart Wind Farm Extension in 2010, and subsequent baseline surveys in 2017, did not identify any evidence indicative of otter presence.

- 10.88. The species is known to be present locally, as identified during field baseline surveys to inform Corriemoillie, which included spraints at Lochan Dubh Mor and along the Allt a Bheith Oig and its tributaries, which flow alongside and intersect the Site.

- 10.89. Whilst, watercourses intersecting the Site are considered to provide some opportunities for commuting and foraging otters, the absence of potential resting locations and limited existing records for the species locally suggests that the Site and immediate surrounding area is of little importance for the species.

Pine Marten

- 10.90. Desk study records reviewed to inform the Lochluichart Wind Farm Extension and Corriemoillie identify the historical presence of pine marten locally within Corriemoillie Forest and along the wooded banks of Loch Luichart. Baseline surveys to inform the Consented Development did not however, record evidence of the species within the Site or immediate surrounding area.

- 10.91. A single pine marten scat was recorded within the north of the Site during survey in October 2017 (**Figure 10.5**). No further evidence of the species was recorded.

- 10.92. The Site is not considered to provide suitable opportunities for den creation, with an absence of favourable features such as rocky outcrops and tree hollows. The most suitable habitats for pine marten locally are located within mature forestry stands beyond the Site boundary. Given the species does occur in a wide range of habitats some use of the open moorland habitats within the Site for foraging and commuting is possible.

Water Vole

- 10.93. Watercourses within the Site are considered to provide suitable opportunities for water vole and the species presence has previously been established within the Site and immediate surrounding area through baseline surveys to inform the Lochluichart Wind Farm Extension and Corriemoillie.

- 10.94. The species presence was reconfirmed within the Site during surveys in 2017.

- 10.95. Evidence of water vole including droppings and burrows has collectively been recorded on the following watercourses within the Site as shown in **Figure 10.5**:

- Allt Giubhais Mor;
- Unnamed tributary to the Allt na Beinne Leithe Bige;

- Allt na Beinne Leithe Bige;
- Caochan Ban; and
- Eag Odhar.

10.96. It is also assumed that water voles are established to varying degrees on all watercourses throughout the Site and the species is also likely to utilise wet ditches and burns to disperse throughout the Site and surrounding area.

Badger

10.97. Baseline surveys to inform the Lochluichart Wind Farm Extension and Corriemoillie did not record evidence of badger within the Site or immediate surrounding area. Desk study records reviewed to inform Corriemoillie do however, identify the historical presence of the species locally.

10.98. No field signs indicating the presence of badgers were identified within the Site or wider study area. Habitats within the Site, predominantly comprising open wet moorland heath, provide sub-optimal conditions for sett building but may offer foraging opportunities.

Red Squirrel

10.99. No evidence of red squirrel was recorded within the Site or immediate surrounding areas during field surveys to inform the Consented Development or Lochluichart Wind Farm Extension and Corriemoillie. Historical records reviewed to inform Corriemoillie do however suggest the presence of the species within the surrounding wider area.

10.100. No signs indicative of squirrel presence were subsequently recorded within the Site during baseline surveys in 2017. The habitats within the Site, predominantly comprising open moorland habitats are largely unsuitable for red squirrel. Establishing coniferous woodland plantations within the Site are currently also considered to provide low habitat suitability for red squirrel; supporting sub-optimal drey building opportunities (typically provided by taller and more mature woodland tracts) and being relatively isolated from more extensive and mature woodland habitats beyond the Site.

Wildcat

10.101. Desk study records reviewed to inform Lochluichart Wind Farm Extension and Corriemoillie do not identify the historical presence of wildcat locally. Baseline surveys to inform the Operational Schemes and Corriemoillie also did not record evidence of the species.

10.102. The Strathpeffer Wildcat Priority Area is located approximately 5 km to the south east of the Site. The priority areas were established to identify key target areas for the species, to focus effort on research where they are known to be found.

10.103. No evidence suggesting the presence or potential presence of wildcat was recorded within the Site during baseline surveys in 2017 and the Site habitats are not considered to provide suitable opportunities for den creation, such as rocky outcrops, existing mammal holes, tree hollows.

10.104. The predominantly wet nature of habitats within the Site is also considered to lower the suitability of habitats for the species; wildcats prefer varied habitats on the edge of moorland, forestry plantation, scrub and pasture. The moorland may offer a seasonal food resource of ground nesting birds, amphibians, reptiles and insects; although these items constitute only a small part of a wildcat diet. The forestry plantation in the northern part of the Site is likely to offer a source of small mammals such as field vole *Microtus agrestis* which can form a key component of a wildcat diet.

10.105. The species may be present in the surrounding locale and the habitats within the Site may provide some limited foraging as part of a wider territory.

Freshwater Pearl Mussel

10.106. No evidence of freshwater pearl mussel was recorded during baseline surveys within the Site in 2010, with the majority of watercourses present considered to provide sub-optimal conditions for the species, comprising of mobile cobble or pebble substrate, torrential flows with exposed bedrock sections, or slow flowing peat or silt dominated substrate.

10.107. NatureScot do hold historic records for the species within the local area outside the Site (as detailed in the Lochluichart Wind Farm Extension ES) but their presence within the Site is considered to be unlikely following the subsequent erection of the Glascarnoch Dam, which prevents salmonid species passage^{xlviii} to the water courses within the Proposed Development.

Fisheries

10.108. The Site falls within the Loch Glascarnoch catchment and the nearest classified watercourse is located outside the Site within the operational Lochluichart Extension I Wind Farm: the Allt Coire Mhuilidh, a tributary of the River Conan. The remainder of the watercourses within the Site are not classified^{xlix}.

10.109. The Cromarty Firth Fisheries, Fishery Management Plan (2008^l), indicates that the Site falls within the Bran sub-catchment area where salmon are known to be absent.

10.110. During consultation for the Operational Schemes, the Cromarty Firth Fisheries Board confirmed the absence of migratory fish (salmon) within the Site.

10.111. The electrofishing survey identified the presence of brown trout at six of the seven sample points. The survey confirmed all streams within the Site were subject to major obstacles for fish migration (i.e. hydroelectric dams) and therefore brown trout populations are year-round residents.

Additional Species

10.112. Site habitats, particularly within the north eastern extent, provide a suitable mosaic of habitats for reptiles and amphibians. The presence of common lizard *Zootoca vivipara* has been confirmed from incidental observations of the species during baseline surveys detailed herein and it is possible that adder *Vipera berus* may also be present.

10.113. No further species are considered likely to be significantly impacted by the Proposed Development.

Embedded Mitigation and Scheme Design Evolution

- 10.114. Full details of the scheme design evolution and embedded mitigation measures are detailed in Chapter 3 'Description of the Proposed Development'.
- 10.115. The adoption of embedded mitigation measures to avoid or minimise adverse effects upon ecological features resulting from the proposed scheme has been part of the iterative design process.
- 10.116. Design consideration and measures to avoid and minimise effects have included:

Land-take

- 10.117. Existing access tracks will be upgraded where possible to minimise habitat loss.
- 10.118. Proposed turbine locations, proposed access tracks and infrastructure have been designed to minimise the requirement for land-take and the number of water crossings, reducing the loss of semi-natural and potentially sensitive habitats.
- 10.119. The scheme design has also sought to avoid sensitive bog habitat, in so far as is possible. Cable connections on the Proposed Development between proposed turbines have also been routed alongside access tracks to minimise any further habitat losses and fragmentation.

Bat Habitat Features

- 10.120. An 80m keyhole for forestry clearance has been adopted around each turbine. Chapter 16 'Forestry' provides further details of removal. It is not proposed that areas will be re-stocked within the Proposed Development.
- 10.121. A minimum 50m buffer (from blade tip) was applied to watercourses, woodland edges, and mature trees in so far as possible, to protect potential bat flight lines and areas of higher foraging and commuting interest for bats typically associated with such habitats.

Watercourses

- 10.122. A minimum 50m buffer between scheme infrastructure was applied around all watercourses so far as possible. The design process reduced the number of watercourse crossings to one.
- 10.123. Existing knowledge of water voles within the Proposed Development influenced the design of proposed water crossings (see **Figure 3.10**).

Construction Environmental Management Plan (CEMP)

- 10.124. A CEMP will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance (SNH, 2015) and as detailed within Chapter 12: Hydrology and Hydrogeology of the 2019 EIA Report.
- 10.125. The CEMP will also include full details of restoration/re-instatement of habitats during the construction phase. The CEMP will include the provision of an Ecological Clerk of Works during the construction phase, tool-box talks,

protection of sensitive habitats, soil stripping, soil & peat storage and method statements for restoration/re-instatement. Further details provided under Mitigation.

- 10.126. CEMP would also include Habitat Specific Protection Plans (HSPPs) detailing good practice measures for construction works within wet heath and blanket bog habitats. HSPPs would detail measures required to manage construction works within these sensitive habitats and include habitat restoration measures.
- 10.127. The CEMP will be submitted to THC for approval prior to the commencement of construction works, in consultation with the Scottish Environmental Protection Agency (SEPA) and NatureScot.
- 10.128. The CEMP will serve to negate any potentially significant effects upon ecological features as a result of the escape of sediments and pollutants beyond the footprint of the Proposed Development.

Habitat Management Plan (HMP)

- 10.129. A HMP will be produced which will include restoration measures of the most sensitive habitats and subsequent monitoring will measure the effectiveness of restoration works, with restoration works adaptable in response to monitoring outcomes. The HMP will also include the management of habitats across the Site to provide an overall net gain.

Fisheries

- 10.130. Proposed watercourse crossing will comprise bottomless arched culverts in accordance with current SEPA guidance (2010^{li}). This will maintain the existing bed substrate, hydraulic connectivity and passage for fish and additional wildlife such as water vole and otter).
- 10.131. The proposed water crossing will also be of sufficient size so as not to restrict or concentrate flows downstream and to convey flows during periods of heavy rainfall (e.g. 1 in 200 year event plus climate change allowance).
- 10.132. In addition, as detailed above, the CEMP prepared for the Proposed Development will include all good practice construction measures and pollution prevention controls, to negate potentially significant effects upon the aquatic environment over the construction phase and operational lifetime of the development.
- 10.133. A monitoring plan will also be established and incorporated into the CEMP in consultation and agreement with SEPA and local fisheries interest groups. The aim of the monitoring plan would be to characterise baseline conditions prior to construction works commencing and to continue throughout the construction and operational phase to confirm that the mitigation measures with respect to water quality and maintenance of potential fish passages are performing.
- 10.134. The monitoring plan would also include details of response and remediation measures in the event mitigation measures are found not to be performing.

Important Ecological Features

- 10.135. A summary of important ecological features is provided in Table 10.7 below. The level of importance assigned to each species is based upon baseline survey results and, for the purpose of consistency for wind farm development at this locale with reference to EIA documentation for the Consented Development and Operational Schemes and Corriemoillie.
- 10.136. Features which are unlikely to be affected by the Proposed Development or which are considered sufficiently widespread, unthreatened or resilient to impacts from the Proposed Development, and hence will remain viable and sustainable, have not been subject to a detailed assessment and have been scoped-out.
- 10.137. Potential for impacts on surface water, groundwater, peat and GWDTEs are discussed separately in Chapter 12: Hydrology.

Table 10.7 Summary of important ecological features.

Ecological Feature	Importance	Scoped in/out detailed assessment
Designated Sites	International/National	The Proposed Development does not form part of any statutory designated site for nature conservation. By virtue of spatial separation and embedded mitigation measures in relation to good practice construction measures and pollution prevention controls (as detailed within Chapter 12: Hydrology and Hydrogeology) no direct or indirect effects upon ecological qualifying interests of any nationally or internationally designated site for nature conservation will occur. Scoped out of detailed assessment.
Habitats	Blanket bog and Wet Heath- Regional Other habitats - Local	Habitat loss within the Site is minimised through the use of existing access tracks for the Operational Schemes and Corriemoillie. Direct land-take resulting in some loss of Annex 1 habitat types will be unavoidable given their widespread nature throughout the Proposed Development. Additional temporary habitat losses are also anticipated to occur during the construction phase. The potential for indirect effects on adjoining/nearby habitats for example through local changes to hydrology is also considered. Scoped in to detailed assessment.
Bats	Local	No potential maternity and/or hibernation/swarming sites have been identified within at least 200 m plus blade tip of the proposed turbine locations. Therefore, in accordance with NatureScot (SNH, 2019)

Ecological Feature	Importance	Scoped in/out detailed assessment
		<p>guidance, effects on roosting bats can be scoped-out.</p> <p>Bat species likely to be present are considered to be at high risk of collision and moderate population vulnerability in accordance with NatureScot guidance (SNH, 2019). Bat activity recorded during baseline survey in 2015 was very low and attributed to common and widespread species.</p> <p>Overall habitats within the Proposed Development provide low habitat suitability for foraging and commuting bats and provide no roosting opportunities.</p> <p>On the basis of very low bat activity levels recorded, sub-optimal habitat, the geographical location, the availability of high value foraging habitat beyond the Proposed Development and the mortality risk to bats arising from the Proposed Development is considered to be low. Over the long-term, operational effects are unlikely to adversely affect the conservation status of any bat species, and as such are not considered to be significant at any population level.</p> <p>Furthermore, embedded into the design of the Proposed Development is a 50m (from blade tip) buffer between turbines and bat habitat features and the avoidance of turbines within areas of high bat activity. On consideration of the embedded mitigation, low activity levels recorded and low site risk, bats are not considered likely subject to significant effects.</p> <p>Scoped out of detailed assessment.</p>
Otter	Local	<p>Watercourses on Site are considered to provide suitable foraging and commuting opportunities for otters and the species presence has been established within the surrounding areas.</p> <p>Baseline surveys have however, not identified the presence of the species within the Proposed Development and as such no impacts upon the species are predicted.</p> <p>Scoped out of detailed assessment.</p> <p>Precautionary mitigation measures are outlined to ensure legislative compliance during the construction phase.</p>
Pine Marten	Local	<p>Habitats with the Site are largely unsuitable for pine marten and no potential den sites locations have been recorded within the</p>

Ecological Feature	Importance	Scoped in/out detailed assessment
		<p>Proposed Development during baseline surveys.</p> <p>Some occasional use of the open moorland habitats by individual pine martens is possible however, overall habitat losses are Negligible.</p> <p>Scoped out of detailed assessment.</p> <p>Precautionary mitigation measures are outlined to ensure legislative compliance during the construction phase.</p>
Water Vole	Regional	<p>Water vole presence has been established within several water courses within and intersecting the Site. It is also assumed that the species will utilise minor burns and ditches to disperse across and beyond the Site. The Proposed Development therefore has the potential to result in habitat loss for the species together with destruction of, or preventing access to, burrows and killing or injuring individuals.</p> <p>Scoped into detailed assessment.</p>
Badger	Local	<p>No evidence of the badger presence within the Site has been recorded during baseline surveys. Habitats present within the Site are also considered sub-optimal for sett building.</p> <p>Scoped out of detailed assessment.</p> <p>Precautionary mitigation measures are outlined to ensure legislative compliance during the operational phase.</p>
Red Squirrel	Local	<p>No evidence of the red squirrel presence within the Site has been recorded during baseline surveys and woodland habitats within the Site are currently considered suboptimal for the species.</p> <p>Scoped out of detailed assessment.</p> <p>Precautionary mitigation measures are outlined to ensure legislative compliance during the operational phase.</p>
Wildcat	Local	<p>No evidence of wildcat identified within the Site and the habitats are considered suboptimal; however habitats may support the species as part of a wider foraging territory.</p> <p>Scoped out of detailed assessment.</p> <p>Precautionary mitigation measures are outlined to ensure legislative compliance during the construction and operational phase.</p>

Ecological Feature	Importance	Scoped in/out detailed assessment
Freshwater Pearl Mussel	Regional	<p>Surveys in 2009 did not identify the species within the Site and the species is considered to be absent. NatureScot consultation for the Consented Development (11/05/2017) agreed that the species can be scoped out of the assessment.</p> <p>Scoped out of detailed assessment.</p>
Fisheries	Regional	<p>Brown trout have been established as present within the Site but Atlantic salmon are considered unlikely to be present due to major migration barriers downstream. The Proposed Development has the potential to directly impact on fish habitats at watercourse crossings. In addition, there may potentially be indirect effects on fish, including downstream from the Proposed Development, where unmitigated works could result in sedimentation or other pollution.</p> <p>Embedded mitigation including the adoption of bottomless culverts for watercourse crossings together with good practice construction measures and pollution prevention controls (as detailed within Chapter 12: Hydrology and Hydrogeology) are however considered adequate to avoid any potentially significant adverse effects upon local fish populations.</p> <p>Scoped out of detailed assessment.</p>
Additional Species	Local	<p>Habitats within the Site do provide some suitability for reptile species, with common lizard recorded during baseline surveys. The presence of adder is also likely. Overall, the predominant habitats within the Proposed Development to be impacted by the proposed scheme, comprising open heathland, provide sub-optimal habitats for reptiles and are extensive within the surrounding wider area. Significant adverse effects upon reptile species are not predicted.</p> <p>Scoped out of detailed assessment.</p> <p>Given the protection afforded to individual reptiles against intentional or reckless killing and injuring reptiles are considered for mitigation, to ensure legislative compliance during the construction and decommissioning phases.</p>

Potential Effects in the Absence of Mitigation

- 10.138. This section identifies the potential effects upon habitats and water vole in relation to the construction and operational phases of the Proposed Development.
- 10.139. Impacts arising from the decommissioning phase of the wind farm have not been presented in detail because they are considered to be of a similar nature to the construction issues identified but of a smaller scale and shorter duration. Therefore, effects arising from decommissioning are anticipated to be broadly similar in nature to, but of a lower level effect than, those arising during construction phase.

Habitats

- 10.140. There are three main ways by which habitat features may be affected during the construction phase:
- Direct loss – to accommodate the Proposed Development infrastructure. These losses are considered permanent in the context of this assessment;
 - Disturbance – the effects of disturbance are variable in their extent, depending on the nature of the disturbance and sensitivity of the habitat feature. Some disturbance types (for example, creation of temporary hard standing areas at the contractor’s compound) result in medium - to long-term disturbance which require extended recovery periods. In other cases (for example, installation of cables at the sides of access tracks, traversing of machinery) disturbance is short-term, and certain habitat types are able to recover quickly; and
 - Indirect effects – these primarily relate to changes in hydrology of wetlands in the context of a wind farm development, the potential for runoff, erosion and sedimentation, along with pollution which may result in the event of contaminant spillage.
- 10.141. The potential for effects upon the hydrological supporting conditions of bog, water quality, soils and peat as a result of surface and groundwater flows, sediment and contaminant discharges, soil loss, erosion and compaction are detailed within Chapter 12: Hydrology and Hydrogeology. Overall potential effects upon the aquatic environment are considered to be highly localised and mitigated through sensitive scheme design, standard best practice construction methods and pollution prevention controls in accordance with current guidance. As such habitat deterioration effects are not discussed further within this assessment.
- 10.142. The areas of plantation forestry are considered synonymous with the bog and wet heath habitats due to their poor nature. The plantation itself is considered to be of negligible value.

Construction Effects

- 10.143. The total footprint of the Proposed Development i.e. the area to be permanently lost under the surface footprint of the proposed turbine hardstandings, access track and associated infrastructure is approximately 10.3ha. This constitutes approximately 1.73% of the total Proposed Development (596ha).

- 10.144. An additional 21.88ha will be temporarily affected during the construction phase to facilitate construction working areas and two borrow pits.
- 10.145. A summary of habitats to be lost permanently under the built footprint of the Proposed Development is provided in Table 10.8.

Table 10.8: Permanent habitat losses.

Phase 1 Habitat Type	Area Lost	Corresponding NVC Community
Blanket bog	7.5ha	M17
Wet heath	2.80ha	M15

- 10.146. A total of 10.3ha of Annex 1 habitats, comprising blanket bog (M17) and wet heath (M15) habitats, will be lost permanently during construction (**Figure 10.1 and 10.2**). Up to 55% of this habitat loss (5.6ha of 10.3ha) comprises poor-quality plantation forestry on top of blanket bog and wet heath habitats, which are therefore poor quality examples of the Annex 1 habitat types.
- 10.147. Permanent habitat loss represents a very small loss in the total area of these habitats remaining both within the Site and the surrounding area. Thus, the impact will be minor and unlikely to result in a significant effect in a local context.
- 10.148. Habitats of local importance would also not be considered significant in the context of their availability within the Site and local area.
- 10.149. The notable plant species (alpine bearberry, dwarf birch and lesser twayblade) are all located within blanket bog habitat and the loss of this habitat may also result in the reduction of these species in the locale, albeit at a low level.
- 10.150. Indirect physical effects arising from the development (such as alterations to drainage patterns) will be limited by the adoption of proven construction techniques that minimise environmental damage and maintain the integrity of the peatland system. This will include the use of floating roads where the tracks cross hydrologically sensitive areas of deeper peat. Full details are presented in Chapter 12.
- 10.151. During the construction phase an additional 21.88ha of temporary onsite habitat disturbance will also occur. This area is based on highly pre-cautionary 30m corridor around the permanent footprint of the development, required for construction working areas, construction compounds, temporary laydown areas, drainage, borrow pits and cabling. Habitats primarily affected will be blanket bog M17 (9.37ha) and wet heath M15 (12.52ha).
- 10.152. These temporary Annex 1 habitat losses will be reinstated and restored following the completion of construction works in accordance with the CEMP, and as such losses would be considered short-term and reversible. Subsequently the impact on these Annex 1 habitats will be of negligible/minor magnitude and therefore not significant.
- 10.153. The on-site habitats to be lost both permanently and temporarily as a result of the Proposed Development are considered to be widespread habitats throughout the Northern Highlands.

Operational Effects

- 10.154. During the operational phase there will be a small increased risk of runoff and pollution however, this will be mitigated through scheme design and the implementation of pollution prevention measures during any maintenance works.
- 10.155. Any impact is considered to be of negligible magnitude and effects would be not significant at any geographical scale.

Decommissioning Effects

- 10.156. The potential decommissioning effects are considered to be of a similar nature as temporary habitat losses incurred during the construction phase, and as such will not be significant.

Water Vole

- 10.157. The presence or potential presence of water vole has been established at several locations along watercourses within intersecting the Site. It is also assumed that the species will utilise minor burns and issues to disperse across the Site and into the wider area.

Construction Effects

- 10.158. The construction of the Proposed Development has the potential to impact upon water voles and lead to a population level effect at a local level as a result of:
- Habitat loss and deterioration;
 - Habitat fragmentation;
 - Incidental mortality and disturbance; and,
 - Pollution.
- 10.159. The spatial extent over which works will be occurring is considered to be highly localised and is only likely to impact upon a small number of individual water vole territories.
- 10.160. The construction of one water course crossing as shown in **Figure 10.1** and **10.2** will require the permanent loss of approximately 20m of ditch bank habitat (10m assumed either side of the ditch) available for potential use by the established water vole population within the Site.
- 10.161. In the context of remaining available and suitable habitat for water voles within the Site and locally, the effects of the Proposed Development are not anticipated to be significant and will not affect the favourable conservation status of the species.
- 10.162. The design of crossings can result in the severance of habitats and restriction of movement for water voles from these territories along watercourses within the Site. One unavoidable crossing is required over a burn supporting water voles. Without mitigation, habitat fragmentation is considered certain, permanent and largely irreversible and an impact of medium magnitude and significant on local water vole populations.

- 10.163. The construction of watercourse crossing has the potential to result in the damage or destruction of water vole burrows and/or killing or injuring of individual water voles. The mobility of the species allows for escape and as such loss of life is considered to be unlikely and comprise no more than a minor/medium magnitude impact and significant effect on local water vole populations.
- 10.164. Noise and visual disturbances are generally considered unlikely to have any significant impacts upon water voles (Dean *et al.*, 2016) however, should disturbances occur to the point at which a water vole may potentially abandon its burrow, this would constitute a breach of the provisions of the Wildlife and Countryside Act 1981 (as amended in Scotland).
- 10.165. The potential for effects upon water voles as a result of the escape of sediments and pollutants into the surrounding aquatic and terrestrial environment is considered to be adequately mitigated through embedded sensitive scheme design, standard best practice construction methods and pollution prevention controls in accordance with current guidance, as detailed within Chapter 12: Hydrology and Hydrogeology.
- 10.166. Mitigation measures are required and are outlined to ensure legislative compliance during the construction phase.

Operational Effects

- 10.167. No potentially significant effects to water voles during the operational phase are anticipated.

Decommissioning Effects

- 10.168. Decommissioning phase effects upon water vole as a result of habitat loss, deterioration, incidental mortality and disturbance are considered to be largely consistent with construction phase impacts and would not be significant.
- 10.169. Mitigation measures are however required and are outlined to ensure legislative compliance.

Mitigation

Ecological Clerk of Works

- 10.170. A suitably qualified and experienced Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction activities and through whom appropriate ecological advice will be provided throughout the construction phase of the Proposed Development.
- 10.171. The ECoW will be responsible for undertaking and/or co-ordinating checks for protected species before construction activities commence. The ECoW (or appointed 'clerks' on behalf of the ECoW) will also maintain a watching brief as necessary throughout the construction phase to ensure compliance with relevant legislation.
- 10.172. The ECoW will be responsible for overseeing water-crossing installations and upgrading works, implementing the Watercourse Crossing Method Statement (WCMS) and monitor the recommended mitigation measures to ensure they are appropriate and functioning correctly to protect watercourses.

- 10.173. The detailed scope of the role and responsibilities of the ECoW will be agreed in consultation with THC and NatureScot.

Protected Species

- 10.174. Pre-construction surveys for protected species will be undertaken no more than 6 months before commencement of construction. Surveys will be undertaken in accordance with current survey guidance within the working areas and appropriate buffers.
- 10.175. Updated ecological information obtained from the pre-construction protected species' surveys will be used to inform and guide the implementation of Species Protection Plans (SPPs) or species-specific mitigation plans, identification of any licencing requirements and appropriate mitigation (including micro-siting) if required.
- 10.176. SPPs will be designed to provide the contractor and ECoW with approved methodologies and mitigation measures for carrying out certain activities and will be agreed through consultation with THC and NatureScot.

Water Vole

- 10.177. Water voles are protected in Scotland under the provisions of the Wildlife and Countryside Act 1981 (as amended). The species is listed on Schedule 5 of the Act and is protected under Section 9, which makes it an offence to:
- Damage, destroy or obstruct access to a water vole burrow; or
 - Disturb a water vole whilst it is using its burrow.
- 10.178. The layout of the Proposed Development has been optimised in so far as has been possible to avoid construction activities occurring in close proximity to the watercourse network within the Proposed Development and the requirement for watercourse crossings.
- 10.179. One watercourse crossing is however unavoidable to permit an operational development and will therefore likely result in the damage or destruction of burrows and/or disturbance of water voles within their burrows.
- 10.180. Water vole populations are highly dynamic with the potential for individual water voles to establish or abandon territories in relatively short spaces of time. As such, the SPP will be finalised in consultation with THC and NatureScot following a pre-construction water vole survey undertaken (as above) in accordance with current guidance. Mitigation measures will include a 10m exclusion zone around active water vole burrows, informed by the pre-construction survey. If this cannot be achieved, a licence from NatureScot may be required. Full details will be included within the CEMP.
- 10.181. Water vole monitoring will be undertaken in the first three years of operation to establish if water vole colonies have been affected by the Proposed Development. Remedial measures and/or habitat enhancement measures (if required) can be proposed based on monitoring results.

Reptiles (and Amphibians)

- 10.182. Common reptiles are afforded partial protection under Schedule 5 of the Wildlife and Countryside Act 1981(as amended). This makes it an offence to "intentionally or recklessly kill or injure" a reptile.
- 10.183. Common lizard and adder are the only reptile species likely to be found during construction works associated with the Proposed Development, with only incidental observation of common lizard recorded during baseline surveys.
- 10.184. A SPP will be prepared for reptiles (and amphibians) prior to the commencement of construction activities. The SPP will detail measures to be implemented during construction activities to protect reptiles (and amphibians encountered) from harm during the construction of the scheme. This will be agreed in consultation with NatureScot and THC.
- 10.185. The SPP will also detail emergency procedures to be implemented by site workers in the event reptiles are encountered during works.

Habitat Reinstatement

- 10.186. Full details of habitat restoration/reinstatement will be provided within the CEMP. Measures will follow 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites 2009' and 'Good Practice during Wind Farm Construction – Joint Publication 2015'. Habitat restoration will be overseen by the ECoW and include the following fundamental principles:
- Following the construction phase, all temporary site offices, containers, machinery and equipment shall be removed and temporary construction compound(s), track verges and any temporary working or stockpiling areas shall be fully reinstated, unless otherwise agreed with the LPA.
 - Soils and turves will be stripped and stored in line with current good practice guidance, and maintained in a viable condition ready for reinstatement.
 - So far as reasonably practical, all disturbed areas which require reinstatement will be reinstated with the same vegetation types as exist at present, thereby ensuring minimal disruption to the surrounding habitats.
 - Storage of materials will not be permitted outside of approved and prepared storage areas or within 50m of watercourses.
 - Stripped soil will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and local/geological/hydrological characteristics.
 - Subsoil, topsoil and turfs will be replaced in same order as removed.
 - During periods of dry weather, exposed peat shall be kept moist.
 - Unless otherwise agreed, turfs will be re-instated following the works and oriented vegetation side up.
 - Reinstatement will be carried out as soon as possible following stripping to ensure integrity of material is maintained.
 - Where turfs are not available, areas will be left to vegetate naturally.
 - Excess soil or contaminated soil will be disposed of offsite at a licenced facility.

- Reinstatement of construction area will be undertaken to a high standard, using existing soil and vegetation material where possible, in accordance with current best practice.
 - If re-vegetation is not successful and has not occurred within an agreed period of time, further consultation with NatureScot and SEPA will agree a course of action which could include re-seeding using a native mix or translocation from other habitats onsite.
 - No mineral soil or clay based soil will be used for habitat reinstatement along the sides of tracks, to prevent silt run off into surrounding habitats.
 - Temporary laydown areas will avoid areas of blanket bog and guided by the ECoW.
- 10.187. Soil within areas of temporary use will also be protected once the top turf layer has been removed by the use of geotextile base to facilitate the removal of any engineer fill required.

General construction-related mitigation

- 10.188. The following actions are recommended to mitigate the ecological impacts associated with the development:
1. Works directly affecting watercourses, where a pre-construction survey indicates there is good quality water vole breeding habitat will be undertaken outwith the water vole breeding season (March to September; in upland habitat and depending on weather conditions the breeding season may be shorter).
 2. Site staff will be provided with information regarding the Site's ecological sensitivities. This will be implemented as part of the health and safety induction and appropriate text can be prepared by the ECoW to be read by the induction manager.
 3. Site compounds/material storage areas will be located as far as possible from the watercourses and all watercourses will be out of bounds to construction personnel (refer to guidelines in point 4 below).
 4. SEPA Guidance for Pollution Prevention (GPP)ⁱⁱⁱ will be applied during works to prevent watercourse pollution.
 5. Temporary lights, if used during construction, will be properly directed and fitted with shades to prevent light spillage outwith the working area. Temporary lights should not illuminate watercourses or the woodland edge.
 6. Holes (e.g. that may be present to lay infrastructure) will be covered at the end of each working day or a wooden plank placed inside to allow a mammal (e.g. otter) to escape, should it enter the hole. Any temporarily exposed open pipe system should be capped in such a way as to prevent animals gaining access.
 7. In the event that a protected species is discovered on the Site all work in that area will stop immediately and the ECoW contacted. Details of the local police Wildlife Crime Officer, NatureScot Area Officer and Scottish Society for the Prevention of Cruelty to Animals (SSPCA) officer will be included in Site emergency procedure documents.

8. The loss of blanket bog habitat is an unavoidable consequence of the Proposed Development. Further, incidental losses of habitat will be avoided by minimising the footprint of the construction activity. This will be achieved by operating machinery and storing materials within the footprint of permanent construction features wherever practicable, such as the access tracks and crane pads, for example. This will also be reinforced through appropriate training of the Site staff and by ensuring that vehicles and their operators do not inadvertently stray onto adjacent habitat areas.

Residual Effects

- 10.189. Providing the implementation of mitigation measures is carried out, including those measures embedded into the scheme design, no significant residual effects are anticipated.

Cumulative Effects

- 10.190. In accordance with NatureScot guidance (2012), a cumulative impact assessment need only be sought where it is considered that a proposal could result in significant cumulative impacts. Notwithstanding, the nearby Corriemoillie Wind Farm is located within a different catchment to the Proposed Development and predicted ecological effects of the other Operational Schemes were determined to be of low (minor) significance. Likely impacts of the Proposed Development will not extend beyond the boundaries of the Proposed Development and subsequently no potentially significant cumulative effects upon ecological features are reasonably predicted to occur.

Enhancement Measures

- 10.191. The HMP will be produced which will include restoration measures of the most sensitive habitats and also provide enhancement of Annex 1 habitats within the Site. The HMP will also include measures to enhance the habitats within the Site for protected species.
- 10.192. The HMP will include a detailed work programme, method statements for habitat enhancement, reporting mechanisms and a monitoring and review strategy.
- 10.193. The HMP will be prescribed and agreed in consultation with THC and NatureScot and seek to provide biodiversity enhancement.

Additional Information and Updated Assessment of Effects

- 10.194. The Proposed Development is not anticipated to result in significant adverse effects on sensitive ecological features; however, in recognition of responses received through Scoping (Table 10.1) from THC and NatureScot, additional surveys will be undertaken in 2021 and comprise:
- Bat Activity Surveys following NatureScot guidance (SNH, 2019):
 - A spring, summer and autumn bat activity surveys, recording at least ten nights in each season.
 - Results will be uploaded to Ecobat and an updated Overall Site Risk Assessment will be provided in accordance with NatureScot guidance (SNH, 2019).

-
- Protected terrestrial mammal walkover in accordance with NatureScot guidance (2020)^{liii}.

10.195. On completion of surveys an updated assessment of effects will be provided.

Summary of Effects

- 10.196. No potentially significant effects upon ecological features resulting from the Proposed Development alone or in-combination are identified.
- 10.197. Mitigation measures are included for the for habitats and water voles and to ensure legislative compliance for other protected species. Providing implementation, no breach of the provisions of the relevant legislation will occur.

Table 10.9 Summary table of effects upon the recorded ecological features.

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance of effect and confidence level (following mitigation)
Habitats	Construction and operation of the Site infrastructure and construction-related mobilisation or release of contaminants.	Loss of 10.3ha or 1.7% and reduction in habitat quality.	Negative, permanent. Minor magnitude. Non-Significant effect.	CEMP and Pollution Prevention Measures. Habitat re-instatement following construction.	Not significant
Water Vole	Construction related earthworks	Habitat loss	Negative, permanent, minor/negligible magnitude impact. Non-significant effect.	Install arched culverts instead of piped culverts. Micro-siting to avoid water vole burrows.	Not significant
		Habitat severance	Negative, permanent, medium magnitude impact. Significant effect.	Install arched culverts instead of piped culverts. Micro-siting to avoid water vole burrows.	Not significant
		Pollution of aquatic habitats	Negligible magnitude impact and non-significant effect.	Apply SEPA pollution prevent controls. Place compounds as far as possible from watercourses.	Not Significant.

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance of effect and confidence level (following mitigation)
		Loss of life	Permanent, medium magnitude impact. Significant effect.	Mitigation licence may be required from NatureScot if infrastructure cannot be micro sited. All works to be completed in full accordance with any licence issued. Stop works if a water vole is observed and seek advice from EcoW. Place ramps in open trenches and cap pipes to stop fauna entering and becoming trapped.	Not significant.
	Construction-related noise, vibration and lighting.	Physical disturbance	Negligible magnitude impact and non-significant effect.	Use of shades to prevent illumination of watercourses or woodland edges. Stop works if a protected species is observed and seek advice of ECoW.	Not significant.

References

- i CIEEM (2018, updated 2019) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester
- ii NatureScot is the operating name of Scottish Natural Heritage (SNH)
- iii Scottish Natural Heritage (2014, updated 2018) Environmental Impact Assessment Handbook. V5.
- iv SNH (2012) Assessing the cumulative impact of onshore wind energy developments. SNH, Inverness.
- v Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition. Bat Conservation Trust, London.
- vi Hundt (2012) Bat Surveys: Good Practice Guidelines 2nd edition. Bat Conservation Trust, London.
- vii SNH (2019) Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation. Joint Publication with SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT)
- viii SNH (2019) Good Practice During Wind Farm Construction. SNH, Inverness.
- ix SEPA (2017) Guidance on Assessing the Impacts of Groundwater Abstractions and Groundwater Dependant Terrestrial Ecosystems. SEPA.
- x NatureScot (2020). SNH General Pre-application and/ Scoping Advice to Developers for Onshore Wind Farms. SNH, Inverness.
- xi <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map>
- xii NatureScot (2020a) Standing Advice for Planning Consultations – Protected Species: Badger. SNH, Inverness.
- xiii NatureScot (2020b) Standing Advice for Planning Consultations – Protected Species: Bats. SNH, Inverness.
- xiv NatureScot (2020c) Standing Advice for Planning Consultations – Protected Species: Freshwater Pearl Mussel. SNH, Inverness.
- xv NatureScot (2020d) Standing Advice for Planning Consultations – Protected Species: Great Crested Newt. SNH, Inverness.
- xvi NatureScot (2020e) Standing Advice for Planning Consultations – Protected Species: Otter. SNH, Inverness.
- xvii NatureScot (2020f) Standing Advice for Planning Consultations – Protected Species: Pine Marten. SNH, Inverness.

xviii NatureScot (2020g) Standing Advice for Planning Consultations – Protected Species: Red Squirrel. SNH, Inverness.

xix NatureScot (2020h) Standing Advice for Planning Consultations – Protected Species: Water Vole. SNH, Inverness.

xx The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

xxi JNCC (2019) The UK Approach to assessing Conservation Status for the 2019

Article 17 reporting under the EU Habitats Directive. Joint Nature Conservation Committee,

Peterborough. Available to download from <https://jncc.gov.uk/article17> [accessed May 2020].

xxii The Wildlife and Countryside Act 1981 (as amended in Scotland under the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011.

xxiii <http://www.legislation.gov.uk/ukpga/1992/51/contents>.

xxiv

https://www.highland.gov.uk/downloads/file/3026/highland_statutorily_protected_species_supplementary_guidance

xxv CIEEM (2018, updated 2020) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

xxvi Corriemoillie Wind Farm (2016) Post Consent Mammal Survey Report 2014. Amec Environment & Infrastructure UK Limited. UK.

xxvii Corriemoillie Wind Farm (2016) Phase 1 Habitat Survey Report 2015. Amec Environment & Infrastructure UK Limited. UK.

xxviii JNCC (2010). *Handbook for Phase I Habitat Survey – a Technique for Environmental Audit*. JNCC, Peterborough.

xxix Scotland and Northern Ireland Forum for Environmental Research (SNIFFER, 2009)WFD95:A Functional Wetland Typology for Scotland – Field Survey Manual. Version 1.

xxx Rodwell, J. S. (2006). National Vegetation Community Users’ Handbook. JNCC, Peterborough.

xxxi Bat Conservation Trust (2007). Bat Survey Guideline. Bat Conservation Trust, London.

xxxii Hundt (2012) Bat Survey Guidelines. The Bat Conservation Trust, London

xxxiii SNH (2017a) Protected Species Advice for Developments: Pine Marten. SNH, Inverness.

-
- xxxiv SNH (2017b) Protected Species Advice for Developments: Wildcat. SNH, Inverness.
- xxxv SNH (2017c) Protected Species Advice for Developments: Badger. SNH, Inverness.
- xxxvi SNH (2017d) Protected Species Advice for Developments: Otter. SNH, Inverness.
- xxxvii SNH (2017e) Protected Species Advice for Developments: Water vole. SNH, Inverness.
- xxxviii SNH (2017f) Protected Species Advice for Developments: Red squirrel. SNH, Inverness.
- xxxix Cresswell W.J. et al. (Eds.) (2012). UK BAP Mammals – Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. Mammal Society, Southampton.
- xl Strachan R et al. (2011). Water Vole Conservation Handbook Third Edition. Wildlife Conservation Research Unit, Oxford.
- xli Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. The Mammal Society, London.
- xlii Cosgrove, P.J. & Young, M.R. (1998). The status of the freshwater pearl mussel *Margaritifera margaritifera* in Scotland. Confidential report to Scottish Natural Heritage.
- xliii YOUNG, M.R., COSGROVE, P.J. & HASTIE, L.C. 2001. The extent of, and causes for, the decline of a highly threatened naiad: *Margaritifera margaritifera*. In: Ecology and evolutionary biology of the freshwater mussels Unionoida (eds. G. Bauer & K. Wächtler), pp337-357. Springer-Verlag, Berlin (Ecological studies, Vol. 145).
- xliv Galloway Fisheries Trust (2006), Lochluichart Windfarm Scheme: Habitat Survey.
- xlv ESS Ecology (2009) Electro-fishing Report, Planned Lochluichart Windfarm, report to Infinergy Ltd
- xlvi The Habitats Directive only includes 'active' bogs that are typified by a high cover of *Sphagnum*.
- xlvii http://jncc.defra.gov.uk/pdf/Habitat_Management_for_bats.pdf
- xlviii Presence of salmonid fish and freshwater pearl mussel are synonymous as the species rely on salmonid fish during their larval stage.
- xliv <https://map.environment.gov.scot/sewebmap/>
- l <http://cromarty.dsfb.org.uk/files/2012/08/cromarty-fishery-management-plan.pdf>
- li SEPA (2010) Engineering in the water environment: good practice guide - river crossings.

^{lii} Available online at <http://www.netregs.gov.uk/netregs/links/63875.aspx>.

^{liii} <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species>